London School of Economics and Political Science

Rethinking the Bengal Connection: Opium Monopoly and Fiscal Capacity in British India, 1862–1908

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Declaration

I certify that the thesis I have presented for examination for the PhD degree of the London School of Economics and Political Science is solely my own work other than where I have clearly indicated that it is the work of others (in which case the extend of any work carried out jointly by me and any other person is clearly identified in it).

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Abstract

It is well known that variations in state capacity between different colonial regimes have had persistent effects in many formerly colonised regions. In particular, the existing literature identifies the presence of taxable trade, pre-colonial fiscal centralisation, population density, and administrative manpower as major determinants of the resources available to colonial states.

However, within this framework the British Empire in India presents a puzzle since it possessed many of these preconditions for fiscal capacity formation, but state revenue remained very small relative to the size of the population and the economy.

This thesis, using the case of the Government of India's Bengal Opium Monopoly, argues that in practice during a long period of colonial rule, the British Indian state avoided the introduction of broad, informationally-intensive taxes, relying instead on charges for government services and commodity revenues, in order to minimise demand for greater popular involvement in government. This trade-off had significant impacts on the quality of government, especially with regard to revenue collection, limiting the development of the colonial state relative to other colonies in Asia.

This thesis is divided into three papers. The first paper examines the Government of India's attempts to control the international market for the drug. While these efforts resulted in greater stability to prices, analytical and informational constraints prevented effective revenue maximisation.

The second paper focuses on the government's procurement of the drug; in this setting the difficulty of collecting and processing information about local agrarian conditions forced the use of decentralised decision-making, thereby limiting oversight, preventing effective control of costs, and encouraging corruption.

Finally, the third paper uses the Government of India's reaction to growing ideological pressure around opium to argue that the difficulty of adapting reforms to local political sensitivities in individual regions heavily curtailed substantive changes to the revenue framework.

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All remaining errors and imperfections are, of course, my own.

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Introduction

0.1 The Opiate of the State

When people today imagine the opium trade among the first things that they generally think of are its links with the British Empire and the drug's role as a tool of imperial penetration, particularly in China. However, although the strong financial interest in opium of various colonial states in South and Southeast Asia has commonly been noted in the popular and academic literature, only limited attention has been paid to its role in the development of colonial states in those regions.[1] While the idea of a state financing itself through the sale of addictive substances may appear extraordinary to modern eyes, in the context of the nineteenth century it was fairly typical of the ways colonial governments sought to pay for themselves. This thesis looks at one specific instance, the Bengal Opium Monopoly, under which the colonial Government of India enforced a monopsony over the production of opium in a large part of India, manufactured the drug, and sold it to exporters at a heavy markup. During India's long colonial period, constraints on the ability of the state to process information and manage its administrative structure were fundamental in limiting revenue maximisation. More widely, this case suggests that such factors were more important than the initial conditions of colonisation in explaining the low level of state capacity in some colonial states.

Following the well-known work of Acemoglu, Johnson, and Robinson, it has become a commonplace in economic history that past institutions can have persistent effects on long-run development. In particular, this type of literature focuses on the role of the extractive nature of colonial states in explaining dramatic differences

[1] See Section 0.2.

in modern per capita income.[2] In response a number of authors have questioned the degree to which such states were really entirely extractive in nature, instead emphasising relative fiscal weakness of many colonial governments as an explanation for the legacy of poor state development left in many formerly colonised countries. Particularly, this literature suggests that the resources available to colonial states fundamentally constrained the way in which state capacity developed.[3] Largely based on African examples, a number of reasons for the low level of fiscal capacity in some colonies have been proposed. The lack of pre-existing centralised fiscal institutions before the arrival of European colonial states, ease of evasion because of the abundance of land relative to the size of the population, the small size, expense, and limited penetration of the European administration, and the threat of tax revolts have all been suggested as possible causes of low fiscal capacity in many colonies.[4] Over time, work in this vein has also increasingly emphasised the importance of the availability of taxable trade to the level of fiscal development within colonies, to the point that a recent book has described it as "*the single most important determinant* of cross-colony variation in budget size."[5]

These theories would seem to predict that India should have had a relatively high level of fiscal capacity relative to other colonies, as most of the potential causes

[2]D. Acemoglu, S. Johnson, and J.A. Robinson. "The Colonial Origins of Comparative Development: An Empirical Investigation". *American Economic Review* 91.5 (2001), pp. 1369–1401, pp. 1369–1401

[3]A. Booth. "Night Watchman, Extractive, or Developmental States? Some Evidence from Late Colonial Southeast Asia". *Economic History Review* 60.2 (2007), pp. 241–266; A. Irigoin and R. Grafe. "Bargaining for Absolutism: A Spanish Path to Nation-State and Empire Building". *Hispanic American Historical Review* 88.2 (2008), pp. 173–209; L.A. Gardner. "Decentralization and Corruption in Historical Perspective: Evidence from Tax Collection in British Colonial Africa". *Economic History of Developing Regions* 25.2 (2010), pp. 213–236; E. Frankema. "Colonial Taxation and Government Spending in British Africa, 1880–1940: Maximising Revenue or Minimizing Effort?" *Explorations in Economic History* 48.1 (2011), pp. 136–149; L.A. Gardner. *Taxing Colonial Africa: The Political Economy of British Imperialism.* Oxford, 2012; E. Frankema and M. van Waijenburg. "Metropolitan Blueprints of Colonial Taxation? Lessons from Fiscal Capacity Building in British and French Africa, c. 1880–1940". *Journal of African History* 55.3 (2014), pp. 371–400; B. De Roo. "Taxation in the Congo Free State, An Exceptional Case? (1885–1908)". *Economic History of Developing Regions* 32.2 (2017), pp. 97–126; M. van Waijenburg. "Financing the African Colonial State: The Revenue Imperative and Forced Labour". *Journal of Economic History* 78.1 (2018), pp. 40–80; and T. Roy. "State Capacity and the Economic History of Colonial India". *Australian Economic History Review* 59.1 (2019), pp. 80–102

[4]See particularly the discussions in Gardner, *Taxing Colonial Africa*, pp. 4–13; and Frankema, "Colonial Taxation", pp. 136–149

[5]E. Frankema and A. Booth. "Fiscal Capacity and the Colonial State: Lessons from a Comparative Perspective". In: *Fiscal Capacity and the Colonial State in Asia and Africa, c. 1850–1960.* Ed. by E. Frankema and A. Booth. Cambridge, 2020, p. 15 Emphasis as in the original.

of lower fiscal capacity in colonial states are not very applicable in its case. In the first place, there is a long history of centralised fiscal institutions in India. In particular, under the Mughals most of India was covered by a relatively developed fiscal state, which was centered on monetised direct taxation.[6] Although the breakup of the Mughal empire in the eighteenth century did considerably disrupt this system, much of the underlying framework nevertheless survived until British rule.[7] In the second, British India was relatively densely populated, making it more difficult for individuals to escape taxes by relocating to unused land outside of the reach of the colonial state. Thirdly, while the actual European presence was still quite limited, the relative size of the colonial state was much larger in India than in most other colonies.[8] For example in 1901, the share of the population who were employed in government in British India was comparable to that in the U.K. and other colonies in Asia (Table 0.1).[9] More impressively, in spite of being the largest single part of the British Empire, the scale of the government relative to the physical size of India, while very more limited than the U.K., appears to have been high relative to other colonies, and was an order of magnitude larger than some places in Africa.

On the question of trade, the evidence is admittedly slightly more mixed. India functioned as a hub of Asian trade in both the pre-colonial and colonial eras.[10] Furthermore, although India's vast population meant that on a per capita basis its trade was relatively small, for almost all of the colonial period India had vastly more trade in absolute terms than almost any other colony. For example, at the turn of the

[6]J.F. Richards. "Fiscal States in Mughal and British India". In: *The Rise of Fiscal States: A Global History, 1500–1914*. Ed. by B. Yun-Casalilla and P.K. O'Brien. Cambridge, 2012, pp. 412–413

[7]For the decline in fiscal capacity during the eighteenth century, see Roy, "State Capacity", p. 89

[8]On European presence Kirk-Greene, for example, suggests that the number of Europeans administering India was comparable to the African colonies and elsewhere. However, in calculating this he counts only the Indian Civil Service (which made up only the top level of the administration), and not the various other services and bodies employed in governing India (A.H.M. Kirk-Greene. "The Thin White Line: The Size of the British Colonial Service in Africa". *African Affairs* 79.314 (1980), pp. 25–44, pp. 33–35).

[9]Here and in Table 0.1 'British India' excludes the Princely States not directly ruled by the Government of India.

[10]See for example: O. Prakash. *European Commercial Enterprise in Pre-Colonial India*. Cambridge, 1998, pp. 8–22; and Kaoru Sugihara. "Patterns of Asia's Integration into the World Economy, 1880–1913". In: *The Emergence of a World Economy, 1500–1914: Papers of the IX International Congress of Economic History, Part II: 1850–1914*. Ed. by W. Fischer, R.M. McInnis, and J. Schneider. Stuttgart, 1986, pp. 714–722

Colony	*Population Density*	*Government Employees*	
	(per sq. km.)	*(per sq. km.)*	*(per capita)*
United Kingdom	132.194	0.809	0.006
British India	82.355	0.509	0.006
Ceylon	54.465	0.307	0.006
Federated Malay States	9.962	0.087	0.009
Gambia	7.757	0.017	0.002
Cape Colony	3.359	0.017	0.005
Natal	12.103	0.017	0.001

Table 0.1: Relative Employment in National or Local Government in Selected British colonies and the United Kingdom, 1901 *Calculated from:* Census of the British Empire, 1901: Report with Summary. *Command Paper Cd. 2660. 1905, pp. 2–5, 36–51*

twentieth century, its exports were worth almost twice as much as those of Australia, the next biggest exporter in value terms.[11] Consequently, while, as will become clear from the rest of this thesis, the limited role of trade in India's economy was certainly not irrelevant to the development of fiscal capacity in India, it would nevertheless be difficult to argue that the colonial government exactly lacked resources when it came to trade to tax.

Beyond these specific constraints, it is also notable that many of the fiscal institutions particularly associated with low state capacity in the African context were absent in India. The state was financed through relatively information intensive forms of revenue; direct taxation took the form of land tax, rather than the hut or head taxes, and most other government revenue came from trade and commodity taxes, rather than, for example, the use of forced labour for infrastructure and other government projects which was ubiquitous in African colonies.[12] In a similar manner, although its collection was largely restricted to the presidency towns, colonial India was one of the earliest adopters of income tax in the world. As a consequence of its relatively developed fiscal structure, from a state capacity perspective India was also relatively unique in that it not only mostly 'paid for itself,' but also made substantial contributions to state power in the wider Empire, not least through the Indian Army,

[11] *Statistical Abstract for the Several British Self-Governing Dominions, Colonies, Possessions, and Protectorates, in each year from 1888 to 1902.* Command Paper Cd. 1729. 1903, pp. 44–45

[12] Frankema and van Waijenburg, "Metropolitan Blueprints", pp. 390–391; and van Waijenburg, "Financing the African Colonial State", pp. 41–43

which was frequently used to further British interests worldwide.

Given these favourable conditions, one would expect India to have been able to support a relatively large state. Certainly in terms of its total budget, India vastly outshone any other colony or dominion.[13] However, the actual rate of taxation was very low; by the end of the nineteenth century, government revenue was only about six percent of GDP.[14] Even more interestingly, at the beginning of the twentieth century, India had a smaller gross public revenue per capita than many 'low state capacity' African colonies.[15] Adjusted for incomes, India looked more like the top performing African colonies, with per capita revenue comparable to the Gold Coast, but still significantly lower than almost everywhere else in the British Empire.[16] This apparent disagreement between the theoretical causes of low fiscal capacity in colonial contexts and the actual level of it in India raises an interesting question: why, after over a century of colonial rule, was the British Indian government able to extract so little revenue relative to colonial states elsewhere, many of which had only had only existed for a very short time?

There are a number of idiosyncrasies in the Indian case which make a direct answer to this question difficult. The length and intensity of India's colonial experience means that there were multiple stages in the development of fiscal capacity. The first period, running from roughly 1765 to the 1860s was marked by a significant increase in the size of both government revenues and state borrowing, the former being largely driven by the adoption of new methods of taxation, especially in opium, salt, and customs.[17] This was followed by a second period characterised by declining receipts from land revenue, and a lack of growth in other types of taxation and debt relative to national income between the 1870s and 1939.[18] This curious underdevelopment of state capacity in colonial India has long attracted interest amongst

[13]Although technically anachronistic in some cases, the term 'dominion' is used here and elsewhere as a convenient shorthand for those colonies that enjoyed varying degrees of self government, i.e. Canada, Newfoundland, Australia, New Zealand, and Cape Colony (and subsequently the rest of the Union of South Africa).

[14]Roy, "State Capacity", p. 91

[15]E. Frankema. "Rasing Revenue in the British Empire, 1870–1940: How 'Extractive' were Colonial Taxes?" *Journal of Global History* 5.3 (2010), pp. 447–477, pp. 471–3

[16]ibid., pp. 473–475

[17]Richards, "Fiscal States", pp. 419–426, 430–433

[18]Roy, "State Capacity", pp. 90–1

economic historians.

One of the more comprehensive answers came from P.J. Thomas who, writing in 1939, diagnosed the problem as being that government revenues were "inelastic," and the main feature of British fiscal policy in India was its "conservatism," and colonial officials were extremely resistant to the introduction of any new taxes.[19] A similar emphasis on both the importance of ideologies and the relative inaction of the Government of India can also be found in more recent literature. In their study of the evolution of fiscal policy in the immediate post-mutiny period Bhattacharyya argues that both the initial form and subsequent development of the Indian revenue system were conditioned by changing political and economic ideologies on the part of colonial officials and pressure from business groups in Britain, both of which militated against significant changes to the sources of the Government of India's income.[20] A slightly later crop of works further endorse that there was very little change in the composition of government revenue in the last decades of the nineteenth century. Kumar again notes the dominance of land revenue in the Indian tax system and the conservative attitude taken by administrators to the appropriate level of taxation, arguing that the choice of taxes was directed more by political safety than fiscal expediency.[21] Writing in the same year, Goldsmith suggested that the Government of India avoided too great a degree of economic intervention, partially for ideological reasons and partially because of the difficulty of collecting a large share of G.D.P. through taxes in 'poor' country like India.[22] Similarly, the importance of land revenue and the relatively static proportion of G.D.P. captured by taxation into the first quarter of the twentieth century are also noted by Charlesworth.[23]

More recently, this curious development of state capacity in colonial India has attracted interest from economic historians working within a fiscal capacity framework. Building on the earlier work of Banerjee and Iyer, Alexander Lee has identified

[19]P.J. Thomas. *The Growth of Federal Finance in India.* Madras, 1939, pp. 212, 429–430

[20]S. Bhattacharyya. *Financial Foundations of the British Raj: Men and Ideas in the Post-Mutiny Period of Reconstruction of Indian Public Finance, 1858–1872.* Simla, 1971, pp. 152–209

[21]D. Kumar. "The Fiscal System". In: *The Cambridge Economic History of India, Volume 2: c.1757–c.1970.* Ed. by D. Kumar and M. Desai. Cambridge, 1983, pp. 905, 916, 917–926

[22]R.W. Goldsmith. *The Financial Development of India, 1860–1977.* New Haven, 1983, p. 38

[23]N. Charlesworth. "The Problem of Government Finance in British India: Taxation, Borrowing and the Allocation of Resources in the Interwar Period". *Modern Asian Studies* 19.3 (1985), pp. 521–548, pp. 523–527

persistent differences in state capacity (and economic performance) across India based on differences in the structure of land revenue administration.[24] On the more general question of the overall development of Indian fiscal resources, Tirthankar Roy has argued that, following from the stagnation in revenue, a lack of co-ordination between borrowing, mainly carried out through the India Office in the London money-markets, and other fiscal activities carried out by the government in India constrained the ability of the state to substitute increased borrowing for revenue, leading to a decline in overall fiscal capacity relative to the size of the economy.[25] However, there are very definite limits to what this argument explains: it is all very well to say, as Roy does, that this constraint on borrowing explains why the size of the Indian state shrunk relative to that in Britain (his main point of comparison) over the last decades of the nineteenth and first of the twentieth centuries. Although it is probable that this trend was not wholly an Indian story, it is in all likelihood the case that had the Government of India invested more heavily in public or administrative infrastructure after 1880 then the fiscal resources (and particularly revenue) available to it would have been higher than they were, but that is a separate question from why they were so low in the first place. On this point Roy returns, as earlier literature does, to the low yield and political sensitivity of land taxes, especially after the Deccan Riots, and a government with "a bias against taxes that were information-intensive and demanded considerable administrative resources."[26]

Whether in its new or its old form, these arguments, while pretty plausible from a descriptive perspective, do little on their own to explain the underlying trend. Especially in the case of preferences for or biases towards limited government, the lack of direct statements of ideological intent by colonial administrators that connect to the observed movements in fiscal indicators makes confirming this line of reasoning difficult.[27] The limited number of major fiscal innovations during the

[24]A. Banerjee and L. Iyer. "History, Institutions, and Economic Performance: The Legacy of Colonial Land Tenure Systems in India". *American Economic Review* 95.4 (2005), pp. 1190–1213, pp. 1190–1213; and A. Lee. "Land, State Capacity, and Colonialism: Evidence from India". *Comparative Political Studies* 52.3 (2019), pp. 412–444, pp. 412–444.

[25]Roy, "State Capacity", pp. 89–100; and T. Roy. "Why Was British India a Limited State?" In: *Fiscal Capacity and the Colonial State in Asia and Africa, c. 1850–1960*. Ed. by E. Frankema and A. Booth. Cambridge, 2020, pp. 83–84, 90–92

[26]ibid., pp. 85–87, 90

[27]A similar observation to this is made in Roy, "State Capacity", p. 91

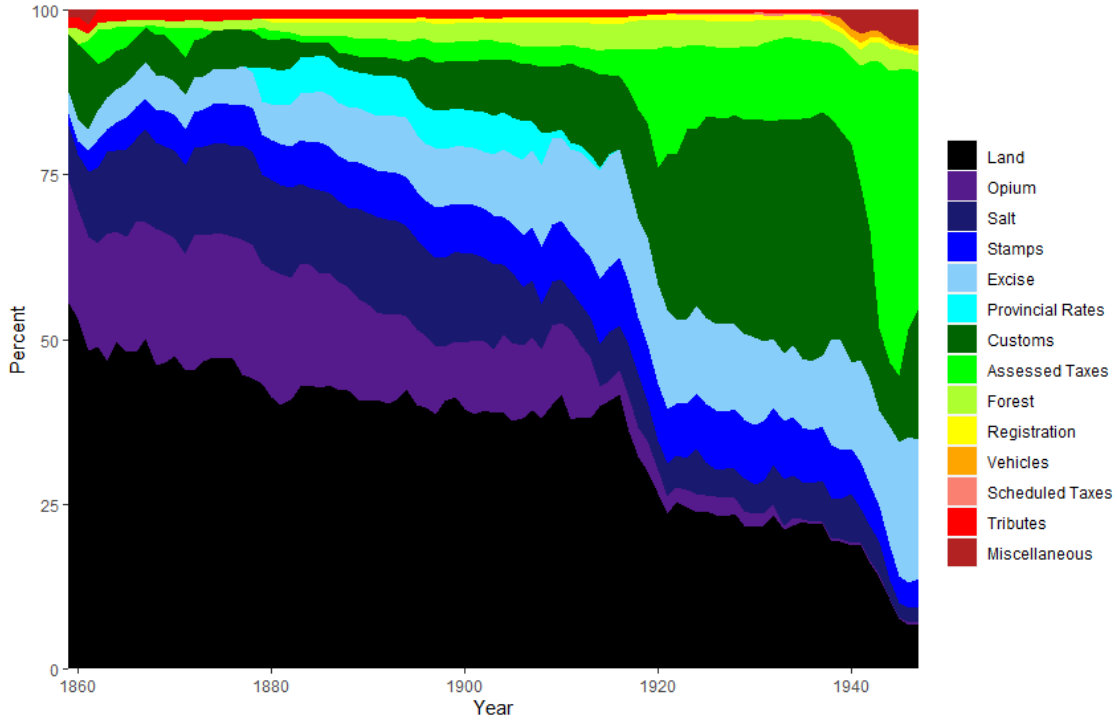

Figure 0.1: Composition of Gross Revenue Receipts by the Government of India, 1859–1947 (% of Total Gross Revenue). Calculated from data in: Finance and Revenue Accounts of the Government of India, 1857–1947. *House of Commons Paper Vrs. 1859–1947.*

second half of the nineteenth century do perhaps indicate that there were constraints that prevented the adoption of more administratively intensive forms of revenue by the government, this is seemingly belied by the high share of the population employed by the government compared with other colonies (Table 0.1), the importance of government enterprises to tax income, and the high administrative costs of collecting land taxes.[28] Furthermore, in neither case do these arguments provide a convincing explanation as to why the Government of India stuck so rigidly to the structure of taxation that had formed by the early 1860s. In particular, at a certain point the argument based on over-reliance on land revenue becomes rather tautologous: that the Government of India was unable to expand its income because it relied too heavily on inelastic sources of revenue was no doubt true, but does not significantly extend our understanding of the logic that underlay this state of affairs.

However, looking at the composition of the Government of India's revenues in Figure 0.1, the large and relatively constant proportion of the total made up from

[28]For the latter, see: Roy, "Why Was British India a Limited State?", p. 86

land revenue is immediately apparent. However, one other feature that stands out is the relatively considerable share which came from just two commodities: opium and salt. Throughout the initial period of revenue stagnation in the late nineteenth century, these two commodities provided the second and third largest sources of revenue respectively for the Government of India. Additionally, as already indicated these same two heads were two of the most important sources of growth in total revenue up to that point. Stamp duty was also significant, and income from the registration of documents, tributes from Princely States, and the sale of products from government forests, while all smaller were persistent features of government revenue in the second half of the nineteenth century. At the same time, once no further gains could be expected from opium, with salt revenues in decline, and under the fiscal pressure of the First World War, the Government of India was able to achieve very significant expansion in areas that had previously been relatively minor, especially customs, assessed taxes, and excise.

In light of these facts, it is possible to unify two of the main strands in the fiscal history of nineteenth-century India — the use of low-productivity forms of taxation and fiscal conservatism on the part of colonial officials — and thereby explain the shortage in fiscal resources, which underlay any effect from a lack of borrowing or investment on the part of the Government of India. There is a substantial body of literature on the subject that holds that the forms of revenue collection adopted by a state's government can significantly shape the subsequent fiscal and political development of that state. Most broadly Moore has argued that governments which rely on revenue sources that require relatively limited organisational effort, such as charges for government services, monopolies over the domestic consumption of certain goods, or surpluses from valuable export goods, experience less pressure to increase either democratic participation and accountability in government or to invest in organisational and bureaucratic capacity.[29] This kind of effect commonly occurs when a state receives substantial amounts of its income from a small number of outside sources, such as exports of valuable resources or transfers from other governments.

[29]M. Moore. "How Does Taxation Affect the Quality of Governance?" *Institute for Development Studies Working Paper* 280 (2007), pp. 16–22

Ross and McGuirk both find that governments in resource-rich countries use rents from exports of those resources to lower domestic taxation, thereby reducing demands for popular accountability.[30] This relationship has been further clarified by Isham, Woolcock, Pritchett, and Busby, who show that countries which rely heavily on 'point source' commodities (oil and minerals) and certain crops that are subject to rent extraction (coffee and cacao are the two examples given) have lower quality public institutions, as these types of resources provide alternative sources of revenue that require neither the development of wider taxation measures or negotiation with the population at large to implement, and also often reinforce social structures that are not conducive to institutional development.[31] In a similarly institutional vein, Besley and Persson argue that both high risk of political instability and resource dependence reduce the incentives for a state to invest in developing its future fiscal (and legal) capacity, and, more recently, that the presence of valuable resources or other external sources of government income lowers revenues from broad-based tax sources.[32]

However, the effects of external sources of income are not restricted purely to the level of this taxation — the way in which revenue is collected declines under these conditions. In modern developing countries, Knack has shown that external income from both foreign aid and natural resource exports reduce the quality of tax policy and administration.[33] Similarly, although their primary focus is on economic growth effects, van der Ploeg and Poelhekke also find that, amongst other negative economic effects, developing states have difficulty in maintaining consistent investment when government resources vary with volatile international commodity prices.[34] Similarly, in their comparison of the post-communist development of the Russian and Polish

[30]M.L. Ross. "Does Oil Hinder Democracy?" *World Politics* 53.3 (2001), pp. 325–361; and E.F. McGuirk. "The Illusory Leader: Natural Resources, Taxation and Accountabiliy". *Public Choice* 154.3/4 (2013), pp. 285–313

[31]J. Isham et al. "The Varieties of Resource Experience: Natural Resource Export Structures and the Political Economy of Economic Growth". *World Bank Economic Review* 19.2 (2005), pp. 141–174

[32]T. Besley and T. Persson. "State Capacity, Conflict, and Development". *Econometrica* 78.1 (2010), pp. 1–34; and T. Besley and T. Persson. "Why Do Developing Countries Tax So Little?" *Journal of Economic Perspectives* 28.4 (2014), pp. 99–120

[33]S. Knack. "Sovereign Rents and the Quality of Tax Policy and Administration". *World Bank Policy Research Working Paper* 4773 (2008), pp. 14–16

[34]F. van der Ploeg and S. Poelhekke. "Volatility and the Natural Resource Curse". *Oxford Econmic Papers* 61.4 (2009), pp. 727–760, pp. 736–737

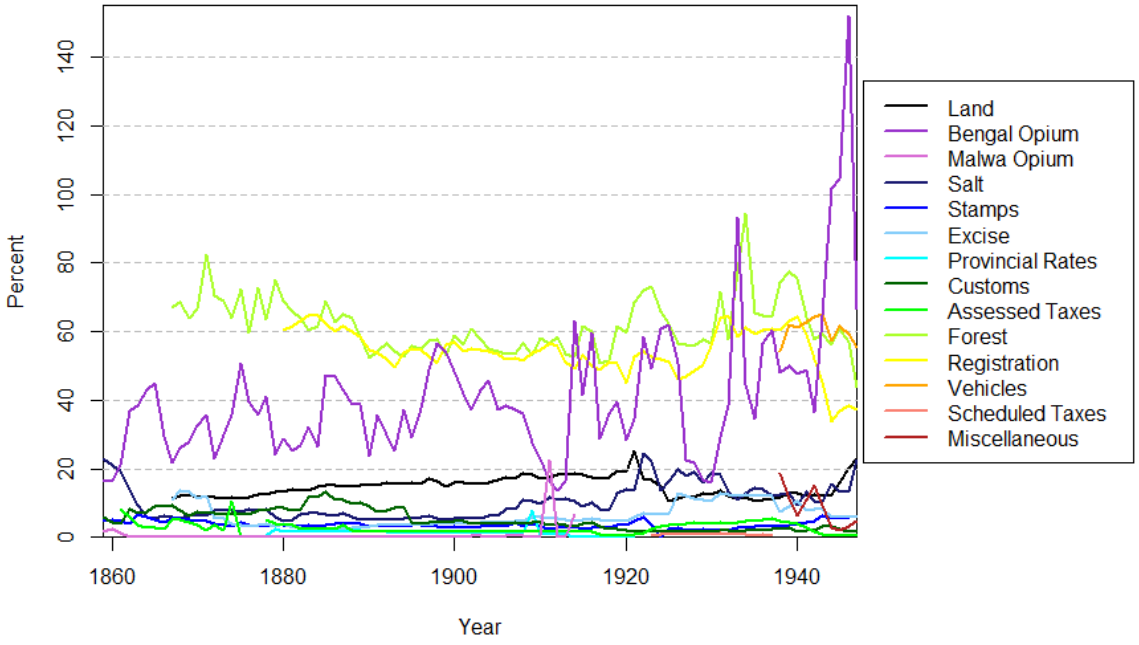

Figure 0.2: Cost of Collection of Revenue Sources by the Government of India, 1859–1947 (% of Gross Revenue). Calculated from data in: Finance and Revenue Accounts of the Government of India, 1857–1947. *House of Commons Paper Vrs. 1859–1947.*

states, Easter shows that the former's reliance on revenue from a small number of large enterprises mostly concerned with natural resource extraction for export has led it to have a narrower, more vulnerable tax base, worse tax compliance, and greater extraction by elite intermediaries than the latter, which pursued a strategy of negotiating much wider direct taxation.[35]

Looked at from this point of view, the institutional inertia suggested in the fiscal histories discussed earlier may actually have reflected a trade-off, in which the Government of India forwent the development of more extensive machinery for tax collection in order to avoid the pressure for greater involvement of, and accountability to, the Indian population that this kind of broad-based taxation would imply. In the aftermath of the 1857 Rebellion and faced by continued unrest in the 1870s and 1880s, the apparent unwillingness of colonial administrators to expand the revenue system may have reflect not so much conservatism or bias against complex tax instruments but rather strategy.

[35]G.M. Easter. "Politics of Revenue Extraction in Post-Communist States: Poland and Russia Compared". *Politics & Society* 30.4 (2002), pp. 599–627

Such an approach was made possible by an inheritance of a plethora of low-organisational-effort taxes left to the incoming Crown administrators by the East India Company. Within this framework the opium revenue was almost a tax *par excellence*: its collection affected only a few limited parts of India, the majority of its actual incidence fell on foreigners in East and Southeast Asia, and by the second half of the nineteenth century it lacked significant involvement from the politically influential British mercantile groups that existed in other trade goods like jute, indigo, or cotton.[36] Although the revenue that the Government of India derived from opium was not as large as the economic rents derived from some commodities, particularly oil, by some modern states, it nevertheless represented a significant inflow into the government of India's budget. Nevertheless, while this approach has the advantage of unifying the different elements of existing arguments into a single trade-off by the colonial state, it also shares their major disadvantage: it is essentially impossible to test without clear evidence of the determinants of fiscal policy of a kind that do not exist for nineteenth century India.

However, in spite of this issue, some of the theory's second-order effects are more testable. In particular, the effect of low bureaucratic effort taxes and external inflows on the quality of revenue administration and policymaking is a much more tractable issue. As outlined above, the presence particularly of external sources of revenue not only interferes with revenue policy, but also negatively impacts administration through vectors such as costs of collection, tax compliance, and corruption.[37] These are important in the long run, since popular engagement with and willingness to pay taxes is likely to be higher in states with broader-based, more impartial taxation systems, as is the proportion of taxable capacity that is actually collected as revenue.[38] The link between impartiality, lack of coercion and the long term development of revenue collection is particularly emphasized by Besley and Persson: "weak and unaccountable states are unlikely to have strong motives to build fiscal

[36]Intervention in Indian tariff policy by the British government on behalf of British mercantile interests has a complex history between 1861 and 1919. For a detailed summary, see: Kumar, "Fiscal System", pp. 920–923

[37]See, for example: Knack, "Sovereign Rents"

[38]R. Ricciuti, A. Savoia, and K. Sen. "How do Political Institutions Affect Fiscal Capacity? Explaining Taxation in Developing Economies". *Journal of Institutional Economics* 15.2 (2018), pp. 351–380

capacity, and their citizens are unlikely to evolve strong norms of compliance."[39] While administrative weakness may be a strategic choice by undemocratic rulers in the short term, it also affects the amount of revenue it is possible to collect from the population in the long term.

However, given the size of the Indian state to look at all aspects of revenue collection in these terms simultaneously would be an enormous undertaking, probably well beyond the scope of any individual work. Consequently, this thesis will focus on the part of the Government of India's revenue system that was both the largest external revenue source and the largest of its narrow-based sources of revenue — opium. Existing studies of Indian fiscal history have highlighted effects which are consistent with the kind of volatility effects proposed by van der Ploeg and Poelhekke. The uncertainty of the opium revenue harmed the ability of the government both to make budgets, while the same instability caused fiscal crises three times between 1861 and 1871.[40] Additionally, inconsistent returns from opium was amongst the factors that first pushed the Government of India towards greater devolution of powers to the provinces, but then inhibited it from producing any permanent federal settlement.[41] However, looking in more detail the most significant part of the opium revenue, that from the Bengal Opium Monopoly, shows that this revenue source was not monolithic. The high cost of collecting revenue through the Bengal Opium Monopoly relative to most other significant forms of taxation, and particularly the main other way the Government of India extracted revenue from opium (the Malwa system, described in more detail below), shown in Figure 0.2, suggests that it was here that the most significant impacts on revenue policy and particularly administration took place.[42]

There are, however, other, more general reasons why the Bengal Opium Monopoly provides a useful example to look at the issue of government quality in colonial India. In the first place, it provided a relatively large proportion of the Government of India's income; opium in general was the second largest source of state revenue, after

[39]Besley and Persson, "Why Do Developing Countries Tax So Little?", p. 118

[40]For the former, see: Thomas, *The Growth of Federal Finance in India*, p. 101; for the latter:Bhattacharyya, *Financial Foundations*, p. 178

[41]Thomas, *The Growth of Federal Finance in India*, pp. 196, 227, 258–259

[42]The Malwa system remains however an important point of comparison throughout. For a more detailed comparison of the relative costs of the two mechanisms for extracting revenue from the Indian opium trade, see Section 0.4.

	Total Revenue	*All Opium*		*Bengal Only*	
Year Ending	*Rs.*	*Rs.*	*%*	*Rs.*	*%*
1838	20,83,27,284	2,28,11,850	10.9	2,09,65,190	10.1
1848	24,67,59,837	2,73,51,300	11.1	2,35,61,020	9.5
1858	31,70,67,760	6,86,42,090	21.6	5,21,59,100	16.4
1868	48,53,44,120	8,92,21,860	18.4	6,56,52,480	13.5
1878	61,97,24,810	9,18,27,220	14.8	6,43,28,810	10.4
1888	78,75,97,440	8,51,54,620	10.8	6,24,52,670	7.9
1898	96,44,20,040	5,17,97,720	5.4	4,20,91,340	4.4
1908	1,33,00,54,935	7,86,74,790	5.9	6,93,29,346	5.2

Table 0.2: Bengal Opium Revenue as a Proportion of Total Indian Government Revenue, Official Years 1838–1908 (Rupees (Rs.)); for comparability all figures are gross revenue. *Calculated from data in:* Accounts Respecting the Annual Territorial Revenues and Disbursements of the East India Company, for the Three Years (1836/37, 1837/38, 1838/39). *House of Commons Paper No. 22. 1841;* Accounts Respecting the Annual Territorial Revenues and Disbursements of the East India Company, for the Three Years (1847/48, 1848/49, 1849/50). *House of Commons Paper No. 437. 1852;* Statistical Abstract Relating to British India, from 1858 to 1867. *Command Paper No. 4178. 1868–69, p. 3;* Statistical Abstract Relating to British India, from 1860 to 1869. *Command Paper C.184. 1870, p. 4; Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce.* Financial and Commercial Statistics of British India. *Calcutta, 1907, pp. 32 & 71; and Department of Statistics.* Statistics of British India: Volume II: Financial Statistics. *Calcutta, 1918, pp. 9 & 161.*

land tax, for most of the nineteenth century, and the Bengal Monopoly provided the lion's share of this. As a result, the state's bottom line was substantially impacted by the effectiveness with which it was able to extract revenue from this source. In the second, as Table 0.2 shows, the development of the opium revenue in general, and the Bengal Monopoly specifically, mirrors the trajectory of Indian fiscal capacity as a whole: relatively rapid growth in the first part of the nineteenth century, followed by a period of relative stagnation from the 1870s to the early twentieth century. Although a changing international drug control environment and a consequent reduction in the importance of opium to the Indian state make it difficult to continue the comparison into the 1920s and 1930s, it nevertheless covers almost the exact period required to understand the origins of colonial India's low rate of revenue extraction. In the third place, since the structure of the Bengal Monopoly combined elements of a trade or commodity tax with the kind of close contact with the populace required for direct

taxation, it allows the examination of factors affecting different types of revenue collection in one place. For the millions of peasants who cultivated government opium, their interactions with the Opium Department may well have constituted their most significant contact with the state. On the trade side, given the extent of the intervention and the scale of the Indian opium trade shown by Table 0.3, the Bengal Opium Monopoly probably constituted one of the more extreme interventions in trade policy undertaken by a nineteenth-century colonial state. Finally, at its height the Bengal Monopoly was probably one of the more informationally intensive methods of raising revenue adopted by the British colonial state. In its most developed form in the late nineteenth century, the collection of the Bengal opium revenue demanded the collection and year-to-year cross-referencing of millions of transactions by a large permanent staff spread throughout North-East India in parallel to the regular administration, who had fairly continuous interactions with, and extensive powers of legal enforcement against, the general population. More widely, successful policy-making also rested on the ability of the central government to co-ordinate internal policies with the state of the international market, which in turn required them to obtain and process daily and weekly price data from cities across East, Southeast, and South Asia. As a result, there can be few better places to look if one wishes to understand what the British Indian Government could and could not do when it came to raising revenue effectively.

So, what does the case of the Bengal Opium Monopoly tell us about how the quality of government developed in nineteenth-century British India? The papers presented in this thesis suggest three main answers to this question. The first is quite surprising in light of the conclusions of the fiscal histories discussed above: the Government of India was to a certain degree capable of undertaking relatively information-intensive revenue collection activities in limited contexts: the maintenance of the Opium Monopoly required the collection of large quantities of data both on the sale (Paper 1) and the production sides (Paper 2). However, a recurring theme across all three papers is that the Government of India struggled to process these large amounts of granular information in order formulate effective policy, and

	Total Exports	*All Opium*		*Bengal Only*	
Year Ending	*Rs.*	*Rs.*	*%*	*Rs.*	*%*
1838	11,58,34,360	3,07,48,970	26.5	1,03,09,938	11.9
1848	14,73,84,350	3,93,74,421	26.7	2,30,89,059	15.7
1858	28,27,84,740	9,10,66,350	32.2	4,74,61,191	16.8
1868	52,44,60,020	12,33,07,995	23.5	6,38,87,086	12.2
1878	67,43,33,238	12,37,43,554	18.4	6,27,70,356	9.3
1888	92,14,82,787	10,06,77,636	10.9	5,98,05,995	6.4
1898	94,17,76,517	6,09,75,632	6.5	3,89,39,565	4.1
1908	1,78,93,20,538	8,67,24,782	4.9	6,38,85,905	3.6

Table 0.3: Opium Exports as a Proportion of Total Indian Exports by Value, Official Years 1838–1908 (Rs.). The first two sets of figures for opium exports are approximate. *Calculated from data in:* Report on the External Commerce of Bengal. *Calcutta, Vrs. Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce.* Financial and Commercial Statistics of British India. *Calcutta, 1907, pp. 72–73, 84–87, 489; Department of Statistics.* Statistics of British India: Volume I: Commercial Statistics. *Calcutta, 1918, p. 121; and Department of Statistics.* Statistics of British India: Volume II: Financial Statistics. *Calcutta, 1918, pp. 168–169.*

this difficulty not only interfered with actual revenue collection, but also led to the devolution of extensive and ineffectively unmonitored decision-making powers, further decreasing the impartiality of the revenue system. The second insight these studies provided is that in manner consistent with other countries' experience of the effects of resource revenue in more recent history, the large inflows from opium led both state employees and other actors to try to appropriate parts of this income for themselves. As a result, the state was forced to shape revenue collection policies around the actions of, *inter alia*, merchants and bankers (Paper 1) as well as government employees and local intermediaries (Papers 2 & 3), the ultimate effect of which was to make the introduction of new policies more difficult (Paper 3). The final again militates against suggestions of ideological conservatism on the part of colonial officials; in practice the Government of India was quite active in undertaking efforts to improve the efficiency of collection within the pre-existing revenue framework. All three papers, to a greater or lesser extent deal with the introduction of changes to the Opium Monopoly system that sought to either in one way or another improve the state's control over income or expenditure within the Monopoly. However, the

extent of reforms was limited by, in addition to the factors already discussed, the fact that the state had little capacity to absorb even short-term reductions in the revenue meant that internal changes were often more limited in scope than they might otherwise have been (see particularly the case of price stabilisation in Paper 1), and provides a mechanism by which the stragergy of adopting relatively narrow revenue sources had the potentential to ultimately become self-reinforcing.

Consequently, with regard to the broader question of fiscal capacity development in India, the key conclusion of this research is that a shift towards more broad-based taxation would have been difficult without substantial external investment in expanding bureaucratic capacity and infrastructure within the British Indian state, and it is here that the constraints on borrowing recently outline by Roy may be most significant. However, doing so would have brought with it the associated political risks. Had the Government of India sought to abandon its reliance on relatively narrow taxes of limited impact, there would have been substantial implications for the political economy of autocratic colonial rule. Some evidence for this connection can be found in the period after 1914, when the Government of India expanded its fiscal base through greater collections from customs, income taxes, and excise (see Figure 0.1). Although it is impossible to separate them from wider political processes, these changes were accompanied by both significant devolution of fiscal powers and authority to the provinces and the incorporation of much greater Indian involvement in the legislative process (albeit through a mixture of appointed and elected representatives). Even these limited shifts in the kinds of taxes which the Government of India collected were associated with very substantial shifts in the basis upon which colonial government in India took place.

The rest of this introduction is divided into six sections. Section 0.2 discusses the existing historical literature on opium in India and elsewhere, with particular reference to the relationship between the drug and the state. Drawing on some of that literature, Section 0.3 gives a basic outline of the development and structure of the Indian opium revenue in the context of the expansion of the colonial state during the eighteenth and early nineteenth centuries. Section 0.4 follows this by

placing the development of the Bengal Opium Monopoly in the wider context of other, similar activities undertaken by colonial governments in India. This is followed Sections 0.5 & 0.6, which provide more detailed context on the way in which opium was cultivated in nineteenth century north India, and give estimates of the distribution of financial returns to the colonial state and other actors in the opium trade. Finally, Section 0.7 describes the international background in front of which the Government of India made opium policy, and argues that, while there were limits to the demand for opium, during the late nineteenth century the amount of revenue derived from Bengal opium was largely determined by the policy decisions made by the Government of India, rather than any inherent inflexibility of opium as a source of revenue.

Following the introduction, the three papers which make up the main body of this thesis each address a specific aspect of the Bengal Monopoly's operation. Paper 1 finds that although the Government of India was able to successfully manipulate opium prices, mitigating several threats to the opium revenue and making the revenue received more predictable, analytical and informational limitations prevented policymakers from maximising revenue effectively. Paper 2 examines the management of the government monopsony over Bengal opium. In this area as well, the difficulty of gathering and accurately communicating information about conditions on the ground meant that important decisions necessarily had to be decentralised. However this structure prevented effective oversight of minor officials and ultimately limited control over production and therefore over the costs of collecting the opium revenue. Finally, Paper 3 looks at a different kind of constraint on revenue collection. Using the Government of India's response to the increased ideological pressures around opium at the end of the nineteenth century, this paper finds that even changes to well established parts of the revenue framework could provoke political complications. The necessity of adapting any reforms of the Monopoly system to a range of different political interests and the unwillingness of the state to provoke social upheaval, limited the pace of changes to the revenue system and ultimately led to the decline of the Bengal Monopoly as a significant feature of the Indian fiscal system.

0.2 The Histories of Opium

Writing in 2004 John Richards, the doyen of historians of the Indian opium industry, observed:"Other than to point out the pecuniary interest of the Indian government in the drug trade, however, the profits and pervasive economic effect of the opium trade on colonial India have not been as well understood."[43] To a certain extent this still holds true today. While the relationships between opium and the state in the Indian context has been explored by a number of authors, the focus has overwhelmingly been on the early development and general institutional form of government control over the drug, rather than its actual operation. As a consequence, there has been a tendency to view the colonial government's opium policy as either largely exogenous or made up of a series of ad-hoc responses to immediate circumstances. However, as this thesis will show, examining not only what the government's policy was, but how they made that policy and how it was implemented produces significant new insights into the place of the Government of India's opium revenue within a wider context. By understanding the process through which the opium revenue was extracted it is possible to use the Government of India's involvement in the opium trade not just an interesting historical curiosity, but also a useful case study for the interpretation of a wider system of colonial state finance.

The treatment of colonial opium policy as an historical question really began in 1934 with David Owen's *British Opium Policy in China and India*, a book which undoubtedly still provides the most comprehensive narrative history of the development of Indian opium policy from the initial establishment of the Monopoly in Bengal to the introduction of a more prohibitionist approach in the twentieth century.[44]However, Owen focuses largely on recounting the evolution of policy discussions over time, and as a result his work pays little attention to the effects of the official discourse that he describes, either on the collection of the opium revenue itself, or on the wider Indian economy.

By contrast, later works have painted on a much more limited canvas, with the

[43]J.F. Richards. "The Opium Industry in British India". In: *Land, Politics and Trade in South Asia*. Ed. by S. Subrahmanyam. New Delhi, 2004. Chap. 3, p. 47

[44]D.E. Owen. *British Opium Policy in China and India*. New Haven, 1934

focus lying to a great degree on the formation and expansion of the monopoly system under the East India Company. Both Prasad and Singh provide detailed accounts of the development of the opium and other government Monopolies during Company rule.[45] The extension of state control over opium production and consumption has also been situated in broader accounts of the extension of colonial and imperial control; for example, Trocki sites the development of the Government of India's parallel opium regimes in eastern and western India in the wider context of imperial expansion in Asia, presenting the drug as one of the key vectors for the expansion of an international capitalist and imperialist order.[46] Elsewhere, Farooqui and Markovits have engaged in a debate as to whether activities of opium merchants in the west of India who attempted to evade the control of the East India Company represented a deliberate subversion of colonial control over the trade in the drug, or were merely motivated by profit-seeking.[47] More recently, Gunnel Cederlöf and Kawal Kour have extended this aspect of the literature to look at the expansion of British control over the production and consumption of opium in marginal areas, such as Rangpur, Cooch Bihar, and Assam, and their incorporation into a wider system of drug regulation.[48]

Moving beyond the period of Company rule to the late nineteenth century, the focus shifts from the institutional form of colonial opium control to the distribution of the profits from the trade in Indian opium. In Richards' own work, the emphasis is on the breadth of the impact of opium; while the state was the main beneficiary of the trade in Bengal opium, the drug was nevertheless a presence in many areas of the Indian economy.[49] In so far as this pervasive impact has been studied in any detail, the main concern has chiefly been the place of government directed opium production

[45]R. Prasad. *Some Aspects of British Revenue Policy in India, 1773–1833 (The Bengal Presidency)*. Delhi, 1970; and N.P. Singh. *The East India Company's Monopoly Industries in Bihar, with Particular Reference to Opium and Saltpetre, 1773–1833*. Muzaffarpur, 1980

[46]C.A. Trocki. *Opium, Empire and the Global Political Economy: A Study of the Asian Opium Trade, 1750-1950*. London, 1999

[47]A. Farooqui. *Smuggling as Subversion: Colonialism, Indian Merchants and the Politics of Empire, 1790–1843*. Lanham, MD., 2005, pp. 7–10; and C. Markovits. "The Political Economy of Opium Smuggling in Early Nineteenth Century India: Leakage or Resistance?" *Modern Asian Studies* 43.1 (2009), pp. 89–111, pp. 102–105

[48]G. Cederlöf. "Poor Man's Crop: Evading Opium Monopoly". *Modern Asian Studies* 53.2 (2019), pp. 633–659; and K.D. Kour. *A History of Intoxication: Opium in Assam, 1800–1959*. London, 2019.

[49]Richards, "Opium Industry"

in the wider agricultural economy of northeastern India, the conditions under which opium was produced, and returns (or lack thereof) of poppy to those who cultivated it. Although authors differ as to the overall benefits or disadvantages of opium cultivation, most emphasise the limited profitability for the Indian cultivators who actually grew poppy for the state.[50] This strand of literature has also been drawn on by other authors who have used the interactions between the colonial government and opium cultivators to examine wider points about expansion of cash crop production in north India during the second half of the nineteenth century.[51] Finally, towards the end of this period another aspect of the interplay between colonial states and opium has also attracted attention. Several relatively recent works have used the involvement of such governments (and especially the Government of India) with opium as a way of understanding tensions within the politics of colonial rule: the development of imperial opium policy formed an important site for conflict between international and British domestic pressures, and popular opinion in the colonies themselves.[52]

Outside of India, the majority of studies on opium have focused on China, which was by far the largest market for the drug during the nineteenth and early twentieth centuries. An early focus of this type of literature was the importance of opium in the development of a triangular trade through which Britain's negative balance of

[50]B. Chowdhury. *Growth of Commercial Agrculture in Bengal, 1797-1900.* Calcutta, 1964; J.F. Richards. "The Indian Empire and Peasant Production of Opium in the Nineteenth Century". *Modern Asian Studies* 15.1 (1981), pp. 59–82; and R. Bauer. *The Peasant Production of Opium in Nineteenth Century India.* Leiden, 2019

[51]For example: P. Robb. "Peasants' Choices? Indian Agriculture and the Limits of Commercialization in Nineteenth-Century Bihar". *Economic History Review* 45.1 (1992), pp. 97–119, pp. 104–106; B.B. Chaudhuri. "Peasant History of Late Pre-Colonial and Colonial India". In: *History of Science, Philosophy, and Culture in Indian Civilization.* Ed. by D.P. Chattopadhyaya. Vol. VIII. New Delhi, 2008, 409–417 and 435–454; and R. Kranton and A.V. Swamy. "Contracts, Hold-Up, and Exports: Textiles and Opium in Colonial India". *American Economic Review* 98.3 (2008), pp. 967–989

[52]J.F. Richards. "Opium and the British Indian Empire: The Royal Commission of 1895". *Modern Asian Studies* 36.2 (2002), pp. 375–420; J.F. Richards. "'Cannot We Induce the People of England to Eat Opium?' The Moral Economy of Opium in Colonial India". In: *Drugs and Empires: Essays in Modern Imperialism and Intoxication, c.1500–c.1930.* Ed. by J.H. Mills and P. Barton. Basingstoke, 2007; M.J. Gilbert. "Empire and Excise: Drugs and Drink Revenue and the Fate of States in South Asia". In: *Drugs and Empires: Essays in Modern Imperialism and Intoxication, c.1500–c.1930.* Ed. by J.H. Mills and P. Barton. Basingstoke, 2007; and W.B. McAllister. "'Wolf by the Ears': The Dilemmas of Imperial Opium Policymaking in the Twentieth Century". In: *Drugs and Empires: Essays in Modern Imperialism and Intoxication, c.1500–c.1930.* Ed. by J.H. Mills and P. Barton. Basingstoke, 2007

trade with China was offset by the latter's negative balance with British India.[53] In a similar vein, Man-houng Lin has argued that the outflow of silver driven by the opium trade had a very significant effects on the Chinese economy, and helped to drive conflict between the Chinese state and foreign powers, especially Britain.[54] This economic impact was not, however restricted to trade and international relations: Wong suggests that the size and value of the opium trade meant that regimes of state control and taxation over the drug were slow to develop, with officials caught between the sometimes competing demands of the ambiguous moral position of opium, internal state-building, and interaction with foreign powers.[55]

Looking beyond opium's role as an item of international and interregional trade, there have been a large number of works which attempt to gauge the effect of widespread opium consumption on Chinese society.[56] Building on this approach, the work of Dikötter, Laamann and Xun and Zhang has recently emphasised the extreme variety of social roles performed by opium in Chinese society.[57] Also seeking to examine the impact of opium on China on a more granular level, several studies have tracked the socio-economic impact of both opium consumption and prohibition at the level of the province.[58] A similar approach has also been applied more generally

[53]See especially: M. Greenberg. *British Trade and the Opening of China, 1800-42*. Cambridge, 1951; and J.Y. Wong. *Deadly Dreams: Opium Imperialism and the Arrow War (1856–1860) in China*. Cambridge, 1998.

[54]Man-Houng Lin. *China Upside Down: Currency, Society, and Ideologies, 1808–1856*. Cambridge, Mass. and London, 2006

[55]R. Bin Wong. "Opium and Modern Chinese State-Making". In: *Opium Regimes: China, Britain, and Japan, 1839–1952*. Ed. by T. Brook and B.T. Wakabayashi. Berkeley, 2000

[56]For example: J. Spence. "Opium Smoking in Ch'ing China". In: *Conflict and Control in Late Imperial China*. Ed. by F. Wakeman and L. Grant. Berkeley, 1975; R.K. Newman. "Opium Smoking in Late Imperial China: A Reconsideration". *Modern Asian Studies* 29.4 (1995), pp. 765–794; and K. McMahon. *The Fall of the God of Money*. Lanham, 2002

[57]F. Dikötter, L. Laamann, and Zhou Xun. "Narcotic Culture: A Social History of Drug Consumption in China". *British Journal of Criminology* 42.2 (2002), pp. 317–336; F. Dikötter, L. Laamann, and Zhou Xun. "China, British Imperialism and the Myth of the 'Opium Plague'". In: *Drugs and Empires: Essays in Modern Imperialism and Intoxication, c.1500–c.1930*. Ed. by J.H. Mills and P. Barton. Basingstoke, 2007; Zheng Yangwen. *The Social Life of Opium in China*. Cambridge, 2005

[58]For example: S.A.M. Adshead. "The Opium Trade in Szechwan, 1881–1911". *Journal of Southeast Asian History* 7.2 (1966), pp. 93–99; S.A.M. Adshead. *Province and Politics in Late Imperial China: Viceregal Government in Szechwan, 1898–1911*. London, 1984; J. Wyman. "Opium and the State in Late-Qing Sichuan". In: *Opium Regimes: China, Britain, and Japan, 1839–1952*. Ed. by T. Brook and B.T. Wakabayashi. Berkeley, 2000; J. Madancy. "Unearthing Popular Attitudes Towards the Opium Trade and Opium Suppression in Late Qing and Early Republican Fujian". *Modern China* 27.4 (2001), pp. 436–483; and J. Madancy. *The Troublesome Legacy of Commissioner Lin: The Opium Trade and Opium Suppression in Fujian Province, 1820s to 1920s*. Cambridge, Mass. and London, 2003

to examine the influence of ideas and politics from within China as a whole on international drug policy.[59]

The other major market for the international opium trade, Southeast Asia, is also the region for which the economic impact of the opium trade has been most clearly quantified.[60] That this should be the case is not entirely surprising, given the importance of retail monopolies over opium to the public finances of most Southeast Asian polities in the period; several authors have identified significant interlinked relationship between the development the revenue structures of colonial states and the formation of economies centered around cash crop production for export in the region.[61]

Elsewhere, a small but significant literature discusses the consumption, trade, and production in the opium exporting countries of the Middle East. However, while the evolution of an international drug control regime especially after the First World War did have a substantial impact on these countries, during the nineteenth century the state is very much more of a background presence in these accounts.[62] Outside

[59]See, for example: K.L. Lodwick. *Crusaders Against Opium: Protestant Missionaries in China, 1874–1917*. Lexington, 1996; and W.O. Walker. "'A Grave Danger to the Peace of the East: Opium and Imperial Rivalry in China, 1895–1920'". In: *Drugs and Empires: Essays in Modern Imperialism and Intoxication, c.1500–c.1930*. Ed. by J.H. Mills and P. Barton. Basingstoke, 2007.

[60]See: W. Bailey and Lan Truong. "Opium and Empire: Some Evidence from Colonial-Era Asian Stock and Commodity Markets". *Journal of Southeast Asian Studies* 32.2 (2001), pp. 173–193

[61]For Southeast Asia in general: A.L. Foster. "Prohibition as Superiority: Policing Opium in Southeast Asia, 1898–1925". *International History Review* 22.2 (2000), pp. 253–273; C.A. Trocki. "Drugs, Taxes, and Chinese Capitalism in Southeast Asia". In: *Opium Regimes: China, Britain, and Japan, 1859–1952*. Ed. by T. Brook and B.T. Wakabayashi. Berkeley, 2000; and E. Tagliacozzo. "Ambiguous Commodities, Unstable Frontiers: The Case of Burma, Siam, and Imperial Britain, 1800–1900". *Comparative Studies in Society and History* 46.2 (2004), pp. 354–377. For the Philippines, see: A.N. Bamero. "The Evolution of Policies, the Tolerance of Vice, and the Proliferation of Contraband Trade in the Philippines, 1843–1908". *Social Science Diliman* 3.1 (2006), pp. 49–83; and D.J.P. Wertz. "Idealism, Imperialism, and Internationalism: Opium Politics in the Colonial Philippines, 1898–1925". *Modern Asian Studies* 47.2 (2013), pp. 467–499. For Singapore and Malaya, see: J.G. Butcher. "The Demise of the Revenue Farm System in the Federated Malay States". *Modern Asian Studies* 17.3 (1983), pp. 387–412; and C.A. Trocki. *Opium and Empire: Chinese Society in Colonial Singapore, 1800–1900*. Ithaca, 1990. For the Dutch East Indies, see: J.R. Rush. *Opium to Java: Revenue Farming and Chinese Enterprise in Colonial Indonesia, 1860-1910*. Ithaca, 1990; and A. Wahid. "In the Shadow of Opium: Tax Farming and the Political Economy of Colonial Extraction in Java, 1807–1911". In: *Colonial Exploitation and Economic Development: The Belgian Congo and the Netherlands Indies Compared*. Ed. by E. Frankema and F. Buelens. 2013. For Burma, see: A. Wright. *Opium and Empire in Southeast Asia: Regulating Consumption in British Burma*. Basingstoke, 2014.

[62]A. Seyf. "Commercialisation of Agriculture: Production and Trade of Opium in Persia, 1850-1906". *International Journal of Middle East Studies* 16.2 (1984), pp. 233–250; J. Schmidt. *From Anatolia to Indonesia: Opium Trade and the Dutch Community of Izmir, 1820–1940*. Istanbul, 1998; R. Matthee. *The Pursuit of Pleasure: Drugs and Stimulants in Iranian History, 1500–1900*. Princeton, 2005; and R.B. Regavim. "The Most Sovereign of Masters: The History of Opium in Modern Iran, 1850-1955". PhD thesis. University of Pennsylvania, 2018

of Asia the literature on opium is much more limited, and focuses mainly on the influence of socio-political developments during the nineteenth century, both on the modalities of consumption themselves and the development of increased government interest in and regulation of opium use.[63]

0.3 Expansion, Regulation, and Control

It was, and is, a relatively a easy matter to produce a range of narcotic substances from opium poppies, many of which have been known since antiquity. While in the modern world, most opiates produced for medical and recreational use are highly processed derivatives like heroin, morphine, and codeine, these drugs were relatively uncommon before the end of the nineteenth century. Instead, simpler, not to mention considerably weaker, substances which could be produced fairly directly from the poppy heads or the latex inside them were far more widespread. Of these opium, laudanum, and poppy head tea were the most common.

By the second half of the nineteenth century, the use of opium as a medicine or for recreational purposes were common phenomenona in much of Asia. Naturally, production of raw opium for domestic use took place in a number of areas, most notably China, but also the Shan States in the highlands of Southeast Asia, as well as Egypt, and Afghanistan. However, while most of these places did export small quantities of the drug, it was but irregularly, and except in the case of Egypt there is little evidence that these travelled beyond the immediate locality. Large scale production specifically for export, on top of internal demand, was, on the other hand, carried out only in India, Persia, and the Ottoman Empire. Of these three, India was by far the largest producer, accounting for the vast majority of internationally traded raw opium.

Opium was an old product in India, and one which had long proved an attractive source of government revenue. Under the Mughals poppy was one of several valuable

[63]See for example: V. Berridge. "Victorian Opium Eating: Responses to Opiate Use in Nineteenth-Century England". *Victorian Studies* 21.4 (1978), pp. 437–461; V. Berridge and G. Edwards. *Opium and the People: Opiate Use in Nineteenth-Century England*. London and New York, 1981; and E. Sinn. "Preparing Opium for America: Hong Kong and Cultural Consumption in the Chinese Diaspora". *Journal of Chinese Overseas* 1.1 (2005), pp. 16–42

crops, also including tobacco, sugar, and indigo, which paid a special rate of land revenue.[64] During the early eighteenth century, as the power of the government in Delhi began to wane, the Nawab of Bengal farmed out a monopoly on the trade in opium to a private merchant.[65] However, it was not until the emergence of the English East India Company as a territorial power in Bengal that a state attempted to entirely control how opium was produced and sold in India. Initially this project was driven by a desire to capture new revenue and avoid large scale evasion. In this first phase, which lasted for the entire period of Company Rule, the extension of the government's control over opium production grew stronger with the expansion of British rule over the subcontinent as a whole.

Following the Battles of Plassey and Buxar and the subsequent assumption of the Diwani (i.e. the right to collect revenue) over Bengal, Bihar, and Orissa by the Company in 1765, a number of the Company's servants established a partial control over the trade in opium around Patna. However, continual attempts by other private merchants and the rival European Companies to circumvent this combination led the Calcutta government to consider measures to control 'clandestine' activity and ensure that the profits from this lucrative trade went to the Company, rather than a limited number of individuals within it.[66] In response, in 1773 the private trade in the opium was replaced by a 'monopoly' on the drug which would be granted to a single contractor who would deliver opium to the government at a fixed price. It would be sold in Calcutta for the benefit of the exchequer. However, the government quickly found defects in this system. Competition between the Company's revenue officers and the agents of the opium contractor allowed individuals to evade taxation by playing one off against the other.[67] Additionally, by the 1790s the contract holders were perceived to be supplying poor quality opium, causing the revenue to fall as consumers abroad were less inclined to purchase a low quality product.[68]

As a consequence, this system only lasted twenty-four years before being replaced in 1797. In that year following repeated problems drawing revenue from opium when

[64]Richards, "Fiscal States", p. 413
[65]Prasad, *Aspects of British Revenue Policy*, p. 13
[66]ibid., pp. 48–49; and Singh, *East India Company*, p. 30
[67]ibid., pp. 34–35
[68]Prasad, *Aspects of British Revenue Policy*, pp. 148–149

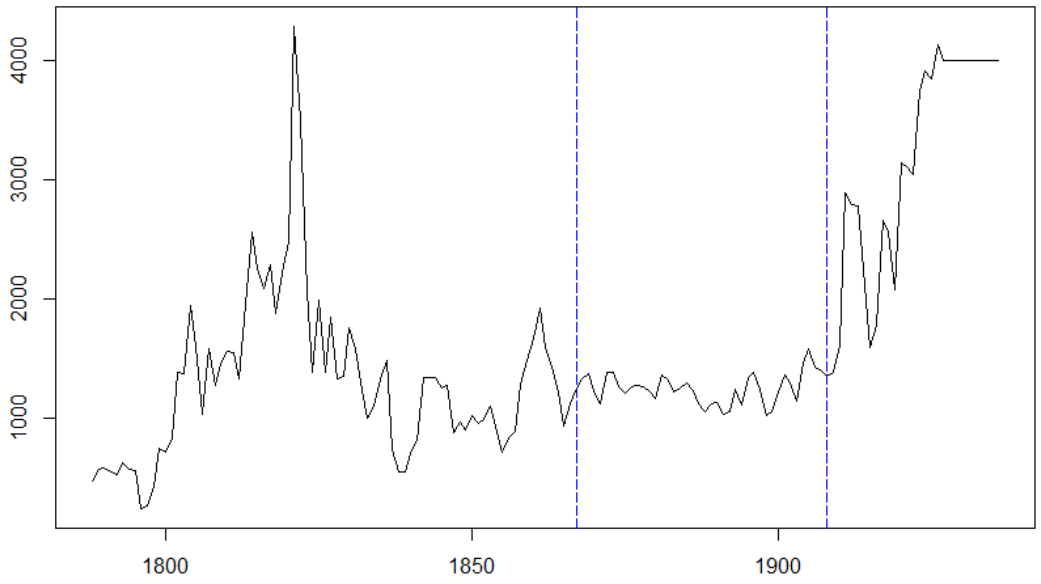

Figure 0.3: Average Price of Bengal Opium at the Government Auctions, 1787–1936 (Rs./Chest). *Sources:* Report of the Select Committee on the Affairs of the East India Company, Appendix IV: Administration of Monopolies, Opium and Salt. *Report of Committee 320D. 1831, p. 14;* Report of a Commission Appointed by the Government of India to Enquire into the Working of the Opium Department in Bengal and the North-Western Provinces. *Calcutta, 1883, pp. 69–70; Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce.* Financial and Commercial Statistics of British India. *Calcutta, 1907, p. 74; Department of Statistics.* Statistics of British India: Volume II: Financial Statistics. *Calcutta, 1918, p. 162;* Statistical Abstract for British India, with Statistics, Where Available, Relating to Certain Indian States, from 1916–17 to 1925–26. *Command Paper Cmd. 3046. 1928, p. 174; and* Statistical Abstract for British India, with Statistics, Where Available, Relating to Certain Indian States, from 1926–27 to 1935–36. *Command Paper Cmd. 5804. 1937–38, p. 922*

the trade was in private hands, production was brought under the direct control of the government and placed under officials called Opium Agents, each of whom was responsible for one of the main areas of opium production. As Figure 0.3 shows, the introduction of this new system of government control over production was relatively successful, being accompanied by steadily rising prices until the 1820s. This success proved to be a double-edged sword; while it brought more revenue into government coffers, it also stimulated competition elsewhere. A growing trade in opium from the Princely States in western India (called 'Malwa' opium), as well as from the Ottoman Empire, and illegal production in Bengal threatened the Company's opium

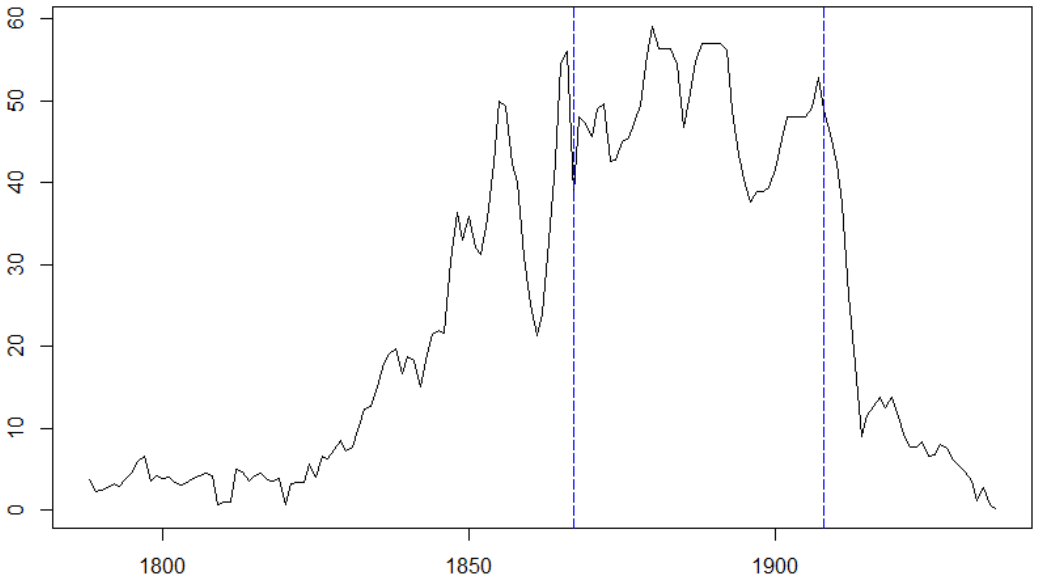

Figure 0.4: Quantity of Bengal Opium Sold at the Government Auctions in Calcutta, 1787–1936 ('000 Chests). *Sources:* Report of the Select Committee on the Affairs of the East India Company, Appendix IV: Administration of Monopolies, Opium and Salt. *Report of Committee 320D. 1831, p. 14;* Report of a Commission Appointed by the Government of India to Enquire into the Working of the Opium Department in Bengal and the North-Western Provinces. *Calcutta, 1883, pp. 69–70; Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce.* Financial and Commercial Statistics of British India. *Calcutta, 1907, p. 74; Department of Statistics.* Statistics of British India: Volume II: Financial Statistics. *Calcutta, 1918, p. 162;* Statistical Abstract for British India, with Statistics, Where Available, Relating to Certain Indian States, from 1916–17 to 1925–26. *Command Paper Cmd. 3046. 1928, p. 174; and* Statistical Abstract for British India, with Statistics, Where Available, Relating to Certain Indian States, from 1926–27 to 1935–36. *Command Paper Cmd. 5804. 1937–38, p. 922*

revenue. The latter responded by increasing the amount offered for sale, in an attempt to out-compete these alternative sources, coupled with direct purchases of Malwa in western India in an attempt to establish a monopoly on that variety as well.[69] However, imprudent buying by the Company's agents and ever-expanding production meant that the latter attempt was a costly failure.

The failure of the Company's attempts to gain control of Malwa production led to the introduction of a new approach in 1830. Rather than direct purchases, the Company instead made use of its control over the greater part of the west coast of

[69]Chowdhury, *Growth of Commercial Agriculture*, p. 10

India to implement export charges, the so called 'pass-duty.' Under this system, any opium passing through British territory had to pay a fixed sum on each chest of the drug, set at a rate calculated to significantly raise the price of exported Malwa in the international market. Initially Indian merchants were able to evade these charges by taking alternative routes, but the British annexation of Sindh in 1843 closed the last major route by which opium could leave the Malwa states without passing through British territory. Although smuggling remained a significant problem for the opium authorities in western India, it was greatly curtailed by this event and the standardisation of enforcement which followed the 1878 Opium Act.[70]

In the Bengal Presidency meanwhile, with the threat from western India under some level of control, the Company embarked on a further policy of expansion, which continued intermittently until the beginning of the 1860s (see Figure 0.4). This drive to expand required much more direct oversight over production than the Agents could practically provide. In 1816 Deputy Opium Agents were appointed, but shortly afterwards the administrative burden of overseeing production again proved too much, and from 1822 low level management of opium production was combined with the revenue and legal administration, as the Collectors for each district were made ex-officio Deputy Opium Agents. This combination of roles unsurprisingly did little to improve the efficiency of the agencies, leading to the introduction a further level of Sub-Deputy Opium Agents in 1835–1836. So successful were the activities of the Sub-Deputies that the Deputy Agent role of the Collectors was increasingly only used in connection with their magisterial role in enforcing the opium laws; by the middle of the nineteenth century, the Sub-Deputy Agents reported directly to the Agents and the operations of the Opium Department were once again largely separate from the rest of the administrative structure.

As a result of this process, by the end of Company Rule a relatively effective system for extracting revenue from India's production of opium had been established. In particular, under the Bengal system the expansion of government control over opium production resulted in the relatively continuous increase in government receipts

[70]For the effect of the latter see: India Office. *Statement Exhibiting the Moral and Material Progress and Condition of India, During the Year 1879-80.* House of Commons Paper 345. 1881, p. 22.

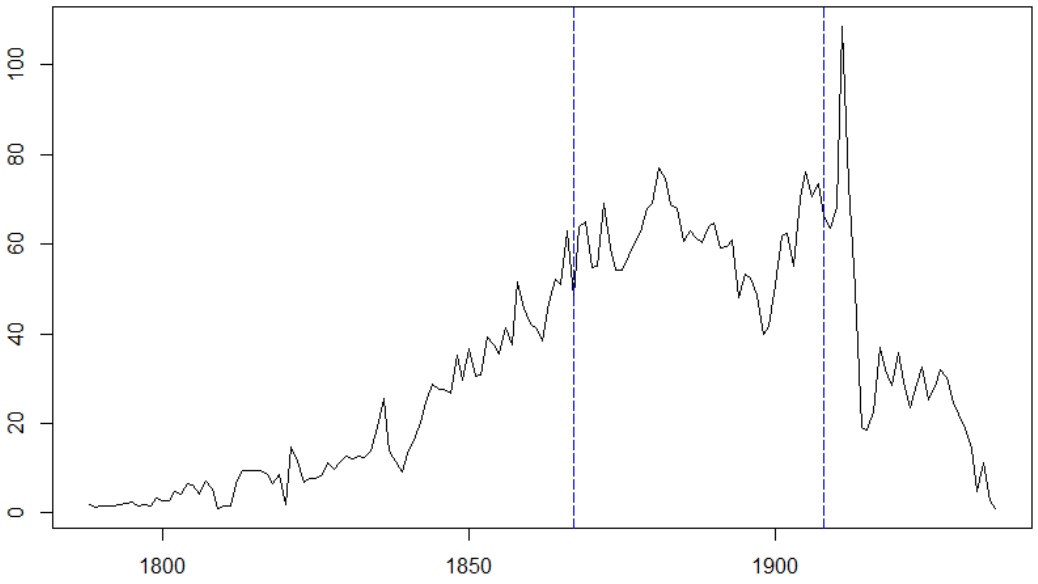

Figure 0.5: Gross Sales Receipts from the Government Auctions, 1787–1936 (Million Rs.). *Calculated from:* Report of the Select Committee on the Affairs of the East India Company, Appendix IV: Administration of Monopolies, Opium and Salt. *Report of Committee 320D. 1831, p. 14;* Report of a Commission Appointed by the Government of India to Enquire into the Working of the Opium Department in Bengal and the North-Western Provinces. *Calcutta, 1883, pp. 69–70; Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce.* Financial and Commercial Statistics of British India. *Calcutta, 1907, p. 74; Department of Statistics.* Statistics of British India: Volume II: Financial Statistics. *Calcutta, 1918, p. 162;* Statistical Abstract for British India, with Statistics, Where Available, Relating to Certain Indian States, from 1916–17 to 1925–26. *Command Paper Cmd. 3046. 1928, p. 174; and* Statistical Abstract for British India, with Statistics, Where Available, Relating to Certain Indian States, from 1926–27 to 1935–36. *Command Paper Cmd. 5804. 1937–38, p. 922*

from the opium sales shown in Figure 0.5. However, the Rebellion of 1857–58 and the subsequent transfer of power from the East India Company to the Crown led to further adjustments of the way decisions about the Bengal Monopoly were made. Day-to-day operations by the Opium Department remained under the authority of the Bengal Board of Revenue and the Lieutenant-Governor of Bengal, while all major policy decisions, such as changes in the quantity of opium to be sold at Calcutta, or the rate of duty to be charged at Bombay, had to be approved through the Financial Department of the central Government of India, and ultimately by the Governor-General-in-Council.

Through this the patchwork of different sets of regulations the Government of India controlled to a greater or lesser degree almost all opium production in the Indian Empire (Figure 0.6). In the East, under the Government Monopoly, the Bihar Agency and the Benares Agency (covering parts of the North-western Provinces and Oudh) respectively were placed a government Agent.[71] Every year, the cultivators in each Agency would be contracted to plant a certain area of land with poppy, in exchange for an advance payment. Outside of these contracts it was illegal to grow poppies for opium production, but at the same time, cultivators would be fined if they failed to grow the amount contracted for. Once harvested, the unprocessed opium was collected and paid for by the Sub-Deputy Opium Agents for each division at a fixed rate for each seer (a unit of mass in this case equivalent to 2.057lbs or 0.933kgs) produced and sent to one of two factories, at Ghazipore (in the Benares Agency) and Patna (in Bihar). Once there, it was dried and divided into 'provision opium' for export and 'excise opium' for consumption within India.[72] The provision opium was divided into chests, each containing 140lbs.,[73] and forwarded to Calcutta, where it was sold by auction as either 'Patna' or 'Benares' opium, usually for three or four times its cost of production. Since provision opium could not be legally sold inside India, exporters held it in warehouses before shipping it to be sold to consumers, mostly in China and Southeast Asia.

In the West, the Malwa system governed opium production in several of the Princely States in the Central India Agency and Rajputana, as well as Baroda. Here opium was grown freely in areas not under direct British rule, but on entering British territory had to pay the heavy pass-duty, which at times amounted to half the export price of Malwa opium.[74] Once this duty was paid, Malwa opium could be exported from Bombay to its main market, China, with the exception of a marginal amount which went to the United Kingdom, East Africa, and Southeast Asia. Under these

[71]In contemporary terms, the Bihar Agency was mostly in modern Bihar Province and the Benares Agency covered a large parts of modern Uttar Pradesh.

[72]In a similar way a small quantity of Malwa was also purchased by the provincial governments for excise use.

[73]About 63.5 kilograms.

[74]Based on the average Bombay market prices given in Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce. *Financial and Commercial Statistics of British India.* Calcutta, 1907, pp. 84–85, and Department of Statistics. *Statistics of British India: Volume II: Financial Statistics.* Calcutta, 1918, pp. 168–169.

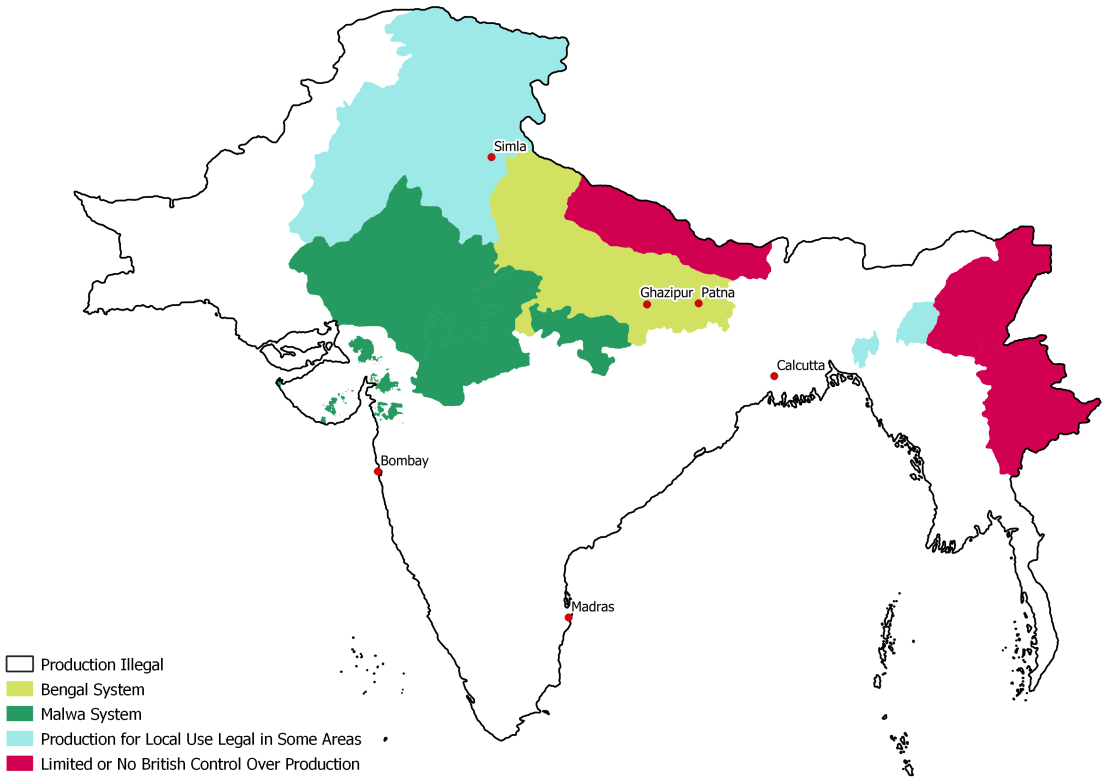

Figure 0.6: Regulation of opium production in the British Indian Empire during the Late Nineteenth Century

systems, the two opium producing regions in India were the largest exporters of raw opium in the world, with the Bengal monopoly producing the majority of the internationally traded drug during the late nineteenth century.

The rest of India grew very little of the drug and none at all for export. Opium production for local consumption was allowed in a small number of areas, mostly in Punjab and Kashmir, but most excise opium was produced under the Bengal or Malwa systems. The majority of opium which Indians bought came through the government and was sold by licensed vendors. There were of course limitations to what production the British Colonial state could control. Although unregulated production in northern Bengal and Assam had largely been ended, the borders with Nepal and Bhutan remained porous and opium from those countries continued to flow into the adjoining regions of British India. Similarly, in Northern and Eastern Burma, where British administration was more nominal than actual, opium was widely produced outside of official oversight, with Burmese opium and opium produced in Southern China flowing freely both ways across the border.

0.4 Taxation Efficiency & the Government as a Commercial Actor

As outlined in the General Introduction governments whose income is to some extent predicated on extracting rents from commodity production, whether externally or domestically, face substantial effects on the way in which they develop fiscal capacity. A very significant proportion of the large growth in government income under Company rule came from expansion in the extraction of revenue from salt and opium, in large part from 'Monopolies' in Bengal and to a much lesser extent Madras.[75] At the same time that the East India Company was increasing its hold over some commodities *qua* ruler, the commercial arms of the Company were in parallel seeking to secure greater control over the production of various other commodities *qua* merchant.

Comparing the two different models of opium taxation in the context of this wider history of the development of economic control, both public and commercial, by the governmental body reveals some of the wider costs associated with this approach to revenue collection and also highlights that many of the issues that will later become apparent in the closer examination of the workings of the Bengal Monopoly were not mere idiosyncrasies of opium specifically (although perhaps exacerbated by some of the peculiarities unique to the drug), but rather reflected wider consequences of these type of taxation structure.

Although the Government of India was involved in a wide variety of undertakings that could be described as commercial, including railways, telegraph, post-office, and irrigation works, these types of activities, even when they actually did turn a profit for the government, represented the provision of services and infrastructure, rather than being directed towards the extraction of revenue. In a similar way, there are a number of other instances of sources of ordinary revenue that, while more intimately connected with taxation do not provide a good point of comparison with the Bengal Opium Monopoly. For example, the management of government-owned estates,

[75]Richards, "Fiscal States", pp. 422–426

which although significant in some parts of India, shared more with Land Revenue administration than other kinds of taxation. Similarly, although the Government of India's Forest Revenue came largely from the commercial sale of timber and other forest products, since the Forest Departments had, at least nominally, conservation as well as revenue-raising aims, their activities are also difficult to directly compare with the Opium Revenue. Given these distinctions, this section focuses on examples that are closely related to revenue extraction from resource production and especially on two case which closely resemble the system of opium revenue — the salt revenue and the short-lived Madras Tobacco Monopoly — together with a selection of commodities commercially procured by the East India Company before it was confined to a purely governmental role in 1833.

The manner in which the Government of India derived its salt revenue, as in the case of opium, varied in the different parts of India. In Bengal, the early development of the salt tax occurred in many ways in parallel to that of the Opium Monopoly. Initially after the establishment of Company rule in the province, a private company was granted exclusive right to trade in salt, tobacco, and betel-nut in exchange for a fixed share of the value of the goods sold. This arrangement was quickly found unsatisfactory, and following a brief experiment with an excise tax, and a somewhat longer one with farming out salt production to the highest bidder, in 1780 the production of salt was brought into the hands of the government. In this enterprise the approach adopted was similar to that used for opium several years later: the salt producing areas of the coast were divided up into agencies, advances were given, and the salt collected by the government. Initially it was then sold at fixed prices from the warehouses, but after 1788 all the salt was brought to Calcutta, divided into lots, and sold at public auctions.

In the Madras Presidency, salt taxation, as introduced in 1805, also took the form of a government 'monopoly.' However like an earlier system in Bengal, while the government bought salt from the producers at fixed prices, it also sold to buyers at fixed prices as well, so that effectively a constant duty was charged on all salt sales in the presidency.

By contrast, there was no consistent system of salt taxation in the Bombay Presidency until 1837, the various manufacturies being under a mixture of government manufacture, revenue farming, local duties, and special land taxes. In that year a general excise tax was introduced to replace the various existing measures. Under this system, the manufacture of salt was restricted to certain places in which unrestricted private production could take place, but from which salt could only be released once it had paid the excise duty. Later in the century as the salt sources in the princely states of central India came under the control of the colonial government, salt from these places also entered British India after paying a duty. Maintaining these divers systems and the different rates of duty under them, would ultimately require the Government of India to maintain and man the 4,000 kilometers of the Inland Customs Line, separating Bengal, the Central Provinces, N.W.P.O., and Punjab from the rest of India, until the unification of the rate of salt duty, although not the means of collecting it, in 1877.

The complexity of the salt tax was no defence against future problems. Particularly in Bengal, salt revenue almost immediately ran into difficulties. The government's chief motivation in introducing a centralised auction system in the first place had been to prevent large merchants from being able to buy up all the salt in the government's warehouse for one district.[76] However, in a pattern that will perhaps become familiar from the detailed discussion of the opium monopoly later in this thesis, the government was beset with problems controlling supply and ensuring consistent revenue.

From the start of the agency system the Board of Trade and subsequently the Board of Revenue struggled to consistently get a sufficient supply of salt from the coast of Bengal to meet the government's needs; the years 1800 and 1813 were marked by a significant oversupply of salt, leading to price reductions, while 1810, 1817–1818, and 1824 saw shortages. Even outside of these years of particular dearth and abundance, prices at the sales were very volatile, leading in turn to a great variability in revenue. The government's response was largely focused on expanding

[76]G. Plowden. *Report of the Commissioner Appointed to Inquire into and Report Upon the Manufacture and Sale of, and Tax Upon Salt in British India.* Command Papers 2084-I, 2084-II, 2084-III, 2084-IV, 2084-V. 1856, p. 146

supply; for example, in 1813 the government increased the price paid to producers to better compete with salt smugglers, and this step was followed four years later by the legalisation of the importation of foreign salt, once it had paid a customs duty set at a rate to prevent competition with the government's salt.[77]

However, risk to the revenue was not restricted to production problems; throughout the period of open auctions, merchants combined to control prices at the government sales, while at the same time limiting the amount available for retail sales, thereby increasing their own profits at the expense of the public revenue.[78] So strong was the influence of this group, characterised at the time as a 'sub-monopoly,' that according to one subsequent historian into the 1820s: "the variation in the average price was quite unrelated to the supply of salt."[79] In response, the government expanded the number of salt sales each year from four at the beginning of the Monopoly to twelve in 1825 with a view to stabilising the auction prices.[80] The combination of this manipulation and unstable supply under government management led to heavy fluctuations in the output of Bengal salt, leading to greater demand for imports.[81] The combined impact of supply problems and difficulty in securing sales from manipulation, coupled with increased competition for government salt from foreign imports led the government to abandon open auctions in 1836. Following the end of the auction system, the authorities in Bengal switched to selling unlimited quantities of salt at fixed prices from the government warehouses, an approach generally closer to that of the Madras Monopoly. Although the manufacture and sale of government salt continued for some time, it was increasingly replaced by foreign imports in both the food and the revenue of the region, and by the start of the twentieth century the Government of India made less than Rs.10,000 each year from the sale of salt in

[77]Previously imports had taken place on account of the government from Madras and Orissa (which was outside the Bengal salt system).

[78]Prasad, *Aspects of British Revenue Policy*, p. 137; A.M. Serajuddin. "The Salt Monopoly of the East India Company's Government in Bengal". *Journal of the Economic and Social History of the Orient* XXI.III (1978), pp. 304–322, pp. 307–311; and Sayako Kanda. "Competition or Collaboration: Importers of Salt, the East India Company, and the Salt Market in Eastern India, c. 1780–1836". In: *Memory, Identity and the Colonial Encounter in India: Essays in Honour of Peter Robb*. Ed. by E. Rashkow, S. Ghosh, and U. Chakrabati. London, 2017, p. 249

[79]Prasad, *Aspects of British Revenue Policy*, p. 137. See for example the discussion of the concept of a 'sub-monopoly' in *Report of the Select Committee on the Supply of Salt for British India*. House of Commons Paper 518. 1836, pp. 34–36, 40–43.

[80]Prasad, *Aspects of British Revenue Policy*, p. 139

[81]Kanda, "Competition or Collaboration", pp. 266–267

Period	*Bengal*	*Madras*	*Bombay*
1797–1806	25.19	—	—
1807–1816	26.96	17.93[82]	—
1817–1826	29.59	23.71	—
1827–1836	33.18	18.78	—
1837–1846	27.56	16.47	8.91[83]
1847–1856	25.91	15.95	8.43

Table 0.4: Average Cost of Collection for Salt Revenue by Presidency (percent of gross revenue). *Calculated from:* Return of the Gross Revenue Derived Annually from the Tax on Land in India since 1792. *House of Commons Paper 336. 1855, pp. 2–15; and* Return Showing the Gross Amount of the Indian Land Revenue, the Receipts from Tributes, Sayer, Abkarry, &c. *House of Commons Paper 200. 1859, pp. 6–7*

Bengal.

Meanwhile, in Madras the government's management of salt production was somewhat less tumultuous, not least because the government's practical involvement in the market was that much less. Although the much higher costs of production in Bengal meant that it was that region which saw the largest efforts to streamline salt tax collection, even in Madras, government involvement in manufacturing meant that collecting the salt revenue was still relatively expensive compared to the excise system in Bombay. Nevertheless, repeated discussion in the middle of the century of the desirability of introducing a similar excise to Madras did not lead to significant changes in the way salt revenue was collected.[84] However, from 1871, salt could also be produced by private manufacturers under an excise system similar to the one in Bombay in parallel to the government Monopoly. Almost immediately from its introduction salt produced under the excise began to gain ground on government salt, and again by the turn of the century the income from this source had largely replaced that from government sales.

Comparing the results of the different systems of salt taxation operated in India in the first half of the nineteenth century, the Bengal system was by far the most

[82]Average of three years only.

[83]Average of nine years only, before this point the cost of collecting the Bombay salt revenue was too small to be included in the accounts.

[84]See for example: Plowden, *Report on Salt*, pp. 111–122

successful in absolute terms — it was only in 1849 that the combined net salt revenue of the rest of India equaled that from Bengal.[85] However, it is difficult to draw conclusions simply from the total gross revenue generated; Bengal was the most populous part of India in this period, and while British possessions in Lower Bengal saw only limited expansion after the late eighteenth century, in most of the rest of India British territory, and consequently the area in which the salt revenue was enforced, increased substantially. Even by the end of Company rule, after seventy years of almost continuous expansion of British control over the rest of India, just under a third of the population under direct British rule lived in Bengal.[86] However, if the limited population figures available for the period are accurate, and on the rather naïve assumption that all salt taxed under a presidency's salt system was actually consumed in that presidency, Bengal, Madras, and Bombay all performed similarly, allowing for population, with an average incidence of roughly 4 annas per head each, while the new northern India jurisdictions performed rather worse.[87]

Turning to efficiency of collection however, a much clearer contrast emerges; Table 0.4 shows the relative proportions of gross revenue spent on collecting the salt tax under each of the three main systems. Although the gross revenue bore a similar relationship to population across all the presidencies, the share of that revenue which was spent on collecting the tax was consistently higher where a Monopoly system was in place, and highest of all in Bengal, where the government internalised the risk related to production. By contrast, the Bombay excise system in the decades that it operated cost only about a third as much as the Monopoly in Bengal, reflecting both reduced vulnerability to changing production costs and the relatively fixed nature of the tax.

The transition away from the full auction system also appears to have had a significant impact on the overall efficiency of Indian salt revenue given the relatively large proportion of the salt revenue made up from sales in Bengal. Up until the

[85] *Return of the Gross Revenue Derived Annually from the Tax on Land in India since 1792.* House of Commons Paper 336. 1855, pp. 2–15

[86] *Return of the Area and Population of each Division of each Presidency of India, from the latest Inquiries.* House of Commons Paper 215. 1857, p. 16

[87] Based on the figures for population from ibid., p. 16 and salt revenue from *Return Showing the Gross Amount of the Indian Land Revenue, the Receipts from Tributes, Sayer, Abkarry, &c.* House of Commons Paper 200. 1859, pp. 6–7.

abandonment of auctions, there was a steady increase in the cost of collection of Indian salt taxation as a whole, which reached its peak in 1833–1834, when 41% of the gross revenue was spent on collection.[88] After that point, the cost decreased intermittently to around 20% in 1860. By 1864 the cost had fallen to just over 6%, with almost all the decline occurring in the official year ending 1862, following a massive increase in imports of foreign salt resulting from the dislocation in Atlantic salt markets caused by the American Civil War and a consequent 85% decrease in the amount of government salt sold in Bengal.[89]

While the collection of salt revenue through government Monopoly was very expensive, it was in an important sense very successful; up until the 1830s almost all of the substantial growth in the Indian salt revenue came from Bengal, with Madras being the second largest contributor.[90] Much like the opium revenue that it grew in parallel with (see Section 0.3), if one considers the question purely in terms of gross revenue collected the Bengal salt Monopoly did achieve at least the first of what Sayako Kanda describes as the twin goals of setting up the Monopoly: "to improve financial stability and expand financial capacity."[91]

However, in other dimensions, this structure was far less beneficial. In the first place, the structure of the Monopoly meant that the government internalised much of the risk associated with production, especially during the repeated supply shortages during the 1810s and 1820s that led to the admission of foreign salt. Secondly, by heavily centralising the market for salt through the system of auction sales adopted in Bengal, the government allowed limited numbers of purchasers to create information asymmetries through co-ordinated action, thereby encouraging rent-seeking behavior on the part of salt merchants and others. Finally, and most importantly of all, this method of collecting salt revenue disincentivised changes to the overall structure of state finance. Since the revenue it provided was high in absolute terms, as in the case

[88]These and the following figures are calculated from data in: *Return of Land Revenue, 1855*, pp. 2–15; *Return of Revenue, 1859*, pp. 6–7; and *Finance and Revenue Accounts of the Government of India, 1857–1947*. House of Commons Paper Vrs. 1859–1947.

[89]India Office. *Statement Exhibiting the Moral and Material Progress and Condition of India, During the Year 1861–62: Part 1 (Bengal and Madras)*. House of Commons Paper 271. 1863, p. 280

[90]*Return of Land Revenue, 1855*, pp. 2–15

[91]Kanda, "Competition or Collaboration", p. 249

of opium, the expanding fiscal needs of the state could be met without the adoption of a more broad-based revenue system. In fact, the shift over the second half of the nineteenth century towards excise and customs taxes on salt instead of government Monopolies can be seen as the adoption by the colonial government of a strategy of increasing net revenue by adopting more efficient ways of collecting revenue from salt, rather than developing broader, more elastic forms of taxation.

To take one more case, a similar 'monopoly' approach to taxing tobacco production was adopted in the west of the Madras Presidency between 1803 and 1854. Although it was a common cash crop, up until the first decade of the nineteenth century tobacco in the main producing regions of south India had been subject only to various small transit dues. However, repeated deficits in the first years of the nineteenth century led the Presidency Government, which at that time had independent legislative powers, to introduce a government 'Monopoly' over tobacco production gradually between 1803 and 1811. Under the Monopoly, in the three large Districts of Malabar, Canara, and Coimbatore, tobacco production was forbidden except on account of the government. The Collectors in each of the districts made advances to cultivators, who would then deposit the tobacco, once grown, at government depots where they were paid fixed prices depending on the quality.[92] From there the tobacco was resold to merchants, again at fixed rates, with the government's revenue coming from the difference between the two prices.

This approach was not a success. Almost immediately the introduction of the Monopoly system led to a rapid growth in smuggling, and by 1812 reports were received in Madras that armed gangs were attacking the government tobacco warehouses.[93] Even an expanded preventative force ultimately proved insufficient to deal with this problem and eventually the army had to be deployed to suppress tobacco smuggling.[94] In part, these difficulties were the result of the geographically distributed nature of tobacco production and the limited presence of the state in

[92]Early experiments were also made with contracting merchants to deliver tobacco at fixed rates to the government, but these proved unsatisfactory. ("Proceedings of the Board of Revenue, Fort St. George, 22nd of June, 1848". In: *Madras Revenue Proceedings, 21st of June to 6th of July 1848*. Vol. IOR/P/307/65. India Office Records, British Library, pp. 9341–9342)

[93]ibid., p. 9346

[94]Thomas, *The Growth of Federal Finance in India*, pp. 37–38

western Madras in this period. However, it is not clear that larger numbers of administrators alone would have resolved the situation, since it was said that public servants "notoriously connive at and participate in the contraband traffic."[95]

Nor were the effects of this activity restricted to a breakdown in public order — the pressure created by the quantity of illicit tobacco circulating in the Monopoly districts forced the government to repeatedly cut prices in an effort to force smugglers from the market. For example, in Canara District, which on one side was exposed to coastal smuggling and on the other had a long border with the tobacco-producing princely state of Mysore, the official sale price was brought down almost continuously, from 66 Pagodas per candy in 1803 to 50 Pagodas in 1848, largely as a result of illicit trade.[96] However, these reductions were not enough to counteract the combined effects of the limited quantities produced under the government's management and the ready availability of smuggled tobacco; already in 1822 a British Commissioner estimated that in the first fifteen years of its operation the Monopoly system had reduced legal consumption by 42%.[97]

As in the case of salt taxation, the attempt to establish a tobacco Monopoly in Madras raised a number of issues for the government. In the first place, setting prices was difficult; with a limited presence and information the government struggled to find a level that would satisfy its own revenue needs without simply pushing consumers away from legal tobacco. In the second, as Figure 0.7 shows the expense of buying tobacco at a high enough price to prevent cultivators from selling to smugglers and maintaining the preventative force to combat the latter meant that costs of the Monopoly were high relative to the revenue received and could vary considerably year-to-year. In the third, avoiding corruption by officials was made harder by the difficulty of effectively monitoring their compliance. Finally, and perhaps most importantly, the consequence of this combination of limited sales and the expense of maintaining the Monopoly systems was that the net revenue which the government actually received was itself restricted and uncertain.

[95]IOR/P/307/65, p. 9349

[96]Before the currency unification of 1836, the Pagoda was a coin worth 4 Current Rupees at the official rate of conversion. The Candy was a unit of mass, equivalent in Malabar to 680lbs, or 308.443kgs. For the effects of smuggling on government prices, see: ibid., p. 9344

[97]ibid., p. 9348

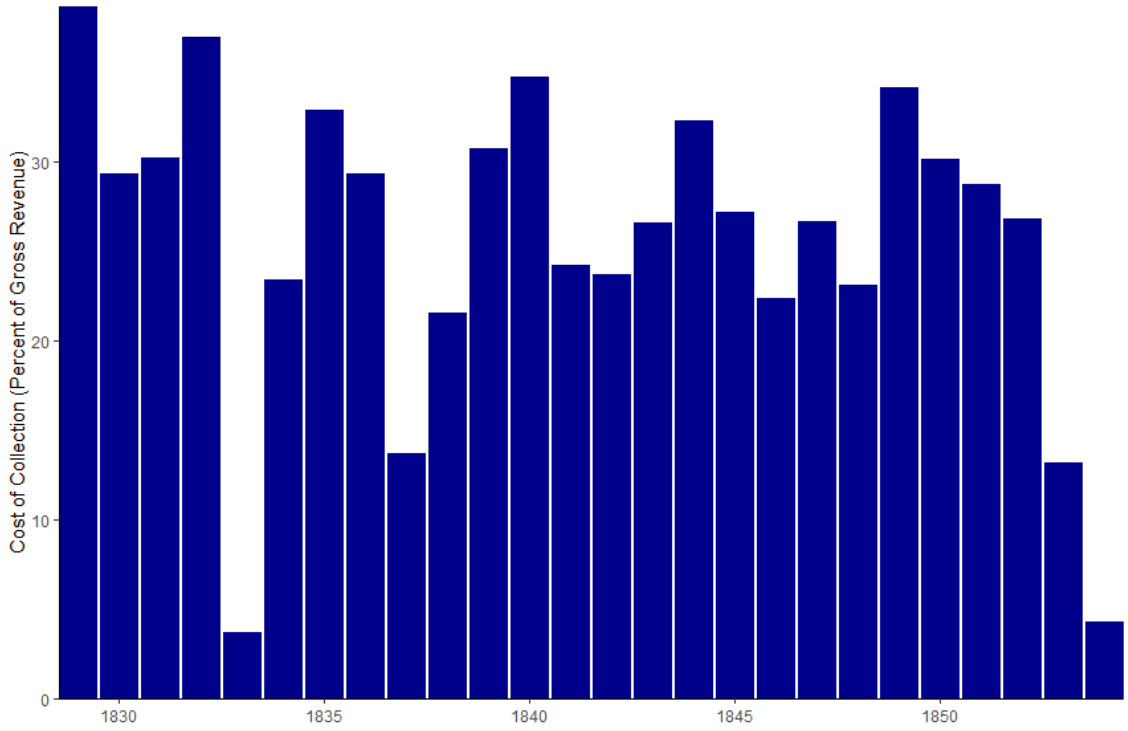

Figure 0.7: Cost of Collection for the Madras Tobacco Monopoly, 1829–1854 (percent of gross revenue). *Data from:* Accounts Respecting the Annual Territorial Revenues and Disbursements of the East India Company, Various. *House of Commons Papers. 1834–1856*

It was ultimately the complexity of resolving these issues, together with the risk posed to public order, which eventually led the government to dispense with the tobacco Monopoly. After the Madras Board of Revenue had recommended that any possible modifications would be unworkable, the Monopoly was abolished in 1852 and its activities had ceased by 1854.[98] So bad, in fact, had this experience been, that although both production and consumption of tobacco were repeatedly discussed over the intervening years as valuable potential sources of revenue, Indian tobacco remained untaxed by the central government until 1943, when an excise duty was applied to it.

Moving away from examples within government, attempts by the East India Company to centralise its procurement and gain greater control over the production of various export goods also reveal certain parallels with revenue-raising systems based on extracting money from the trade in individual commodities. Obviously in these cases, the potential for effects on the structure of taxation is limited, but nevertheless,

[98] Amongst the alternatives considered were more traditional taxes on the production and sale, transit duties, and excise and licensing systems for tobacco (IOR/P/307/65, pp. 9361–9403).

many of the same negative effects are evident, suggesting that such issues were not restricted to the individual commodities which the colonial government chose as sources of fiscal revenue.

For example, some similar problems to those already described were encountered when the Company took over the Monopoly on saltpetre that had existed under the Nawabs of Bengal.[99] In particular, the Company's agents had difficulty in preventing smuggling by the producers, who were forbidden from taking other work.[100] Concurrently, the same agents were accused of using unfair weighing practices and illicit charges against the manufactures.[101] Matters were further complicated by the fact that demand for saltpetre in Britain fluctuated with as peace and war alternated in Europe, and frequent low prices in this major export market meant that Bihar saltpetre was often used for ballast, as the trade was not necessarily otherwise profitable.[102] Monopsony procurement was initially replaced with a system similar to that used for piece goods, and then completely removed in 1814, although an existing tax on its manufacturers was retained for some years.

Even when the Company made no attempt to establish a monopsony over the production of a commodity, it could not avoid problems created by the moral hazard which occurred in purchasing goods from producers and through intermediaries. This can be illustrated by two examples from the textiles sector. First, in their 2008 article, Kranton and Swamy specifically contrast what they view as the relatively successful procurement of opium for the Bengal Monopoly with the difficulties that the Company had while buying cotton goods in ensuring contract performance by the weavers themselves, at the same time as preventing expropriation by agents and contractors through whom it made purchases.[103] As in other cases, the Company's factors were prevented by the decentralised nature of production and alternative potential monitoring difficulties from adopting a more vertically integrated procurement structure.

[99]It is worth noting that this 'monopoly,' although mandated by law, was part of the Company's 'commercial' rather than 'territorial' operations, and so was not counted as a regular source of government revenue as salt and opium were.

[100]Singh, *East India Company*, p. 98

[101]ibid., pp. 121, 125

[102]ibid., p. 112

[103]Kranton and Swamy, "Contracts, Hold-up, and Exports", pp. 976–981

However, Hutková has recently shown, in the case of silk, that even where the centralisation of manufacturing did allow the mitigation of some agency issues with producers and the enforcement of consistent manufacturing methods, the geographically diffused nature of the production of the raw materials for silk meant that the Company continued to be overcharged by intermediaries in this part of its procurement process and enjoyed limited control over the quality of silk cocoons that it received.[104] In all of these instances, as in salt and tobacco, the difficulty of controlling production and capturing value was made difficult by the fact that the production of raw materials necessary for consumption goods (either for the domestic or export markets) was conducted by many individual producers spread out over a large area, and that both the Company's commercial residents and revenue officers were relatively few and heavily relied on intermediaries in making purchases.

These examples from the period before Crown Rule illustrate a number of the themes which will become evident from a closer examination of the Bengal Opium Monopoly. In particular, the high costs of collection associated with government involvement in commodity production and the difficulty of preventing both individuals acting as agents for the government and outside actors from capturing revenues that otherwise would have gone to the government. At the same time, there are of course obvious differences between these cases and that of the Bengal Opium Monopoly. In the case of salt, as a general item of consumption throughout India there were generally stronger limits on what outcomes, in terms of the retail price of salt, were acceptable for the government, while for tobacco, the pressures created by the introduction of a Monopoly extended beyond revenue concerns to issues of public order, revealing that there were real limits to the government's ability to enforce not only its Monopoly on tobacco but also its monopoly on violence.

Conversely, for the examples of commercial purchasing under the East India Company, there were obvious difference both in terms of the goals of the procurement process and the legal frameworks around enforcement in which it took place. In any event, government production and sale of opium in Bengal and salt in Madras were

[104]K. Hutková. *The English East India Company's Silk Enterprise in Bengal 1750–1850: Economy, Empire and Business.* Woodbridge, 2019, pp. 102–103

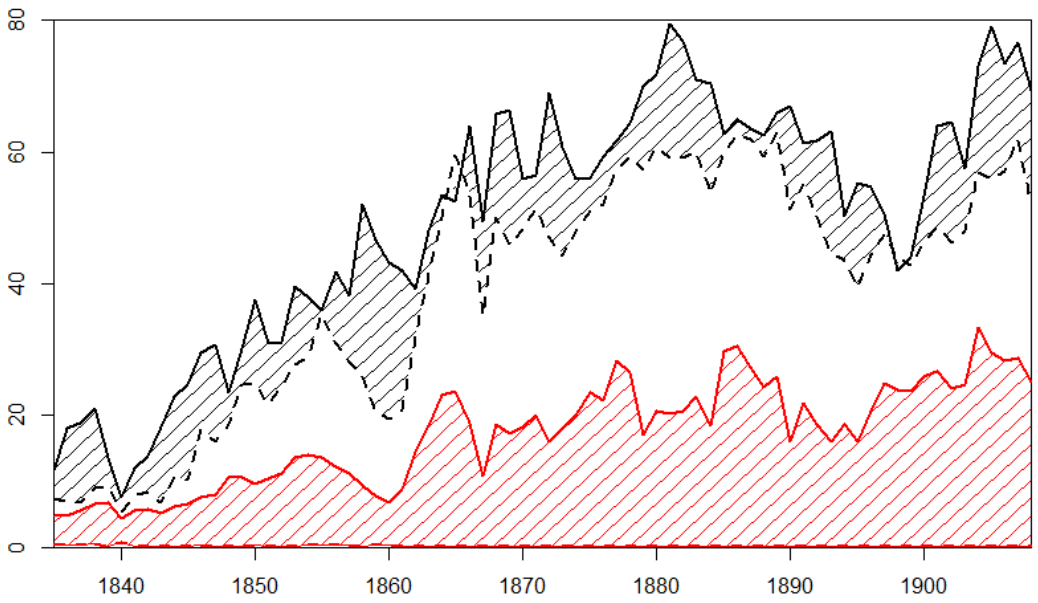

Figure 0.8: *Comparison of Gross Bengal Revenue and Cost with Minimal Malwa Counterfactual (Million Rs.); for details see surrounding text. Calculated from: Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce.* Financial and Commercial Statistics of British India. *Calcutta, 1907, pp. 71, 72–73; and Department of Statistics.* Statistics of British India: Volume II: Financial Statistics. *Calcutta, 1918, pp. 161, 162*

certainly somewhat more successful, if by no other metric than that the Government of India considered them worth continuing for more than a century each. However, this still leaves the question of why the Government of India continued with the 'monopoly' model of collecting revenue for Bengal opium when in, for example, the case of salt the general tendency after the end of Company rule was to move towards excise taxes.

One relatively simple way to consider the question is to look at how different the fiscal results of Bengal opium would have been if the average costs and profits per chest of opium had been the same as those which were actually received under the Malwa system. Although very far from a perfect counterfactual, not least because it is almost certain that the Government of India would have pursued a different strategy with regard to setting the rate of pass-duty if it had been collected on all Indian opium, it does at least provide a relatively simple point of comparison, which if anything is likely to under-represent potential income from the counterfactual. The

results of this exercise are presented in Figure 0.8. The area under the red dashed line shows what the cost of collecting the Bengal opium revenue would have been if the cost of collection per chest of opium had been the same as it actually was under the Malwa system, the red-striped area is the additional cost actually incurred by the Bengal Monopoly, the white area is the net profit to the Government of India under the hypothetical Bengal Malwa system, and the black-striped area is the additional revenue brought in by the Bengal Monopoly over and above this amount. Consequently, comparing the sizes of the red- and black-striped areas shows how much the government had to pay for the amount of additional revenue it received. While in almost every year, the actual Bengal Monopoly did generate more net revenue than this simple counterfactual, the investment required to pay for the costs of running the Monopoly was significantly larger than the additional net revenue gained by it. Particularly given the relatively low costs of collection for other sorts of taxation used by the Government of India raises the question of the opportunity cost of investing this money in the Opium Monopoly — was this really the most revenue that the government could have generated from this expenditure?

This question becomes even more pointed if one considers that, as mentioned in the previous section, in the 1820s and 1830s the government attempted to also gain a similar 'monopoly' over the sale of Malwa opium for export, only settling on the pass-duty system once these efforts had failed as a result of a lack of control over production itself and unwillingness to co-operate on the part of some of the princely states involved. The answer to some extent is that given in the introduction: that the colonial government sort to maximise total revenue from control of a limited number of resources in this way, even if it decreased the overall efficiency (and increased the cost) of taxation in general, since doing so both avoided the need to develop the kind of bureaucratic capacity that would have been required to capture a larger share of national income and reduced the political risk of demands for more popular government that might have followed higher taxes on the general population. As the examples in this section have illustrated the limitations of this kind of revenue collection were not unique to opium but also existed when similar strategies were

adopted with other commodities, and even in the cases of other commodities which were not drawn into the fiscal system. However, opium was attractive for this purposes, given the relatively limited scale of production and the large profits in absolute terms which the Government of India could realise from it, both of which made it a good fit for this kind of revenue extraction.

The next sections will discuss these issues in more detail, describing the specifics of opium production under the Bengal Monopoly, provide limited estimates of how revenues from opium were distributed, and examine the international context in which the Bengal Monopoly operated.

0.5 The Basics of Opium Cultivation

Since the manner in which the Government of India collected revenue from the Bengal Opium Monopoly was to a great degree dependent on climatic and agricultural considerations, it may be as well at this point to provide an outline of the process by which opium was grown. Given that the details of cultivation varied considerably through the area of the two Bengal agencies, the account given here is of a very general kind and no attempt is made at this stage to disentangle the various controversies surrounding the subject, however the most significant of these issues are discussed in Section 2.2.

Poppy was for the most part grown in small plots on the high quality land close to the villages in which the cultivators lived, and to the wells which provided the water for its irrigation. Besides these advantages, this type of plot also tended to be relatively well fertilised, since animal manures could be applied to them relatively easily. As a result, similar land was used for various high-value crops in addition to poppy, especially tobacco, spices, and vegetables. However, the expansion of opium production over the course of the nineteenth century meant that the range of cultivators and kinds of land used expanded, and occasionally poppy was grown on very unsuitable land for that crop.[105] In particular, poppy was sometimes used as a

[105]See for example: J.R. Reid. "Azamgarh Settlement Report (1881)". In: *A Consise Encyclopaedia of North Indian Peasant Life, Being a Compilation from the Writings of William Crooke, J.R. Reid, G.A. Grierson.* Ed. by S. Amin. Manohar, 2005, p. 332

relief crop, as in areas where sugarcane had been grown before, to allow the soil to recover.[106]

Both in Bihar and the N.W.P.O., agriculture was divided into two seasons. The first ran roughly from May to September, and produced crops which required hotter, wetter conditions, while the second occupied the remainder of the year, and was used for the cultivation of more temperate crops. Opium fell into this second category, with maize being one of its most common antecedents. The 'opium year,' therefore, began in September, when, as described in the previous section, the government issued licenses and advances for the cultivation of a certain area of poppy. Following this, the cultivators began a period of extensive preparation before planting. In some areas this began with animals such as sheep and goats being allowed onto the field to provide additional manure, but in all cases the prospective poppy land was broken up with a plow repeatedly over a period of several weeks. Finally, the soil was watered before sowing commenced. Depending on the condition of the rains, the sowing took place between late September and the end of October. The seeds were steeped in water, and mixed with earth before being sown. In some cases cultivators planted other crops, such as spinach, in between the poppy plants, although they were explicitly forbidden to do so in the government licenses.

After the seeds had been sown, one of the main jobs of the cultivator was to keep the developing plants irrigated. In fact poppy required an especially large amount of water, even more than other spring crops like wheat and sugarcane.[107] Since the most common source of water for opium cultivation was wells, this represented a significant demand on the labour of the cultivators. However, the impact of this issue was very unevenly distributed — in some areas of the Benares Agency, the young poppy plants only needed to be watered four or five times in total, while in drier areas irrigation took place every two weeks after their germination.[108] The contrast was even stronger in the other agency, since in parts of Bihar the soil was so naturally moist that no watering was necessary, although this advantage came at the

[106]G.A. Grierson. *Notes on the District of Gaya.* Calcutta, 1893, p. 71
[107]ibid., p. 62
[108]J.F. Duthie and J.B. Fuller. *Field and Garden Crops of the North-Western Provinces and Oudh, Part I.* Roorkee, 1882, p. 66

cost of a lower average output.[109] The other major task involved with cultivation was weeding, a process that had to be carried out regularly during the growth of the poppies. The proximity of the opium fields to the village meant that this type of regular work could be and commonly was carried out by the women and children in the cultivator's family, who could consequently combine looking after garden crops with domestic activities.[110]

Harvesting, which took place between the end of January and the beginning of March, was also mostly done using the labour of the cultivator's family. The poppy plot was first divided into two or three sections. In the afternoon and evening of the first day the seed capsules in one section of the field were scored with a special four-bladed knife. The next morning, the latex which had flowed out of these cuts onto the outside of the seed head was scraped off and collected. The next section of the field was then lanced that afternoon, so that the whole field could be covered in two or three days. Once all the parts of the field had been attended to, the cycle was then repeated until the poppy heads stopped yielding latex, often after two or three weeks of harvesting. The processes of quickly lancing the heads and scraping the latex without either loosing large amounts of opium or irreparably damaging the plant were skilled tasks that required experience and practice.[111] The opium latex was then dispatched to the government's weightment stations, along with a limited quantity of leaves and petals which were used to package processed opium. The remaining parts of the plant along with the poppy seeds could then be sold to merchants or retained for the use of the cultivator's own family.

The ultimate results of this process are shown in Table 0.5, which contains some basic statistics for opium production over the period covered by this thesis. These reinforce the small scale and widely dispersed nature of opium cultivation in the Bengal Monopoly, relative to its importance as a source of revenue for the Government of India. Even in the peak year of 1904, the total amount of land from which opium was harvested only covered land slightly larger than that of the modern

[109] J. Scott. *Manual of Opium Husbandry, for the Use of Officers in the Government Agencies.* Calcutta, 1877, p. 3

[110] For a more in-depth discussion of the issue of familial and hired labour in opium cultivation, see Section 2.2

[111] See for example the discussion in: Scott, *Manual*, pp. 74–76

	Area Under Opium	*Output of Unprocessed Opium*
Year Ending	*Hec.*	Tonnes
1858	101,435.49	2,049.56
1868	183,529.39	3,128.49
1878	189,404.32	2,965.36
1888	217,325.83	4,596.29
1898	235,378.30	3,181.68
1908	197,861.94	2,664.91

Table 0.5: Area Under Poppy (excluding failures) and Output of Unprocessed Opium under the Bengal Monopoly, Selected Years 1858–1908. *Data Sources: Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce.* Financial and Commercial Statistics of British India. *Calcutta, 1907, p. 78; and Department of Statistics.* Statistics of British India: Volume II: Financial Statistics. *Calcutta, 1918, p. 164.*

country of Luxembourg, but was spread out over area well over a hundred times that size. Together with the fact that the number of licensed cultivators varied between about one and one and a half million, again emphasises both the small scale and labour intensity of poppy cultivation. However, wider trends are also evident. The growth in both the quantity of opium sold and the revenue which the government of India dervive from over the first three quarters of the nineteenth century that were noted in the preceding section are also reflected in these production figures; both the area under cultivation and the output of opium increased gradually across the first four decades covered in this table. However, looking at production also reveals an interesting additional trend: although the area under poppy continued to increase until the start of the twentieth century, output reached its highest point in the late 1880s, and after that point output per hectare was generally considerably less, a development which will be explained in Paper 3. These figures also provide an interesting point of comparison with Tables 0.2 and 0.3 in the General Introduction, which cover, respectively, the revenue and trade contributions of opium; given the relative economic importance of Bengal opium to India in this period relative to the small scale on which it was cultivated, the question of where the significant profits from opium went to is obviously an important one. In the following section the distribution of these returns will be discussed in more detail.

0.6 Dividing the Spoils

As the preceding sections have shown, over the first century and a half of British rule in India, the Government of India sought to develop effective strategies for collecting revenue from opium in spite of the diffused nature of production. However, the returns from opium were not restricted to the Government of India; the various kinds of economic activity associated with the opium trade had impacts on large sections of the nineteenth-century Indian economy.[112] As a consequence, the colonial government faced significant competition from a variety of other actors who also sort to capture as much of the value of the trade as they could. A closer examination of the distribution of the profits from export production of opium in India highlight the core issues in the Government of India's attempt to tax the drug, that will be the focus of the remainder of this thesis.

Figure 0.9 presents some estimates of the various costs and payments that were involved in the production and export of the various kinds of Indian opium.[113]

[112]Richards, "Opium Industry"

[113]The example costs given in Figure 0.9 are calculated on the basis of a notional journey of chests of opium produced in the 1892–1893 season, which were the sold in Cacutta and Bombay in October 1893, shipped immediately to East Asia, and then sold as soon as they arrived. Although opium was shipped in this was, it was not always the case: opium could be stored for several years without significant depreciation in its quality. Both the Government of India and especially private merchants frequently held opium in warehouse for relatively long periods of time, in the former case in pursuance of the reserve policy discussed in Paper 1 and in the latter for the purposes of inter-temporal arbitrage. In the case of the Malwa opium, it is explicitly assumed to be produced in Indore state and weighed at the Indore scales to minimise the complexity of the transactions involved. The costs of the Government of India's opium production at its two factories is given as the total expenditure under various heads given in *Report on the Administration of the Opium Department, Inclusive of the Operations of the Behar and Benares Opium Agencies, During the Year 1892–93*. Calcutta, 1894, pp. 23–25, 65–66 divided by the total number of chests produced by the relevant agency. Since no distinction is made in the original source between the cost of producing provision and excise opium, the latter, converted into their equivalent to provision chests, are included in the total used to calculate costs per chest. The costs of producing Malwa opium up to its departure from Indore are based on those given in the: Evidence of Lieutenant-Colonel Robertson, Political Agent of Baghelkhand and Superintendent of Rewah State, *Royal Commission on Opium, Volume IV*. Cmd. Paper C.7471. 1894, p. 89, the only modification being that, in order to maintain consistency, the price at Indore given in this estimate was compared with average Indore price during the previous year which most closely matches it in the source described below (i.e. October 1893). Doing this reveals a difference of Rs. 5.14.0, which is added to the cultivator price of Rs. 368 given in the original. Malwa prices in Indore and Bombay and the amount of stamp duty paid on the hundis (a kind of bill of exchange) are drawn from: *Report on the Political Administration of the Territories within the Central India Agency for 1893–94*. Calcutta, 1894, pp. 91–92. Of this, the average profit to the merchant exporting to Bombay is taken from the: Evidence of Rao Bahadur K.C. Bedarkar, Minister of Indore State, *Royal Commission on Opium, Volume IV*, p. 106, with the rest of the price difference between the two is assumed to represent transportation and other miscellaneous costs. The prices of the two kinds of Bengal opium at the government sales are the averages for the relevant sales given in: Department of Statistics and

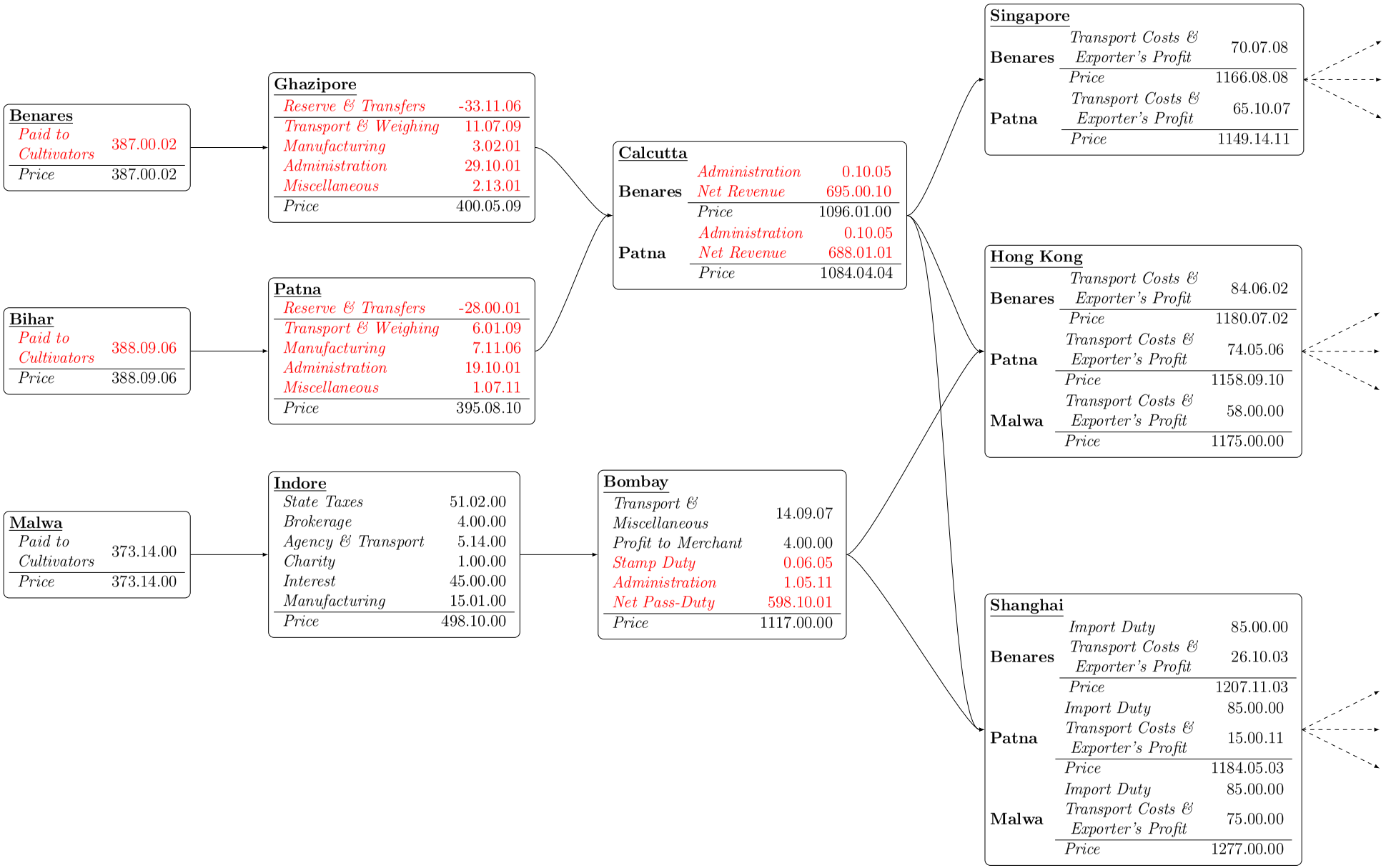

Figure 0.9: Estimates of the Components of the Prices of Benares, Patna, and Malwa Opium Passing through Calcutta and Bombay in October, 1893 (Rs./chest); Items Marked in Red are those in which the Government of India was Directly Concerned. *For sources and construction of the estimates, see surrounding text.*

Starting at the point of cultivation, perhaps the most immediately striking feature of both the Bengal Monopoly in eastern India and the Malwa system in western India is that the amounts paid to the cultivators for unprocessed opium were relatively similar, and in fact slightly lower in western than eastern India. This is surprising since under typical models one would expect a monopsonist (like the Government of India) to pay a lower price than purchasers in a competitive market.[114] However, there are potential issues with this conclusion; although rich in terms of available sources, the early 1890s is not necessarily the most representative period for Indian opium production in general. Successive poor harvests meant that yields were uncommonly low across both Bengal agencies.[115] Additionally, declining demand over the preceding decade had driven down prices for Malwa opium, leading to complaints about the unprofitability of that part of the trade. As a consequence, the amounts paid to cultivators for both Malwa and Bengal opium were probably lower in this period than they had been previously. Nevertheless, even if slightly higher international prices for Malwa earlier in the century did translate into more money being paid to the cultivators, these figures suggest that in spite of having a complete monopsony over opium in Bengal, the Government of India did not buy its

Commercial Intelligence Department and Departement of Finance and Commerce, *Financial and Commercial Statistics (1907)*, p. 75, and the costs of administration in Calcutta and Bombay are calculated from the same source (Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce, *Financial and Commercial Statistics (1907)*, pp. 71, 81). The international shipping costs and the exporters' profits are given as a single, residual item as unfortunately these cannot be separated in a satisfactory way. At the final stage the entrepôt prices for Patna and Benares opium are the averages of the daily prices for Singapore and Hong Kong given in: "Produce". *Singapore Free Press and Mercantile Advertiser* (October, 1893), Vrs. and "Commercial: Opium". *Hong Kong Daily Press* (October, 1893), Vrs. and the weekly prices for Shangai in: "Commercial Intelligence: Opium". *North China Herald* (October, 1893), Vrs. during October 1893. For Malwa, average prices for October are taken from *Report on the Administration of the Opium Department of the Bombay Presidency, for the Year 1893–1894*. Bombay, 1895, p. 6. Since, as outlined above, it is assumed that the opium was that of the season 1892–1893 and was shipped immediately from Indore to Bombay and from thence to China, prices for 'new Malwa' were used throughout (i.e. for Malwa that had not been allowed to mature for a year before being packed); no equivalent distinction existed for the Bengal varieties. In the case of Shanghai, import duties are included, but *lijin* (transit tax) is not, since at the first sale after the opium was landed the former was meant to be paid by the importer and the latter by the purchaser (Chefoo Agreement, 1876, Chinese Maritime Customs Service. *Treaties, Conventions, Etc., between China and Foreign States, Volume I: Russia, International Protocol, Great Britain, United States of America, France, Import Tariff Agreement*. Shanghai, 1917, pp. 496–497). The rate of duty is that given in the Additional Article to the Chefoo Agreement, 1885 ibid., pp. 500–501.

[114]This of course assumes that the product was the same in both places. While this was almost certainly not true, as the next section will show there is no reason to assume that the Bengal varieties were *inferior* in quality to Malwa.

[115]See Paper 3.

opium significantly more cheaply than merchants operating in the somewhat more competitive markets in western India.

There were also some similarities in the structure of local procurement under the two systems. Under the Bengal Monopoly, officials in the Opium Department contracted with cultivators through intermediaries in the villages. In the areas which produced Malwa opium, rural moneylenders initially purchased the unprocessed drug from the cultivators through a broker, either acting as an agent for a city merchant or as their own investment. The opium was then delivered to the merchant who advanced the capital with which opium purchases were made, weighed and taxed.[116] The parallels between these structures may indicate that merchants in the Malwa regions faced similar issues of moral hazard with cultivators to those experienced by the colonial government.[117] This being the case, the use of brokers at this point and later in the sale process may have been an attempt to mitigate some of these problems.

With whom, then, did the money paid to the cultivator actually end up? Although there can be no very precise answer to this question, some idea can be gained by using the amount of land that would be required to produce a chest of opium, based on the average outturn of each agency for 1892–93, to calculate possible proportions of these payments that might go to different destinations. According to the rates given by various witnesses before the *Royal Commission on Opium*, rent made up between 16% and 105% of the average payment in Bihar and 13% to 87% in Benares.[118] As may be imagined from this evidence, the choice of rent rates heavily determines the conclusions that will be drawn here and there are considerable difficulties in this area, which will be discussed in more detail later in this thesis.[119] Additionally, these calculations use average outturn, while better, more productive land probably paid higher rents. Nevertheless, a significant proportion of the money paid to the cultivators may have ended up in the hands of their landlords.

[116]Evidence of Rao Bahadur K.C. Bedarkar, *Royal Commission on Opium, Volume IV*, pp. 105–106 and Evidence of Sirsubha Sakharam Martand, Revenue Minister of Indore State and Jagirdar, ibid., p. 113

[117]For a discussion of the latter, see Paper 2

[118]See Appendix D for the sources and classification of these rates.

[119]See Section 2.2

Quantifying the importance of payments to intermediaries is still more difficult. In the 1890s, one Sub-Deputy Agent in Bihar reported intermediaries as receiving amounts ranging between 6 annas and 2 rupees per bigha, or between 1.5 and 8.5 percent of the average payment given in Figure 0.9.[120] Similar examples are more difficult to find for the Benares Agency, partially because excessive extraction by the intermediaries was seen as less of a problem by government administrators than was the case for Bihar. However, in one instance, a rate of Rs. 1 per maund of opium (less than 0.5 percent of the average payment) was given, and in any case, payments in this agency were probably not higher than those in Bihar.[121]

Returning to the chests of opium in Figure 0.9, differences emerge in the processing of the collected opium. By concentrating all production into two factories, the Government of India realised economies of scale relative to more widely distributed private production in western India. As a result, Bengal opium enjoyed an advantage over Malwa in manufacturing costs, as in the case of the latter, processing had a much more distributed structure, sometimes being directly undertaken by the merchants who owned the opium themselves, and sometimes being contracted out to others.[122]

While both kinds of Begal opium were shipped to Calcutta to be sold at the government auctions, as described in the previous section, in western India the merchant generally sold the Malwa opium, again through a broker, to another merchant who exported it to Bombay. This was also the point at which the pass-duty was collected. However the Government of India was not the only party seeking to tax opium; taxes in the princely state in which the opium was produced contributed to those states' budgets, a fact which probably constrained the colonial government's ability to increase the tax on Malwa to a limited extent, since such a course of action would require some degree of negotiation between the state government and

[120]Evidence of A.G. Tytler, Sub-Deputy Opium Agent of Chupra Sub-Agency, Bihar *Royal Commission on Opium, Volume III.* Cmd. Paper C.7419. 1894, p. 52; and "Memorandum by A.G. Tytler, Sub-Deputy Opium Agent of Aliganj, — Alternative Assamiwar Scheme for the Bihar Opium Agency, November, 1896, (No. 757)". In: *Proceedings of the Government of India Department of Finance and Commerce, January to June, 1898.* Vol. IOR/P/5489. India Office Records, British Library, p. 1079

[121]J.H. Rivett-Carnac, Opium Agent of Benares *Royal Commission on Opium, Volume II.* Cmd. Paper C.7397. 1894, p. 56

[122]Evidence of Rao Bahadur K.C. Bedarkar, *Royal Commission on Opium, Volume IV*, pp. 105–106

the paramount power. Beyond this issue, it is also at this stage that another key difference between the Bengal and Malwa systems becomes apparent. In contrast to the pass-duty on Malwa which remained fixed on a per chest basis, the realisations from the Bengal Monopoly not only varied with the market price but were also different between the two varieties of government-made opium; Benares opium brought the Government of India a slightly higher net revenue, in spite of its higher administration costs.

The prices of Indian opium in major cities in the drugs's chief export markets in the last stage of Figure 0.9 also raise some interesting issues. In the first place, the fact that the relative prices of the different kinds of opium are different suggests some degree of differentiation in these markets, a factor which would have mattered for policymakers in deciding the levels at which to tax the drug. However, an apparent anomaly is also evident: once the Chinese import duty is factored in, the amount left to account for both transport expenses and any profit to the merchant is less in Shanghai than in the other (closer) ports. Some temporary distortions depending on local conditions may provide an answer, especially given that this was a period in which complaints about falling profits from opium were relatively common. More importantly for this specific example, 1893 was the year that Indian mints were closed to coining silver, effectively removing India from the silver standard, and raising the price of Indian opium in all of its major export markets. In Shanghai itself the Commissioner of Customs reported low imports of all kinds of Indian opium as a result.[123] In this context some level of dislocation even between silver-based markets is not completely inexplicable, however, it does further emphasise the vulnerability of the opium revenue, and Bengal revenue specifically, to changing conditions in international markets.

The 1890s were an extraordinary period for the opium trade, and the specific question of the long term dynamics of opium prices in the drug's major markets will be addressed in the next section. However, the key point to draw from this section is the nature of the two different strategies adopted by the Government of India

[123]E. Faragó, Trade Report: Shanghai, Imperial Maritime Customs Service. *Returns of Trade at the Ports in China Open by Treaty to Foreign Trade.* Shanghai, 1894, pp. 218–221

in taxing opium: the risks associated with both procurement and fluctuations in the international market were assumed by the state under the Bengal system, and by private merchants under the Malwa system. The consequences of this for the government's revenue are discussed in the papers which form the main part of this thesis.

0.7 Indian Opium in the Global Market

In thinking about fiscal capacity in colonial India through the lens of the Bengal Opium Monopoly, it is important to recognise that one of the latter's most significant idiosyncrasies was that it fundamentally consisted in extracting revenue from consumers of opium outside of India, largely in China and Southeast Asia. Consequently, in order to understand how efficiently the Government of India was able to tax opium exports it is necessary to have some idea of both the structure of the market for opium in general, and the place of the Bengal drug within it. While the size of the international opium market and the number of countries in which it existed make a detailed study of this question well beyond the scope of this work, this section will provide a brief overview of the place of Indian opium policy in the wider international context. As it will show, during the second half of the nineteenth century market conditions were such that the Government of India had a not inconsiderable amount of freedom to determine opium policy.

In the case of the Bengal Monopoly, the income realised by the government was defined by both the quantity sold for export and the price that it was sold for, as well as the cost of producing the opium, so that:

$$Revenue = (Price \cdot Quantity) - Costs \tag{1}$$

In theory, a given level of revenue could be reached either by selling a large quantity of opium at a low price, or a small quantity of opium at a high price. Consistent over-supply would have lowered international prices for Bengal opium, potentially compromised the profitability of the monopoly, and damaged a key plank

in the Indian fiscal system. At the same time, chronic under-supply, risked increased smuggling and the loss of Bengal's pre-eminent position in the global market to cheaper producers in other regions (especially to domestic production in China). Both of these situations would have severely compromised the Government of India's opium revenue. However, obviously these operations did not take place in a vacuum; the ability of the monopoly to maximise or maintain revenue at a steady rate was directly dependent on the degree to which it could influence the international market for the drug, which in turn was determined by its share of that market relative to other producers and the response of consumers to changes in price.

The second of these two questions, the price elasticity of demand for opium, can be answered relatively simply. Following from the rational addiction model of Becker and Murphy, a number of authors have used nineteenth and early twentieth century opium consumption as a case study to examine economic responsiveness amongst consumers of addictive goods.[124] Although the range of potential short- and long-run elasticities produced by these authors varies quite considerably, the majority of these works find values for boiled opium (as sold to consumers) of less than -1.[125] There are two exceptions to this rule. Chandra, who found that in the Dutch East Indies in the 1920s and 1930s, low intensity Chinese consumers had an overall price elasticity of -1.13 to -1.16 (the equivalent values for all other groups were between 0 and -1), an effect which came entirely from price effects on the number of users.[126] In the second instance, during early twentieth-century prohibition efforts in Taiwan, Liu *et. al.* observed a long-run elasticity of -1.377 (short-run, -0.481).[127] Apart from these special cases, both of which can scarcely be taken to be representative of the market

[124]G.S. Becker and K.M. Murphy. "A Theory of Rational Addiction". *Journal of Political Economy* 96.4 (1988), pp. 675–700; and G.S. Becker, M. Grossman, and K.M. Murphy. "Rational Addiction and the Effect of Price on Consumption". *American Economic Review* 81.2 (1991), pp. 237–241.

[125]S. Chandra and M. Chandra. "Do Consumers Substitute Opium for Hashish? An Economic Analysis of Simultaneous Cannabinoid and Opiate Consumption in a Legal Regime". *Drug and Alcohol Dependence* 156 (2015), pp. 170–175; E.W. van Luijk and J.C. van Ours. "The Effects of Government Policy on Drug Use: Java, 1875–1904". *Journal of Economic History* 61.1 (2001), pp. 1–18; and J.C. van Ours. "The Price Elasticity of Hard Drugs: The Case of Opium in the Dutch East Indies, 1923-1938". *Journal of Political Economy* 103.2 (1995), pp. 261–279

[126]S. Chandra. "Economic Manifestations of Opiate Addiction: Evidence from Historical Data from Colonial Indonesia". *Drug and Alcohol Dependence* 90S (2007), S69–S84

[127]Jin-Long Liu et al. "The Price Elasticity of Opium in Taiwan, 1914–1942". *Journal of Health Economics* 18.6 (1999), pp. 795–810

	Bengal		*Malwa*		*Persia*		*Turkey*		*Total*
Year	*Chests*	*%*	*Chests*	*%*	*Chests*	*%*	*Chests*	*%*	*Chests*
1888	56,385	56.1	33,711	33.6	4,385	4.4	5,991.9	6.0	100,472.9
1908	47,440	65.0	16,320	22.4	4,931.3	6.8	4,258.7	5.8	72,949.9

Table 0.6: Opium exports by country, 1888 & 1908; figures for Persia and Turkey are approximate. *For sources and construction, see Appendix A.1.*

in the late nineteenth century, these results suggest that opium was relatively price inelastic. Consequently, changes in the quantity of the drug available would have led to changes in price before changes in consumption, even in the long term. If the Government of India was in a position to control the amount of opium in the market through the Bengal Monopoly, it could control and stabilise prices to some extent.

Unfortunately, data on opium production outside of India is relatively limited. Table 0.6 contains approximate market shares for the four main export producing regions at the end of the nineteenth century, drawn from the available trade statistics (see Appendix A.1). To these should be added Chinese domestic production, which according to estimates compiled by the Chinese delegation to the International Opium Commission in 1909, stood somewhere between 148,100 and 584,800 piculs from 1905 to 1908 (1 picul weighs about 133.3lbs or 60.5 kgs).[128] Together, these figures suggest that, while almost certainly the largest single producer in the world, the Bengal Monopoly did not have a totally dominant position in the market if opium is considered as an undifferentiated commodity.

There is, however, reasonably strong evidence that opium was not viewed in this light either by those engaged in the trade or by consumers: consumption of the different varieties of opium seems to have varied substantially by region, and these different consumption patterns for the most part remained consistent over time. Further, the price structures of the various kinds of opium appear to have differed considerably, a fact which could be taken to represent the effect of strong, highly persistent consumer preferences. However, these trends are not unambiguously present; it is important to note that much of the data now available to us on the

[128] *Report of the International Opium Commission, Shanghai, Volume II: Reports of the Delegations.* Shanghai, 1909, p. 57. By convention in the trade, owing to drying in transit, one picul was regarded as equal to an Indian chest, although the latter was slightly larger at the point of production.

international part of the opium trade is imperfect, either because the necessary information was not systematically collected, or because when it was collected it was somewhat marred by measurement issues, especially those caused by widespread opium smuggling.[129]

In spite of this, what is relatively clear is that the general course of the international opium trade showed a very high degree of regional differentiation. This was especially pronounced in the case of China; as apparent from Figure 0.10 all the regions apart from the North of China had relatively consistent proportionate imports of the different kinds of foreign opium.[130] Although this data again does not include Chinese opium, it nevertheless does suggest some degree of regional specificity in consumption patterns. Amongst the Northern Ports however, there does appear to have been substantial change. However, what appears to have been a general rearrangement of the opium markets in the region was actually just the result of a massive reduction in the amount of Malwa imported, which shrank from 10,501 piculs in 1874 to only 100 in 1908, while the quantities of the other varieties remaining relatively similar across this period. While this may represent evidence of substitution between Malwa and domestically produced opium, the fact that it only affected one variety bears out the idea that the demand for different kinds of opium were determined by different factors, and perhaps even suggests that the market for Bengal opium was substantially different than that for other varieties.

A markedly similar pattern was apparent in Southeast Asia. Figure 0.11 shows the proportions of the different varieties of opium imported into the Straits Settlements, the major hub for the opium trade within Southeast Asia. Here Benares opium dominated, other varieties were generally marginal, and Malwa was barely to be seen.[131] The only major exception to this was the temporary expansion of Persian imports into Malacca during the late 1890s. However, given the extremely small size

[129]For a more detailed discussion of these issues, see Appendices A.1 and A.2.

[130]A close examination of the raw import data suggests that the introduction of the Chefoo Convention in 1886 does appear to have led to some redistribution in the trade in Patna from the Yangtze to Southern Ports, however this probably reflects a change in trade routes rather than in consumption patterns.

[131]This pattern was also apparent in direct exports of opium from India to the various Southeast Asian countries. There were also significant imports of Turkish opium into the Dutch East Indies each year, so the pattern in that colony may have been slightly different, but similarly consistent (See Schmidt, *Anatolia to Indonesia*; and Rush, *Opium to Java*, pp. 65–68).

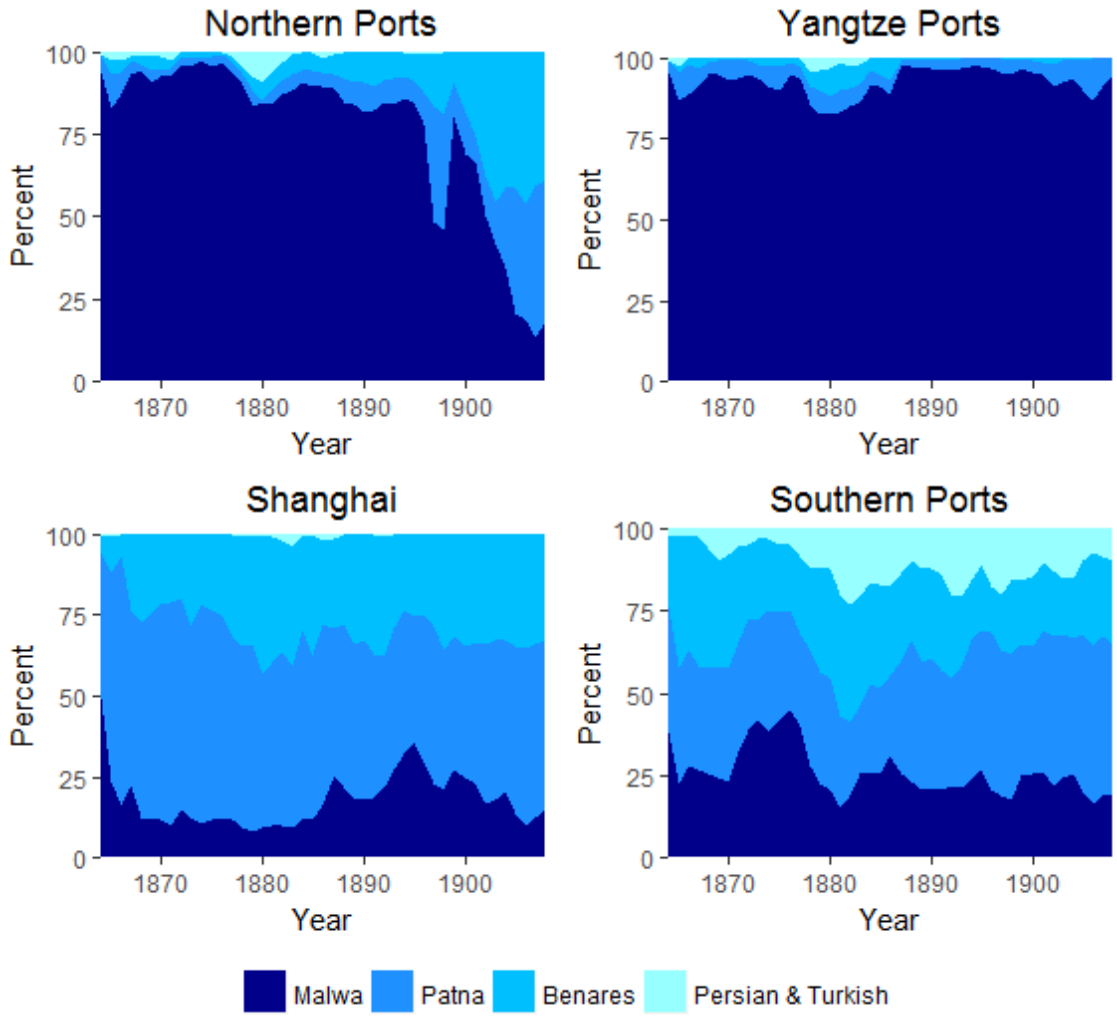

Figure 0.10: Recorded Chinese net regional opium imports into treaty ports by variety, 1864–1908. *For sources and adjustments, see Appendix A.1.*

of imports into that port (no more than 150–170 chests of any kind generally passed through Malacca in any year) this represents only a very small absolute change.

The differentiation between different types of the drug is made even clearer by an examination of their relative prices. The export prices shown in Figure 0.12 not only disagree in level but also in the timing of movements and the overall structure of volatility. Even types of opium grown under relatively similar conditions, such as Malwa and Bengal or Szechwan and Yunnan, appear to have had significant divergences in price which lasted for years at a time. This is counter-intuitive, as information transmission between major ports took only months at the beginning of the period, and the spread of the telegraph meant that this was reduced to days or less for much of the second half of the nineteenth century. As a result, if all the different varieties of opium were effectively homogeneous, the Law of One Price

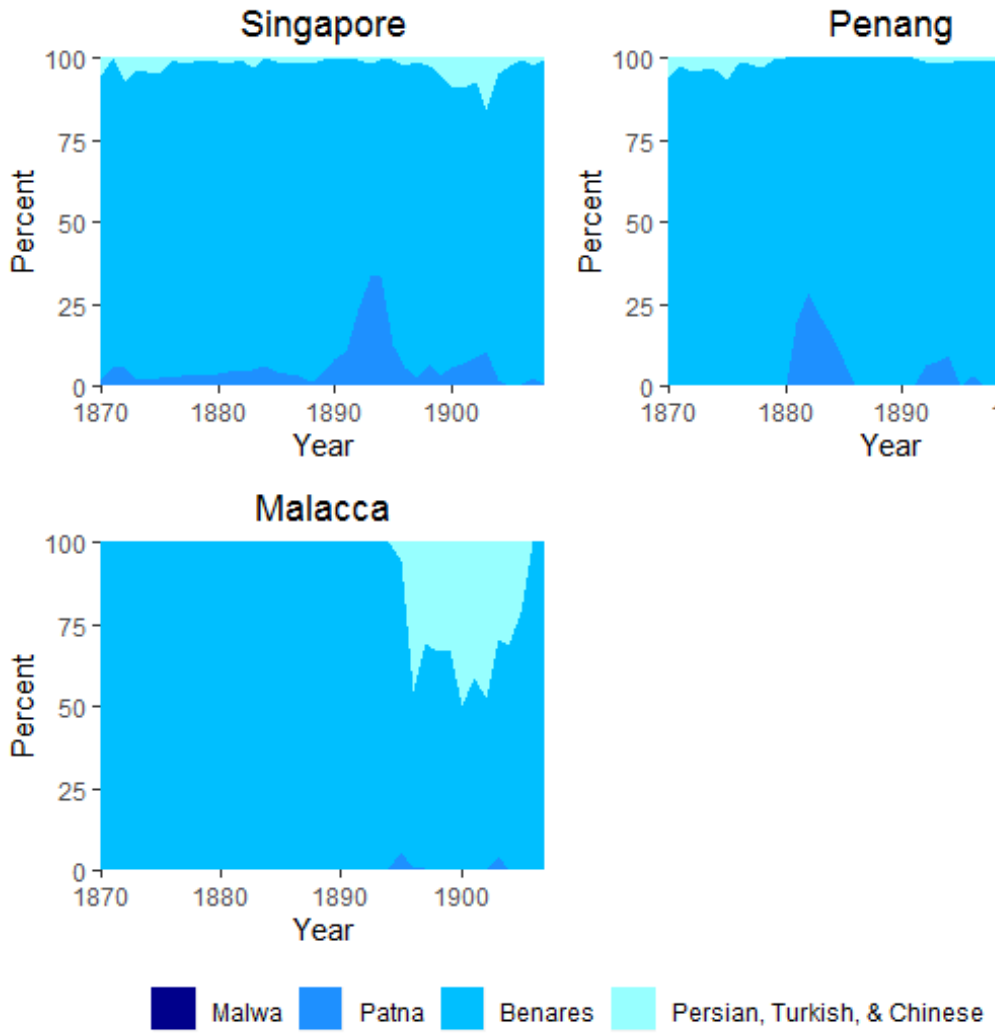

Figure 0.11: Recorded gross opium imports into the Straits Settlements by variety, 1870–1908. *For sources and adjustments, see Appendix A.1.*

suggests that while local production shocks would still have produced temporary divergence, prices should have converged, probably in considerably less than a year. As the price data in the figure is at annual or greater frequency such effects should be largely invisible; the fact that variable price differences are not only conspicuous, but also appear persistent provides strong corroborative evidence that the different varieties of opium did not function as perfect substitutes for one another. Even more directly it suggests that some degree of price control by the Government of India was possible: if opium prices could diverge and have different levels of volatility in the long term, supply regulation could affect those variables for the varieties over which it had most control: the two kinds of Bengal opium.

However, although this data is probably close to the best that can now be

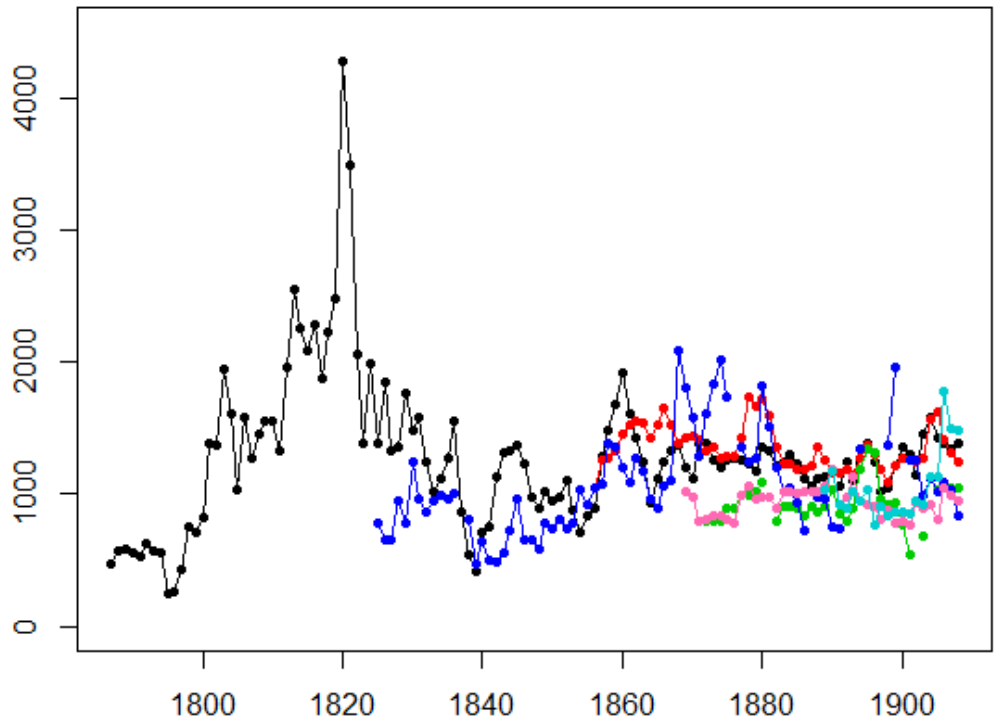

Figure 0.12: Export prices and unit values of the major varieties of opium, 1787–1909 (Rs./Indian Chest), at the following main ports: Bengal, Calcutta (black); Malwa, Bombay (red); Turkish, Smyrna (dark blue); Persian, Bushire (green); Szechwan, Shanghai (pink); and Yunnan, Shanghai (light blue).*For sources, construction, and adjustments, see Appendix A.2.*

obtained, it has, as noted earlier, some issues of representativity; for a more general view, it is necessary to look at other sources of information on consumption. While a comprehensive study of the modalities of opium use in even one of the major regions of consumption would be a substantial research project in itself, considerably beyond the scope of this thesis, there is at least some evidence that consumers did in fact discriminate significantly between different kinds of opium. The existing historical literature indicates that the various kinds of opium were differentiable based on attributes other than their prices. In particular, the work of Dikötter Laamann and Xun amongst others has shown that different types of opium were highly differentiated, and connoisseurship was an important part of elite opium

consumption.[132] In a similar vein, in *The Social Life of Opium in China*, Zheng Yangwen has described in excellent detail the differing social modes surrounding opium consumption of rich and poor, and especially the luxurious material culture surrounding elite opium consumption.[133] Both of these directly or indirectly imply differentiation within opium; while it is conceivable that the same people who hired specialist 'opium chefs' or spent large amounts on finely crafted smoking furniture were content to consume the same kind of opium as a common ricksha driver or plantation worker, the experience of similar goods elsewhere suggests that even had no inherent differences existed, the elite consumers would have found it necessary to invent them.[134]

Fortunately, however, there is no need to rely on deductive arguments alone; even a small selection of the most easily available qualitative sources on opium consumption help to confirm that individuals had strong preferences for certain types of opium. That those directly involved in the trade recognised non-price differences as highly important is evident from their answers when canvased by servants of the Government of India on the state and probable prospects of the market. Although the opium merchants often made general comments on the trade in the Indian drug as a whole since many of the same firms dealt in different kinds of opium, they also took for granted that each had different attributes and a different market, meaning the varieties were not directly interchangeable. To take one example, in 1890, a partner in Meyer Brothers, the largest exporter of opium to the Straits Settlements described the preference for Benares opium as opposed to other varieties as having a strong element of persistence: "those who have during their residence in the Straits become habituated to its [Benares's] use, adhere to it even after their return to their native country."[135] These remarks tend to endorse the regionalised pattern of

[132]Dikötter, Laamann, and Xun, "Narcotic Culture", p. 322; and Dikötter, Laamann, and Xun, "China, British Imperialism and the Myth of the 'Opium Plague'", pp. 24–25

[133]Zheng Yangwen, *Social Life*, 71–86 and 164–180

[134]The examples of conspicuous consumption around the drug are taken from Dikötter, Laamann, and Xun, "China, British Imperialism and the Myth of the 'Opium Plague'", p. 24 and Zheng Yangwen, *Social Life*, pp. 164–171. Owing to their physically demanding work, ricksha drivers and plantation workers were well known for their heavy consumption of opium (See for instance: Trocki, *Opium and Empire*, pp. 67–69 and X. Paulès. "Opium and the City: A Spatial Study of Guangzhou's Opium Houses, 1923–1936". *Modern China* 35.5 (2009), pp. 495–526, pp. 515–516).

[135]"K.G. Gupta, Officiating Secretary to the Board of Revenue, Lower Provinces to the Secretary to the Government of Bengal Revenue Department, 4th of March, 1890 (No. 522)". In: *Pro-*

consumption observable in Figures 0.10 and 0.11, and further, suggest was not purely the result of local commercial conditions, but in all probability rather more ineffable attributes.

Similarly, while it appears from the data presented earlier that there was some movement away from Malwa, especially in northern China, this does not necessarily imply a regular substitution dynamic. During a relatively informal consultation in 1887 of some of the leading opium merchants and shippers in Bombay by E.J. Sinkinson, the Accountant General of Bombay, on developments in the market, the former were relatively in agreement that, *inter alia*: "The taste for Indian opium is stated [by the merchants] to be yielding in the rising generation to a preference for the the home-grown product, and that in most cases when Indian opium is smoked, it is used in small quantities to flavour native opium exactly as Indian tea was, and is used in England to flavour Chinese tea."[136] Sinkinson was however skeptical, having "been educated in the creed that opium is like wine, and every smoker who can afford it will have Indian opium whatever the price."[137] Although the first of these quotations explicitly describes a process of substitution, the fact that the change in preferences is spoken about in generational terms implies a markedly slow speed of transition relative to a simple reaction to changes in price, a consideration which may help to reconcile the different accounts of the nature of opium consumption offered by Sinkinson and the merchants. Additionally, the idea of 'taste' both in its broad and narrow sense is important in both descriptions of the nature of the choice between the different kinds of opium. Again, this suggests that the motivations for smoking or eating a particular type of opium were rather more deep seated than a lot of product choices.

Further corroboratory evidence for this can be found in sources from the major

ceedings of the Government of India Department of Finance and Commerce, January-June, 1890. Vol. IOR/P/3733. India Office Records, British Library, p. 712

[136] "Demi-Official from E.J. Sinkinson, Accountant General, Bombay to the Honerable J. Westland, Officiating Secretary to the Government of India Department of Finance and Commerce, 18th of August, 1887 (No. 781)". In: *Proceedings of the Government of India Department of Finance and Commerce, January-December, 1887.* Vol. IOR/P/3032. India Office Records, British Library, p. 593. The firms and individuals consulted were David Sassoon & Co., E.D. Sassoon & Co., Rampatab Harbilas & Co., the P.&O. Co., Mr Sassoon J. David, Mr. Moses, and Mr. Ezra, the last three presumably being of the eponymous firms.

[137] ibid., p. 593

areas of consumption. Although, as noted earlier, any systematic treatment of patterns of consumption would be impossible within the bounds of this thesis, some ideas about this subject can be gained from the immediately available sources. For example, in the case of China, a small snapshot is given by an 1888 circular from the Inspector General of Customs which asked a series of questions on opium price, consumption, and customs practices in the Treaty Ports. The responses, although certainly far from comprehensive, do take at least some account of the consumption of Chinese opium. Each of the local Commissioners of Customs put together answers, apparently by consulting merchants in the port and in some cases personal investigation. The way the information was collected consequently means that at best they probably only relates to the area immediately around the Treaty Port. The responses as they exist, however, reveal a great deal of heterogeneity in consumption patterns: in some ports it was reported that Malwa or Turkish or Chinese opium were not consumed at all, and there was a great deal of inter-regional difference in which varieties were blended together.[138] To illustrate this variation in more depth it is only necessary to take a couple of examples. In the north, in Newchwang (modern Yingkou), it was stated that:

> Of smokers who indulge in the vice at their own homes, 90 per cent. smoke the Native drug [i.e. Chinese opium], 5 per cent. smoke pure Malwa, 5 per cent. smoke a mixture of Malwa and Native Opium. Of the Opium divans, 50 per cent. sell Prepared Native Opium, 20 per cent. sell a mixture of Native and Benares, 20 per cent. sell Prepared Malwa, and 10 per cent. sell Prepared Benares. Patna is smoked by southerners resident in the province, and is never used in adulteration.[139]

Meanwhile, in Kiungchow (part of modern Haikou) in the far south, the situation was quite different:

> Native Opium is known here, and a very small quantity is used. ...The total amount imported is believed not to reach 5 piculs yearly. It is bought by a few residents who have acquired a taste for it elsewhere, and by some of the soldiers who have come from the mainland in the last two years. When used it is mixed with Patna or Benares — not with Malwa.[140]

[138]See the various replies in Imperial Maritime Customs Service. *Opium: Crude and Prepared.* Shanghai, 1888.
[139]ibid., p. 5
[140]ibid., p. 61

As well as showing the extreme difference in consumption patterns between north and south, these two quotations also further illustrate that when people moved between locations they did not necessarily abandon their previous preferences. This suggests that regional variation was not directly related to local variations in price, but rather reflected individual preferences.

Given that the differences between the various kinds of opium are frequently elided with their morphine content, it is worth giving some consideration as to whether the two were actually identical.[141] Certainly this issue is a very important one for the question of the Government of India's opium policy: if the differentiation discussed in this section can be explained simply by the amount of morphine in the various varieties it removes a great deal of the room for active policy on the part of the opium administration in India. However, since this is quite a narrow issue and requires quite detailed treatment, the relevant discussion has been relegated to Appendix B. The upshot of the discussion there however is the consumers differentiated between the various kinds of opium on the basis of things other than the amount of morphine they contained. Rather than choosing Bengal or Malwa opium because they were the cheapest way to get a given quantity of morphine purchasers instead appear to have made their selections on the basis of factors like taste or local culture.

The preceding discussion provides, at the very least, strong *prima facie* evidence for five basic points about the nature of the market for opium. First, demand for opium as a whole was relatively price-inelastic. Second, the types of opium under the direct control of the Government of India formed a very substantial share, although not a majority, of the market. Third, opium in this period was not a homogeneous good, but varieties were differentiated on non-price factors. Fourth, this differentiation was not on the basis of morphine content (which, incidentally would in reality have been just another kind of price differentiation). Fifth, as a result, individuals had relatively strong, persistent preferences for certain types of opium over others (i.e. substitution elasticities were also probably comparatively low). With these in place it becomes possible to form an overall idea of the structure

[141]See for example: A. Farooqui. "Colonialism and Competing Addictions: Morphine Content as Historical Factor". *Social Scientist* 32.5/6 (2004), pp. 21–31, pp. 21–31

of the market for opium, and from that determine whether, and to what degree, the Government of India was able to manipulate the prices of the opium that they produced.

Within the nineteenth-century opium market there were a very large number of firms making continuous products (within their own type), each of whom was too small to affect the overall supply, and a single large producer, whose decisions could alter aggregate supply, and whose products had no perfect substitutes amongst the other kinds of opium. That is to say, there were many producers each of Malwa, Turkish, Szechwan, or Yunnan opium, and while those broad categories were differentiable, the product of any single individual or firm was not necessarily. Conversely, the two types of Bengal were both distinguished by consumers from other kinds of opium and were only made by one large producer: the Government of India. The latter had, then, two chief advantages over other producers in the market. First, they had an effective monopoly on the production of two specific varieties of opium so that they could control the supply of those varieties to the market, and second, they were large enough that they could behave strategically within the market as a whole, as their decisions would affect the total amount of opium available. Since consumer preferences for specific kinds of opium were comparatively strong and the Bengal varieties formed a relatively large proportion of the market, one would expect both of these factors to have relatively significant effects. Consequently, the structure of the market falls somewhere between monopolistic competition (in that the products are differentiable and there are a large number of firms some of which cannot affect aggregate supply) and oligopoly (in that some producers are large enough to change aggregate supply).

So far as the Government of India was concerned this is relatively consistent with the recently developed models of mixed markets, in which large firms whose decisions can affect aggregate supply coexist with a fringe of small monopolistically competitive producers. Under this type of model, the mark-up of any firm (the difference between their marginal costs and price) is a combination of their monopolistic power (which comes from selling a differentiable product) and their strategic power (which comes

from their ability to affect aggregate quantities). For the smaller firms, who have no ability to affect the overall supply of the good to the market, their mark-up comes only from the former, whereas for firms who have sufficient market share to affect prices through their production decisions, it comes from both. The mark-up charged by the larger firms in these models is then bigger than that of the small firms.[142] Obviously, casting other market participants as a monopolistically competitive fringe of firms does not fit the circumstances of the opium trade as closely: each small producer did not produce a differentiable kind of opium, but rather had a large number of intra-variety competitors. Nevertheless, two important features were maintained: the various varieties were differentiable, and the small producers were price-takers; as individual producers they were too small either to affect the aggregate supply of opium in general, or of the variety they produced in particular.

This interpretation of the Government of India's position in the market makes it much clearer that it was possible for their decisions to affect the market for the opium that they produced. In particular, it is a considerable improvement in this regard on approaches that are, explicitly or implicitly, based on the assumption that different kinds of opium were perfectly interchangeable with one another (either because of their morphine content or simply as opium). Most importantly, it makes clear that the Government of India did have some, although far from unlimited, power to control the prices of the Bengal varieties of opium.

[142]Ken-Ichi Shimomura and J. Thisse. "Competition Among the Big and the Small". *The RAND Journal of Economics* 43.2 (2012), pp. 329–347, pp. 340–341; and M. Parenti. "Large and Small Firms in a Global Market: David vs. Goliath". *Journal of International Economics* 110 (2018), pp. 103–118, p. 107.

Paper 1

Taxing the Foreign Consumer: Revenue Policy and Price Controls Under the Bengal Opium Monopoly, 1867–1908

Abstract

Although the British Government of India's extraction of a large revenue from the notorious Asian opium trade is widely discussed in both popular and academic literature, existing studies remain vague as to the assumptions, policy instruments, and the degree of success with which this was achieved. To bridge this gap, this paper argues that the volatility of opium prices, as well as their level, was a key consideration in the colonial government's interventions in the market for the drug. A series of statistical tests are applied to monthly data covering the period from the mid-nineteenth to the early twentieth centuries to measure the time-variant volatility dynamics of the price of Indian opium. The results indicate that while between 1867 and 1892 the Government of India was able to stabilise opium export prices by controlling the quantities released into the international market, ultimately colonial officials were unable to resolve the informational problems at the heart of taxing opium.

"The price of opium is spasmodically affected by causes beyond the actual state of the China markets. It is affected by exchange, by speculation, by rumours, by the state of rice crops in China, by the internal state of China, and by a number of causes for which the most experienced opium merchants, Native and European, in China and Calcutta, are altogether unable to account."[1]

1.1 Introduction

The preceding quotation, taken from a letter between an official of the Bengal Presidency and the central government, encapsulates a problem at the heart of the fiscal system of British India. During the nineteenth century, the production and sale of opium for export provided a significant proportion of state income, and the government-made drug also played a key role in Indian trade, finance, and commerce. However, the vicissitudes of the market and the very fact of government intervention made opium inherently unstable as a source of revenue. Although the degree to which British officials were even aware of — let alone able to respond to — such issues has frequently been downplayed, during the period of Crown Rule the Government of India developed consistent and largely successful policies to deal with these problems at least with regard its own internal objectives. In particular, controls on the quantity of opium available for export from the government's so-called 'Bengal Monopoly,' introduced in 1867 through the formation of a strategic reserve, ushered in twenty-six years of stability in the opium market.

While the literature on the social and economic impact of the opium trade in East and Southeast Asia is very extensive, we know substantially less about India, the largest exporter of the drug.[2] In the case of Bengal, Kranton and Swamy have

[1] "H.L. Dampier, Additional Secretary of the Government of Bengal to the Secretary of the Government of India Financial Department, 29th of December, 1868 (No. 30)". In: *Proceedings of the Government of India Financial Department, January-December, 1870.* Vol. IOR/P/436/37. India Office Records, British Library, p. 209.

[2] It would be impractical to cite even a small fraction of the works written about opium in these two regions, however, for a broad sense of the geographical and thematic range, see: Greenberg,

shown that in comparison with the other commodities which the English East India Company (E.I.C.) traded in, the opium monopoly system allowed relatively effective control of producers and agents, thereby avoiding large-scale fraud and smuggling, a state of affairs which continued into the era of Crown Rule.[3] However, when it comes to the role of the Bengal Monopoly within the wider market for the drug there is little consensus amongst those authors who have touched upon the subject. In his two broad-ranging studies of Indian opium production, Richards notes that opium experienced less price volatility than India's other main exports at the time (most of which were also agricultural), and suggests in passing quantity controls as a potential explanation.[4]

However, few of the other historians of the British Indian Government's opium policy ascribe to it any stabilising impact. Owen, the earliest author to approach British opium policy from an historical perspective, characterises its attempts at revenue maximisation as "vacillating" and inconsistent, with central government policy acting as little more than a 'rubber stamp' for those managing cultivation on the ground.[5] Later authors were still less inclined to view the impact of government policy on the opium market favourably. Writing in 1964, Chowdhury suggests that although the governments cultivation policy was driven by a desire to keep the opium revenue high, a fundamental misunderstanding of the factors which affected the market by the administration led to an inability to maintain consistent policy with regard to the drug before 1865 (the effective end-date of his study).[6] More recently, Trocki, while emphasising the British Indian Government's strong interest in controlling its "cash cow" opium, does not ascribe much of a role to policy in creating or restraining fluctuations in the opium trade.[7] Overall, in existing discussions of the opium revenue under Crown Rule, the focus is on the mere magnitude of the amount extracted rather than the manner in which it was obtained.

Exploring the problem faced by the Government of India on a more abstract level

British Trade; Rush, *Opium to Java*; Trocki, *Opium and Empire*; Trocki, *Opium, Empire and the Global Political Economy*; and Zheng Yangwen, *Social Life*

[3]Kranton and Swamy, "Contracts, Hold-up, and Exports"

[4]Richards, "Indian Empire", pp. 68–69; Richards, "Opium Industry", p. 47

[5]Owen, *British Opium Policy*, pp. 280–282

[6]Chowdhury, *Growth of Commercial Agriculture*, pp. 24–25

[7]Trocki, *Opium, Empire and the Global Political Economy*

does not make matters any clearer. The state of the opium revenue was fundamentally bound to the the price of the drug. As well as the absolute level of prices, their predictability and the degree to which they vary also has important implications for the production, trade, and consumption of commodities. More volatile prices can also be indicative of underlying instability in supply and demand,information which is useful to both end consumers and other market participants in making decisions. This is especially the case for agricultural commodities where the unpredictable nature of supply means that prices are likely to be systematically more variable than for other types of goods. However, higher levels of volatility can also increase risk and uncertainty, disincentivising consumption and investment. On a broader level, excessive volatility which does not reflect changes in real market conditions can also transmit misleading signals leading to the misallocation of resources.

One potential solution to the problem presented by volatility, widely examined in economic theory, is inter-temporal storage. At a time when relatively abundant supplies of a good are available, some of that good can be kept, either by private arbitragers or by some public body, to be sold at a time of relatively high demand. Following from the work of Gustafson, the effect of storage behaviour on price dynamics in a setting of perfect competition with independent, identically distributed (i.i.d.) shocks have been widely studied.[8] This group of models indicate that under these conditions the presence of private storage alone dampens the effect on price of temporary variations in the amount of the commodity in the market and consequently substantially explains the autocorrelation found in the prices of many commodities. Even if one introduces the realistic assumption that shocks, especially supply shocks, are not unrelated over time, this model may still explain the serial correlation in the prices of many commodities, suggesting private storage alone renders price less variable.[9] However, imperfections in the market structure of

[8]See for example: R.L. Gustafson. "Implications of Recent Research on Optimal Storage Rules". *Journal of Farm Economics* 40.2 (1958), pp. 290–300; P.A. Samuelson. "Stochastic Speculative Price". *Proceedings of the National Academy of Sciences* 68.2 (1971), pp. 335–337; D.M.G. Newbery and J.E. Stiglitz. *The Theory of Commodity Price Stabilization: A Study of the Economics of Risk*. Oxford, 1981; and J.C. Williams and B.D. Wright. *Storage and Commodity Markets*. Cambridge, 1991.

[9]Although the initial work of Deaton and Laroque on this point found that the presence of autocorrelated shocks made private storage a poor explainer of the observed autocorrelation in prices relative to the effects of the underlying variations (A. Deaton and G. Laroque. "On

production have a substantial impact on price dynamics, even when the market for storage is competitive.[10] These effects are accentuated when dominant producers are also able to store the commodity; in the presence of imperfect competition in storage alone or in both production and storage, those with relative market power will generally store more than private speculators would do.[11] However, whether dominant producers are willing to use these stocks in an optimal manner depends on the nature of the shocks that they face: in his 2006 paper, Thille found that where supply (cost) is the unpredictable element, imperfectly competitive markets exhibit lower volatility, while in face of unpredictable demand the dominant producers make insufficient use of the stocks that they hold and so prices are relatively more variable.[12]

In a similar way the effect of market structure on price dynamics has also been considered in the historical literature, albeit with different conclusions. Past economic institutions, such a privileged companies and guilds, are frequently assumed to have been effective in reducing volatility in general, either by centralising inter-temporal storage behavior, or by more directly regulating prices themselves.[13] This is especially true in the case of the European privileged companies in Asia, who are supposed to have reduced price volatility by concentrating price formation, preventing speculative behavior, and ensuring the availability of accurate market information.[14] This activity was necessary, it is argued, to counteract a perceived lack of co-ordination

the Behavior of Commodity Prices". *The Review of Economic Studies* 59.1 (1992), pp. 1–23; A. Deaton and G. Laroque. "Estimating a Nonlinear Rational Expectations Commodity Price Model with Unobservable State Variables". *Journal of Applied Econometrics* 10. Special Issue: The Microeconometrics of Dynamic Decision Making (1995), S9–S40; A. Deaton and G. Laroque. "Competative Storage and Commodity Price Dynamics". *Journal of Political Economy* 104.5 (1996), pp. 896–923), recently, more precise model specifications confirm the value of the competitive storage model in explaining this type of price dynamic (C. Cafiero et al. "The Empirical Relevance of the Competative Storage Model". *Journal of Econometrics* 162.1 (2011), pp. 44–54).

[10]S. Mitraille and H. Thille. "Monopoly Behavior with Speculative Storage". *Journal of Economic Dynamics & Control* 33 (2009), pp. 1451–1468; and S. Mitraille and H. Thille. "Speculative Storage in Imperfectly Competative Markets". *International Journal of Industrial Organization* 35 (2014), pp. 44–59

[11]D. M. Newbery. "Price Stabilization in Imperfect or Cartelized Markets". *Econometrica* 52.3 (1984), pp. 563–578; H. Thille. "Inventories, Market Structure, and Price Volatility". *Journal of Economic Dynamics & Control* 30 (2006), pp. 1081–1104; and S. Mitraille and M. Moreaux. "Inventories and Endogenous Stackelberg Leadership in Two-Period Cournot Oligopoly". *Journal of Economics and Management Stratergy* 22.4 (2013), pp. 852–874.

[12]Thille, "Inventories, Market Structure, and Price Volatility"

[13]S.C. Ogilvie. *Institutions and European Trade: Merchant Guilds, 1000–1800.* Cambridge, 2011

[14]ibid., pp. 396–404

and isolation amongst even the wealthier indigenous merchants.[15] These possible vectors for an effect of the reserve system on price volatility are also worth considering given that more general assumptions about things like information availability are much harder to support in the context of commercial life in nineteenth-century Asia.

Given that, then, the ability of the Government of India to control the opium market should have depended largely on the structure of the market and the nature of the shocks to the price, it is odd that there is no historical consensus as to whether it was actually able to do so. Part of the reason for this is in part a misunderstanding of the nature of the government's interventions during the second half of the nineteenth century. As originally constituted in the early nineteenth century, the system by which the opium revenue was collected inherently created price instability. However, in the mid-1860s, shortly after the beginning of Crown Rule in India, this issue was identified by the government and after a concerted effort, the opium reserve system was introduced as a solution to the problem. In contrast to earlier policies, this was generally a success, at least at its lower levels: empirical analysis of opium prices reveals that the successful operation of the reserve system was associated with a period of reduced price volatility which lasted twenty-six years. Although it is important to recognise that the ultimate success of the reserve system may have been limited by the informational and analytical constraints of the time and place, it nevertheless performed well relative to likely alternatives. Additionally, while external factors eventually led to the breakdown of the system and a return to more volatile prices, such a long period of success ensured predictable government revenue and removed a perceived source of risk to the broader Indian economy. As a result, while the large and stable returns from opium which were expected to contribute indefinitely to the Government of India's coffers indefinitely proved in practice to be something of a Barmecide feast, the reserve system was nevertheless, within its own

[15] See for example: A. Das Gupta. *Indian Merchants and the Decline of Surat, c. 1700-1750*. Wiesbaden, 1979; N. Steensgaard. *Carracks, Caravans and Companies: The Structural Crisis in the European-Asian Trade in the Early 17th Century*. Copenhagen, 1973; and N. Steensgaard. "The Seventeenth-Century Crisis and the Unity of Eurasian History". *Modern Asian Studies* 24.4 (1990), pp. 683–697. For examples of contrary views, see: I. Habib. "Merchant Communities in Precolonial India". In: *The Rise of Merchant Empires: Long Distance Trade in the Early Modern World, 1350-1750*. Ed. by J. D. Tracy. Cambridge, 1909; and S. Chaudhury. *Companies, Commerce and Merchants: Bengal in the Pre-Colonial Era*. Abingdon, 2017, pp. 387–412.

frame of reference, highly effective.

However, on a wider scale both the problems identified by the Government of India and the solution developed by officials pose important questions about the ways in which colonial governments financed themselves. In the literature on colonial state capacity the use of taxes on trade and export commodities are frequently viewed as having been more conducive to the development of fiscal resources, since they allowed relatively limited colonial governments to obviate the problems associated with more complicated direct taxation.[16] The fact that in administering the Bengal Opium Monopoly, almost certainly the largest commodity tax in any colony in terms of revenue raised, the Government of India faced very substantial informational problems, problems which they were ultimately only able to partially mitigate, suggests that the dichotomy between simple trade taxes and difficult to collect direct taxation has been oversimplified. In trying to tailor their policies to complicated internal and international markets for opium, the officials managing the Bengal Monopoly found themselves almost as much at sea as their colleagues who attempted to control and tax the colonised population. If the policy of price stabilisation adopted by the Government of India achieved its aims it was because it made the amount of opium available at any one time more predictable for market participants, rather than because it actually represented an efficient solution to the problem of capturing revenue from opium exports.

The remainder of the paper will be structured as follows. The main reasons for the instability of the pre-1867 system are outlined in Section 1.2, together with the way in which the solution of the opium reserve system was developed. Section 1.3 introduces the price data used in the quantitative analysis, the methods, results, and analysis of which are given in Section 1.4.

[16]For an outline of this problem, see: Gardner, "Decentralization and Corruption", pp. 215–218

1.2 Uncertainty in the Market for Opium & the Emergence of the Reserve System

All policy, whether fiscal or otherwise, consists of multiple levels. At the top are the broad political aims with which the policy is introduced. However, these are not achieved by themselves: in the first place there are policy instruments, that is the actions which the state actually takes. Usually, rather than targeting the political aim directly, these are intended to have some direct and immediate effect, which represents a tactical aim. Depending on the complexity of the overarching goal, this might in turn be subordinated to a strategic aim, which could be considered as the general approach taken to satisfying the political aim. To take a common example, suppose that one wished to maintain a fixed exchange rate (a political aim). One might seek to fix the value of one's currency relative to a metal such as gold, by fixing the ratio of money issued to stock held of that metal (strategic aims), to maintain this reserve requirement, one could seek to induce capital inflows or outflows (a tactical aim) by raising or lowering the central bank discount rate or other interest rates accordingly (a policy instrument). Although this is obviously a very simplified example, it still illustrates the important points well. The lower levels directly rest on certain information, assumptions, and an analytical framework, which leads to a series of conclusions that such-and-such an action will create such-and-such a desired effect. Since this is the point at which the system as a whole encounters the real world, success or failure at this stage is in some sense prior to success at a higher level: a policy that never achieves any of its tactical aims cannot possibly succeed in its political aims.[17] In the example above, if one looked only at the aim of fixing exchange rates and the frequent alterations in the discount rate without any idea of the intermediate steps while one might in a very general way be able to tell whether exchange rates remained fixed or not, one would have very little idea why that was the case, or what parts, if any, of the actual policy were successful. At the very least, the actions of the central bank would probably appear very confused an inconsistent.

[17]It is, of course, possible that the desired outcome occurs anyway, but in such a case it would be a purely accidental result, rather than being a consequence of the policy.

Consequently, it is necessary to draw a distinction between the consistency of the strategic approach, the success of individual policy instruments, and the degree to which these achieved their overarching political goal.

As suggested in the introduction, so far as the period of crown rule is concerned, the existing literature has concentrated for the most part on the top, political, level, that is the Government of India's desire to raise the maximum possible net revenue from opium. However, without looking at the details of aims and instruments it is difficult to move beyond generalities about the consistency, success, or failure of Indian opium policy. A closer examination of its intermediate levels presents a much more consistent, and in someways more successful, picture. In short, the reserve system as actually put into practice emerged as the product of the tensions between two countervailing forces. By the early 1860s, British officials had identified features of the Monopoly that caused instability and which they regarded as systematic problems, prejudicial to the government's overarching aim of realising the largest possible revenue from Bengal opium. In response, they developed a framework — the opium reserve system — intended to mitigate these issues, which they consistently applied for most of the remaining years of the nineteenth century. However these efforts were compromised by analytical and informational constraints; the difficulties of gathering and processing the volume of data required to support such active intervention in the market proved too much for the powers of nineteenth-century colonial government.

Opium under the auction system had always been a somewhat unpredictable source of revenue. To some extent this was an inherent problem; at a fundamental level there were features of opium as a crop that made it an especially uncertain crop in the first place. In spite of efforts on the part of the Opium Department to incentivise investment in irrigation and to promote the spread of best-practice cultivation techniques, the poppy harvest remained vulnerable to a wide range of climatic and biological hazards.[18] Blight, and too much or too little rainfall remained

[18]For examples of attempts to improve the consistency of poppy crops see: *Report on the Administration of the Opium Department, Inclusive of the Opperations of the Behar and Benares Opium Agencies, During the Year 1870-71.* Calcutta, 1872, p. 4; and *Report on the Administration of the Opium Department, Inclusive of the Opperations of the Behar and Benares Opium Agencies, During the Year 1873-74.* Calcutta, 1875, p. 1

serious sources of uncertainty for opium yields throughout the entire period of the Monopoly.[19] Nevertheless, the biggest source of supply uncertainty came from the structure of the Bengal Monopoly itself. Before the mid-1860s, the primary method used by the opium administration to regulate the supply on Bengal opium was to try to set the area under cultivation so that the harvest produced exactly the provision desired for the next year's sales. The problem with this approach was that the significant random elements in the size of the harvest, together with the limited availability of information on the rural economy meant that it was practically impossible for the government to accurately predict what the effect of any given policy adjustment would be.

A detailed account of the continual and often self-defeating course of these attempts up to 1865 is given by Chowdhury.[20] However, one of the best examples of the tail-chasing results of this approach, and the instance that was most in the minds of the officials who created the reserve system, comes from the period immediately before the latter was introduced. In the early 1850s, concerns that cultivation might be expanding too quickly led the government to reduce the price paid to cultivators twice in short succession. This decision, combined with competition from other crops lead to a much faster reduction than the government anticipated, and by 1860 the provision fell as low as 21,363 chests. The central government recognised that the policy of contraction had been too effective, and a general expansion was ordered.[21] The cultivator price was raised from Rs. 3.04.00 (Rs.$3\frac{1}{4}$) to Rs. 5 The response was quick; in 1865, a harvest of 64,111 chests was sold, and the sudden expansion caused an equally rapid fall in price.[22] These sudden changes in policy were not atypical of the earlier portion of the nineteenth century.

Although some improvements were made in the system of procuring opium after this point, these problems remained significant throughout the life of the Bengal

[19] *Report on the Administration of the Opium Department, Inclusive of the Operations of the Behar and Benares Opium Agencies, During the Year 1879-80.* Calcutta, 1881, pp. 15 & 65; India Office, *Statement Exhibiting the Moral and Material Progress and Condition of India, During the Year 1879-80*, p. 21

[20] Chowdhury, *Growth of Commercial Agriculture*, pp. 7–25

[21] ibid., pp. 24–25

[22] See the price and quantity figures in: Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce, *Financial and Commercial Statistics (1907)*, pp. 71–94

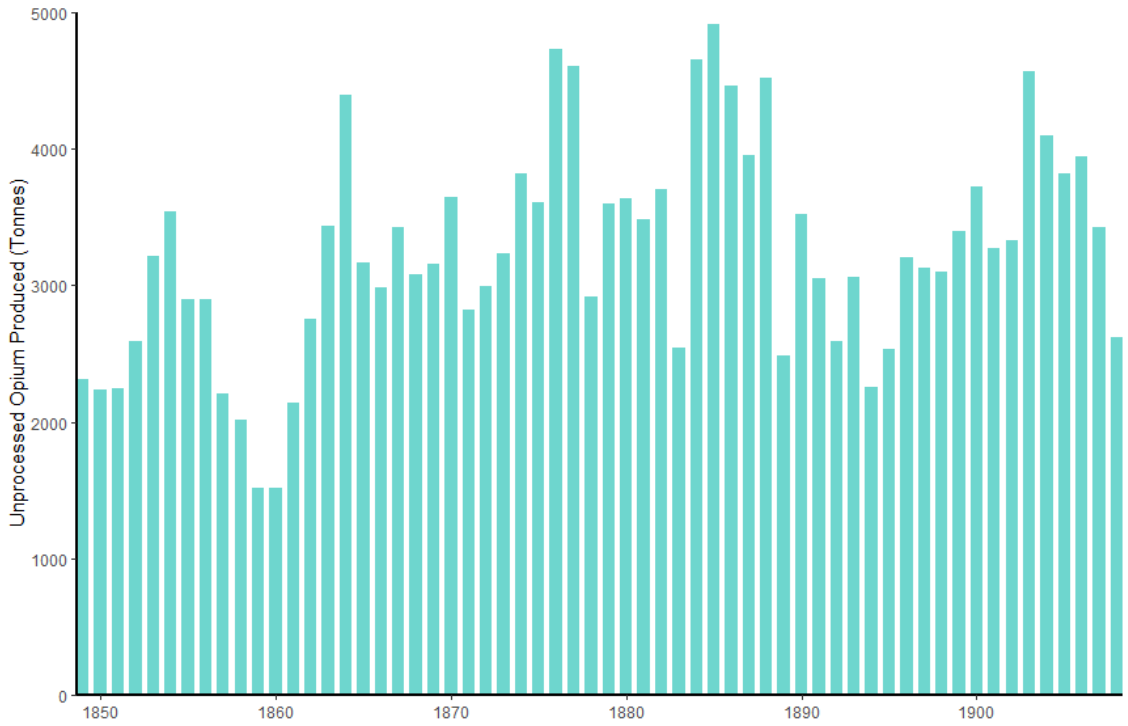

Figure 1.1: Quantity of Unprocessed Opium Harvested in Bengal (Tonnes), 1848–1908. *Calculated from data in: Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce.* Financial and Commercial Statistics of British India. *Calcutta, 1907, pp. 78–80; and Department of Statistics.* Statistics of British India: Volume II: Financial Statistics. *Calcutta, 1918, pp. 164–165.*

Monopoly. As Figure 1.1 shows, between 1848 and and 1908 although a basic level of production was consistently maintained, the total out-turn could vary quite considerably year-to-year. On an immediate level this presented a serious problem for the government, since if the quantity that could be sold was purely defined by a single harvest, that implied price instability, and, since the Monopoly's revenue was a function of cost, prices, and the quantity sold, variable revenue as well.

The structure of the Monopoly also encouraged instability in other significant ways. The centralisation of the supply of Bengal opium to the Government sales and the consequent concentration of price formation produced extreme variations in prices between sales. Part of the problem was that for some of the period, sales were irregular. Before 1847, there were only five Government Sales in a year, usually all in the first six months. In that year, a further four were added, and from the beginning of 1848 sales became monthly. As a result, changing market conditions across several months could produce large adjustments at some sales. However, the concentrated

nature of the auctions and the unpredictability of the sale provision also presented the Government of India with a much more difficult threat: market manipulation. The dangers presented by 'speculation' and 'gambling' in the opium market to the government's revenue were common subjects of complaint at all levels of the opium administration. Nor were these dangers entirely illusory; while cases of fraud and manipulation were certainly not unknown elsewhere, up until the mid-1860s they were especially common at the Government opium auctions. The reason for this was comparatively simple: as well as purchases of real opium for export, there was a very much larger trade in 'time bargains,' contracts for forward sale or delivery either settled physically, or much more commonly, financially.

The problem these type of transactions presented for market stability is well illustrated by a series of forty legal cases in India and England from the late 1840s and early 1850s in which Ramlal Thackoorseydass, the Bombay representative of a India-wide firm, sought to recover up to Rs. 20 million in profits on a single sale's time bargains just in Patna opium.[23] Both sides freely admitted that they and their allies had sort to change the prices at the auction with a view to 'winning' time bargains.[24] While, in this instance the 'tejiwallahs' (bulls) won, pushing the eventual Patna average to Rs. 1793, the 'mundiwallahs' (bears) had put up a good fight, having caused the entire sale to be canceled and re-run a month later than scheduled following their unusually aggressive manipulation the first time. Nor were these operations particularly expensive; Mr. Howard, the counsel for the plaintiff, estimated that it cost about Rs. 1,69,000 to raise the average sale price by Rs. 100.[25]

Amongst the negative impacts of this type of behavior, one of the most important is that it may disincentvise honest purchasers from entering the market, since those engaged in the price manipulation know more about probable future price movements than other market participants.[26] As a result, a narrow analogy might be drawn

[23]To put this amount in context, at the time this was almost a million times the average labourer's wage in India, or equivalent to about one-eighth of the Bank of England's bullion reserves.

[24]Sir Erskine Perry. *Cases Illustrative of Oriental Life and the Application of English Law to India, Decided at H.M. Supreme Court at Bombay.* London, 1853, pp. 171–193 & 197

[25]ibid., p. 204

[26]Unlike the superficially similar case of Indigo auctions, recently examined by Aldous (See: M. Aldous. "Rehabilitating the Intermediary: Brokers and Auctioneers in the Nineteenth-Century Anglo-Indian Trade". *Business History* 59.4 (2017), pp. 525–553), neither quality uncertainty nor problems of exchange played a significant role in the actual opium auctions themselves. As

with Akerlof's famous observation about the impacts of asymmetric information about quality, that: "dishonest dealings tend to drive honest dealings out of the market."[27] The losses associated with frequent market manipulation may well lead legitimate purchasers leave the market; given the existence of a small number of individuals, perhaps grouped into factions, who have private knowledge about future movements in the spot price, which they themselves intend to cause, accurately evaluating the probable return of either the derivative or a spot purchase. Specifically, in the case with which this paper is concerned, the purchaser of a time bargain relating to a specific opium sale had no way to know whether the sale price would be manipulated, either by their specific counterparty or by someone else. Since such manipulated prices might well not be commercially viable, without similar private knowledge of their own these potential buyers may have decided allocate their money into another investment instead. Such difficulties could therefore become a self-reproducing problem, as competition can drive initially non-manipulative firms to take part in such actions.[28] The costs of this kind of behavior can then travel far

highlighted at length elsewhere in this thesis, government opium was manufactured to a fixed consistency, and the method of manufacture meant that the produce of each factory was relatively homogeneous. Additionally, unlike private indigo producers, the Government of India had an incentive to maintain these standards, as its ability to extract a price above the cost of production depended in no small part on the reputation of the 'brands' of Patna and Benares opium (see the discussion of market structure in Section 0.7) The consequence of this was that beyond a very small number of cases of deliberate fraud there were few complaints about quality variation in Bengal opium at any stage in the trade, although this was not always true for the privately produced varieties which competed with the Bengal drug. By the period covered in this thesis, the majority of the merchants who purchased opium at the sales were representatives of Indian firms from Calcutta and Bombay (although they sometimes placed their bids through European agents) and many of them had access to as much information as anyone about market fundamentals. Purchasers paid a deposit for the opium that they bought and after the auction and the opium was held by the government until payment was made and the opium was exported, meant that defaults in this part of the trade were rare and did not seriously impede the functioning of the market. Instead, the main reason why market manipulation was possible (and as a result why volatility in the opium market was so high in the pre-reserve period) was that the supply of a commodity which had a very large and consistent market and an important role in commercial credit in East and Southeast Asia was concentrated in one (quarterly or monthly) sale, which was the source of all Bengal opium in the market. An apt comparison can be drawn with the Bengal Salt Monopoly, discussed in Section 0.4, where significant amounts of market manipulation took place when the supply of salt was confined to a single regular auction of a limited quantity, but practically disappeared when the system changed so that government salt could be bought in indefinite quantities from depots around Bengal (interestingly, unlike opium, there were significant quality differentials in the auctioned salt, although these were not un-identifiable for market participants).

[27]G.A. Akerlof. "The Markets for "Lemons": Quality Uncertainty and the Market Mechanism". *Quarterly Journal of Economics* 84.3 (1970), pp. 488–500, p. 495

[28]G.A. Akerlof and R.J. Shiller. *Phishing for Phools: The Economics of Manipulation and Deception*. Princeton, 2015, pp. x–xii

outside the initial 'loosers' in the transaction.[29]

Such was the case in the opium auctions of nineteenth-century India — if merchant houses stood to gain a couple of crore in exchange for spending only a few lakhs to manipulate the Bengal sale price, the temptation was obvious.[30] By the time these suits came to trial it was already common knowledge that prices in Calcutta had for some time largely been determined by the activities of rival factions of time bargain speculators.[31] The effects of this activity extended well beyond the opium market. The battle over the November and December sales in 1846 "interrupted all legitimate business" in Bombay as well as Calcutta.[32] Although the government responded with an act of Governor-General in Council which made time bargains unenforceable (though not illegal), this did little to stem the influence of opium on the financiers in the bazaars of Calcutta, Bombay, and other cities in northern India.[33]

Speculation in time bargains continued through the 1850s, but the great crisis in opium did not come until 1861, when the markets in Calcutta, Bombay, and Indore were thrown into further disarray. On the expectation that the small Bengal provision coupled with the end of the Second Opium War would lead to higher prices in China, the parties to various time bargains bid the price of Patna at the Calcutta sales to Rs. 2,576.[34] This, in turn, raised the price of Malwa, which led merchants in Bombay and Indore to make forward purchases on the next crop at much high prices than would have ruled otherwise.[35] When a shortage of credit in Calcutta

[29] Akerlof and Shiller, *Phishing for Phools*, pp. 133–134

[30] Even in modern markets, these types of incentives still exist. Where both spot and futures markets exist, informed market participants who hold positions in the futures market trade more aggressively around the expiration date with a view to influencing the value of their derivatives holdings(Chih-Hsiang Hsu and Hsiu-Chuan Lee. "Insider Trading and Information Revelation with the Introduction of Futures Markets". *Economic Modeling* 43 (2014), pp. 173–182). In the case that a participant has significant market power in the spot market, they are incentivised to alter their behavior to change the spot price, making their holdings in futures more profitable(A. Muermann and S.H. Shore. "Spot Market Power and Future Market Trading". *Financial Markets Group, LSE Financial Markets Group Discussion Paper* 531 (2005)).

[31] Perry, *Cases*, pp. 175–243

[32] "The Bombay Market". *Bombay Times and Journal of Commerce* (16th December 1846), p. 8

[33] "Act for Avoiding Wagers (Bombay), Act XXI of 1848". In: *The Acts and Regulations of the Legislature in Force in the Presidency of Bombay, 1827–1858*. Ed. by R. West. Vol. 1848. Byculla, 1868, p. 1. A previous act had already made time bargains void in the Calcutta courts.

[34] "Col. Sir R. Shakespear, Agent of the Govenor-General for Central India and Opium Agent for Malwa to E.L. Jenkins, Acting Commissioner of Customs, Salt, and Opium, Bombay, 11th of July, 1861 (No. 147)". In: *Proceedings of the Government of India Financial Department, January-February, 1866*. Vol. IOR/P/437/1. India Office Records, British Library, pp. 140–141

[35] "Col. Sir R. Shakespear, Agent of the Govenor-General for Central India and Opium Agent for Malwa to E.L. Jenkins, Acting Commissioner of Customs, Salt, and Opium, Bombay, 8th

and contrary news from China caused the price to crash and the insolvency of the speculators there, this set of a chain reaction of failures in the other cities, and led to general suspension of payments not only in time bargains themselves, but also in hundis (a type of negotiable instrument similar to a bill of exchange and the main source of credit and transfer in the indigenous banking system). In Bombay, even the richest merchants were not safe, with men "posted as defaulters whose hoondis [sic] have hitherto been held equal to government securities in every bazaar in the country."[36] At Indore meanwhile, at least six merchant houses failed and twenty brokers in time bargains absconded, with the loss on the future crop alone estimated by the British Agent as being around Rs. 10 million.[37]

Although these examples were extreme cases, they nevertheless represent the disruptive influence of time bargains on the opium market. The competition between the mundi and teji factions to manipulate prices in their favour was such a ubiquitous feature of the government opium sales that it became almost proverbial. During the wave of failures in 1865, a crisis which had little to do with opium, commentators in India and elsewhere saw the origin of the losses in cotton and shares in the corrupt commercial morality of the Calcutta sale room and the opium bazaar. In London, *The Spectator* concluded a jeremiad against 'gambling' in Indian financial circles by observing that:

> ... there is hardly a man in the bazaars of either Calcutta or Bombay who has not at one time or another done a time bargain in opium, a contract which is nearer simple gaming than a similar one on the stock exchange, because the judgment has so much less scope to play. A man may calculate on a vote of the Greek Legislature or the policy of a new Finance Minister at Madrid, but nothing can enable him to guess the price to which chests of opium will at a particular sale be artificially run up.[38]

In India meanwhile, the problem was seen as one of institutions rather than culture. Questions began to be raised about whether the Monopoly system was partially responsible for the negative effects of time bargains. The apparent influence of the

of July, 1861 (No. 147)". In: *Proceedings of the Government of India Financial Department, January-February, 1866*. Vol. IOR/P/437/1. India Office Records, British Library, p. 139

[36] "Commercial". *The Times of India* (4th July 1861), p. 2

[37] IOR/P/437/1/147, p. 139

[38] "Settling Day in Bombay". *The Spectator* (12th of August, 1865), p. 883

one upon the other was outlined in a letter to the editor of *The Times of India*, by an author who signed themselves simply 'Civis': "No doubt time-bargains can be made on other commodities, but the fixity in time and the official imprimatur opium sales possessed, and the large fluctuations in value attending them, than appertained to other merchandise in quiet times, gave them a seductive influence."[39] This was not an isolated view, with some apparently even going further; *The Friend of India* reported that by October 1865 that the Board of Revenue was "openly accused in Calcutta" of allying itself with the intersts of opium "gamblers."[40] However, while the Government of India were hardly insensible to either the reputational damage at home and abroad or the wider systemic risks presented by this type of behavior, the primary concern of the officials running the Monopoly was again a fiscal one. The upward and downward price shocks caused by such speculative activity, combined with the uncertainty of the amount of opium actually available at each harvest were seen as clear dangers to the opium revenue.

The problem with high or unstable prices, as conceived in India, was twofold. In the first place, they encouraged retailers and consumers in China to adulterate expensive Bengal with Chinese varieties to produce a cheaper opium that still had most of the flavour of the preferred sort. For those running the Monopoly this represented lost sales, as it was thought that those who bought adulterated Bengal did so because they could not afford the pure sort. However, this type of behavior also appeared to threaten a more serious, long-term problem; it was feared that the more Chinese opium was sold combined with Bengal, the greater the incentive would be for producers of the former to try to imitate the taste and other characteristics of the latter. The successful competition of Szechwan opium with Malwa in north China, improvements in consistency, and the reduction of a unpleasant "grassy" taste that had formerly been present in Chinese opium both convinced officials in India that such adaptation was a very real possibility.[41] Only by avoiding both generally high

[39] 'Civis'. "The Share Gambling Mania: To the Editor of the Times of India". *The Times of India* (13th July 1865), p. 2

[40] "Opium Gambling". *The Friend of India* (12th October 1865), p. 1190

[41] "R.L. Mangles, Officiating Junior Secretary of the Board of Revenue (Lower Provinces) to the Secretary of the Government of Bengal, 8th of December, 1868 (No. 31)". In: *Proceedings of the Government of India Financial Department, January-December, 1870.* Vol. IOR/P/436/37. India Office Records, British Library, p. 210

prices and sudden price spikes could the future of the revenue derived from Bengal opium be assured. The mechanical nature of the relationship as understood by the opium administration, ubiquitous in the policy discussions of the early-to-mid-1860s, is well illustrated by a description of the problem in a letter sent from the Board of Revenue to the Government of Bengal, written shortly after the introduction of the reserve system:

> ...the preference of the Chinese for [Bengal] opium is universally acknowledged, the balance between the two is regulated by the price of Bengal opium. At a certain rate of price, Chinese opium is entirely excluded from competition; at a higher rate it enters into competition by being mixed with Bengal opium in the proportion of one-third to two-thirds; and the extent of this competition and adulteration varies with the rise and fall in value of the superior article.[42]

Although such an understanding of the opium market appears rather simplistic, it carried with it an attractive implication: that there was a certain Bengal price at which a higher total revenue would be realised, while at the same time removing the potential risk of direct competition in the future.

The turmoil of the early 1860s brought all three of these issues to the forefront of opium policymaking. As well as making the state's income more unpredictable, price instability driven by the difficulty of ensuring a consistent output of opium, or even arriving at a consistent standard of production, and by the structure of the government sales which encouraged speculative activity and manipulation was perceived to be creating a very real threat to the Monopoly's product in by far its most important market. This confluence of events created a sense in both the central government and in the Government of Bengal that there was an urgent need to fundamentally change the basis upon which this part of the opium revenue was collected. However, more importantly, it also set the terms by which potential solutions would be evaluated; any potential reform should ensure that the highest revenue possible was collected, that price were kept stable and below the level that might stimulate direct competition in China, and that a consistent quantity of opium would be required each year.

[42]IOR/P/436/37/31, p. 210

The first proposal that attempted to satisfy at least some of these aims followed in the wake of the crash of 1861, and carried the endorsement of the Governor of Bombay, Sir George Russell Clarke. In a letter to the Government of India, the Presidency Government denounced the opium system as it existed in Bengal for encouraging 'gambling' in opium, and suggesting that the solution was to unify both Presidencies under the Malwa system with a unified rate of duty.[43] This suggestion was declined, a fact that may be explained by the consideration that even in the original report it was admitted that whether or not "that system which requires the Government not to interfere in the production, manufacture, or sale of the article is the only legitimate course for it to adopt," to do so would "entail at first a heavy sacrifice of revenue."[44] This was certainly not a sacrifice which the Central Government was willing to make, and although this was not the last time that such a simplification of the opium revenue system would be suggested, it was always met with a curt refusal.[45]

In Bengal, meanwhile, the focus was more on revising the current system to meet the required ends, rather than its wholesale replacement. In early 1865 an intense discussion of the issue began. The Board of Revenue argued that while there was still comparatively little to fear in terms of direct competition from Chinese opium, there remained a substantial threat from unpredictable price increases. The Board emphasised that a single party had sometimes in the past been able to buy the entire amount sold at successive sales and that if it were to happen again "the market is not likely to hold out against the monopolist for more than a month or two." [46] Nevertheless, rather than solving this problem by abandoning the Bengal system altogether, the Board proposed to strengthen it by increasing the minimum

[43] "A.D. Robertson, Acting Cheif Secretary to the Government of Bombay to W. Grey, Secretary to the Government of India, 17th of September, 1861 (No. 151)". In: *Proceedings of the Government of India Financial Department, January-February, 1866.* Vol. IOR/P/437/1. India Office Records, British Library

[44] ibid.

[45] See for example: "R.B. Chapman, Secretary of the Government of India Financial Department to the Secretary to the Government of Bengal, 20th of July, 1871 (No.10)". In: *Proceedings of the Government of India Financial Department, 1871.* Vol. IOR/P/665. India Office Records, British Library

[46] "Junior Secretary of the Board of Revenue to the Secretary of the Government of Bengal, 5th of April, 1865 (No. 252)". In: *Proceedings of the Government of India Financial Department, July-December, 1865.* Vol. IOR/P/188/71. India Office Records, British Library, p. 336

price per chest at the Calcutta auctions to the point where it would actually start to affect the market. An upset price of Rs. 1,000 was, it was hoped, sufficient to simultaneously prevent attempts to corner the market, ensure consistent revenue, and avoid unhealthy price variation.[47] The response from the Government of Bengal was that while such a measure probably would be effective in preventing some shocks from affecting the auction price, it would also have the effect of making the number of chests sold unpredictable.[48]

The final proposal, and the option preferred by both the central government and the higher levels of the Government of Bengal, the opium reserve system, originated in an 1865 Minute, by the Lieutenant-Governor of Bengal, Sir Cecil Beadon. The central idea was to fix sales of opium at a specific level (initially 45,000 chests) for years at a time, with surpluses when there were good harvests being kept by the government to supplement harvests in less productive years.[49] Given the context in which the discussion was taking place, the appeal of this idea is obvious. Beadon highlighted that the system would allow the government to hold prices at a level that would discourage the growth of Chinese competition, while still drawing a larger revenue from their sales of Bengal than the pass-duty on Malwa.[50] Elsewhere the Government of Bengal also noted that it had the additional advantages of discouraging speculation and price manipulation and ensuring that the required harvest was consistent.[51] After the rejection of their initial proposal, members of the Board of Revenue was also quick to argue for the advantages of this alternative proposal, stating that: "With such a reserve there would be always a means of preserving the equilibrium of the Calcutta market, and a recurrence to dangerous high prices would be easily

[47] "T. Bruce Lane, Junior Secretary of the Board of Revenue (Lower Provinces) to the Secretary of the Government of Bengal, 23rd of January, 1865 (No. 533)". In: *Proceedings of the Government of India Financial Department, December, 1865.* Vol. IOR/P/212/69. India Office Records, British Library

[48] "A. Eden, Secretary to the Government of Bengal, to the Junior Secretary of the Board of Revenue (Lower Provinces), 22nd of May, 1865 (No. 251)". In: *Proceedings of the Government of India Financial Department, July-December, 1865.* Vol. IOR/P/188/71. India Office Records, British Library

[49] "Minute by C. Beadon, Lieutenant-Govenor of Bengal, 21st of February, 1865 (No. 210)". In: *Proceedings of the Government of India Financial Department, March-April, 1865.* Vol. IOR/P/212/65. India Office Records, British Library

[50] ibid., pp. 200–202

[51] IOR/P/188/71/251, pp. 334–335; and "Minute by C. Beadon, Lieutenant-Govenor of Bengal, 18th of April, 1867 (No. 33)". In: *Proceedings of the Government of India Financial Department, August-September, 1867.* Vol. IOR/P/437/10. India Office Records, British Library, pp. 493–494

prevented."[52] Although the Government of India remained cautious, they accepted this proposal for trial in 1867, with an initial target of 45,000 chests to be sold and 3,000 to be kept in reserve.[53] So apparently successful was this trial, that the system was permanently introduced from 1868, with revised sales of 48,000 and a desired reserve of 10,000 chests. Although the sale and reserve quantities were changed a number of times over the next decades as conditions changed (by the 1880s, the standard quantities stood as high as *c.*57,000 chests to be sold and 30,000 to be reserved) to suit circumstances, this basic mechanism remained the firm guiding principle of Bengal opium policy for the next four decades.

However quickly the logic of the reserve system became ingrained into the Bengal Monopoly, as will be clear from the foregoing discussion, it was nevertheless fundamentally based on a series of simple assumptions about the opium market, which were in turn based on very limited information. In particular, the core of the approach was that there was a single price at which there would be no incentive for other opium producers to compete directly with Bengal, that that price would correspond to a certain (potentially time-variant) number of chests auctioned, and that both these values could be at least approximately determined. The method by which the various parts of the opium administration attempted to do the latter was by combining statistical evidence of past variations in quantities and prices with the results of consultations with merchants, either in India, or through the British consular establishment, in China.

This approach had obvious flaws besides the naïveté of the model. In the first place, the information on demand was generally insufficient. In the first place, merchants often had their own reasons for wanting the supply of opium expanded or contracted and the Government of India only gathered the opinions of the larger British and Indian exporting-importing firms, and not the local merchants involved in the internal trade and sale of opium. Official inquiries were sometimes even less useful; relatively basic information about conditions in the major centres of

[52] IOR/P/212/69/533, p. 539

[53] "E.H. Lushington, Secretary to the Government of India Financial Department to the Secretary to the Government of Bombay, 10th of March, 1865 (No. 211)". In: *Proceedings of the Government of India Financial Department, March-April, 1865.* Vol. IOR/P/212/65. India Office Records, British Library

demand proved difficult to obtain. This was especially the case for China, by far the largest market for Indian opium; even basic information, such as the size of domestic production of opium, or the population of the major regions could only be estimated in a very approximate way, while accurate data remained illusive.[54]

On the other hand, if the Government of India had too little solid data about the end markets for opium, it had in some senses too much about conditions in India. Even with annual events like the size of the harvest, the methods available at the time meant that it was difficult to process much beyond isolated individual movements or very broad trends. This problem was even worse with the monthly or daily price data collected from auctions or the markets. Consequently, the analyses carried out within the opium administration were based on limited, often highly selected information. Beadon, for example, made his calculations of the relationship between the size of the provision and prices with only four data points, all annual averages. Other officials commonly based similar calculations on just a few recent auctions. As a result, in the discussion over market stabilisation, the policy prescriptions in any individual analysis were highly contingent on the level of competition that was considered acceptable, what assumptions were made about the prices in China, and what data was used to determine structural relationships in India.

Nevertheless, between 1865 and 1868, a general consensus emerged that the goal of the reserve system should be stabilisation around Beadon's suggested price of Rs. 1,200. The initial increase in the size of the provision to 48,000 chests was made on the recommendation of Beadon himself, on the basis that increased Chinese demand meant that more opium was needed to bring the price to Rs. 1,200.[55] Although this action was considered to be successful, prices remained above the desired level, leading the central government two years later to mandate an increase in the provision to 60,000 chests a year gradually, but with "as much promptitude as

[54]Attempts were made to improve the quantity of information available about markets in China, in particular by subscribing to telegraph news service to get daily opium prices from Hong Kong and Shanghai, although this appears to have been of relatively limited use in practice ("Matters of Routine, No. 34, 16th of February, 1871". In: *Proceedings of the Government of India Financial Department, 1871*. Vol. IOR/P/665. India Office Records, British Library).

[55]IOR/P/437/10/33, pp. 493–494; and "E.H. Lushington, Secretary of the Government of India Financial Department to the Secretary to the Government of Bengal, 30th of September, 1868 (No. 38)". In: *Proceedings of the Government of India Financial Department, January-December 1868*. Vol. IOR/P/436/35. India Office Records, British Library, pp. 729–730

may be conveniently practicable."[56] Although small adjustments were subsequently made, the overall result was that the reserve system was consistently based on a target price of Rs. 1,200 at least up to the early 1890s, and policy on the quantities sold at auction, the area to be placed under poppy, and the price to be paid to the cultivator were determined accordingly.[57]

The introduction of the opium reserve, then, represented a consistent response to a clearly defined set of problems within the existing structure of the Bengal Monopoly. The question of how successfully the policy was implemented is, however, rather more complicated. Certainly, in a fairly abstract sense one can produce a simple answer: it is quite probable that the reserve system failed in a narrow sense, although it is difficult to confirm without more data on demand and the supply of substitutes than is available to the historian at present. The ultimate aim of the Government of India in intervening in the opium market was to raise the largest revenue possible, and one can be reasonably sure that attempting to maintain the price at a constant level over several decades was almost certainly not strategically optimal in this regard; the late nineteenth century was a period of substantial change in the international opium market, and it is unlikely that such a conservative policy actually succeeded in maximising revenue across this period.

However, whether the reserve succeeded in a more practical sense remains interesting for two reasons. In the first place, the decisions taken by the Government of India were very obviously not made in a world of perfect information. Given the significant limitations in this regard, the system as introduced may, as far as the opium administration was concerned, have been preferable to any reasonable

[56]See: IOR/P/436/37/30, p. 209; "Resolution by the Government of India Financial Department, 25th of March, 1870 (No. 42)". In: *Proceedings of the Government of India Financial Department, January-December, 1870*. Vol. IOR/P/436/37. India Office Records, British Library, p. 161

[57]There were, of course, some dissenting opinions. Most prominently, E.H. Lushington, the Secretary of the Government of India Financial Department argued in a detailed response to Beadon's arguments that there was: "something incompatible or contradictory in the idea of a monopoly price which by its lowness shall bar competition, while yet it must be made to yield an enormous revenue from a profit of more than 200 per cent. on the cost of production."("Note by E.H. Lushington, Secretary of the Government of India Financial Department, 25th of April, 1867 (No. 38)". In: *Proceedings of the Government of India Financial Department, August-September, 1867*. Vol. IOR/P/437/10. India Office Records, British Library, p. 504) Instead, according to Lushington, the reason why limited competition existed at all was that the price was not at around Rs. 500, rather than that it was above Rs. 1,200. Consequently, he argued that prices could be set as high as Rs. 1,400 before competition became dangerous.(ibid., p. 503) However, neither part of this argument appears to have had any significant influence on opium policy.

counterfactual alternative. In the second, given the importance of opium to the Indian economy and to the wider system of intra-Asian trade and finance, if the colonial state was able to systematically manipulate the price of one of the most important kinds of opium to such a degree, that is in itself significant. As the next two sections will show that in terms of its short-term objectives, the reserve system was, in this sense, highly successful.

1.3 Data

The data upon which the following quantitative analysis is based is drawn primarily from the information collected by the Finance and Revenue administration itself to facilitate the formation of opium policy. As well as collecting data from the monthly Calcutta sales, the Finance Department also sought to bring together information on the price of the various kinds of Indian opium, from major markets both inside and outside India. While, unfortunately, this data is not longer available in its original form, it was aggregated together into monthly averages, both for internal use and for general publication in the *Miscellaneous Statistics Relating to the Finances of British India* which were appended to each year's Finance and Revenue Accounts between 1870 and 1893. At that point *Miscellaneous Statistics* ceased to be published, and the average prices were split, with the data on the Calcutta sales continuing to be reported in its successor volume, *Financial and Commercial Statistics of British India*,[58] and the average market prices being relegated to lesser publications including, most importantly, the *Report on the Administration of the Opium Department of the Bombay Presidency*. Nevertheless, in spite of these somewhat Byzantine changes in statistical reporting, by combining data from these sources, it is possible to derive a pretty consistent set of average prices, from 1835 for the Government sales, and from mid-1856 for the market prices.

For an analysis of the effects of the introduction of the reserve system on price volatility, the most important of these is obviously the series relating to the Government Calcutta Sales, shown in Figure 1.2. At these sales, the opium was divided into

[58]Subsequently subsumed as Volume II of the *Statistics of British India*

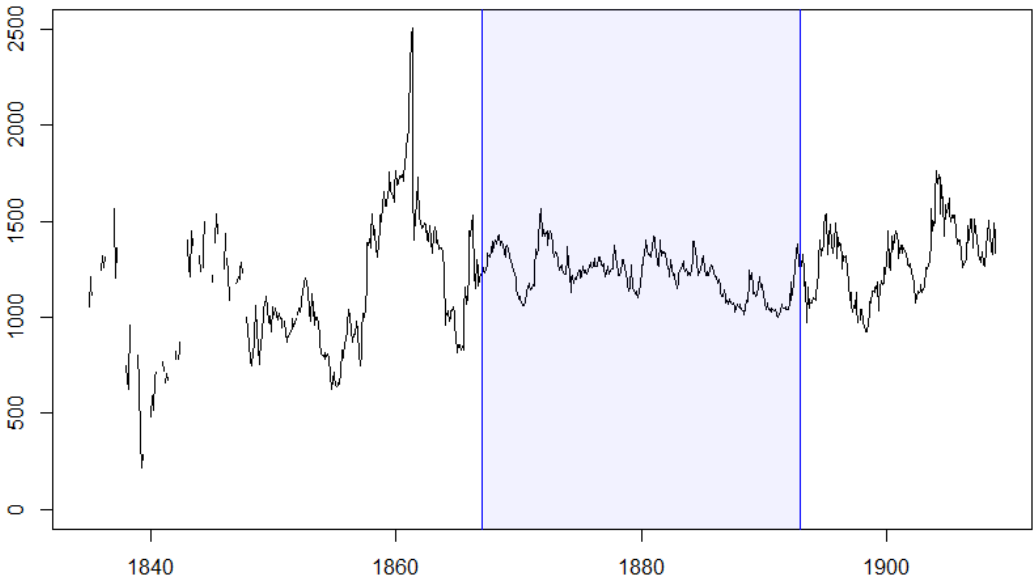

Figure 1.2: Average Government Sale Prices per chest for Bengal Opium, 1835–1908; the blue area indicates the period in which the reserve system was able to effectively control sale quantities. Finance and Revenue Accounts and Miscellaneous Statistics Relating to the Finances of British India, Part 3: Miscellaneous Statistics. *Calcutta, 1870-1893; Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce.* Financial and Commercial Statistics of British India. *Calcutta, 1907, pp. 75–76; Department of Statistics.* Statistics of British India: Volume II: Financial Statistics. *Calcutta, 1915, p. 159; and Department of Statistics.* Statistics of British India: Volume II: Financial Statistics. *Calcutta, 1918, pp. 162–163.*

lots containing multiple chests, so to produce an 'average price' per chest, the total receipts from an auction was divided by the number of chests sold. Additionally, before January 1855 the averages for Patna and Benares were not reported separately (both before and after this point, both varieties deviated very little from one another in price), meaning that for consistency, only the 'Bengal Average' can be used across the whole period. Together these two facts mean that the 'prices' in this series do not correspond to the actual price paid by any individual buyer at the Calcutta sales. Nevertheless they remain useful, firstly because, while they may hide substantial differences in same-sale prices, they are more representative of the general cost of the opium introduced into the market, and secondly, because the main matter of concern is inter- rather than intra-sale price variation. In the absence of comprehensive

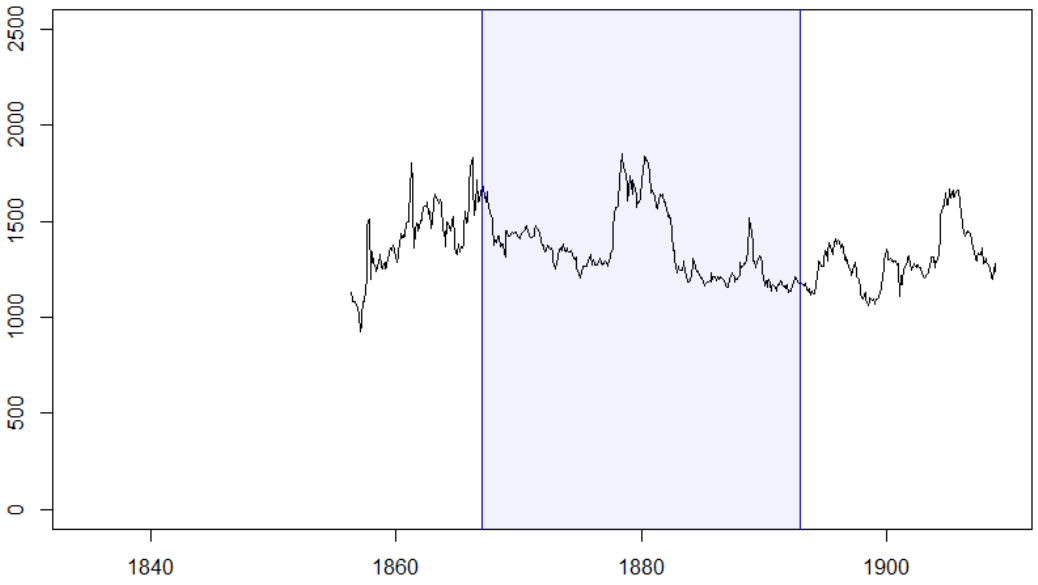

Figure 1.3: Monthly Average Bombay Market Price per chest for Malwa Opium, 1856–1908; the blue area indicates the period in which the reserve system was able to effectively control sale quantities in Bengal. Finance and Revenue Accounts and Miscellaneous Statistics Relating to the Finances of British India, Part 3: Miscellaneous Statistics. *Calcutta, 1870-1893; and* Report on the Administration of the Opium Department of the Bombay Presidency. *Bombay, 1892–1909.*

data on prices and lot sizes for each sale, this type of average is less vulnerable to distortions from potential inconsistencies in individually reported prices.

A perhaps more serious problem comes from the irregularity of sales towards the beginning of the period covered by this data, described in Section 1.2. Unfortunately, since all the irregular observations are concentrated in the first thirteen years of the series, there is not way to adjust the data to take account of this irregularity without seriously biasing the results. As a partial solution however, the results in the following section are reported both with and without these observations included.

For comparison between the volatility effects of the Bengal and Malwa systems, average Bombay market prices are used (Figure 1.3). In contrast to the Calcutta data however, the averages for Malwa simply represent averages of the daily observations of market prices collected by the revenue administration in Bombay on the orders of the Central Government. This presents a similar, albeit slightly more serious, problem to that of aggregating prices across each auction into a single number; variation in prices

Type of Opium	*Sample*	*N*	*Minimum*	*Maximum*	*Mean*
Bengal	1835–1908	795	220	2507	1214.32
Bengal	1848–1908	729	624	2507	1229.75
Bengal	1856–1908	630	637	2507	1265.76
Malwa	1856–1908	632	925	1852	1356.90

Table 1.1: Descriptive statistics for various samples of Bengal and Malwa opium price data. *Sources as described in the text.*

actually paid by people in the opium trade is lost. In this instance however such losses are to some degree unavoidable. Not only is consistent data of higher resolution non-existent, but also in order to produce a series with the same observational frequency as the Calcutta series some method of combining more frequent observations together on a monthly basis is needed. Relative to the alternative of simply using a single observation to represent the whole month, averaging is in many ways preferable. Again, as in the case of the Calcutta auction prices, to produce a consistent series over the whole sample I have aggregated together sub-varieties that only have prices reported for a limited period of time.[59]

The descriptive statistics presented in Table 1.1 suggest the the various samples of the Calcutta auction data used in the analysis are at least superficially similar. The greatest difference, the much larger range for the full 1835–1908 sample come from a single period of especially low prices in 1839–1840, during the early months of the First Opium War. By contrast, the Malwa sample shows both a considerably higher mean price, and a smaller range. As well as suggesting that the extreme peaks and troughs in the price of Malwa may have been smaller, this also potentially raises the question of how comparable the two sets of data are. Consequently, normalised measures of volatility will be used in the following analysis to avoid the possibility that results are driven by differences in relative magnitude.

[59]In this case the only distinction is between Old and New Malwa, which for obvious reasons are even more correlated than is the case with the two Bengal varieties.

1.4 Results & Analysis

A cursory visual inspection of Figure 1.2 suggests that there was a significant difference in price volatility between the period before the introduction of the reserve and during its operation. Dividing the series in January 1867, the point at which the reserve was introduced, produces contrasting pictures of price behavior. As expected, the 1830s, 1840s, 1850s, and early 1860s are characterised by repeated large price swings. While some of these are coincident with events likely to significantly disrupt trade (notably the First and Second Opium Wars), others are not, suggesting that these movements represent wider volatility in the market. After the introduction of the reserve, however, prices appear considerably more stable, with no movements of similar magnitude to those which punctuated the pre-1867 period. In fact auction prices appear to have varied very little at all between at least 1867 and the early 1890s.

The degree to which this represents a real change in the volatility profile of prices at the Calcutta Auctions can be gauged more specifically by directly quantifying the extent of price variation in the two periods and comparing them. A simple and widely used measure of volatility is the standard deviation of the logarithmic rate of change of the price. This metric has the advantage of allowing relatively direct comparison as it depends on proportionate movements in the variables, rather than their absolute levels. This measure is described by the equation:

$$\sigma = sd\left(ln\left(\frac{P_i}{P_{i-1}}\right)\right) \tag{1.1}$$

where P is price, and σ is the measured volatility.

The results of applying this procedure to the Government Sale price data are presented in Table 1.2. As in the raw price data, there is a substantial difference in volatility between the two periods. While excluding the thirteen years with irregular sales at the beginning of the sample does reduce the pre-reserve value, it still remains well above that for the duration of the reserve. Again, this is not unexpected,

Type	*Sample*	*Full*	*Pre-Res.*	*Res.*	*F-Stat.*	*Result*
Bengal	1835–1908	0.07381	0.10722	0.04142	6.70087	Significant Decrease
Bengal	1848–1908	0.05145	0.06775	0.04142	2.67546	Significant Decrease
Bengal	1856–1908	0.04997	0.07253	0.04142	3.06630	Significant Decrease
Malwa	1856–1908	0.02969	0.045982	0.02106	4.76674	Significant Decrease

Table 1.2: Standard Deviations of Logarithmic Rate of Change for Monthly Indian Opium Prices during the pre-reserve, and reserve periods, Various Samples.

since prices which were formed further apart (not to mention at sales unevenly distributed through the year) are more likely to exhibit large movements as market participants adjusted to changed circumstances. In general, these results suggest that the combination of greater control over the amount of opium reaching the market, more consistent policy, and better signaling of intent enabled the Financial Department to achieve its goal of improved opium price stability.

When compared with the same metrics for the Malwa price series however, the picture becomes somewhat less clear. Although volatility is lower for Malwa during the pre-reserve and reserve period, there is nevertheless a fall in the measure between the two periods which is proportionately similar to that for Bengal. There are a couple of reasons why this might not actually reflect a significant change in the variability of Malwa prices separate from that for Bengal. The two kinds of opium were, at least to some degree, substitutes, and the two markets, Calcutta and Bombay were well connected by ship, and later in the period, by rail and telegraph also. As such then, it is likely that more stable opium prices in one variety would be also reflected in the other. Additionally, the number of observations available before 1867 is probably too small to produce comparable results. Nevertheless, this does raise the question of whether the apparent reduction in volatility is the result of a general decrease in opium price variability over the whole of the period, rather than being specifically associated with the introduction of the reserve system in Bengal.

One way to discount this possibility is to measure the timing of the fall, instead of its absolute extent. The same measure outlined in Equation 1.1 can again be used, but instead of using the entire sample at once, it is applied to a rolling thirty observation window (equivalent to 2.5 years). This produces a series which captures

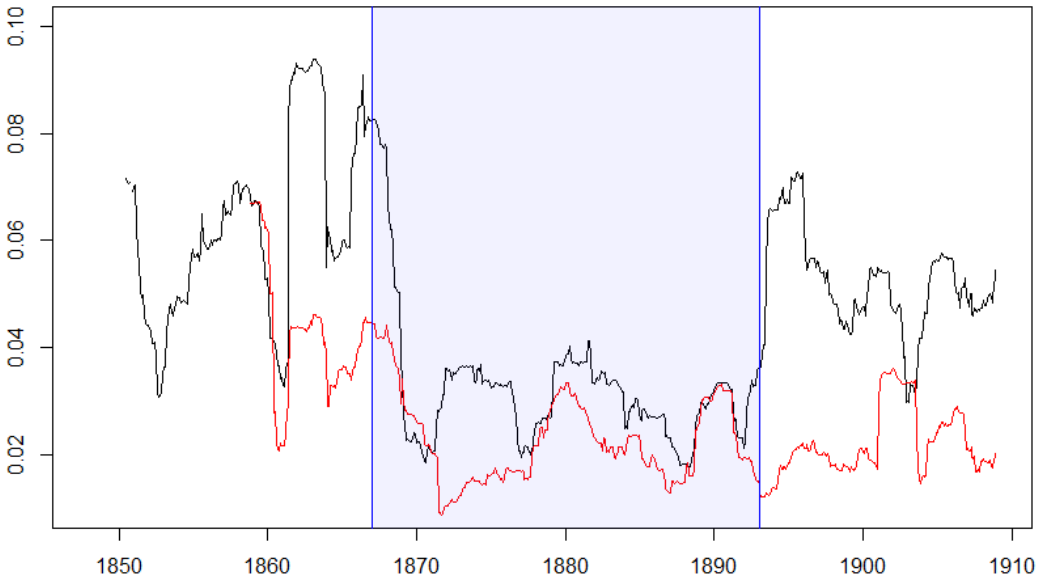

Figure 1.4: Rolling standard deviation of the logarithmic rate of change (with a thirty observation window) of average prices at the Government Sales (black) and in the Bombay market (red), 1848–1908; the blue window indicates the period of successful operation of the reserve system in Bengal.

changes in volatility in the relatively short term. In the interests of producing a consistent measure over time, it has only been applied to the periods for which monthly data is available.

The clearest result evident from calculating this series for Bengal (Figure 1.4) is that the timing of the fall is very closely associated with the introduction of the reserve system. From January 1867, the rolling standard deviation declines very rapidly, and then remains low until the mid-1890s, when it increases suddenly again, probably because of the production crisis which took place then. Turning to Malwa, there is little evidence of a similar volatility dynamic. As Figure 1.4 shows, while the measure does decline after the beginning of 1867, it does so considerably more slowly and with apparently less persistence than was the case for the Bengal varieties.

These results strongly suggest that the introduction of the reserve system to Bengal did have a significant impact on price volatility at the Calcutta sales. Conversely there is little evidence of a more general decline in price volatilities, since the change in Malwa appears to by-and-large follow that for Bengal, rather than preceding it.

Furthermore it is notable that from around the start of 1870 to the mid-1890s, the rolling measure is a comparable level for both Bengal and Malwa, suggesting that the higher volatility found for the entire 1867–1908 period may be largely driven by more variable prices at the end of the period. Together, these facts suggest that the operation of the reserve did successfully reduce price volatility to a level comparable with a considerably less interventionist system at least in the short- to medium-term. However, neither of these are perfectly conclusive. Standard-deviation-based measures of volatility remain vulnerable to heteroskedasticity in the underlying returns series. Additionally more complex measures will allow the independent identification of periods of low and high volatility, divorced from the narrative of the opium reserve system. Since the preceding analysis strongly implies, and further testing empirically confirms (See Appendix C), that the variance of returns changed over time (and may be highly clustered), it is necessary to adopt an approach which can capture the existence of systematically different volatility dynamics in different parts of the data.

The first of these two problems is conventionally resolved through the Autoregressive Conditional Heteroskedasticity (ARCH) methodology of Engle, and its generalised extension (GARCH) developed by Bollerslev.[60] Both of these models assume that the variance of the underlying process changes over time. However, since in the case of the Bengal Monopoly if the reserve system had any effect it may have led to a structural shift in the variance dynamics of the price, it is necessary to use an approach which can model different volatility regimes.[61] Since in this case, the data shows evidence of GARCH behavior, and the potential change in volatility regime(the adoption of the opium reserve system) was largely exogenous, a Markov-switching GARCH (MSGARCH) model is preferred to observation switching alternatives, as the latter assumes that the switching variable is endogenous to the underlying process.

[60]T. Bollerslev. "Generalized Autoregressive Conditional Heteroskedasticity". *Journal of Econometrics* 31.3 (1986), pp. 307–327;R.F. Engle. "Autoregressive Conditional Heteroscedasticity with Estimates of the Variance of United Kingdom Inflation". *Econometrica* 50.4 (1982), pp. 987–1007

[61]For the problems caused by failure to model this type of shift see C.G. Lamoureux and W.D. Lastrapes. "Persistence in Variance, Structural Change, and the GARCH Model". *Journal of Business and Economic Statistics* 8.2 (1990), pp. 225–234.

Following the approach developed by Haas, Mittnik, and Paolella, the time series, ϵ, is modeled as a Markov-switching GARCH process:

$$\epsilon_t = \eta_t \sigma_{\Delta_t, t}\,, \tag{1.2}$$

where η_t are the standardised innovations and Δ_t is a Markov chain with state space $S = \{1, 2, ..., k\}$ and a $k \times k$ transition probability matrix, P, in which $P = p_{ij} = P(\Delta_t = j \mid \Delta_{t-1} = i)$ and $i, j = 1, ..., k$.[62] The vector of conditional variances, $\sigma_t^{(2)} = [\,\sigma_{1t}^2, \sigma_{2t}^2, ..., \sigma_{kt}^2,\,]$ follow a GARCH model:

$$\sigma_t^{(2)} = \alpha_0 + \alpha_1 \epsilon_{t-1}^2 + \beta \sigma_{t-1}^{(2)}, \tag{1.3}$$

where $\alpha_i = [\,\alpha_{i1}, \alpha_{i2}, ..., \alpha_{ik}]\,, (i = 0, 1)$ and $\beta = diag(\beta_1, \beta_2, ..., \beta_k)$, and α_0, α_1, and β are constrained so that $\alpha_0 > 0$ and $\alpha_1, \beta \geq 0$.

As model selection is a key consideration in time series analysis, a variety of models were applied to the data (see Appendix C). Based on the standard information criteria a two-regime model was selected, with t-distributed standardised innovations, described by the probability density function:

$$f(\eta_t, \upsilon) \equiv \frac{\Gamma(\frac{\upsilon+1}{2})}{\sqrt{(\upsilon-2)\pi}\Gamma(\frac{\upsilon}{2})} \left(1 + \frac{\eta_t^2}{(\upsilon-2)}\right)^{-\frac{\upsilon+1}{2}}. \tag{1.4}$$

with υ signifying the degrees of freedom. As well as performing well relative to other similar models, this specification also intuitively matches the context of the data well; one would expect two different sets of volatility dynamics (one when the reserve system was in operation and one when it was not) and non-normal conditional distributions are common in financial time series.

In general, the results of both the Markov-switching GARCH model and a standard GARCH model (which performed similarly in model selection (see Appendix C)), tend to confirm the earlier results. The conditional volatilities generated by these two models from the Calcutta sale prices, presented in Figure 1.5, show clear evidence

[62] M. Haas, S. Mittnik, and M.S. Paoella. "A New Approach to Markov-Switching GARCH Models". *Journal of Financial Economics* 2.4 (2004), pp. 493–530

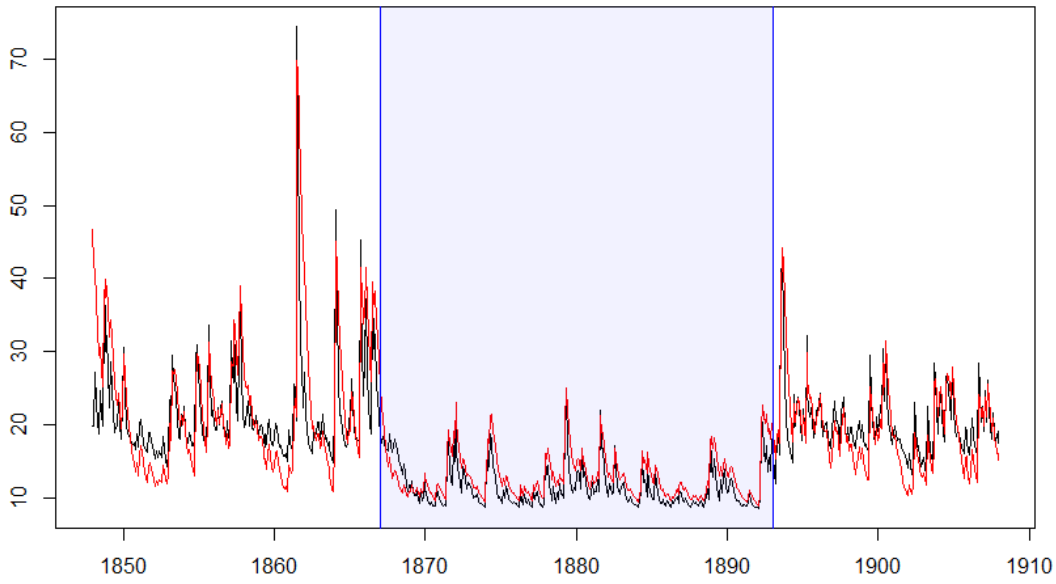

Figure 1.5: Conditional volatilities for the GARCH (red) and MSGARCH (black) models, both with t-distributed innovations; again the blue area represents the effective operation of the reserve system.

of an impact from the introduction of the opium reserve system. Like the previous measures, both GARCH and MSGARCH models suggest that the beginning of the reserve period coincided with a large reduction in conditional volatility. Although local spikes in volatility indicate that some seasonal or yield-based variation remained, prices at the government sales remained relatively stable until supply problems of the early 1890s destabilised the reserve system. This change was also coincident with a significant change in conditional volatility: once the government's ability to control quantities became more limited prices also began to vary more.

Beyond more rigorously confirming the results of the simpler metrics, the structure of the MSGARCH model allows the timing of the change in volatility regimes to be measured more directly. The smoothed probabilities from this model shown in Figure 1.6 reveal the same pattern. Outside of the main reserve period the probability of the high volatility regime are consistently very close to one, while from 1867 to 1892 it remains almost at zero. Once again this indicates significant change in price variance structure associated with the quantity controls introduced by the Government on India.

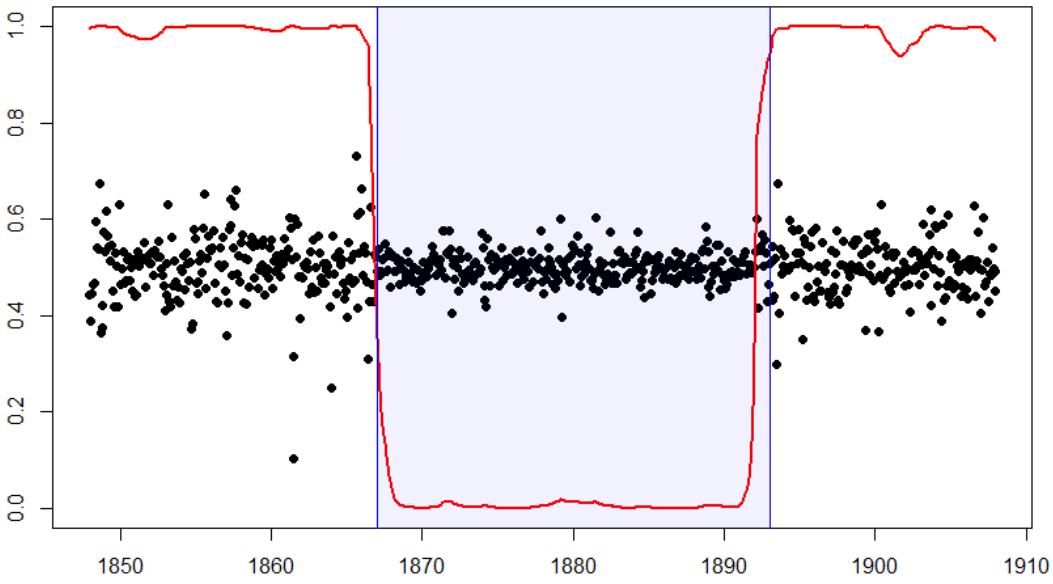

Figure 1.6: Smoothed probabilities of the high-volatility regime for the two-regime MSGARCH model with t-distributed innovations; again the blue area represents the effective operation of the reserve system.

Looking more closely at the details of the change, the coefficient results in Table 1.3 show the largest difference between the two regimes is between the α_{1i} (although the coefficient for the low volatility regime is only significant at the 10% level). Since this parameter measures the effect of a past volatility shock on current volatility, this suggests that volatility clustering was reduced under the reserve system (the low volatility regime). This effect also feeds into the persistence of volatility shocks $(\alpha_{1i} + \beta_i)$, although for both regimes this measure is less than 1 (the point at which volatility is persistent, that is the process is non-stationary).[63] Under the opium reserve system, the effects of such shocks were reduced, and as a result also went away more quickly. These outcomes match the literature on inter-temporal commodity storage fairly well insofar as the uncertainty of supply of opium is concerned. The use of the reserve by the Government of India to smooth the availability of opium and so avoided the high volatility associated with uncertain supply and frequent stock-outs. That the main effect comes through a reduction in volatility clustering is interesting

[63]Interestingly, this is only barely true for the GARCH model, where $\alpha_1 + \beta = 0.9923$, indicating that shocks to volatility would decay very slowly under this model, although in this case the coefficient for α_1 is statistically insignificant.

	GARCH	MSGARCH
α_{01}	0.0001**	0.0003**
	(0.014 6)	(0.016 4)
α_{11}	0.2404	0.2121*
	(0.172 9)	(0.075 2)
β_1	0.7519***	0.4135***
	(0.000 0)	(0.007 4)
V_1	0.082 10	0.0301
π^1_∞	1	0.3114
α_{02}	—	0.0014**
		(0.014 7)
α_{12}	—	0.2768**
		(0.048 7)
β_2	—	0.3975**
		(0.010 9)
V_2	—	0.0653
π^2_∞	—	0.6886

Table 1.3: Coefficient results for GARCH and MSGARCH models, both with t-distributed innovations; the π^i_∞ are the stable probabilities and the V_i are the unconditional volatilities. The p-values are reported in parentheses.

as this can to some degree be interpreted as a reflection of the expectations of the merchants purchasing opium. Buyers who were confident that the government would consistently sell the promised amount faced less uncertainty and consequently were quicker to return to their normal patterns of opium purchases in the wake of a shock.

What do these results tell us about the relative success of the Government of India's opium policy? In the first place for the twenty-five years which followed the introduction of the reserve system the tactical approach worked. The sale of consistent quantities of opium, announced in advance appears to have significantly reduced price volatility for Bengal opium. Evidence from the level of the price is similar, although rather more ambiguous. The mean for the period from 1867 to 1892 stood at Rs. 1228.07.06 (Rs. 1228.47) only slightly higher than the target price of Rs. 1,200 per chest, although a comparison with Table 1.1 shows that the same was true for Bengal for all of the periodisations used. Nevertheless, this comparison of policy goals and their actual results at the levels below the broad aim of raising revenue

produce a novel view of the Bengal Monopoly: the policy pursued by the Government of India was generally consistent and successful, at least until the early 1890s. Insofar as government opium policy failed, it failed at the point of the analytical connection which officials drew between pursuing a single constant price and maximising net revenue.

1.5 Conclusion

Except at the level of its overarching political aims, the Government of India had good reason to be satisfied with the way that the reserve system performed up to the 1890s. Both the variability of prices and the extreme price spikes notable in pre-1867 are not in evidence during the period of successful operation of the reserve system. Both the effects of harvest uncertainty and speculative price manipulation appear to have at least been reduced. Additionally, returning to Table 0.2, that part of the opium revenue generated by the Bengal Monopoly remained fairly stable across the two-and-a-half decade period during which the reserve operated and it was also at this time that the revenue gained from Bengal opium reached its peak.

There are very important caveats however; the reserve system must to some extent be interpreted as a way of solving problems of the Government of India's own creation. Most directly, the problem of market manipulation and associated systemic effects on the Indian financial system came almost entirely from the way in which the production of Bengal opium had been organised under the Government of India. Additionally, on the production side, although, in line with the theoretical predictions outlined in the introduction, centrally planned production and storage appear to have mitigated some of the effects of unstable harvests, the high volatility profile of the supply of opium was largely the result of the inconsistent management of cultivation before 1867. Bengal prices were not clearly better in volatility terms than, for example, those in the more competitive Malwa market: during the reserve period variability for the Bengal varieties probably comparable to that other varieties. For the Government of India, however, the focus was always on revenue; the reserve system produced a larger income for the government than the alternative, while

largely avoiding the significant fluctuations which had accompanied earlier efforts at price management. Given the analytical and informational constraints of the time, it is difficult to see obvious ways the officials managing the opium revenue could have improved the system to more effectively achieve their aims. On the other hand, it is even more clear that the system carried with it significant costs in terms of market efficiency. The large profits obtained by the British Indian state came directly from consumers paying much higher prices than they would have done in a hypothetical free market for opium.

Obviously, the nature of colonial government and the ambiguity of opium as a commodity makes it difficult to directly interpret these findings in any straightforward terms. Nevertheless, in the last analysis, they are of not inconsiderable historical significance. Most directly, these results confirm, and to some degree, within the constraints of the available data, quantify the often alluded to, but never systematically examined, manipulation of opium prices by the Government of India. Even beyond that they also help to endorse the idea that the Bengal Opium Monopoly was a considerably more complex entity than previously thought, with aims beyond simple revenue extraction, which in turn created at least two structurally distinct periods. Finally, as suggested in the introduction, they also suggest that in trade and commodity taxes as in direct taxation, active management by colonial governments could easily founder on informational obstacles. Overall, therefore, a picture of the Indian opium economy in the second half of the nineteenth century emerges in which active, systematic, but only partially successful government management, rather than the simple passive extraction of revenue, is the leading motif.

Paper 2

A Tyranny of the Average?: Markets, State Intervention, and the Profitability of Opium Cultivation in Nineteenth-Century North India

Abstract

In the large literature on colonial state capacity trade and commodity taxes are frequently associated with the development of relatively high fiscal capacity in this context owing to the ease with which they could be collected by limited colonial states. By contrast, direct taxation, it is held, produced limited fiscal returns and stimulated corruption and rent-seeking, because of the small number of colonial officials and widespread evasion. Using the case of the British Government of India's Bengal Opium Monopoly, this paper argues that neither shortages of official manpower nor the use of direct taxation were clear causes of these issues. Instead, the centralised nature of decision-making, the difficulty of collecting and processing information over a wide area, and limited oversight between different levels in the opium administration, meant that even a well-staffed department entirely devoted to collecting a single

kind of commodity tax faced similar problems. A mixture of qualitative and quantitative evidence further suggests that problems of corruption and limited control were at there worst when mid-level officials were least able to directly oversee interactions between the Department's officers, non-state intermediaries, and opium cultivators.

I have compared the figures in the Opium Commissioner's Report with the figures obtained from four or five different sources, and the four or five gentlemen who have given me those figures have probably got many more; but I find it absolutely impossible to reconcile the figures. My experience is that it is generally different to reconcile figures in statistics.

Evidence on the Profitability of Poppy Cultivation by Additional Commissioner Wace, Royal Commission on Opium[1]

2.1 Introduction

Variations in both economic development and the strength of states in the large parts of the world that were in the past part of European colonial empires has of late become the subject of significant discussion in economic history. In recent years, a substantial number of works have argued that differences in the capacity of modern states in formerly colonised regions are to a great degree explained by variations in the development of colonial fiscal systems, which were in turn constrained by the resources available to each colony.[2] Based largely on African cases, this literature has argued that a lack of easily taxable trade and commodity resources led some colonial states to adopt relatively information intensive direct taxation. However, the small number of colonial officials, a limited degree of fiscal centralisation, and frequent evasion caused by abundant land and poorly defined borders compromised the ability of the state to collect these kinds of taxes and led to lower fiscal capacity in colonies with such features. In particular, in probably the most detailed study of the problems of tax collection in this context Gardner argues that limited official manpower, the devolution of fiscal authority, and the complexity of implementing direct taxation led to low levels of fiscal development in British colonies in eastern

[1] *Royal Commission on Opium, Volume III*, p. 7.

[2] See for example: Frankema, "Raising Revenue", pp. 451–452; Frankema, "Colonial Taxation", pp. 136–149; andGardner, *Taxing Colonial Africa*, pp. 4–10

Africa.[3] However, given the very different economic conditions which prevailed in Asian colonies, and especially in British India, there remains an open question as to how well this explanatory mechanism applies in this setting.

Taking the case of one such commodity tax, the British Government of India's Bengal Opium Monopoly, this paper argues that it was the information intensity and administrative structure of the method of taxation that primarily determined the success of the colonial state in collecting revenue. In this instance a relatively large, single-purpose department, controlled by the central government faced very similar problems in administering a commodity tax that relatively isolated, general purpose officials experienced when collecting direct taxes elsewhere. Consequently, these results suggest that rather than being the result of specific type of revenue collection, official manpower levels, or fiscal devolution, the difficulties implementing policy and frequency of corruption were essential features of implementing informationally complex taxation systems in a colonial context. The implementation of centrally made decisions, based on limited information, across a large densely populated area, by junior officials and functionaries, often with limited or no oversight fundamentally compromised the state's control over outcomes in this part of its fiscal system. However, this paper does find some evidence that changes in the form of administration could partially ameliorate these issues; although the negative effects of this revenue system were to some degree universal, where steps were taken to increase oversight by mid-level officials of the lower levels of the opium administration the impact of these problems was somewhat reduced.

Existing attempts to understand the level of control exercised by the colonial state over opium cultivation have resulted in quite divergent conclusions. For example, in their study of the determinants of successful control over export production, Kranton and Swamy use the management of the Opium Monopoly by the East India Company and subsequently the government of India as key example of successful mitigation of agency problems and removal of corruption.[4] Conversely, Robb, in considering the ambiguous nature of 'commercialisation' in nineteenth-century Bihari

[3]Gardner, "Decentralization and Corruption", pp. 213–236

[4]Kranton and Swamy, "Contracts, Hold-up, and Exports", pp. 281–283

agriculture, argues that structure of opium cultivation under the Monopoly deepened the level of control exercised by intermediaries over cultivators, a relationship which the colonial state was unable to break.[5] The literature which focuses specifically on the state-sponsored production of opium in nineteenth century north India has also produced a similar range of conclusions about the question of state compulsion. Both Prasad and Singh find some indications of improvement in the level of control over junior officers and intermediaries exercised by the government as the administrative apparatus of the Opium Department expanded over the first half of the nineteenth century.[6] However, Chowdhury and Trocki, who both look at a slightly later period, still find substantial evidence that abuses and coercion were either sponsored or tolerated by the state.[7] The two authors who have delved into the question in the most detail have found similarly conflicting results. John Richards, who in his widely cited 1981 paper argued that although coercion was relatively uncommon at best opium cultivation only returned marginally more than it cost, in later work has been at pains to emphasise the advantages and profitability for cultivators of growing poppy.[8] On the opposite side of the question, Rolf Bauer has recently presented a very developed version of the unprofitability-compulsion hypothesis focusing mainly on conditions in Bihar, according to which collusion between the officials of the Opium Department, landlords, and intermediaries forced poorer peasants to cultivate opium at a very substantial loss.[9]

Since a number of authors describe the colonial government's control over opium production in terms of a greater or lesser degree of state coercion, it is worth considering whether conditions in nineteenth century north India were *ex ante* conducive to this kind of relationship. Given that a very large proportion of historical labour relationships were to some extent coerced or unfree, the conditions under which such relationships emerge has naturally attracted a certain amount of interest. For example, within the extensive literature on the impact of historical institutions

[5]Robb, "Peasants' Choices", pp. 104–106

[6]Prasad, *Aspects of British Revenue Policy*, pp. 158–160; and Singh, *East India Company*, pp. 75–86

[7]Chowdhury, *Growth of Commercial Agriculture*, pp. 25–71; Chaudhuri, Peasant History, pp. 453–454, 467–469; and Trocki, *Opium, Empire and the Global Political Economy*, pp. 61–70

[8]Richards, "Indian Empire", pp. 77–79; and Richards, "Moral Economy", pp. 75–76

[9]Bauer, *Peasant Production of Opium*

on development, Acemoglu, Johnson, and Robinson have found that in a colonial context compulsive and extractive institutions were most commonly associated with labour abundance.[10] However, this view is far from universal; Domar suggests that historically the use of forced rather than free labour was the product of scarcity of labour relative to land.[11] Similarly, looking at the use of corvée in French Africa, van Waijenburg has argued that while the imposition of forced labour did imply a certain amount of direct coercive power, it functioned more as a solution to difficulty of direct taxation in the context of relatively sparsely populated colonies.[12] More recently, Acemoglu and Wolitzky have attempted to synthesise the scarce-labour and abundant-labour points of view, arguing that the use of coercion depends on the relative effect of labour abundance on the market price of the good being produced and workers' outside option.[13] So, for example, this would suggest that in a context of labour scarcity, an export boom in a particular commodity would increase the incentive for employers to engage in coercive behavior. This is in line with the two most well-known instances of a colonial state demanding the delivery of cash crops as a form of taxation, the cultivation system in the Dutch East Indies and the domanial system in the Congo Free State. In both these cases, the decision to adopt this kind of compulsive extraction was driven by an aim of bringing indigenous labour into cash crop production to allow the state to profit from booming European demand for various tropical products.[14]

By contrast, in the case of Bengal opium there was relatively little incentive for the state to engage in labour coercion. Bihar and the North-Western Provinces and Oudh (N.W.P.O.) were both places where labour was abundant relative to land, and by the second half of the nineteenth century the Government of India had adopted

[10]D. Acemoglu, S. Johnson, and J.A. Robinson. "Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution". *Quarterly Journal of Economics* 117.4 (2002), pp. 1231–1294, pp. 1231–1294

[11]E.D. Domar. "The Causes of Slavery or Serfdom: A Hypothesis". *Journal of Economic History* 30.1 (1970), pp. 18–32, pp. 18–32

[12]van Waijenburg, "Financing the African Colonial State", pp. 41–45

[13]D. Acemoglu and A. Wolitzky. "The Economics of Labor Coercion". *Econometrica* 79.2 (2011), pp. 555–600, pp. 555–600

[14]Thee Kian Wie. "Colonial Extraction in the Indonesian Archipelago: A Long Historical View". In: *Colonial Exploitation and Economic Development: The Belgian Congo and the Netherlands Indies Compared*. Ed. by E. Frankema and F. Buelens. Abingdon, 2013, pp. 45–47; and B. De Roo. "Taxation in the Congo Free State, An Exceptional Case (1885–1908)". *Economic History of Developing Regions* 32.2 (2017), pp. 97–126, pp. 103–115

a policy of price stabilisation by fixing the amount it sold at relatively low level compared with its total productive capacity. At the same time, there were substantial increases in the prices of other cash crops, especially grains.[15] As a result, opium production at the time was characterise by an abundance of labour and relatively stagnant prices, together with an increasing outside option; that is to say, within the Acemoglu and Wolitzky framework, the returns to coercion were increasing in the non-opium parts of agricultural economy, but probably decreasing in opium production. In practice, officials frequently identified overproduction as one of the main sources of unpredictability in the amount of net revenue the state received from the Monopoly, since excess opium still had to paid for, but could not be sold within the limits of the reserve system. As a result, while there may have been some reason for the state to engage in coercion in the 1810s and 1820s, when opium prices were increasing very rapidly, at least on a theoretical level this incentive was decreasing over the second half of the nineteenth century relative to other parts of the agricultural sector.

Instead, the complaints of corruption, abuse, and coercion leveled at the Opium Department were symptoms of the relative weakness of the state. Limited oversight, together with the sheer amounts of money being poured into state-sponsored opium production encouraged malfeasance and prevented close control over the amount of opium produced. Since the conditions under which poppy was cultivated were very heterogeneous, local knowledge was vital to effective control. However, this same complexity, together with limited capacity to process information on the part of the Government of India meant that the central state relied heavily on low-level officers and intermediaries to carry out their policies. While key decisions were made centrally, the extreme latitude given in their implementation, together with quite limited oversight naturally enough created opportunities for corruption and rent-seeking (and in some areas localised coercion) at the local level. The colonial state was not however completely helpless in the face of these problems, however: in those parts of the Bengal Monopoly where the administration was organised such

[15]M. McAlpin. "Price Movements and Fluctuations in Economic Activity (1860–1947)". In: *The Cambridge Economic History of India, Volume 2: c.1757–c.1970*. Ed. by D. Kumar and M. Desai. Cambridge, 1983, pp. 884–891

that mid-level officials were better able to check the behavior of junior officers and intermediaries these problems do appear to have been reduced somewhat.[16] However, it is also important to note that although the degree to which it was deliberate state policy to coerce opium production has sometimes been overstated in the past, the system by which the opium revenue was raised was structurally exploitative. The amount of revenue raised depended overwhelmingly on the difference between the cost of the raw opium and the price for which it could be sold to consumers overseas; the Government of India therefore tried to raise the latter as high as it could and lower the former as far as it could. Leaving aside the question of direct profitability, those who cultivated the opium sold by the Government of India were almost certainly paid considerably below what would have otherwise been market price.

The main part of this paper will be structured as follows. Section 2.2 will give a brief introduction to the agricultural context of opium cultivation under the Bengal Monopoly, and critique the existing methodology used to examine the relationship between the colonial state and opium cultivators. A new approach to this issue will be outlined in Section 2.3, which will emphasise the importance of institutional capacity and structure in determining the ability of the state to regulate opium production. Section 2.4 will introduce the sources and approach in the main quantitative analysis, the results of which are presented and discussed in Section 2.5.

2.2 The Economy of Opium Cultivation

One of the most significant problems facing the officials of the Government of India in administering the Opium Monopoly was the wide range of different local conditions that existed across the area covered by the two opium Agencies (Figure 2.1). Throughout the late nineteenth century markets in India were becoming increasingly integrated: the expansion of communication and transport networks brought about

[16]This broadly matches the expected outcome according to the economic literature on corruption, which predicts that the probability of detecting corruption depends in no small part on the ratio of supervisors to supervised (See:A. Mishra. "Corruption, Hierarchies, and Bureaucratic Structure". In: *International Handbook of the Economics of Corruption*. Ed. by S. Rose-Ackerman. Cheltenham and Northampton (Mass.), 2006, p. 204).

a period of substantial price convergence in food and non-food commodities.[17] However, on a more local level numerous imperfections remained; the fact that opium production took place under a monopsony was not atypical of agriculture more generally. Particularly notorious was the degree of compulsion used by indigo planters to induce peasants to grow an unprofitable crop, which rested on the formers leasing of zamindari (i.e. landlord) rights and use of advances.[18] In a similar vein, the assiduousness with which sugar producers in the N.W.P.O. ensured that production only took place under there own hypothecation agreements has been explicitly compared by one subsequent author to the state's enforcement of its Opium Monopoly.[19] Additionally, cultivators were often persistently indebted to moneylenders, a situation that was sometimes made worse by the adoption of cash crop cultivation.[20] By contrast the conditions under which government opium was grown were at least nominally rather easier; the advances that came with the cultivation licenses were interest free, and since the state had a direct interest in the quantity and quality of opium produced, the Opium Department sought to improve output by making loans to cultivators for the construction of wells, and also embarked on several (unsuccessful) experiments with additional loans to encourage the use of better types of seed and more intensive manuring.

However, when it comes to the actual economic relationship between the colonial state and opium cultivators, the assessment of the modern scholarly literature has generally been less than positive. Even according to one of the more favourable accounts, opium production took place "on the economic edge."[21] Others have gone even further, arguing that poppy cultivation was unprofitable for cultivators and was controlled primarily through coercive pressure from the government. The two ideas

[17]See for example: M.B. McAlpin. "Railroads, Prices, and Peasant Rationality: India 1860–1900". *Journal of Economic History* 34.3 (1974), pp. 662–684; J. Hurd. "Railways and the Expansion of Markets in India, 1861–1921". *Explorations in Economic History* 12 (1975), pp. 263–288; and T. Andrabi, S. Bharat, and M. Kuehlwein. "Post Offices and British Indian Grain Price Convergence". *Economic History of Developing Regions* 35.1 (2020), pp. 29–49.

[18]Chaudhuri, Peasant History, pp. 455–457

[19]S. Amin. "Small Peasant Commodity Production and Rural Indeptedness: The Culture of Sugarcane in Eastern U.P., c. 1880-1920". In: *Credit Markets and the Agrarian Economy of Colonial India*. Ed. by S. Bose. Delhi, 1994, pp. 80–135, p. 110

[20]E. Whitcombe. *Agrarian Conditions in Northern India, Volume I: The United Provinces Under British Rule, 1860–1900*. Berkeley, 1972, pp. 161–171

[21]Richards, "Indian Empire", p. 78

Figure 2.1: The Bihar and Benares Opium Agencies in the late nineteenth century (The actual area licensed changed from year to year).

are very much self-reinforcing: the idea that poppy was unprofitable to cultivators leads naturally to the conclusion that they must have been coerced into growing it. In fact, evidence of the lack of return to poppy cultivators has been used, both in the late nineteenth century and now, to give additional credence to the relatively sparse evidence of systematic coercion. Typically the main evidence used to assess the relative profitability of poppy cultivation is a reconstruction the detailed income and expenditure of a typical opium cultivator in the course of a year. In this connection, this section will primarily address two works, both focusing on the late nineteenth century, that provide the most detailed and systematic examples of the approach, John Richards' *The Indian Empire and the Peasant Production of Opium* and Rolf Bauer's *The Peasant Production of Opium in Nineteenth Century India*, although similar objections can also be applied to the others which use similar methodology. Both authors draw heavily on the *Reports* of the Royal Commission on Opium which collected large quantities of evidence in northern India during 1893 and 1894, supplemented with additional information from more general agricultural works of

Item	*Rs.*
Expenditure:	
Ploughing, 15 times	6.9.0
Feed for bullocks, over 15–18 bighas	2.0.0
Interest on borrowed capital	1.0.0
Manure	1.0.0 – 2.0.0
Irrigation, 6–9 times	6.0.0
Weeding	2.4.0
Lancetting poppy heads	2.13.0
Extracting poppy juice	5.10.0
Rent and misc. payments	10.0.0
Total Expenditure	37.14.0
Income:	
Opium, 4 seers 6 chittacks	21.14.0
Pattal	0.8.0
Seeds	6.0.0
Interest on advances	0.6.0
Total Income	28.12.0
Loss to Cultivators	9.2.0

Table 2.1: Income and expenses of poppy cultivation per opium bigha (0.625 acres or 0.253 hectares) based on conversations with 10–20 cultivators in Shahabad and Patna Districts, Bihar. *Abstracted from: Evidence of Guru Prosad Sen, Barrister of Patna,* Royal Commission on Opium, Volume III. *Cmd. Paper C.7419. 1894, p. 17.*

the period.[22]

Table 2.1 gives an example of the kind of information upon which conclusions about the profitability or otherwise of opium cultivation are based.[23] These figures were presented to the Royal Commission by Guru Prosad Sen, a barrister from Patna, who had toured the area around the city, talking to a number of cultivators about their experience of growing opium. Sen gave these estimates of the costs and receipts from poppy cultivation as representative of Bihar.[24] Other witnesses gave similar accounts, although they varied in what costs were included, what values were given for each item, and whether poppy came out as a profitable or unprofitable crop in the end. Which of these figures have been used by subsequent historians has also varied in part because of a belief that this variation in costs was driven

[22]For a detailed description of the Royal Commission as a source, see: Richards, "Opium and the British Indian Empire"

[23]This particular account is used by both Bauer and Richards.

[24]Evidence of Guru Prosad Sen, *Royal Commission on Opium, Volume III*, p. 20

by the differing political objectives of the witnesses.[25] In any event, both authors select a very limited number upon which to base their analysis: Richards presents one example, supported by details from one or two others, while Bauer uses five or six to produce his own 'conservative' estimates.[26]

It would be naïve to assume that there was no political influence on these kinds of estimates, especially in the case of the Royal Commission; most people giving evidence were clearly seeking to establish some kind of moral or practical position about the opium revenue. However, a closer examination reveals that a significant proportion of the variation probably represents genuine differences between places, across time, and in the circumstances of individual cultivators. As a result, the essential objections to this approach are twofold: this methodology fails to capture the very significant regional and temporal heterogeneity in most of the important variables, and even more importantly produces results which are extremely dependent on the assumptions made about methods of cultivation. While quantitative methodologies are immensely useful in a wide range of historical applications, given the complexity of the issue and the limitations of the available sources, in this case the attempt to reduce the question to a simple problem of arithmetic obscures more than it illuminates. As the next two subsections will show, the local situation has a very significant influence on the success or failure of opium cultivation, in a way which cannot be accurately captured by this methodology.

2.2.1 Income

Since the opium produced by cultivators was paid for at a fixed price for a fixed quality, the returns to opium cultivation depended heavily on the yield. However, poppy was well known to be a very variable crop with output in some regions and some years often very much higher than in others. Weather, general climate, the incidence of blight, and local soil conditions commonly were cited as causes, although the different varieties of poppy used throughout the Bihar and Benares Agencies also produced quite different quantities of opium from one another, further complicating

[25]Bauer, *Peasant Production of Opium*, p. 155

[26]Richards, "Indian Empire", pp. 74, 77–78; Bauer, *Peasant Production of Opium*, pp. 153–154

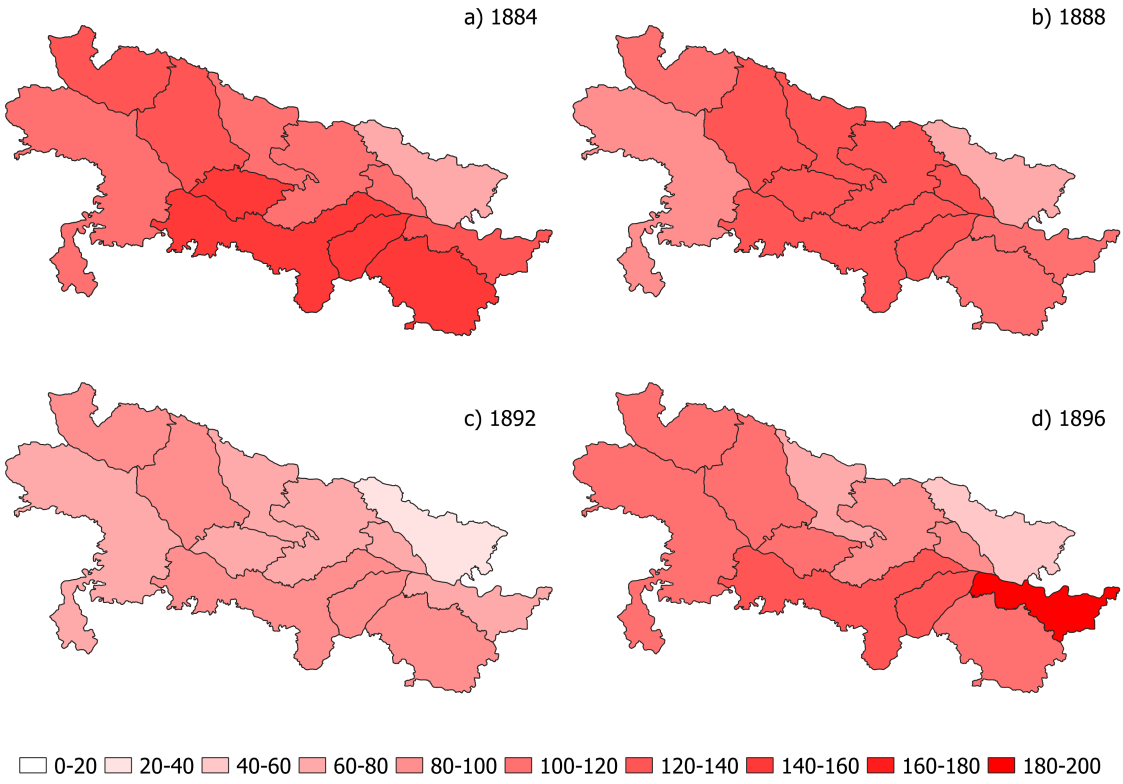

Figure 2.2: Average total payment from the Opium Department (Rs. per measured hectare), adjusting for balances due, selected years. The divisions used are not the original ones (see Section 2.4 and Appendix E). Calculated from data in: Report on the Administration of the Opium Department, Inclusive of the Opperations of the Behar and Benares Opium Agencies, Vrs. *Calcutta, 1882–1898*.

matters.[27] As yields could vary a great deal across space and time independently of the cultivation methods used, using only one or two figures, especially ones that are based on conditions in a specific locality, is unlikely to tell us anything particularly useful about the general returns to cultivating poppy.

The evidence of actual payments by the Opium Department to cultivators, further bears out the idea that individually constructed numbers for incomes from poppy are generally unrepresentative of the diversity of experiences of opium cultivation. Figure 2.2 presents the average total payment per hectare for all poppy products purchased by the government, adjusted for any outstanding balances due to either the cultivator or the Government.[28] The average is calculated on the basis of the

[27]For a detailed account of the former factors see: Scott, *Manual*, pp. 1–7, 95–102, 134–171; for the latter: ibid., pp. 105–108; Reid, "Azamgarh Settlement Report", p. 334; and Duthie and Fuller, *Field and Garden Crops of the North-Western Provinces and Oudh, Part I*, p. 64.

[28]Payments for other poppy products are very marginal in all cases. Similarly, including or excluding balances due the Government and the cultivators makes very little difference to the figures presented here. It is also worth noting that this Figure does not include the sale of poppy seeds, which were not monopsonised by the Government, to private merchants, although as Bauer

area under opium measured by the Opium Department after planting since the area planted very commonly exceeded the area engaged for and this figure also takes account of land on which the poppy crop failed completely before it was harvested. This data makes it clear that the return to growing opium varied considerably even between relatively broad regions and over a short period of time. Additionally, while some regions consistently show relatively high or relatively low average payments, some others change considerably across the period. In fact, although only selected years are shown here, in the original data there are sometimes even extremely sharp differences from one year to the next within the same region. As a result, it is very difficult to find any one number that can accurately capture what income cultivators received from opium for even one Agency in one year, let alone all opium production across the late nineteenth century.

With a view to partially mitigating this problem, both Bauer and Richards do compare the figures that they use to data for some of the years surrounding the period during which the Royal Commission was taking evidence and find them consistent with their own (different) figures.[29] However, there is a significant problem with treating the early 1890s as typical years for opium production: the period from 1889–1895 represented probably the most severe and sustained production crisis in this history of the Bengal Monopoly.[30] Successive years of bad harvests led to crashing yields, reduced quality of raw opium, and large numbers of cultivators abandoning poppy. The effect of these events is evidence in the Commission report itself, where even some of the witnesses who said (in 1894) poppy made a loss stated that it used to be profitable in the relatively recent past.[31] As a result, it seems likely that this is the period in which opium was the least profitable to cultivators, a fact which further calls into question representativity of these kinds of individual figures as a point of comparison.

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very sensibly points out since poppy leaves and seeds were both used for food by the cultivators themselves these sales may well have been very marginal (Bauer, *Peasant Production of Opium*, pp. 147–8).

[29]ibid., p. 151; Richards, "Indian Empire", pp. 77–78

[30]See Paper 3

[31]Evidence of Babu Saligram Singh, Zemindar of Several Villages in Shahabad, *Royal Commission on Opium, Volume II*, p. 175; and Evidence of Guru Prosad Sen, *Royal Commission on Opium, Volume III*, p. 17.

However, although it does appear that most existing studies do perhaps underestimate cultivators' income from opium, at least for the late nineteenth century as a whole, the point of this discussion is not so much that the individual numbers fixed upon are necessarily incorrect in themselves. Rather the argument is that it is not just the average income that matters, but also the variation across space and time and the distribution within the unit of analysis. Without a much more complete idea of these dimensions, any profit-and-loss account can hardly be considered to give a complete picture of who profited and by how much or how little from growing opium.

2.2.2 Expenditure

The expenditure side can be largely broken down into two main items: rent and labour costs. As far as rents are concerned, the main point is essentially the same one as raised for income: that in practice rents varied far more than can be accurately captured by one or two 'representative' figures. Even within the the Royal Commission hearings no consistent picture of opium rents emerged, with witnesses quoting amounts paid for poppy land varying from Rs.15.81 per hectare to Rs.98.84. The way different rates were described also makes it clear that the rent that cultivators paid varied considerably by caste, the nature of their tenure, what crops they had planted on the land outside of the opium season, the suitability of the land for poppy, and its proximity to the village.[32] Additionally, the example rents given were not necessarily intended to be wholly representative; witnesses often gave the maximum or minimum rents, a range of possible rates, or attempted to estimate the mean or modal rate for the district which they were talking about (for a complete list of the rent rates given before the Commission, see Appendix D). As a result, not only is it difficult to choose a 'representative' rate in a way that does not rest on relatively unsupported assumptions, but also since few of the witnesses who gave evidence on this point has detailed knowledge of more than a couple of districts, even with the most careful selection procedure it is difficult to extrapolate the state

[32]Other sources tend to corroborate these kinds of variation; see for example :G.A. Grierson. *Bihar Peasant Life: Being a Discursive Catalogue of the Surroundings of the People of that Province.* Calcutta, 1885, pp. 327–329

Year Ending	*Rice*	*Wheat*	*Cotton*	*Opium*	*Fibers*	*Sugarcane*	*Tobacco*
1872	10.42	13.36	14.94	24.21	11.16	25.10	25.21
1877	7.07	12.48	12.39	19.23	13.47	22.24	28.70
1882	7.95	12.38	12.70	34.29	12.86	20.89	26.23
1887	12.82	14.52	12.51	21.93	7.41	22.24	19.15
1899	—	—	16.68	22.24	16.68	22.24	37.06

Table 2.2: Reported Average Rates of Crop-Specific Rent for Sitapur District, Oudh, selected years 1872–1899 (Decimalised Rupees per Hectare). *Data from* Report on the Revenue Administration of the Province of Oudh*. Allahabad, 1872–1887; and* Final Report on the Settlement of the Sitapur District*. Allahabad, 1899, p. 7.*

of rents in the Agencies as a whole from individual or small groups of observations.

Once the element of change over time is included, the picture becomes still more complicated. During most of the nineteenth century the increasing density of rural population and the expansion of cash crop cultivation drove an increase in agricultural rents.[33] However in the case of opium the situation appears rather more complex. While there is some evidence of a general increase, poppy rents were probably as vulnerable to local conditions as much as broad provincial trends. As an example, Table 2.2 shows the average rates of rent for various crops in Sitapur, a district in western Oudh as recorded by the land revenue administration. Although there are questions about the consistency of how this data was assembled from the underlying village accounts, even the basic outline does make it clear that the rents paid for poppy land varied considerably over time, not just in absolute terms, but also in relation to other crops. If anything the actual level of variation was probably even larger; between 1868–1887, the recorded rents for poppy ranged from Rs.9.88–49.42 per hectare across Oudh as a whole.[34] In Bihar the increase in rents also appears to have been unevenly distributed. Sir William Hunter in his *Statistical Account of Bengal* found that around Patna, the rents on land used for tobacco, sugarcane, and poppy ranged from the equivalent of Rs.19.77 to Rs.39.54 per hectare in 1872.[35] Meanwhile, in neighbouring Gya, Hunter reported that poppy

[33]B. Ram. "Land and Society in North Bihar, India: Agrarian Relations in the Later Nineteenth Century". PhD thesis. School of Oriental and African Studies, University of London, 1988, pp. 133–135; and J. Ghosh. "The Determination of Land Rent in a Non-Capitalist Agriculture: North India, 1860-1930". *Modern Asian Studies* 22.2 (1988), pp. 355–382, pp. 358–361

[34]*Report on the Revenue Administration of the Province of Oudh.* Allahabad, 1869–1887

[35]W.W. Hunter. *A Statistical Account of Bengal, Volume XI: Districts of Patna and Saran.* London, 1877, p. 128

paid Rs.7.41 to Rs.31.63 in the same year.[36] However, by the early twentieth century land described as being used for poppy, vegetables, and other valuable crops was reported to be much higher, paying from Rs.14.83 to Rs.59.31, while around the same time in Gya sugarcane and poppy paid only Rs.9.88–Rs.39.54.[37]

Local idiosyncrasies in how rent payments were made also militate against the applicability of this methodology. While most poppy was grown under simple annual cash rents, more complex payments were also sometimes used. For example, in Gaya, in some cases the landlord paid the initial expenses of growing sugarcane, poppy, and rice over successive years, with the capital investment by the landlord was recovered through the three interlinked rents, with the cultivator paying a cash rent for the sugarcane and poppy in exchange for a crop share from the rice.[38] The existence of this kind of arrangement, although probably relatively rare, nevertheless calls the usefulness of individual local rent observations even further into question.

Obviously, attempts have been made to identify the typical situation of opium cultivators to identify typical rents. Many cultivators held so-called non-occupancy tenancies, that is to say they had no legal protection from rent increases or from being ejected by the landlord. This kind of tenant typically paid a much higher rent than occupancy tenants in the same situation. Bauer argues for the use of one of the higher rate rents since this type of cultivator was more subject to exploitation.[39] However, besides reducing the generalisability of the results still further, even this does not solve the central issues, since the available maximum and non-occupancy rents also exhibit considerable variation.[40] Furthermore, traveling the roughly one thousand kilometers between Aligarh in the west of the Benares Agency to Bhagalpur in the east of Bihar, it seems unlikely that all non-occupancy tenants paid anything like the same rate of rent. Furthermore, even if there were such a thing as a single 'representative' rent for all opium lands in an agency, such a rate would only at best represent a few years, not the whole of the late nineteenth century, let alone the

[36]W.W. Hunter. *A Statistical Account of Bengal, Volume XII: Districts of Gaya and Shahabad*. London, 1877, pp. 104–105

[37]L.S.S. O'Malley. *Bengal District Gazetteers: Patna*. Calcutta, 1907, pp. 125–126; and L.S.S. O'Malley. *Bengal District Gazetteers: Gaya*. Calcutta, 1906, p. 148.

[38]Grierson, *Notes*, p. 71

[39]Bauer, *Peasant Production of Opium*, pp. 117, 140, 156–157

[40]Compare the various figures given in Appendix D.

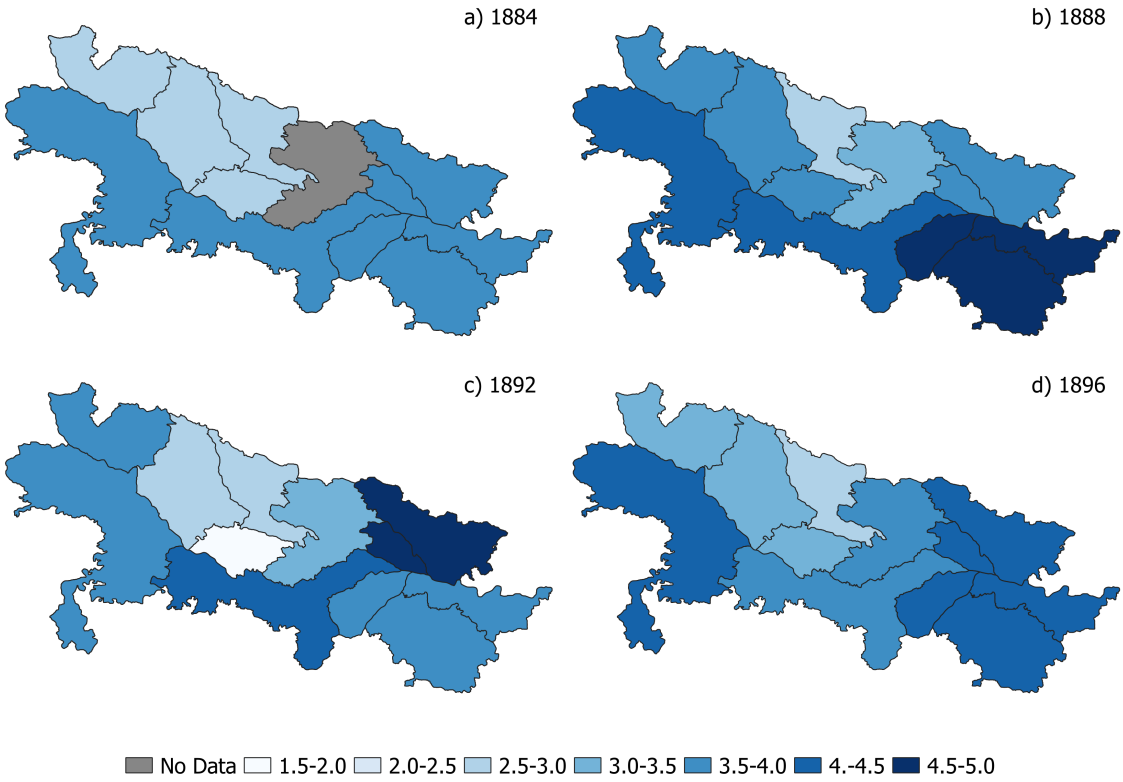

Figure 2.3: Average Wages for Unskilled Agricultural Labourers, Selected Years. The divisions used are not the original ones (see Section 2.4 and Appendix E). *Sources:* Prices and Wages in India. *Calcutta, 1906, pp. 272–283; and* Report on the Administration of the North-Western Provinces and Oudh, Vrs. *Allahabad, 1885–1897.*

whole period of opium cultivation under the Bengal Monopoly.

For the overall question of the profitability of opium cultivation, however, rents are generally less important than labour costs, since in most accounts wages were the single biggest element of the costs of cultivation. Taking them at face value, the estimated labour costs carry with them the same problems as those for incomes and rents; wages varied substantially between different areas in the two Agencies. Figure 2.3 groups unskilled agricultural wages into several broad regions.[41] Even at this comparatively low resolution it is clear that wages varied substantially across the area covered by the Opium Agencies. Additionally, while some continuity is apparent over time, it is clear that if disassociated from its specific context, any one wage observation is not necessarily representative even of the region from which it came.

However, on an even more basic level, there are considerable reasons to question

[41] As described in Section 2.4, only one value each is given for north and south Bihar.

whether wages should be included in this kind of calculation at all, since most cultivation was not done by hired workers, but rather by members of the cultivators own family. The use of unpaid familial labour was especially common amongst members of the koeri and kachhi castes, who formed the majority of opium cultivators.[42] As a result, the assumption the cultivators were normally paying wages leads to a very substantial overestimate of the costs of opium production. The decision to include wages distorts the picture especially heavily since the minority of high caste and occupancy tenants used considerably more hired labour than their low caste and non-occupancy counterparts.[43] This used of labour was commented on by specialist agricultural authors, and before the Royal Commission evidence of the widespread use of family labour was given by officials, cultivators, landowners, and others.[44] As such, then, there can be few facts about the manner in which poppy was cultivated that are better attested.

This consideration has, however, not had much impact in the profitability literature. Although Richards notes the widespread use of unpaid labour in poppy cultivation, he still includes the costs of hired workers as the largest element in his profitability calculations.[45] Bauer addresses the question in rather more detail, arguing that hired labour was probably most commonly used on the basis that since money amounts for labour costs are nearly always included in accounts of opium's profitability, they must represent real transactions, and that it would be difficult for a single average-sized family to harvest an entire bigha of poppy in a single day.[46]

Neither of these points is particularly insurmountable. In the first place, it is relatively uncontroversial that a minority of tenants, especially high caste ones whose families did not work in the fields, did hire labour, however the fact that it was possible for people to find values for transactions of this kind does not mean

[42]For example, koeris made up 80–90 percent of opium cultivators in Azimgarh District in the early 1880s (Reid, "Azamgarh Settlement Report", p. 332).

[43]Duthie and Fuller, *Field and Garden Crops of the North-Western Provinces and Oudh, Part I*, p. xix; and Evidence of A.G. Tytler, Sub-Deputy Opium Agent of Chupra Sub-Agency, Bihar, *Royal Commission on Opium, Volume III*, p. 51.

[44]Evidence of Various Witnesses, *Royal Commission on Opium, Volume II*, pp. 58, 68, 139, 150; and Evidence of Various Witnesses, *Royal Commission on Opium, Volume III*, pp. 3, 5, 12, 15–16, 20, 26, 31, 42, 51, 62, 68–69, 70, 72, 89, 97, 105, 142, 145, 259, 283; Duthie and Fuller, *Field and Garden Crops of the North-Western Provinces and Oudh, Part I*, p. 67; and Scott, *Manual*, p. 75

[45]Richards, "Indian Empire", pp. 78–79

[46]Bauer, *Peasant Production of Opium*, pp. 154–160

that they were typical. Additionally, many of the commonly used sources do give reasons for including money wages to stand in for unpaid labour. For example, in Duthie and Fuller's *Field and Garden Crops of the North-Western Provinces and Oudh*, one of the main sources on costs used by Bauer, the authors state that they include cash wages to "appraise home labour at the rates at which it would obtain renumeration if let out to hire."[47] Similarly, several Royal Commission witnesses followed their lists of costs with a clarification that hired labour was not common or alternatively simply asserted that the cultivators were "ignorant" of the true costs of cultivation.[48] In any event, the concern of a great many of the witnesses before the Royal Commission was with what was fair for the state to pay for its opium, rather than simply whether it gave a monetary return to the cultivator (although the two were frequently conflated). Monetary amounts consequently provided an apparently straightforward way of measuring the effort put into cultivation, rather than being records of actual payments.

On the second point, it is worth noting that one family having to harvest an entire bigha in a day is something of an artificial scenario. In the first place, plots of that size seem to have been the exception rather than the rule; in every Division the average area per cultivators was consistently under a bigha, and was almost certainly very much less for the majority of small cultivators.[49] Furthermore, although it is certainly true that any individual poppy plant once scored had to have its sap collected the next day, this does not mean that the entire plot had to be harvested at once. Duthie and Fuller, for example, state that in the N.W.P.O. cultivators generally spread the poppy harvest over three days, with only a third of the crop being collected at a time.[50] Additionally, it also seems that in some cases even

[47]Duthie and Fuller, *Field and Garden Crops of the North-Western Provinces and Oudh, Part I*, p. xix

[48]For the former, see for example: Evidence of A. Forbes, Commissioner of Patna, *Royal Commission on Opium, Volume III*, p. 3; Evidence of Reverend Prem Chand, Missionary of Gaya, ibid., pp. 26–31; and Evidence of Rai Isari Prasad, Zemindar of Various Villages in Patna, ibid., p. 42. For the latter: Evidence of Reverend Daniel Jones, Missionary of Patna, ibid., p. 12; and Evidence of Guru Prosad Sen, ibid., p. 17.

[49]Compare the annual divisional statistics provided in: *Report on the Administration of the Opium Department, Inclusive of the Opperations of the Behar and Benares Opium Agencies, Vrs.* Calcutta, 1865–1909.

[50]Duthie and Fuller, *Field and Garden Crops of the North-Western Provinces and Oudh, Part I*, p. 67. The existence of a two or three day gap between each time a specific poppy plant was harvested is also noted elsewhere, for example in: Reid, "Azamgarh Settlement Report", p. 333.

the assumption that unpaid labour was restricted entirely to the cultivator's own family may also not be entirely correct. One witness before the Royal Commission, Raja Rampal Singh, described a process where labour could be shared amongst poppy-growers within a village: "Men, women and children — all his [the cultivator's] family work. Sometimes they go and work for one another. When one man is in want of help, the others go and help him. They give return labour to one another."[51] Although Singh was a large landlord, so his direct experience of cultivation may have been limited, such exchanges of labour seem to have been common in agricultural production in general.[52]

Given these conditions, it seems difficult to justify the assumption that most cultivators hired labour to work on poppy plots. Together with the evidence on rents and incomes shifts the balance of probabilities towards the conclusion that growing opium probably did bring a not inconsiderable amount of money to the cultivators. However, the intent here is not to suggest that opium was everywhere and always fantastically profitable. In light of the petitions and evidence from a number of cultivators stating that they lost money by growing opium, it is very right to be skeptical of the public claims of the virtues of growing poppy made by colonial officials. In fact imprecise estimations of this kind lead to a less accurate assessment of what the real impact of opium cultivation was on those who undertook it. To take just one example, at one point during its investigations the Royal Commission received a petition from a group of cultivators who stated that the only reason they were not made destitute by the expense of cultivation was that they could use free family labour to ameliorate the costs.[53] More widely, the contention here is that the extreme variation in local conditions means that assembling and collating accurate knowledge about the conditions and motivations under which poppy was grown has proven very difficult, both at the time or now. Consequently, one cannot infer very

[51]Evidence of the Honorable Raja Rampal Singh, Talukdar of Kalakankar, Partabgarh, Oudh, and Member of the Lieutenant-Governor's Council, N.W.P.O., *Royal Commission on Opium, Volume III*, p. 62

[52]W. Crooke. "Materials for a Rural and Agricultural Glossary of the North-Western Provinces and Oudh (1879)". In: *A Consise Encyclopaedia of North Indian Peasant Life, Being a Compilation from the Writings of William Crooke, J.R. Reid, G.A. Grierson.* Ed. by S. Amin. Manohar, 2005, pp. 114–115

[53]Petition from Two-Hundred Cultivators of Various Villages in Pargana Arrah, Shahabad District, *Royal Commission on Opium, Volume III*, p. 259

much about the relationship between the colonial state and cultivators from this type of evidence. Instead, as the next section will show, a direct examination of the question is far more useful.

2.3 Planning Cultivation

The problems faced by contemporary scholars in trying to quantify the profitability of opium cultivation to some extent mirror those faced by the Government of India in attempting to regulate production. Like modern historians of the Bengal Monopoly, officials involved in the opium administration had to render extremely complicated and varied circumstances into relatively simple synthetic conclusions, often based on quite limited information. However, unlike them the issues they faced in doing this had serious real-world consequences. The problems inherent in managing opium cultivation across such a large area, and in particular the difficulty of aggregating and centrally processing information meant that many aspects of policy implementation had to be devolved onto relatively junior officials. Not only did this mean that central government policy was ineffectively implemented, but also prevented effective oversight of the Opium Department's minor officers and the intermediaries who functioned as the key link between the state and cultivators. This in turn led to widespread corruption and in some cases serious abuses against the peasant population.

The question at the heart of opium policy throughout the nineteenth century, and the one which faced the government most frequently was how much land to license for poppy cultivation. At a basic level this decision was driven by reserve policy; production had to be sufficient to provide the number of chests required for sale and to maintain the reserve, without exceeding this amount and thereby driving up costs.[54] Since engagements for the next year began in September, decisions about the area to be licensed had to be made by the summer at the latest.[55] However, although the Government of India was relatively active in ordering changes to acre over the

[54]See Paper 1

[55]In practice, even orders made at this point could not always be implemented in the same year.

second half of the nineteenth century, the information on which these decisions were made was generally quite limited and abstracted.

Each year the first estimates of the size of the harvest became available in the spring, from the area then under poppy and the climatic conditions. By early summer the actual likely output was reported based on the actual receipts and the general consistency of the unprocessed opium. As they arrived at the Financial Department, both of these sets of figures were aggregated by Agency without any detail of local variation. Additionally, further information on previous years sometimes at the division level was also received by the central government, most commonly in the annual reports from the two Opium Agents, accompanied by a summary from the Board of Revenue and various statistical tables.[56] The government sometimes asked for specific further information or advice, but for the most part the major decisions about the management of opium cultivation were made with quite a limited amount of information about actual conditions on the ground. Once the number of chests of provision opium had been decided on, the approximate amount of land which should be planted with poppy to produce that much opium was estimated on the basis of previous average output. For example, when in 1865 the provision was set for future years at 45,000 chests, it was calculated that the total area required would be about 700,000 bighas, 1,30,000 bighas less than was under poppy at the time, which led to substantial reductions being ordered.[57] Similarly, other changes in the target acreage in mid-1870s and the late 1880s were made to bring the area under poppy in line with the number of chests needed for the current sale standard on the basis of fairly basic calculations of how much land was required to produce a given number of chests.[58]

Changes to the price paid to cultivators and expansions or contractions in the area

[56]From the 1890s onwards, only the summary and the statistics were forwarded to the central government.

[57]IOR/P/212/65/210, p. 201; and IOR/P/212/65/211, p. 22

[58]"E.J. Sinkinson, Officiating Secretary to the Government of India Department of Finance and Commerce to the Secretary to the Government of Bengal , 23rd of July, 1888 (No. 798)". In: *Proceedings of the Government of India Department of Finance and Commerce, January to December, 1888*. Vol. IOR/P/3270. India Office Records, British Library, pp. 717–718; and "Resolution by the Government of India Financial Department, 6th of June, 1877 (No. 31)". In: *Proceedings of the Government of India Financial Department, November, 1877*. Vol. IOR/P/966. India Office Records, British Library, pp. 300–301

which could be licensed for production were often made on similarly limited evidence. Even when more detailed inquiries were carried out, the actual level of detail which was taken into account could be extremely limited. To take just one example, in 1876 and 1877, the Government of India undertook one of the most significant reorganisations of opium production during the second half of the nineteenth century, closing several areas to licensing and reducing the price paid to cultivators by half a rupee to Rs.4.8.0. To support this the Financial Department circulated what was by their standards a very detailed survey of the conditions under which opium was grown. Both Sub-Deputy Opium Agents and the Collectors for each district were separately instructed to provide independent replies to the following questions about the effects of opium cultivation:[59]

1st. — Is the division of land now devoted to poppy from cereal and other crops injurious to the country either by raising the prices of food or curtailing its supply?

2nd. — Is the cultivation popular, and is it a source of profit to the cultivators?

3rd. — Does the cultivation lead to the use or abuse of opium among the people?

4th. — Upon the whole, is the cultivation beneficial to the country, or the reverse, and, apart from financial considerations, is its curtailment considered desirable or not?[60]

Based on the officer's replies to each question, which were often only a couple of sentences long, the places in which cultivation could be licensed were substantially reduced in several Divisions and entirely closed in most of Chota Nagpur, where it was reported to be both unpopular and unprofitable for the cultivators, and characterised by "bullying on the part of the zilladars and other underlings of the

[59]The office of Collector combined responsibility for judicial and land revenue administration at district level.

[60]"Resolution by the Government of India Financial Department, 8th of August, 1876 (No. 17)". In: *Proceedings of the Government of India Financial Department, November, 1877*. Vol. IOR/P/966. India Office Records, British Library, p. 326

department".[61] That such major decisions were made on the basis of these kinds of very short and impressionistic statements is illustrative of the limited informational foundation for much of centrally determined opium policy.

However, although very broad decisions could be made on such information, given the wide variation in conditions across the two agencies outlined in the previous section, local knowledge was key to actually achieving any desired change, meaning that the actual implementation of decisions about acreage had to be decentralised. Once the total quantity required from each Agency had been determined, orders were then transmitted via the Government of Bengal to the Opium Agents. They in turn, made a very similar calculation of the area needed and then apportioned the area amongst the Divisions of his Agency accordingly. However, even at this level, the difficulty of capturing and processing information about local conditions meant that beyond the broad amount of land to be licensed in each Division, decisions about production were not made centrally. For instance, at the time of the Royal Commission J.H. Rivett-Carnac, an Opium Agent of very long service, described the process as largely one of delegation:

> General directions are issued, and each officer sends a forecast. I have to leave the details largely up to them. Possibly they send reports and recommendations. They may say that the cultivation in such a part has been very unsatisfactory, and they may recommend that cultivation be given up there altogether. Or they may say that it has been very satisfactory, and that they will cut down certain villages or certain licenses or certain persons. The details are left very much to them.[62]

Given this amount of latitude in how they achieved their production targets, Sub-Deputy Agents essentially functioned as independent authorities within their Divisions. Accordingly, the techniques they used to control cultivation and how far and how effectively they implemented government policy varied considerably between Sub-Divisions.

This contingency in implementation is most easily seen in the difficulty the central

[61] "W. L. Robinson, Commissioner of Chota Nagpur Division to the Secretary of the Board of Revenue, Lower Provinces, 24th of November, 1876 (No.23)". In: *Proceedings of the Government of India Financial Department, November, 1877*. Vol. IOR/P/966. India Office Records, British Library, p. 273

[62] Evidence of J.H. Rivett-Carnac, Opium Agent of Benares *Royal Commission on Opium, Volume II*, p. 57

government had in actually controlling the area under poppy. Changes to area policy by the central government were generally only implemented very slowly. For example, the reductions in the mid-1860s had to be delayed for an entire season because of the complexity of making such changes on short notice, a delay which led to some discussion between the different levels of government.[63] Even standard changes in area could prove difficult to enforce; in his summary of the Sub-Deputy Agent's responses to the 1876 survey the Acting Agent for Benares noted that: "the greatest difficulty is found in restraining cultivators from bringing lands under opium in excess of their engagements; indeed, in one district I visited I found that the cultivators persistently declared they would sow in excess, no matter what might happen to them!"[64] In fact, the statistics provided with the Agent's annual reports show that throughout the period it was very common for the amount of land planted with poppy to be in excess of the amount cultivators had been licensed to grow.

Similarly, the ambiguity surrounding the question of exactly how far officials could go to persuade cultivators to grow opium does appear to have led some Sub-Deputy Agents to overstep the bounds of permitted behavior in order to achieve the targets set for them. One landlord from Patna who gave evidence before the Royal Commission provided a copy of a letter from the Sub-Deputy Agent, Mr. Blair, which stated that the latter would "feel much obliged to [him]" if he could "make arrangement for cultivation of poppy on as much area as [he could] afford."[65] The use of local elites to persuade or pressure cultivators into producing opium ran contrary to the government's policy that cultivators were free to contract or not as they chose.[66] Elsewhere, the use of illegitimate means to meet production targets

[63]See for example: "T. Bruce Lane, Junior Secretary of the Board of Revenue, Lower Provinces to the Secretary of the Government of Bengal, 27th of January, 1865 (No. 535)". In: *Proceedings of the Government of India Financial Department, December, 1865.* Vol. IOR/P/212/69. India Office Records, British Library, p. 552; and "Junior Secretary of the Government of Bengal to the Junior Secretary of the Board of Revenue, Lower Provinces, 22nd of June, 1865 (No. 537)". In: *Proceedings of the Government of India Financial Department, December, 1865.* Vol. IOR/P/212/69. India Office Records, British Library, p. 553.

[64]"F.M. Halliday, Officiating Opium Agent of Benares to the Secretary of the Board of Revenue, 9th of December, 1876, Lower Provinces (No. 23)". In: *Proceedings of the Government of India Financial Department, November, 1877.* Vol. IOR/P/966. India Office Records, British Library, p. 250

[65]Quoted in: Letter from Rai Isari Prasad, Zemindar of Various Villages in Patna District, to the Commission, *Royal Commission on Opium, Volume III*, p. 153

[66]Landlords exerting pressure on cultivators to select certain crops does not seem to have been particularly unique to opium; several witnesses before the Royal Commission openly discussed their

may have gone even further; in another case there were accusations that Sub-Deputy Agents were sometimes complicit in putting financial pressure on the cultivators to keep growing opium once they had started.[67]

However, the difficulties inherent in ensuring that a centrally determined policy was actually implemented were not the same across the two Agencies. In particular, by the end of the nineteenth century, differences in the administrative structure meant the amount of control excised by even the Sub-Deputy Agents was much higher in one than the other. Interactions between the state and opium cultivators in Bihar took place exclusively through an intermediary called a khattadar. Each year the khattadar for each village or group of villages, together with the relevant zilladar (the lowest level of opium officer, responsible for local enforcement), would prepare a list of those cultivators who wanted to be included in the license. The khattadar would then go to be issued a joint license for all his cultivators, and accept the advance for all of them, which he would (in theory) take back to the village and distribute. Delivery of the opium and all subsequent payments from the government to the cultivators would also go through the hands of the khattadar. In the Benares Agency the Opium Department still dealt with headmen in each village (called lambardars in Benares), but all important transactions were carried out with the cultivators themselves, and under the direct supervision of a Sub-Deputy or Assistant Sub-Deputy Opium Agent. This system (called the 'Assamiwar' system) had begun in the area immediately around the Ghazipur factory, but from the mid-1870s onwards was expanded to cover all of the Agency. A single advance was paid to the cultivator, who also had his own individual license issued to him directly.[68] Once cultivation was complete, the opium was delivered and paid for with each cultivator individually, and subsequent adjustments were made also with the cultivator in person at the next settlement. The lambardar paid a certain amount as security for the fulfillment of the whole license and was supposed to generally oversee cultivation, as well as providing a point

attempts (successful or unsuccessful) to persuade their cultivators to grow crops like sugarcane or indigo (For examples, see: Evidence of Miss Sturmer, *Royal Commission on Opium, Volume III*, p. 72; and Evidence of F.C. Chapman, Landholder of Patabgarh District, Honorary Magistrate, and Justice of the Peace, ibid., p. 282).

[67]See for example: Evidence of Babu Rasik Lal Ghosh, Representative of the Indian Association in Bihar, ibid., p. 34

[68]A joint license for all of the cultivators was also issued to the lambardar.

of contact for the zilladars when they came to the village.[69]

These differences in organisation meant that there were significant differences in the presence of the opium department. There were consistently eleven to twelve divisions in the Bihar Agency from the early 1860s and the 1900s, whereas in Benares the number rose from ten to nineteen divisions across the same period.[70] The size of the local establishment was also very different: in the early 1890s there were eleven Sub-Deputy Agents and twelve Assistant Sub-Deputy Agents in Bihar and in Benares there were sixteen Sub-Deputy Agents and thirty-four Assistant Sub-Deputy Agents, while at the other end of the scale, the number of zilladars in each agency was six hundred and twenty-two and eight hundred and ninety-two respectively.[71] This meant that not only was the ratio of divisional officials to cultivators higher in Benares, but so was the ratio of divisional officials to the subordinate officers of the Department. Additionally the Assamiwar system in Benares required the Sub-Deputy Agents to move around a series a fixed points in their Divisions both for the issuing of advances and for settlements at the end of the year.[72] As a result, although the Benares Agency covered a much larger geographical area than the one in Bihar, there were a comparable number of cultivators in each producing a similar quantity of opium, but with much more contact between mid-level officials and the cultivators in Benares.[73]

The dissimilarities between the two systems also had significant implications for how effectively even the Sub-Deputy Agents could control production. In Bihar under the khattadari system, the Sub-Deputy Opium Agents were almost entirely dependent on the zilladars and khattadars to manage production. Without direct contact with the cultivators, the lists prepared by the intermediaries and minor officials were the

[69]Both of these accounts are based on the system as prescribed in the relevant opium manual, but seem to largely conform to what happened in practice. (See especially: Bengal Board of Revenue. *The Opium Manual: Volume II: District Procedure, Rules for the Guidance of Officers of the Benares Opium Agency.* Calcutta, 1891, pp. 30–37, 59–60, 65–67; and Bengal Board of Revenue. *The Opium Manual: Volume II: District Procedure, Rules for the Guidance of Officers of the Behar Opium Agency.* Calcutta, 1892, pp. 32–40, 65–67, 72–75)

[70]*Report on the Administration of the Opium Department, Inclusive of the Opperations of the Behar and Benares Opium Agencies, Vrs.*

[71]J.H. Rivett-Carnac. "Note on the Supply of Opium". In: *Royal Commission on Opium, Volume II, Appendix V.* Cmd. Paper C.7397. 1894, pp. 319–320, 323–324

[72]Evidence of J.H. Rivett-Carnac *Royal Commission on Opium, Volume II*, p. 58

[73]This larger establishment also meant that opium was more expensive to produce on a per unit basis in the Benares Agency. (Bauer, *Peasant Production of Opium*, p. 70)

only source these officials had to identify potential cultivators, existing or new. By contrast the Assamiwar system allowed the Sub-Deputy Agents much more control over which land was accepted. Since most cultivators were actually present during the issuing of licenses, the officials had a considerably larger role in selecting those who would be allowed to grow poppy. Even under the Assamiwar system, however, control of opium production was still to a great extent reliant on the zilladars. This was mainly because the actual methods of selection remained quite simple; in one case a Sub-Deputy Agent stated that in good years, when large number of potential cultivators presented themselves, he would simply limit licenses to those who had a past average output of above 4 seers per bigha (about 32.5kgs per hectare).[74] In years when less cultivators came to offer land, selection decisions again had to be made on the basis of individual local knowledge which only the zilladars and lambardars could provide.

Besides limiting the government's control over output, the other main effect of this reliance was to limit the level of oversight that the Sub-Deputy Agents and Assistants could exercise over minor officers like the zilladars. The main consequence of this state of affairs was that the corruption of the latter was practically proverbial even in parts of the government that had little to do with opium; Additional Commissioner Wace opined that in the Patna Revenue Division the zilladars and other lower opium officers were "some of the most dishonest of our servants," who made routine exactions from the cultivators, either through direct payments or by receiving unauthorised perquisites like food when they came to villages.[75] Just as the Government of Bengal and the Government of India in Calcutta found it difficult to ensure that the divisional staff were following the policies laid down for them, so too did the divisional officers struggle to exercise effective control over the zilladars and other minor officers under them. However, although petty illicit charges and extortions were common across both Agencies, the difference in administrative structure meant that the problem was very much worse in Bihar. Accusations of corruption, and especially of coerced cultivation made by cultivators, landlords, and others were

[74]Evidence of G.M. Gregory, Sub-Deputy Opium Agent of Ghazipur, *Royal Commission on Opium, Volume III*, p. 89

[75]Evidence of A.A. Wace, ibid., pp. 6–8

heavily concentrated in the Shahabad, Patna, and Gaya Divisions, all in South Bihar. To some extent this was probably simply a function of where the Royal Commission visited; Patna was one of four places where the Commission took evidence, however there were no equivalent clusters around Benares, Lucknow, or Agra, where the other hearings were held, suggesting that conditions were genuinely worse in Bihar. While in giving public evidence most officials tried to minimise the problem across the whole of the Bengal Monopoly, in private discussions within the opium administration it was almost taken for granted that the corruption problem was very much worse in Bihar. To take just one example, a few years before the Royal Commission, a proposal was made to give transit allowances to cultivators to encourage them to attend weightments and settlements. The Benares Agent was enthusiastic, saying that the idea would be very popular, the Bihar Agent was far more pessimistic, arguing that any extra payments would only tend to increase the "already excessive" extraction by the minor officers in his Agency.[76]

The Khattadari system compounded the problem to some degree, as many of the functionaries under the Sub-Deputy Agents were paid a commission based on the amount of opium produced in the area for which they were responsible.[77] This encouraged compulsion by the minor officers, since under this system they directly profited from expanding cultivation as much as possible. In Shahabad, for example, it was reported that the zilladars used threats of fines and imprisonment to induce cultivators to grow poppy.[78] Even high-caste cultivators, wealthy enough to employ hired labour could be subjected to violent enforcement of the cultivation contract: in one case the zilladar uprooted other crops when they were planted on land that had been licensed for opium.[79]

The problems caused by limited oversight were not, however, limited only to the formal employees of the Opium Department. Although corruption by the intermediaries was recognised as a problem in both agencies, the differing roles of

[76] "C.E. Buckland, Officiating Secretary of the Board of Revenue, Lower Provinces to the Secretary of the Government of Bengal Revenue Department, 5th of March, 1885 (No. 14)". In: *Proceedings of the Government of India Financial Department, January to December 1888*. Vol. IOR/P/3270. India Office Records, British Library, p. 81

[77] No similar commission existed in Benares, where equivalent officials were paid a flat wage.

[78] Evidence of Babu Rasik Lal Ghosh, *Royal Commission on Opium, Volume III*, p. 36

[79] Evidence of Poonit Singh, Cultivator of Patna District ibid., p. 22

khattadar and lambardar in relation to the cultivators meant that these problems were again worse in Bihar. Not long after the general extension of the Assamiwar system in the Benares Agency, the problem caused by corruption amongst the khattadars were already generating calls within the opium administration for it to be extended to Bihar. By 1885 the Board of Revenue was expressing the view that: "the evils of the khattadari system are patent to everyone in Bihar."[80] Although these problems were already well known within official circles, they became very publicly apparent nine years later during the Royal Commission's hearings. One witness cited an instance where a khattadar included a cultivator in the license without their knowledge, appropriating the entire advance and leaving the cultivator to face a fine for not fulfilling the contract.[81] While this was almost certainly an extreme case, a significant degree of extraction seems to have been an accepted part of being a khattadar; elsewhere another witness described the process by which villages selected their khattadars through a sort of Dutch auction, with candidates bidding down what they would charge the cultivators in additional payments.[82] While corruption existed to a greater or lesser degree across the whole of the Bengal Monopoly, the lack of oversight within the khattadari system meant that it was very much worse in Bihar.[83]

The general result of a close examination of the administrative structure through which the colonial state sought to control opium production, then, is that the ability of policy-makers to get their decisions carried out in practice was fundamentally constrained. Many of the phenomena cited by previous authors as evidence of a general policy of compulsion, such as extraction at various levels in the opium administration, are evidence of the limited nature of policymaker's control over the rural economy, rather than the contrary. Even the assamiwar system represented a compromise between the high informational demands of the Opium Monopoly

[80]IOR/P/3270/14, p. 81

[81]Evidence of the Reverend Prem Chand, *Royal Commission on Opium, Volume III*, p. 28

[82]Evidence of A.G. Tytler, ibid., p. 55

[83]Even extraction by the khattadars was not apparently universal; Reverend Daniel Jones, a missionary in Patna District gave the Royal Commission the example of: "One old Khatadar, who was supported in his statement by several others, told me that he continued to cultivate the poppy for two or three years more he would not have an ox or anything left, and as it was did not look as though he had much left." (Evidence of the Reverend Daniel Jones, Missionary of Patna, ibid., p. 12)

system and the limited resources of the state; in the words of one official: "If the Government had not a lambardar in every village, they would have to have a zilladar; and the paid establishment would be very much larger than it was now."[84] However, although the cost of even the existing establishment was never far from official discussions within the opium administration, the limited capacity of the Government of India to control opium cultivation not purely a question of dedicated manpower: together the Agency, Divisional, and Sub-Divisional offices in Bihar and Benares employed almost three thousand people by the end of the nineteenth century, who in turn interacted with about about fifty thousand intermediaries. Instead, it was the quantity of information required for management of the Monopoly and its centralised structure which compromised its effectiveness. At each administrative level the difficulty of transmitting a large amount of highly localised information from above to below heavily hampered both decision-making and oversight. In particular, it seems clear from the available evidence that where higher- and mid-levels of the opium administration were most reliant on and least able to oversee minor officers and intermediaries, the problems of corruption and other abuses were at their worst.

2.4 Data & Model

If the individual sources suggest this kind of relationship, is it possible to test these effects in aggregate? In fact the main prediction of the unprofitably-compulsion hypothesis is essentially about aggregates: at its core this view states that because they were forced to, cultivators grew poppies that they would not otherwise have done, or to put this another way, the use of compulsion *ceteris paribus* led to increased production of opium. If this were true, there are a number of relatively intuitive ways in which this effect might occur, the most important of which are illustrated in Figure 2.4. Whatever type of compulsion one considers, the most direct effects are likely to have been that individuals who otherwise would not have produced opium at all were induced to do so, or that the amount of land each individual used to grow poppy was increased.

[84]Evidence of G.M. Gregory, *Royal Commission on Opium, Volume III*, p. 92

However, there is also a third way which compulsion could have potentially affected output: through productivity. For this mechanism to work, one must assume that the intermediaries were taking an active role in overseeing production. While this is not generally discussed very much, this idea is actually implicit in the compulsion argument. Although the proponents of this hypothesis sometimes make general reference to economic coercion by the landlords, as will be clear from the preceding sections, their focus in terms of both arguments and evidence is on direct compulsion by either the intermediaries, or by junior officials of the Opium Department. If one accepts that this was this case, it is clear that cultivators were being actively forced to grow opium, not just making disadvantageous or sub-optimal decisions because of imperfect information or imperfect markets.

It has long been known that such agency problems exist when there is uncertainty in the relationship between an agent's action and the outcome that determines the payoff that they receive. This is especially common in the case of agricultural contracts, where crop output is dependent both the agent's effort and other more random factors, such as climatic conditions. As a result, the principle faces a trade-off between investing in monitoring the agent's behavior and transferring some of the risk associated with the contract to the agent.[85] In the latter case, the principle seeks to minimise the negative effects of such problems by designing the contract in such a way that the agent is incentivised to carry out the desired actions by aligning the principle's and the agent's interests.[86] For example, where sharecropping is used, the incentives for the agent to put in effort are such that there is no need for the principle to monitor the agent's behavior directly, although such incentives are only worthwhile where the effect the agent has on the outcome is sufficiently high it is profitable for the principle to offer them.[87]

[85]See for example: B. Holmström. "Moral Hazard and Observability". *Bell Journal of Economics* 10.1 (1979), pp. 74–91; M. Harris and A. Raviv. "Opitimal Incentive Contracts with Imperfect Information". *Journal of Economic Theory* 20.2 (1979), pp. 231–259; and K.M. Eisenhardt. "Agency Theory: An Assessment and Review". *Academy of Management Review* 14.1 (1989), pp. 57–74

[86]J. Laffont and D. Martimort. *The Theory of Incentives: The Principal Agent Model*. Princeton, 2001

[87]G.J. Miller and A.B. Whitford. "The Principal's Moral Hazard: Constraints on the Use of Incentives in Hierachy". *Journal of Public Administration Research and Theory* 17.2 (2006), pp. 213–233; for an study of this effect in practice, see: M. A. Wendimu, A. Henningsen, and T.G. Czekaj. "Incentives and Moral Hazard: Plot Level Productivity of Factory-Operated and Outgrower-Operated Sugarcane Production in Ethiopia". *Agricultural Economics* 48.5 (2017),

The initial agency problem faced by the Opium Department in dealing with cultivators was essentially similar to this common example. When government officials made contracts with individual cultivators, there were a number of things about the behaviour of the latter that the former either could not or could not practically ascertain at the time, which can be broken down into four main items:

C.1 That they were who they said they were and had the land that they said they did.

C.2 That they planted the area contracted for with opium.

C.3 That they did not adulterate the opium once produced.

C.4 That they only sold the opium produced to the government.

These four items, four (C.1, C.2, C.3, and C.4) would have potentially presented problems under most conditions. Turning first to Items C.1 & C.2, since the government gave advances ahead of any actual cultivation there was a risk that people presenting themselves as potential cultivators could mispresent their land, their knowledge, or their intention to grow opium. This would have been a particular problem when the government was dealing with a large number of new cultivators, as when it was attempting to expand the area under poppy. Officials were able to directly mitigate this problem to some extent, in the first case by prefering individuals who had cultivated successfully in the past, and in the second by measuring the area under poppy several times throughout the year. However, while this meant that the state could at least select for experienced opium cultivators, even these checks did not remove the risks associated with taking on new cultivators nor the need for someone to confirm the identity of cultivators.

Although Item C.3 was an issue at some points in the history of the Opium Monopoly, by the end of the nineteenth century adulturation was relatively easy to detect and cultivators were fined for delivering adulterated opium at the weighments. By contrast, illegal retention or sale of opium by the cultivators (Item C.4) did continue to occur throughout the opperation of the Monopoly, and was and is by

pp. 549–560.

its nature relatively hard to measure. However, it seems unlikely that this was a particularly large problem: the quantities of illegal opium that were siezed were generally small compared with output even at the sub-division level, penalties for being caught with illegal opium were relatively severe, and there is no evidence of significant quantities of smuggled opium circulating in late nineteenth century north India.

All four of these issues were present to a greater or lesser extent throughout the history of the Opium Monopoly. Some were, as explained above, mitigated with improvements in measurements and monitoring as the development of the Opium Department continued through the nineteenth century. Other problems were, however, not so easily removed; in particular issues related to identifying and vetting new cultivators and smuggling were by their nature difficult to solve with technical solutions. Instead, the state adopted a different approach: dealing with the cultivators through intermediaries, who were, at least theoretically, approved by both the Opium Department and the cultivators — the lambardars and khattadars.

These intermediaries were individuals with whom the state had a repeated relationship, who could confirm the identity, holdings, and standing of cultivators within the village, further mitigating the risk associated with giving advances.[88] Since the intermediary recieved additional payments relative to other cultivators, which depended on the output of opium, and were in turn responsible for ensuring that the land in their license was actually cultivated, they had an incentive to only vouch for cultivators who were likely to actually cultivate poppy, rather than, for example, absconding with the license payment. Additionally, given that the intermediaries were themselves cultivators and the scale of their official additional renumeration small, the costs of collecting information this way were very much lower than had the state attempted to collect all the required information directly itself.[89] Consequently, the use of intermediaries was useful for the state in preventing

[88]This screening is reminiscent of rural moneylenders' use of local knowledge to screen clients as described by Stiglitz (J.E. Stiglitz. "Peer Monitoring and Credit Markets". *World Bank Economic Review* 4.3 (1990), pp. 351–366).

[89]For the higher fixed costs associated with this type of screening, again in the context of agricultural credit, see: A.V. Banerjee and E. Duflo. "Giving Credit Where It Is Due". *Journal of Economic Perspectives* 24.3 (2010), pp. 61–79, pp. 62–64

issues with Items C.1 & C.2.

On the other hand, in the cases of smuggling and adulteration the scope for intermediaries to make a significant difference was limited, since, as suggested above the state already had effective means to detect and deter these activities.[90] Additionally, both adulteration and smuggling, particularly the practice of cultivators illicitly keeping back opium for their own use, would have been difficult for intermediaries to monitor. Harvested opium was held by the cultivator until it was delivered to the government, and even had the intermediary been able to directly watch as each field was harvested, quantifying the amount of latex as it was collected would have been practically impossible. As a result it seems that the primary purpose of intermediaries from the perspective of the state was to ensure the *bona fides* primarily of new cultivators and ensuring that payments were given to the correct individuals at the beginning and end of each year.

However, as discussed in the previous section, while the introduction of intermediaries did reduce the problems of moral hazard related to the cultivators, since the ability of the Opium Department to monitor the intermediaries themselves was limited, the presence of the latter produced its own set of agency problems. As in the case of the cultivators, there were several pieces of information about the behavior of the intermediaries that the state could not accertain in advance:

I.1 That the monitoring that they did was accurate.

I.2 That they paid any money that was due to the cultivators to them.

I.3 That they prevented cultivation above the quantity desired by the government.

Since the state had only limited ability to confirm information which the intermediary gave them, there was a possibility that the intermediary might either conspire with cultivators to hide one of the activities which the existence of intermediaries was designed to prevent or try to defraud them by appropriating money which was owed to

[90]See also: Kranton and Swamy, "Contracts, Hold-up, and Exports", pp. 982–983; although opium is one of several examples that Kranton and Swamy use to illustrate their model of export commodity procurement, they do not consider the role of village-level intermediaries in mitigating agency issues for the Monopoly. Instead they focus only on the interactions between officials and producers.

them (Items I.1 & I.2). Both of these presented a problem since, as in the case of the cultivators, where the government's ability to detect deviation was low enough, the gains for the intermediary from these actions could offset the risk of being caught. In the latter case there is some evidence of the development of autochthonous solutions to the problem developing: as described in an earlier section, instances existed of negotiation between intermediaries and cultivators over the actual distribution of payments between the intermediary and the cultivator. However, apart from this, the main disincentive of these for intermediaries specifically was that if they were caught in malfeasance they were barred from being an intermediary in future and would in consequence loose the additional income which it brought to them. The effectiveness of this deterrent was dependent on the degree to which the state could monitor the intermediaries directly, which in turn relied on its ability to monitor its own employees, such as zilladars, something which, as outlined above, the available evidence suggests that it was not always very good at.

The final issue listed above, Item I.3, was the result of a misalignment of the incentives of the intermediaries and the wishes of the government. While the intermediaries were paid more the more opium their license produced, under the reserve system the government had a target for the amount of opium that it wanted to be produced, something that might also change from year to year. While it was important that this target was met, overproduction was a problem as it not only required the government to purchase additional opium from the cultivators, but also meant that the additional opium had either to be sold, which would lower the price received at auction, or stored, which lowered the government's profit for that year. In practice, falls in net revenue were frequently associated with much higher than expected output of opium raising the cost of running the Monopoly above the expected amount. The risk of this happening was particularly high under the khattadari system, where the intermediary received a commission on all of the opium that their license produced and enjoyed substantially less oversight with regard to the money that they held for the cultivators. The consequence of this was that the khattadar's main incentive was to increase the output of opium from their license,

as doing so would not only mean that they received more in formal payments, but also would have increased the amount available to be extracted informally from the cultivators. By contrast, lambardars received far less formally, and rarely held money for the cultivators in their licenses. This incentive for intermediaries to compel additional cultivation even when it was undesirable for the cultivators introduced a new piece of potentially unknown information about the latter's behaviour:

C.5 That they carried out the labour (irrigation, weeding, harvesting, and so on) in such a manner as to maximise the output and quality of opium produced.

Item C.5 is unusual since ordinarily cultivators' incentives in this area would have been well aligned with those of the state. Final payments were made on the basis of quantity and quality, and in the period covered by this paper, both could be measured with a relatively high degree of accuracy. As a result, under these circumstances it was in a cultivator's own interest to produce as much and as high quality opium as he was able, since the financial return which he recieved dirrectly depended on these two attributes. However, were it the case that cultivators were compelled to grow poppy even though it was relatively or absolutely unprofitable for them, then this incentive would obviously not exist. Instead, they would be incentivised to minimise the amount of effort that they put into opium, instead using the resources they had available cultivating other more profitable crops, an effect would potentially have been even stronger for any cultivators that were using hired labour. Since opium output was not wholly defined by cultivator effort, but also depended on a number of essentially stochastic factors (rainfall, incidence of blight, and so on), it would be impossible for the state to identify shirking purely from the outcome of the years cultivation. Consequently, were the only parties to the transaction the state and ordinary cultivators, widespread compulsion would be associated with lower average yields.

This was of course not the case in practice. The intermediaries formed a third group who not only potentially had incentives to engage in compulsion, but also had a much greater ability than the state to monitor the activities of the cultivators. For the khattadar, who stood to benefit quite considerably from the additional

commission which higher output would bring him, the impulse to use any available social or economic pressure available to him to induce the assamis in his license to take on more poppy than they otherwise would is obvious. Additionally, they would not face the same problems from shirking; intermediaries, unlike other potential compellers were present throughout the growing process, when the degree to which weeding and watering were actually being carried out would have been evident. The degree to which an intermediary could have done this this would have depended on the degree to which they were able to closely monitor the behaviour of the cultivators; where intermediaries could effectively identify and prevent shirking the negative effect of compulsion on output would be reduced.

Similar problems were also present for other crops in which the state was less involved, and the use of intermediaries to solve informational problems in agricultural and craft procurement was ubiquitous amongst exporters in nineteenth-century India.[91] To return, for example, to the two crops briefly mentioned in Section 2.2, sugar and indigo, for both of these crops, information gathering and enforcement were both key issues for processors who contracted with cultivators. However, unlike in the case of opium, where enforcement took place as a direct administrative function of the state, the merchants and planters writing the contracts had to come up with outside mechanisms to deal with the risk of non-performance.

Advances for sugar cultivation by moneylenders were made through landlords or were made by the landlords themselves, as these individuals already had knowledge of, and relationships with potential cultivators, and were in a position to exert social or economic pressure towards them.[92] Cultivators signed agreements which included penalties for independent production, which were enforced by employees of the lender who visited villages to look for illicit sugarcane.[93] In addition, because of the multi-year growing period for sugar, structures which treated the initial advance as a loan, against which the value of the final crop was hypothecated were especially common, as they provided a means for the lender to control the cultivator's behavior.[94]

[91]T. Roy and A.V. Swamy. *Law and the Economy in Colonial India*. Chicago, 2016, pp. 20–21
[92]Chaudhuri, Peasant History, pp. 416–417
[93]Amin, "Small Peasant Commodity Production", p. 110
[94]Chaudhuri, Peasant History, p. 460

A rather different process took place in Indigo cultivation in Bengal, which was mostly conducted by European planters. Here, as elsewhere in nineteenth century India, formal contract enforcement was expensive and slow, and even when a favourable judgment could be gained by a planter, its implementation was often impossible.[95] As a result, planters made use of a combination of advances and the influence of local headmen to ensure performance in areas where legal avenues for enforcement were less strong.[96] Ultimately, the difficulty of preventing contract breaches, together with evolutions in the Indian legal regime, led to a shift from planters contracting with cultivators to one of direct cultivation with hired labour on land that the planters held themselves, a process that in turn increased vertical integration across the industry as a whole.[97] A great deal of the cultivation of Indigo was transfered to north Bihar during the second half of the nineteenth century, with it eventually taking up about 10% of cultivated land in Tirhut.[98] However, here planters often also held zemindari rights over villages, which could be used to informally solve contractual difficulties, so most production in this region took place through contracted peasant production.[99]

If these relationships existed in opium production, given that poppy was a sensitive and labour-intensive crop, it seems probable that yields would suffer without relatively constant supervision if cultivators were growing it against their will. In fact, the main version of the compulsion hypothesis, which assumes a conspiracy between the intermediaries and either the landlords or the Opium Department to compel production, fairly directly implies such a relationship, since it is difficult to see why either the government or the zamindars (landlords) would need to engage with the intermediaries in this connection unless they performed some kind of enforcement role. Put simply, there was only an incentive for cultivators to shirk if their production of opium was involuntary, and it was only through the prevention of shirking that the

[95]T. Roy. "Indigo and Law in Colonial India". *Economic History Review* 64.S1 (2011), pp. 60–75, pp. 64, 66–69

[96]ibid., pp. 64–66

[97]M. Aldous. "From Traders to Planters: The Evolving Role and Importance of Trading Companies in the 19th Century Anglo-Indian Indigo Trade". *Business History* (2019), pp. 6–7, 13–14

[98]Roy, "Indigo and Law", p. 72; and Ram, "Land and Society", p. 135

[99]Chaudhuri, Peasant History, pp. 455–457

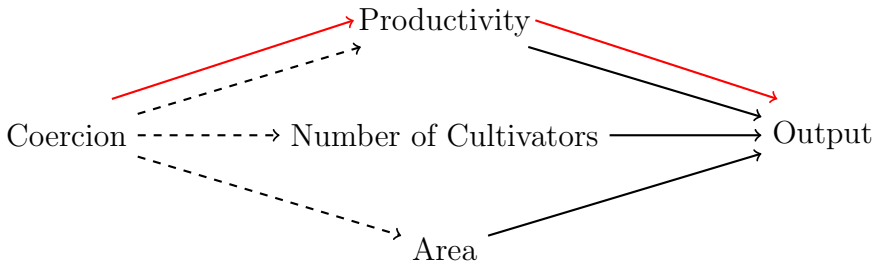

Figure 2.4: Channels through Which Coercion Could Affect Opium Output.

presence of intermediaries had an effect on productivity. Consequently, if both of these statements are true, a significant positive relationship between the presence of intermediaries and output, once other imputs are controlled for, would indicate compulsion. These predicted effects provide a means of at least roughly testing the role of the intermediary in opium production.

Of the three, cropping and labour decisions would be difficult to model accurately using the available sources. Without data on rents and prices, not only of opium, but also of other crops, it would be practically impossible to determine the causal relationships driving allocation of land to opium in a meaningful way. Besides, even with this type of information there would almost certainly be further substantial issues, not least from the nature of the Opium Monopoly itself. Given that licenses to grow a certain area of opium were allocated by the state, the relative proportion of land which could be placed under opium was not entirely determined by the cultivator, a fact which would substantially complicate modelling. Instead, returning to Figure 2.4, the approach taken here is to measure the effect on total factor productivity: given that cultivators allocated a certain amount of land and labour to producing opium, how did coercion affect the amount of the drug they actually got from those inputs? As a way of formally implementing this approach, one can think of opium production in region i during year t as being described by a simple Cobb-Douglas type production function:

$$Y_{it} = L_{it}^{\alpha_1} \cdot P_{it}^{\alpha_2} \cdot A_{it}, \tag{2.1}$$

where Y is the output of opium, L is labour, P land, and A is total factor productivity. Linearising this equation produces:

$$lnY_{it} = \alpha_1 lnL_{it} + \alpha_2 lnP_{it} + lnA_{it} \tag{2.2}$$

As described in the preceding analysis, there is within A_{it} a component, C_{it}, which represents the strength of compulsion. In this analysis, the measure of compulsion chosen is a simple one — the number of intermediaries. The relatively intuitive mechanism underlying this choice is that the more cultivators and the larger the area of land each intermediary had to manage, the more difficult it would be for them to effectively oversee production. Consequently, the lower the number of intermediaries relative to the number of cultivators and the amount of land, the less effective compulsion would be.

Actually implementing this model, however, requires multiple adjustments. Most importantly, since both paid and unpaid labour are attested as being used in opium cultivation there is no single measure of labour inputs which is wholly satisfactory. Consequently as well as agricultural wages, the number of cultivators is also included to proxy for the cultivator's family's unpaid labour. Unfortunately, the close relationship between the number of cultivators and the amount of land brought under cultivation means that there is likely to be high degree of multicollinearity within the land and labour variables and the elasticities produced are unlikely to be very useful or consistent. However, with one exception (discussed below) C_{it}, the coefficient of interest, is unaffected. Additionally, besides land and labour inputs and any compulsion that took place, there were probably quite a few other factors which affected productivity in opium cultivation. Most importantly, the impact of rainfall on output was well known to be particularly high in the case of opium. However, as outlined in Section 2.2, there were a wide variety of other ways in which opium cultivation varied across different areas, so region fixed-effects are used to model the various unmeasured region specific factors affecting output. The main specification used is therefore:

$$lnY_{it} = \beta_1 lnC_{it} + \underbrace{\beta_2 lnS_{it} + \beta_3 lnW_{it}}_{L_{it}} + \beta_4 lnP_{it} + X_{it} + \gamma_i + \mu, \tag{2.3}$$

where S_{it} is the number of cultivators, W_{it} is the unskilled agricultural wage in decimalised rupees, X_{it} is a vector of controls including monthly rainfall during the opium growing season, the government price for opium, the prices of wheat and rice, and the share of opium land irrigated, and γ_i is the region fixed-effect. The measure of output is the quantity of opium paid for by the government at standard consistency in kilograms, while for P_{it}, land, the area harvested in hectares is used.

The data for this analysis are drawn from a range of sources. The annual *Report on the Administration of the Opium Department* contains detailed figures on output, the area of land contracted for, measured, and harvested, the proportion of that land irrigated, the number of cultivators and intermediaries, and the amount paid for opium for the year by opium division.[100] This source has the major advantage that the data and written report that it contained were used for opium policy-making, and so as a consequence it was directly in the interest of the British Indian state to ensure its accuracy. While there were occasional complaints from cultivators about the way opium area was measured, overall they were generally regarded as being precise, reliable, and consistent.[101] In particular, the fact that the numbers produced by the Opium Department were always based on direct observation and measurement, rather than estimation and extrapolation that were often used elsewhere, means that they are amongst the most accurate and consistent sets of agricultural statistics for nineteenth century India. Finally, the wide range of information contained in the *Reports* is also especially valuable, as it allows a number of supplemental statistics to be calculated.

However this data, in spite of its virtues, does present some problems. While the *Reports* themselves cover a relatively extensive period, the areas within the Agencies in which cultivation was permitted changed considerably over that time, especially in the South and West of the Benares Agency. Although the broad layout of the two agencies remains relatively consistent, the borders of individual subdivisions moved very frequently, meaning that a village which was in one Division in one

[100] *Report on the Administration of the Opium Department, Inclusive of the Opperations of the Behar and Benares Opium Agencies, Vrs.* Calcutta, 1882–1898

[101] The issue of whether rods or wheels were used for measurement was particularly controversial, as the former tended to produce a slightly lower area than the latter.

year could be in another the next and be returned to the first one a few years later. These facts make the Opium Divisions unsatisfactory as consistent units of analysis over any considerable period of time. A further difficultly is presented by the fact that the Opium Divisions, Sub-Divisions (in Benares), and Kothis (in Bihar), did not correspond to the Revenue Divisions, Districts, and Teshils, which were used for more-or-less every other administrative purpose in British India. This means that one cannot directly combine the opium statistics of a certain area with data on practically any other subject, further complicates the use of this data for this type of analysis.

While there is clearly no perfect solution to this problem, it is possible to mitigate it somewhat by making use of those borders that did stay the same for relatively long periods (often because they represented a historical political division or followed a river). To this end, I have aggregated the data together by constructing twelve regions (five in Bihar and seven in Benares) that are comparable in terms of opium output, and which have consistent borders over time(these are the same regions used in Figures 2.2 & 2.3). While there are obvious issues with this approach, it does allow the derivation of consistent units of analysis out of Sub-Divisions which, as their overlapping borders suggest, were often historically associated. In fact, many of the constructed regions were single Sub-Divisions at one time. As such, therefore, they do function as a relatively reasonable division so far as opium production is concerned, and without new, extremely disaggregated data, some process of this kind must be applied if this data is to be used (more details on the construction of the regions are given in Appendix E). This method of division is also significant as it defines the period covered by the analysis — 1881–1897, as this is the longest possible period for which such regions are constructible. Fortunately, these years are also those most covered by the existing secondary literature, at least in terms of sources used, and so are in many ways the most interesting for the purposes of this Paper.

Several other variables use data taken from *Prices and Wages in India*.[102] This is a relatively standard source, widely used for a range of applications in Indian

[102] *Prices and Wages in India*. Calcutta, 1906, pp. 4–25, 272–283

economic history. Of the data used here, the most important is monthly wages for an 'able-bodied agricultural labourer,' with the observations found in each region averaged to produce a single rate for each year. While there is a reasonable amount of evidence that wage rates in practice differed slightly for different jobs (and for different labourers), nevertheless this value probably reflects the cost to cultivators of hiring additional labour for opium production to a reasonable extent. However, as some of the regions used in the Bihar Agency are much smaller than those in the N.W.P.O., and as a result it is relatively difficult to obtain representative average wage series for all five regions, especially in the case of the relatively small regions of Saran and Shahabad, for which there are no wage observations. As a partial solution, I use only two wage rates for Bihar, one for those regions located north of the Ganges and one for those south of it. While this may reduce the fit of the model slightly, it appears not an unreasonable assumption that wages are likely to have been similar across these areas in any case given their relatively small size, so the impact is likely to be small. Since no wages are given in this source for the region comprising the Opium Divisions of Gorakhpur, Asamgarh, or Basti, this missing data is replaced, for the years ending 1885 to 1897, with the monthly equivalent of the average daily unskilled wage reported across the relevant districts in the yearly *Report on the Administration of the North-Western Provinces and Oudh*. Before 1885, it appears there was no systematic collection of wages in the region.[103]

Grain prices, also from *Prices and Wages*, are used to represent the market for cash crops other than opium. For this purpose average retail price of rice and wheat at the district capitals are taken, and again grouped and aggregated for each region. These prices perform several other roles in the model. In the first place, if wages in kind were in fact used to compensate hired workers on opium land, these series supplement the data on money wages by capturing at least some of the variation in the equivalent value of the former. In the second, they provide a proxy for the cost of food (for cultivators, their families, and any workers they employed), and in particular the presence of the extreme shortages or famines, which were a perennial feature of

[103] *Report on the Administration of the North-Western Provinces and Oudh, Vrs.* Allahabad, 1885–1897

North Indian agriculture in the period. Finally, since these retail prices are likely to be highly correlated with local agricultural prices, this data provide some measure of the relative success or failure of other crops produced by cultivators. Rice and wheat were not crops in direct competition with poppy, since the former were grown in a different season, and generally on different land to the latter. Nevertheless, although they do not represent substitutes for poppy cultivation, these crops instead provide some indication of the general results of the year for cultivators. Consequently, as more detailed price data on most other cash crops is not available at the local level for all areas, these two series are useful as a general proxy for the state of the agricultural economy in each region. As the prices in this sources a given as an average for a calendar year, they are matched with the other data so that the prices for the year containing the harvest immediately preceding the start of a given opium year are used for that year, since the former event probably had the most significant impact on grain prices and consequently wider conditions for the entire following year.

Given that the sensitivity of the opium harvest to climatic conditions, especially rainfall, was notorious and the amount of rain varied considerably from month to month, it is important to take account of changes across the entire period in which the poppy crop was being grown. Total rainfall for each of the months of the opium year, from the period before planting to harvest(September to March), from sixty observation stations spread throughout Bihar and the N.W.P.O., are taken from the *Report on the Meteorology of India* for 1880 to 1890 and subsequently *Rainfall of India*.[104] This data represents the sum of daily rainfall observations at constant locations over the seventeen years covered by the data. These can be aggregated across the regions to produce average monthly rainfall.

2.5 Results & Analysis

The results presented in Table 2.3 tend to support the idea that there is little evidence of systematic coercion of opium cultivators on the part of the intermediaries.

[104]Meteorological Department. *Report on the Meteorology of India, 1880–1890.* Calcutta, 1882–1892; and Meteorological Department. *Rainfall of India, 1891–1897.* Calcutta, 1892–1898.

The effect for the entire sample is both negative and not statistically significant, and although there is a positive intermediary coefficient for the Bihar Agency, it is also insignificant. Consequently, this test fails to find clear evidence of systematic coercion in either the sample as a whole or in the Bihar sub-sample. The most surprising result, however, is that the value for the Benares Agency is both negative and significant. That is to say that allowing for land and labour inputs, the fewer lambardars there were in a region, the larger the quantity of opium that region produced. These results conform relatively well to what we know about the structure of the opium administration: the region where contact between the Sub-Deputy Agents and cultivators was higher produces the result most strongly against the coercion hypothesis. However, other factors such as variation in tenure systems between the two areas may also explain the differences in coefficients. In any case, one emphatically does not see the consistent positive and significant results that one would expect if the colonial state were to have adopted a consistent policy of using the intermediaries to force production.

However, this result does generate some questions of its own. From the model outlined in the previous section it is unclear why such a positive (and relatively large) effect should exist at all. If one assumes that intermediaries were otherwise neutral, a lack of coercion should simply produce insignificant coefficients on C_{it}, so why is this not the case in Benares? Probably the most convincing answer is simply that they were not otherwise neutral. As discussed in Section 2.2, both khattadars and lambardars appear to have frequently received informal payments from the cultivators that they nominally represented. Just as the ratio of intermediaries to assamis (cultivators) and land would have affected their ability to coerce the latter into growing opium, so too it would also have limited their ability to demand higher payments and commissions. In cases where intermediaries had to deal with a relatively larger number of cultivators, the share of each individual cultivator's receipts which they could demand was lower. As a consequence non-intermediary cultivators received a larger return from poppy than was the case otherwise, and so their allocation of time and other resources to opium cultivation was proportionately

	Bih.	*Ben.*	*All*
C_{it}	0.368	−0.438***	−0.229
	(0.410)	(0.002)	(0.136)
S_{it}	−0.557	0.878***	0.261
	(0.322)	(0.000)	(0.258)
W_{it}	−0.117	0.294**	0.060
	(0.581)	(0.033)	(0.640)
P_{it}	2.391***	0.507***	0.867***
	(0.000)	(0.000)	(0.000)
N	85	115	200
Adj. R^2	0.610	0.737	0.591
Rainfall		Yes	
Prices		Yes	
Irrigation		Yes	
Region FEs		Yes	
Year FEs		No	

Table 2.3: Regression results from the model represented by Equation 2.3, controlling for opium price, with region fixed-effects.

higher. Although this is certainly not the only explanation for this result, it is the most straightforward, and conforms relatively well to the historical evidence, which suggests that actual coercion may have been quite geographically concentrated, while corruption was a much more universal problem across the two agencies.

To help confirm this pattern, Table 2.4 contains the results of an alternative specification including year fixed-effects to control for idiosyncratic effects affecting production in an individual year. Controlling for this kind of factor is important since while production varied between different sub-agencies, generally the range of output was lower in some year than others.[105] Since the price paid for opium was spatially invariate in this period, it cannot be included in the specification with

[105]There were a variety of factors which probably caused these effects but whose incidence cannot be measured individually in a precise way. For example, poppy blight, which during outbreaks would often affect output across most regions, but there is no exhaustive list of all the places affected by blight in a given year.

	Bih.	*Ben.*	*All*
C_{it}	0.435	−0.399**	−0.220*
	(0.269)	(0.012)	(0.099)
S_{it}	−0.758	0.655***	−0.068
	(0.120)	(0.006)	(0.737)
W_{it}	−0.431*	0.157	−0.207*
	(0.070)	(0.257)	(0.099)
P_{it}	1.850***	0.641***	1.002***
	(0.000)	(0.000)	(0.000)
N	85	115	200
Adj. R^2	0.207	0.617	0.455
Rainfall		Yes	
Prices		Yes	
Irrigation		Yes	
Region FEs		Yes	
Year FEs		Yes	

Table 2.4: Regression results from the model represented by Equation 2.3 with region and year fixed-effects.

time fixed-effects and is consequently omitted as a control. Removing opium price as a variable and including year fixed-effects in the regression produces very similar results. The coefficients for the number of intermediaries have the same sign and roughly the same magnitude, with the only major difference being that the negative coefficient in the regression using all the regions is now significant at the ten-percent level. As well as reinforcing the conclusions drawn earlier, this also helps to show that these results are not driven by a small number of years alone. This is quite important given the high level of output variation during the sample period, and confirms that the lack of evidence of coercion found here was not just the case during the investigations of the *Royal Commission*, but is also reflective of the general conditions of opium production in the late nineteenth century.

This specification does also show slightly different wage effects than the previous

one. The negative coefficients for Bihar and the whole sample are weakly significant and the positive one for the Benares Agency is now insignificant. This outcome is closer to the theoretically expected results, which may indicate that this model captures some effects which the other does not. Additionally, it perhaps provides some further support for the idea that while cultivators and their families provided most of the labour for opium production in the Benares Agency, hired workers had more of a role elsewhere. However, it should be noted that this group of results all have a lower adjusted R-squared than the previous ones, substantially so in the case of Bihar, meaning that if this model is an improvement, it leaves a large amount of unexplained variation in output in that Agency. The remaining coefficients are generally close to those reported in Table 2.3.

Given the limitations of the data used, it is important to consider how sensitive these results are to changes in the model used. Consequently, a range of alternate specifications were used, the detailed results of which are shown in Appendix F. For all the tested specifications, the sign of the coefficients remain consistent and the overarching picture presented by the results remains broadly the same. Using the entire sample of both Agencies produce very similar coercion coefficients, which are all only weakly significant or insignificant. Similarly, across the different specifications the results for the Benares sub-sample remain relatively consistent in magnitude and, with one exception, are always significant the the five percent level.[106] However, in the case of the Bihar sub-sample, the magnitude of the main coefficient does vary quite considerably and some alternative specifications do produce a significant positive result. Further testing reveals substantial multicollinearity affecting the coercion coefficient for this sub-sample(but not for the sample as a whole, or the Benares sub-sample). Comparison of the different sets of results suggests that the less information about the amount of land that is included, the larger and more significant the coercion effect becomes in Bihar. This may indicate that the positive results are the consequence of the collinear relationship between the amount of land under opium and the number of intermediaries in that region. Repeating the analysis for Bihar using more disaggregated data removes the multicollinearity problem and again

[106]The exception is still significant at the ten percent level (see Table F.4).

returns positive but insignificant results under both specifications (Appendix F.3).

The fact that they are less than perfectly robust means that these results should be taken as indicative rather than conclusive. However, in spite of this some general patterns do appear clear. At a minimum, as elsewhere in this paper, this quantitative analysis has failed to find any evidence of general coercion. Additionally, the apparent differences between the two Agency sub-samples helps to endorse the idea that there existed a continuum of influence, running from simple corruption to outright coercion. Like so much else about opium cultivation, the abuses allowed by limited oversight were not geographically homogeneous, but instead varied considerably across the area under cultivation. Finally, that this variation appears to follow the relative presence of the Opium Department does provide some circumstantial evidence in favour of state presence being a decisive factor in determining the relationship between intermediaries and cultivators, although of course this cannot be taken as a casual relationship. As a result, while a more definitive answer will have to wait for the discovery of better data that will allow for more precise and robust estimation, the existing quantitative evidence is more consistent with a model centered on corruption and abuses being the result of state weakness, rather than one with consistent state-driven compulsion.

2.6 Conclusion

To return to the questions raised at the beginning of this paper, the Government of India was limited in its ability to regulate production by the very complexity of the task. Although broad policy decisions could be made by the central government based on limited information, since their implementation required extensive knowledge of local conditions, the success or failure of the opium administration's efforts remained dependent on the machinery of the colonial state to collect and process large amounts of information. As a result, key decisions for the implementation of production policy had to be delegated to comparatively junior officials, and even then often depended on individual local officers or outside intermediaries. This centralisation of decision-making and decentralisation of action made effective, systematic oversight

and control practically impossible. As a result, not only were policy positions taken by the central government unevenly implemented, but the lack of effective monitoring also drove rent-seeking, bribery, and extortion, especially at the lower levels of the Opium Department. Besides the negative effects on those cultivating opium, the end result of these conditions was that the Government of India had considerable difficulty in choosing how production was regulated. Control over costs and the net revenue actually derived from the Bengal Monopoly was consequently compromised in turn.

However, in spite of the ubiquity of corruption and the existence of some locally concentrated instances of cultivators being forced to grow poppy, the available evidence does not support the general unprofitability and compulsion suggested in some of the existing literature. Furthermore, the results presented in Section 2.5 do provide some evidence that differences in administrative structure could somewhat mitigate these problems. In the Benares Agency, under the Assamiwar system, a higher number of mid-level officials and more contact between them and the cultivators does appear to have mitigated some of the problems associated with low levels of oversight to a limited extent. However, in contrast to at least superficially similar situations in other colonial contexts, the results presented here suggest that this effect was the result of the organisational structure of the Opium Department, which under the Assamiwar system partially closed avenues for corruption, rather than one purely of official manpower levels.

Finally, although it is perhaps beyond the scope of this analysis, the issues discussed here do provide a salutary reminder that the historian is also constrained by information available to them in the available sources. The statistical and rhetorical categories adopted for specific purposes by historical actors do not necessarily represent the actual level of variation within the distribution of outcomes. Just as one should attempt as far as possible to avoid false positives due to selection bias, one must also be cautious in accepting the concepts and categories in which information and data are organised. In particular when one views nineteenth-century opium production in the context of the wider north Indian agricultural economy,

one must seriously question whether the idea of a single, undifferentiated 'opium cultivator,' with unified interests, behaviors, and views about opium as a crop, is a meaningful analytical or empirical concept, or merely an abstraction created by the colonial fiscal state.

Paper 3

Controlling Crisis? Politics, Drought, and the Decline of the Bengal Opium Monopoly, 1888–1908

Abstract

Even before widespread prohibition, the international opium trade was by many measures in decline. While in the past this has generally been interpreted as a symptom of declining consumer demand or worsening terms of trade, closer analysis of the available statistical evidence suggests that in the case of the world's largest producer, the Government of India's Bengal Opium Monopoly, a combination of a production crisis and a limited policy response were more important than underlying market conditions. This paper argues that under pressure from a growing metropolitan anti-opium movement, the British colonial state attempted a series of reforms with the aim of reducing transaction costs in one of the main areas of production. However, this effort ultimately failed since the existing system had become so entrenched in the rural economy over the previous century that changes to the government's system of opium procurement were limited and ineffective. As a result, the declining importance of Bengal opium in the Indian fiscal system can be seen as an economic consequence of tensions between imperial, colonial, and local

power.

"The assameewar principal is acknowledged to be the best that can be devised, but the khattadari system has become so firmly established that [the agent] feels the need for great caution in proposing a procedure which in practice might break down."[1]

3.1 Introduction

In contrast to the situation in most of the world today, where opium and its derivatives are extremely highly controlled, in nineteenth century India it was perfectly legal and, in fact, formed the second largest source of government revenue. This was no coincidence; opium was also one of India's largest trade goods, forming between five and thirty percent of the colony's exports during the second half of the century. However, at the beginning of the 1890s, a production crisis led Indian opium exports to fall very rapidly. At the same time a growing political campaign in Britain against the Government of India's benefiting from the sale of an addictive drug substantially curtailed policy-makers' freedom of action in managing this source of revenue.

This paper will use this unprecedented crisis for the Bengal Opium Monopoly to argue that, in spite of being forced by external circumstances to make at least some changes to the way opium revenue was collected, the Government of India was unable to effectively alter institutions associated with higher transaction costs and monitoring difficulties. In particular, regional variations in the economic and power relationships created by earlier cycles of colonial revenue policymaking inhibited subsequent reforms. As a consequence, there was a degree of path dependence — once a regionalised system of revenue administration was introduced, it could be very hard to get rid of. Earlier dependence on local elites (in this case village elites) produced a situation in which the ability of the Government of India to respond to changes in circumstances or to rationalise the system of opium administration across the whole of the Bengal Monopoly was severely curtailed. This in turn had

[1] IOR/P/3270/14, p. 81.

significant long-term effects on the fiscal system of British India, as the system by which Government of Indai's opium revenue was collected became increasingly untenable even before the emergence of significant international pressure to end the trade in the drug.

In general terms, it is not particularly surprising that the Government of India had to accept arrangements for collecting opium revenue that were, from its perspective, less than optimal. As outlined in the General Introduction, a number of authors have drawn a link between governance quality and government reliance on natural resource revenues. Such a relationship is however conditional on a number of factors, especially the nature of existing institutions and the past decisions made by the government. For example, Mehlum, Moene, and Torvik have shown that the payoffs from rent-seeking are relatively higher when institutions are bad, in contrast to 'producer-friendly' systems offer fewer opportunities for corruption.[2] Other works have clarified some of the factors determining this relationship; the impact is dependent on both the degree of ethnic fractionalisation and the level of democratic institutions; places that have relatively undemocratic institutions and have heterogeneous populations experience a stronger effect on corruption from natural resource revenues.[3] More recent work has distinguished between the various dimensions of 'government quality,' but still find that the presences of significant natural resource income has negative impacts on the quality of governance primarily through the opportunities which it provides for rent-seeking and corruption.[4]

However, institutional and administrative form and quality are not static endowments, rather the development of both are path-dependent. Political allocation of authority to certain groups can lead to feedback loops creating successively more uneven distributions of power.[5] Path dependencies can also emerge as a result of a desire on the part of administrators to avoid the disruption that might be caused

[2]H. Mehlum, K. Moene, and R. Torvik. "Cursed by Resources or Institutions?" *World Economy* 29.8 (2006), pp. 1117–1131

[3]R. Hodler. "The Curse of Natural Resources in Fractionalized Countries". *European Economic Review* 50.6 (2006), pp. 1367–1386; and S. Bhattacharyya and R. Hodler. "Natural Resources, Democracy and Corruption". *European Economic Review* 54.4 (2010), pp. 608–621

[4]M. Busse and S. Gröning. "The Resource Curse Revisited: Governance and Natural Resources". *Public Choice* 154.1/2 (2013), pp. 1–20

[5]P. Pierson. "Increasing Returns, Path Dependence, and the Study of Politics". *American Political Science Review* 94.2 (2000), pp. 251–267

by otherwise desirable policies or as a consequence of inertia intended to mitigate perceived negative effects for the administrating department as an entity.[6] Recently, Tyburski, Egan, and Schneider have found such state-dependent dynamics at a sub-national level — based on the contemporary United States of America, these authors show that natural resource revenues worsen corruption in already corrupt environments, as political leaders who start providing resource rents to supporters find it difficult to stop, creating an effect that persists beyond the lifetime of the resource revenue.[7]

Evidence of such contingent trade-offs abounds in the historical literature. As Margaret Levi has argued in her well-known work on the subject, when collecting revenue states are sometimes willing to accept higher transaction costs in order to capture the support of important agents.[8] For European colonial empires, the need to make such concessions appears to have been particularly great; the existing comparative literature on colonial fiscal capacity emphasises that a large number of constraints at the level of the colony, such as trade availability, population density, and the availability of official manpower, were fundamental determinants of the structure of colonial taxation systems, having considerably more impact than, for example, metropolitan policies.[9] Given these constraints, colonial states often relied on local elites to collect taxes in areas where its presence was relatively limited, particularly in the African context.[10] Looking more specifically in the Indian case there have been a number of studies that suggest that the growth and development of the state was inhibited at various points by special interest groups. In his recent study, Lee finds that local variation in land revenue policies led to significant (and persistent) differences in fiscal capacity across India.[11] Although his focus is mainly on the effect of these differences over time, Lee's results carry with them the implication that in the permanently settled zamindari (landlord) areas the colonial state effectively

[6]D.P. Moynihan and J. Soss. "Policy Feedback and the Politics of Administration". *Public Administration Review* 74.3 (2014), pp. 320–333, p. 326

[7]M. Tyburski, P. Egan, and A. Schneider. "Deep Determinants of Corruption? A Subnational Analysis of Resource Curse Dynamics in American States". *Political Research Quarterly* 73.1 (2020), pp. 111–125

[8]M. Levi. *Of Rule and Revenue*. Berkely, 1988, p. 13

[9]See especially: Frankema and van Waijenburg, "Metropolitan Blueprints", pp. 371–400

[10]See: Gardner, "Decentralization and Corruption", pp. 227–228

[11]Lee, "Land, State Capacity, and Colonialism", pp. 412–444

forwent revenue by implementing a system of indirect collection due to its need to ensure the support of powerful landlords. Similarly, in a post-colonial context Bardham and Chibber have separately shown that the influence of specific interest groups could substantially limit the effectiveness of the implementation of government policy.[12] However, while there is ample discussion of the reasons intermediaries were employed at the points that the state was establishing its legitimacy or specific taxes were introduced, there has been substantially less consideration of how this approach affected fiscal policy on a more granular level.

In attempting to fill this gap, it is important to distinguish between the different kinds of factors which affected the ability of colonial governments to impose a specific tax structure. On the one hand, there were what one might call general constraints — things like the availability of official manpower, the quality of existing fiscal structures, and the threat of revolt by the colonised — which existed to some degree in all such states. On the other, there were also much more local considerations, contingent both upon the specific social conditions and the previous trajectory of fiscal policymaking. Since, in most cases, both communal structures and the point in time at which the colonial administrative machinery were introduced were far from uniform across different parts of a given colony, so too did the ability of a colonial government to implement a specific policy vary across the areas under its control. Put another way, the power of the state to negotiate, and importantly to re-negotiate, the fiscal contract with the population was different in different regions.

Turning back to the Indian opium revenue evidence for the *existence* of significant local differences in collection is not particularly difficult to find. Most prominently there was an extreme difference between indirectly and directly ruled areas of India. In the former, the Malwa system was designed to minimise the amount of direct involvement by colonial administrators and depended on the enforcement of treaties with the rulers of the opium-growing princely states, whereas in the latter the Bengal Monopoly required a great deal of direct official involvement in all stages of opium production and sale. However, as discussed extensively in Paper 2, there were

[12]P. Bardhan. *The Political Economy of Development in India.* Oxford, 1984, pp. 60–74; and V. Chibber. *Locked in Place: State-Building and Late Industrialization in India.* Princeton, 2003, pp. 29–44

substantial administrative differences even between the two Agencies within the Monopoly. The khattadari and assamiwar systems emerged in the context of distinct economic and social conditions and differing systems of land tenure.[13] However, the degree to which these differences not only were the products of policy, but also shaped policy is a much more open question. How free was the Government of India to change the terms under which it managed opium production in each of these regions when circumstances altered? The experience of the 1890s and 1900s suggests that the answer to this question may be 'not very.' Faced with external political pressure and an internal production crisis, the Government of India attempted to transplant the assamiwar system from the N.W.P.O. into Bihar. As this paper will argue, this effort failed largely because the khattadari system had become entrenched in the economy of rural Bihar. The much more limited changes that the Government of India was eventually able to implement proved insufficient and ultimately precipitated the collapse of opium production in Bihar, with the long term consequence that the Bengal Monopoly as a whole became substantially less viable. Although far from the only influential factor, this effort at reform nevertheless marked the beginning of the end of opium's role in the Indian fiscal system.

The remainder of the paper will be structured as follows. The next section will give a brief outline of the international context for the Government of India's attempts to reform its system of opium procurement, with a particular focus on the political pressures surrounding opium in the imperial core. The third section will then present the main part of the argument, examining in detail the ways in which the colonial state had to adapt individual reforms to local constraints, producing results which conflicted with the goals that the government had set out with. The final section will show how the failure of these efforts impacted on the wider fiscal structure, ultimately ending the Bengal Opium Monopoly's position as one of the cornerstones of public finance in the colony.

[13]The variation in tenure with and between provinces was obviously partially itself a product of fiscal policy, and the different land revenue arrangements in Bihar, Oudh, and the majority of the Northwestern Provinces represented distinct fiscal bargains made at different times and aimed at different parties.

3.2 Crisis, What Crisis?

3.2.1 Production & Trade

The origin of the Government of India's attempt at reforming the system of opium procurement lay in two places: a production slump in Bengal driven by prolonged drought, and new political pressures which resulted from the evolution of attitudes to the drug in Britain and India. As a result, the Bengal opium revenue underwent something of a crisis beginning in about 1888: a series of factors, external to government opium policy, created a situation in which the Government of India essentially had to make some kind of change to the methods by which the opium revenue was collected or lose that income altogether. The compulsory nature of the impetus for change is important, then, since it suggests that the failure of these efforts was not due to a lack of will or some kind of institutional conservatism within the colonial government.

This position is broadly in conflict with received view in the historical literature on opium, which holds that the 1890s and early 1900s were not especially notable. Of those who mention it at all, most authors see these years as more or less a continuation of a constant but gradual decline from the peak of Indian opium exports sometime between 1879 and 1881, which lasted until the introduction of more general international controls on the opium trade beginning in 1908. This process is in turn usually ascribed to increased competition from domestically produced opium in China and, less commonly, other external forces like the fall in the gold value of silver.[14] However, not only is there significant evidence that the narrative of gradual decline is incorrect in respect of Bengal opium, there are also positive indications that the changes that did occur were driven by problems with production in India, rather than by changes in consumer preferences or the terms of trade.

Turning first to the statistical basis for a general decline in the opium trade, it is

[14]For changing Chinese demand, see: Trocki, *Opium, Empire and the Global Political Economy*, pp. 125–7; Madancy, *Troublesome Legacy of Commissioner Lin*, pp. 60–2; Richards, "Opium Industry", p. 59; and Zheng Yangwen, *Social Life*, p. 156; for the impact of the shift in currency values, see: Owen, *British Opium Policy*, p. 309.

evident that a long general decline in India's opium exports appears only when the different kinds of Indian opium are aggregated together. In fact, these changes were not a monolithic event; in contrast to Malwa opium, the decline in Bengal opium occurred only in the 1890s, and then very rapidly. While exports of Malwa fell by over half between 1888 and 1908, over the same period Bengal only lost about 16%.[15] To some extent these divergent performances can be put down to differences in end markets. Of the tens of thousands of chests of Malwa exported each year during the late nineteenth century, on average less than a hundred went anywhere other than China. As far as Bengal was concerned, the picture was somewhat different; although China was also an important market for that variety of the drug, substantial quantities also sold in Southeast Asia and around the Indian Ocean.[16] Nevertheless, a more diversified customer base can only explain some of the greater resilience of Bengal opium. Again comparing across the twenty years starting in 1888, while 23% less Bengal went to China at the end of the period than at the beginning, the fall in Malwa was more than twice as large, at 51.6%.[17] Clearly, even within China, the negative effect was substantially weaker for Bengal than Malwa.

This bifurcated structure can be seen still more clearly in the structure of exports over time, shown in Figure 3.1. In the mid-1870s, shipments of Malwa began a steady decline which continued more or less unabated until the end of the period. By contrast, there is little evidence of any similar fall in Bengal, or for further comparison, in Persian opium during the same period. Rather, in the case of the former, exports increased during the 1880s along with increasing quantities being made available at government sales, while for the latter, the quantity shipped appears roughly constant over time. The drop in Bengal, when it did come, was sharp and

[15]Calculated from export statistics in Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce, *Financial and Commercial Statistics (1907)*, pp. 86–7; and Department of Statistics, *Financial Statistics (1918)*, pp. 170–1.

[16]Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce, *Financial and Commercial Statistics (1907)*, pp. 71–2; and Department of Statistics, *Financial Statistics (1918)*, p. 162

[17]These figures include re-exports via the Straits Settlements. Owing to the way the statistics were recorded, mainland China, Hong Kong, and Taiwan are counted together as 'China.' Calculated from data in Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce, *Financial and Commercial Statistics (1907)*, pp. 71–2; Department of Statistics, *Financial Statistics (1918)*, p. 162; *Finance and Revenue Accounts and Miscellaneous Statistics Relating to the Finances of British India, Part 3: Miscellaneous Statistics.* Calcutta, 1870-1893; Straits Settlements Statistical Office. *Straits Settlements Blue Book.* Singapore, 1868–1909

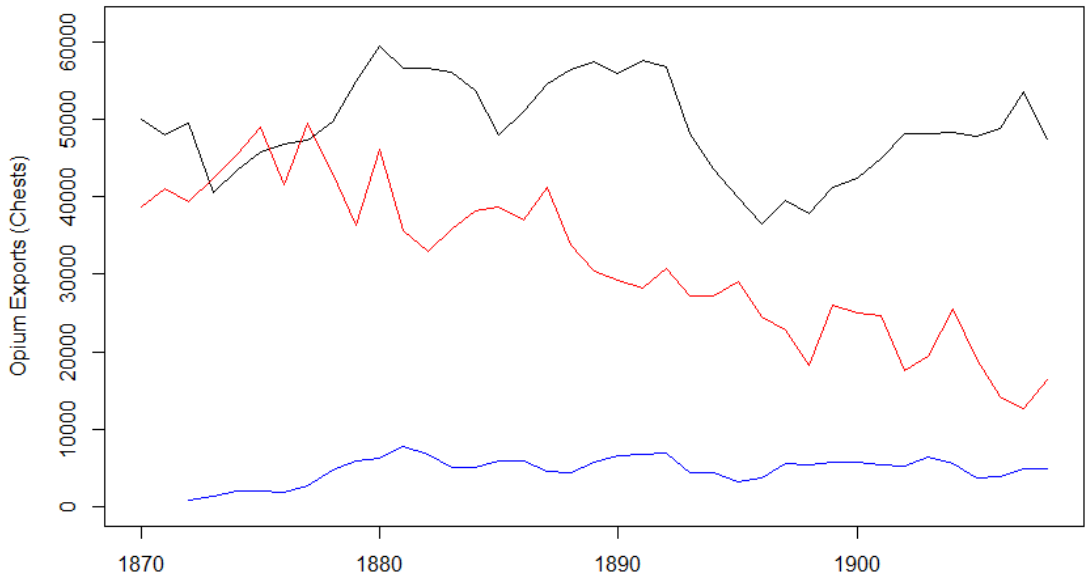

Figure 3.1: Total exports of Bengal (black), Malwa (red), and Persian (green) opium, 1870–1908. *Indian data from: Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce.* Financial and Commercial Statistics of British India. *Calcutta, 1907, pp. 71–2; and Department of Statistics.* Statistics of British India: Volume II: Financial Statistics. *Calcutta, 1918, p. 162. Persian exports calculated from figures in* Reports by H.M. Secretaries of Embassy and Legation on the Manufactures and Commerce of the Countries in which they Reside. *Command Papers. 1872–1886;* Diplomatic and Consular Reports. Persia. *Command Papers. 1886–1916; and* Diplomatic and Consular Reports. Turkey. *Command Papers. 1886–1916.*

sudden: exports fell from 56,773 chests to 36,390 in just four years between 1892 and 1896, before recovering somewhat, almost as quickly to stand at 48,062 in 1902, a level which they remained around for the next six years. This process is radically different from that followed by Malwa for three reasons. Firstly, in line with its more managed supply structure, exports from Bengal were much more stable, generally remaining at one level for several years before shifting to a new level. Secondly, the decline of Bengal was very significant but also very restricted in time, while that of Malwa was much slower, but very much more persistent. Thirdly, in contrast to Bengal, there is no evidence of any sustained recovery in Malwa. These facts suggest that while a general decline in demand probably does explain the long-term reduction in Malwa exports, it is less satisfactory when applied to the data for Bengal.

Instead it appears far more consistent with the impact of sudden and to some extent temporary shocks, such weather effects, rather than a slow but permanent shift in relative prices or consumer tastes.

Export quantities of course, can only tell part of the story. Since, the amount of Bengal opium reaching the international market was heavily controlled by the Monopoly, one might expect quantities to be less responsive to demand than for opium produced under less restrictive conditions; it is possible, under this assumption, that the Government of India was simply dumping opium on an already saturated market. In that case, one would expect opium prices, and particularly the price of Bengal to fall, as merchants struggled to sell the full provision to consumers. However, the available data on export prices does not match this hypothesis. Figure 3.2 shows monthly average price data collected by the Government on India from Calcutta and Bombay; together the two series provide a reasonable picture of Indian opium export prices across the period under consideration. While both the Bengal and the Malwa series show a slight decline in prices to the early 1890s, it is but a moderate one, and does not appear to systematically follow the changing quantities of Bengal on the market. This suggests that there was no consistent oversupply of Bengal opium during this period; instead the more stable exports of that variety of the drug probably actually represented more stable demand.

Obviously it is unlikely that the were no changes at all in the market for Bengal opium. The growing threat of Chinese production to all Indian varieties of the drug was very widely expressed at the time and the export figures cited above also show clear evidence of a shift in the destinations of the drug from China to Southeast Asia, presumably as a consequence of substitution towards domestic opium in the former case and increased purchasing power in the latter. Nevertheless, in-depth examination of the available export data reveals scant evidence of a sustained and systematic decline in demand for the Bengal Monopoly's products, in contrast to the fate of Malwa. Instead, the suddenness of the decline in exports of Bengal opium was the result of a combination of poor harvests and government policy.

To illustrate this point, it is necessary to recall the general effects of opium

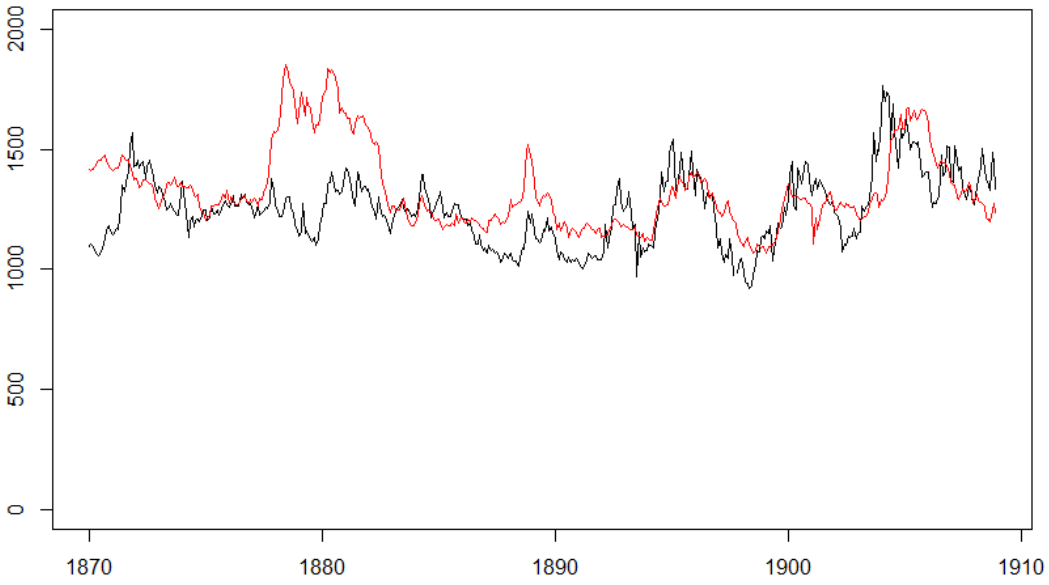

Figure 3.2: Monthly average government sales prices for Bengal opium (black) and average Bombay market prices of Malwa opium (red), 1870–1908 (Rs. per chest). *Data from:* Finance and Revenue Accounts and Miscellaneous Statistics Relating to the Finances of British India, Part 3: Miscellaneous Statistics. *Calcutta, 1870-1893; Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce.* Financial and Commercial Statistics of British India. *Calcutta, 1907, pp. 75–76; Department of Statistics.* Statistics of British India: Volume II: Financial Statistics. *Calcutta, 1915, p. 159; Department of Statistics.* Statistics of British India: Volume II: Financial Statistics. *Calcutta, 1918, pp. 162–163; and* Report on the Administration of the Opium Department of the Bombay Presidency. *Bombay, 1892–1909.*

policy before the 1890s. As described in Paper 1 the amount of Bengal available to the international market was defined by the quantity sold every month at the government auctions in Calcutta. In turn, this was dependent on two things: the total size of the year's harvest and the government's operation of the opium reserve. While the former was the main source drawn on for export opium, the latter was supposed to effectively remove year-to-year variations in the quantity of the drug sold. Additionally, by adjusting the targeted sale, the Government of India could react to changes in demand, keeping the price stable in the long run. As Figure 3.3 shows, in the first twenty-five years of its operation the quantity actually sold remained relatively close to the sale target, and with the exception of one year in the mid-1880s, the reserve prevented unexpected changes in the amount of opium auctioned.

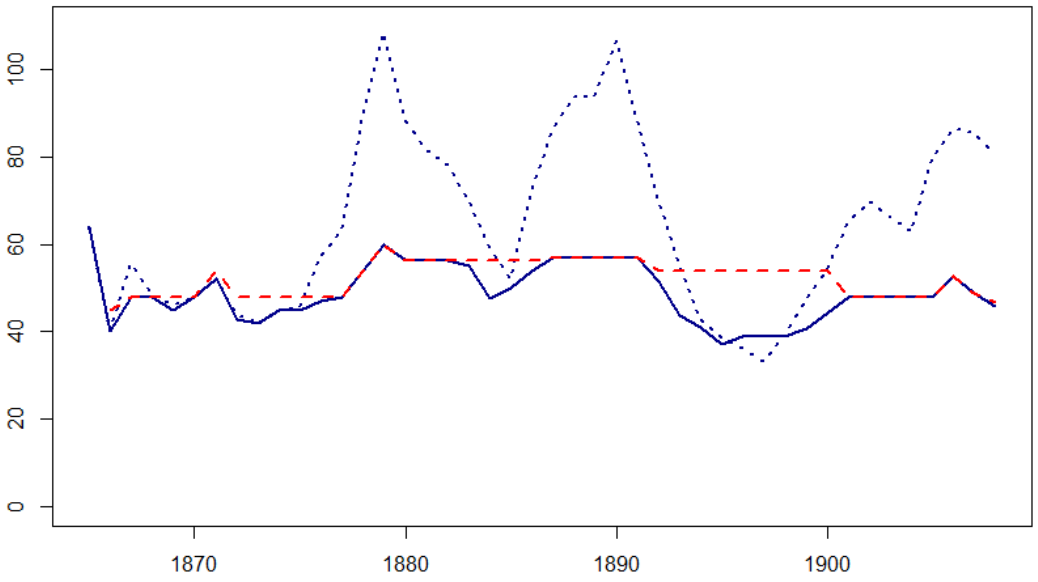

Figure 3.3: Opium reserve policy: quantity sold at government auction (solid blue), reserve (dashed blue), and sale target (red), 1865-1908 ('000 chests). Negative reserve values indicate years when sales drew on the current crop. *Data from:* Finance and Revenue Accounts and Miscellaneous Statistics Relating to the Finances of British India, Part 3: Miscellaneous Statistics. *Calcutta, 1870-1893; Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce.* Financial and Commercial Statistics of British India. *Calcutta, 1907; Department of Statistics.* Statistics of British India: Volume II: Financial Statistics. *Calcutta, 1918; and* Proceedings of the Government of India Department of Finance and Commerce. *Vol. IOR/P Vrs. India Office Records, British Library.*

This quarter-century of stability came to a sharp and comparatively sudden end. By the late 1880s, the quantity of opium held in reserve was becoming so high that it was difficult to make sure that all opium was sold before it spoiled. However, concerns about the risk of oversupplying the market prevented increased sales to clear the surplus. In response, the Government of India mandated a reduction in the area under poppy, with a view to production being concentrated in the most productive areas, with the significant caveat that steps should only be taken that would mean "that, in the event of stock being depleted by a bad year of production, it should not be out of the power of the Government to expand cultivation."[18] Although reported to be unpopular with cultivators, this programme was largely successful, reducing opium acreage by 7.5 percent over two years, after which further reductions were

[18]IOR/P/3270/798, p. 718

halted.[19]

However, when the very next year in 1889 short harvests did occur, and then continued for another seven years, the Government of India did not respond by ordering an immediate increase in the area under poppy. Instead, acreages remained low for several years, the reserve was entirely eaten up, and the amount of opium sold each year had to be rapidly and summarily reduced. This was entirely contrary to the way in which the reserve system was meant to operate: rather than production and the level of the reserve being adjusted to guarantee the desired level of sale, the sale target was apparently being abandoned with little effort to defend it. The effects of this are fairly apparent; the successive effects of the initial shock from the poor outturns, followed by the recovery and the stepped reductions in the provision target to meet the actual level of production shown in Figure 3.3 largely explain the developments of Bengal opium exports seen in Figure 3.1.

As such, then, the course followed by the Government of India over this period represented a significant deviation from previous practice. The standard response to past instances of declining opium output had been simply to increase the area licensed for poppy. Although there was usually a delay of a year or two between a change in acreage being ordered and the increase or decrease actually being effected, this had proven a reasonably adaptable solution. There was no apparent lack of will on the part of the government, and neither, as noted earlier, was the overall situation especially unusual; the poppy's extreme vulnerability to adverse weather conditions and blight, as well as competition from other cash crops meant that output was very unpredictable, with a major trough in production at least once per decade throughout the second half of the nineteenth century. Why then did the crisis of the early 1890s, a predictable albeit particularly bad shock to supply, so completely dislocate the existing reserve system? And, further, it having done so, why did Bengal opium not suffer the same fate of permanent decline that Malwa did? The answer to both these questions lies in the local political and economic constraints on the response of the Government of India.

[19]India Office. *Statement Exhibiting the Moral and Material Progress and Condition of India, During the Year 1888-89.* House of Commons Paper 384. 1890, p. 71

3.2.2 The Politics of Opium

The second, and in some ways more immediate, impetus for change to the opium revenue came from a more distant source. A shift in British public opinion on the morality of the trade in general, and the Government of India's participation in it in particular, constrained the actions which the latter could take in response to the rapid decline of opium production. The tension between a rising tide of anti-opium sentiment in Britain, its own fiscal policies, and domestic political pressures in India meant that in its response to the production crisis the Government of India was faced with a problem: any policy which failed to restore the system of opium procurement could potentially cause serious fiscal and political problems in India, while inconvenient legislation in Britain could bring an end to the opium revenue altogether. Consequently the approach it took to the production crisis was conditioned by the specific currents of the debate over the opium question.

Since the trial of Warren Hastings, the involvement of the Government of India and its officials in the opium trade had been a matter of some discussion in British political life.[20] However, from the middle of the nineteenth century, a widespread and increasingly organised anti-movement began to take shape in response to the perceived evils of the drug. While early calls for the control of the opium were mostly concerned with consumption within Britain, and had their origin in the increasing regulation of the Medical and Pharmaceutical professions and growing interclass tensions, increasingly the focus of popular attention shifted onto the role of Britain in the supply of opium overseas, and especially in Asia.[21] Under the influence of Nonconformist groups, many of which had strong links with missionary activity in China, a discourse which cast opium consumption and the opium trade as fundamentally immoral developed.[22] These different movements were brought

[20] "11th Article, Articles of Charges of High Crimes and Misdemeanors Against Warren Hastings, Esquire, Late Governor General of Bengal". In: *Papers Relative to Hasting's Impeachment, Volume 3, Part 2, 1786 and 1787, House of Commons Sessional Papers of the Eighteenth Century.* Vol. 59, pp. 1–3; and Edmund Burke. "Speech on the Impeachment of Warren Hastings, Esq., Third Day of Reply, 3rd of June, 1794". In: *The Works of the Right Honourable Edmund Burke, Volume VIII: Speeches on the Impeachment of Warren Hastings and Letters.* London, 1877, pp. 69–70

[21] Berridge, "Victorian Opium Eating", pp. 442–451 & 460

[22] As an example of the importance with which opium was viewed by the these groups, the synod of the Presbyterian Church of England passed six anti-opium resolutions in the second half of the

together by the formation of the Society for the Suppression of the Opium Trade (S.S.O.T.) in 1874.

Initially focused on the diplomatic aspects of the opium trade, the Society's membership and political influence grew rapidly, reaching a peak in the late 1880s and early 1890s.[23] At the same time, it was beginning to redirect its efforts to focus primarily on the production of opium in India and the revenue which the colonial government drew from it. Following the publication of its *Statement of the Facts and Principles Upon Which the Action of the Society for the Suppression of the Opium Trade is Based* the Society concentrated largely on lobbying for an end to opium production in India, especially in those areas under direct British control (i.e. primarily Bengal).[24] This increased scrutiny culminated in a successful motion passed in the House of Commons in 1891 to the effect: "that this House is of the opinion that the system by which the Indian Opium Revenue is raised is morally indefensible, and would urge upon the Indian Government that they should cease to grant licenses for the cultivation of poppy and sale of opium in British India, except to supply the legitimate demand for medical purposes, and they should at the same time take measures to arrest the transit of Malwa opium through British territory."[25] While this motion had little practical impact, it nevertheless represented a substantial victory for the anti-opium movement.

In the long term, one of the main impacts of the campaign in Britain was to increase political pressure on the Liberal government which came to power in 1893 to take some action on the opium question, resulting in the monumental *Royal Commission on Opium*, which while its main subject was conditions in India, nevertheless also took evidence on the impacts of Indian opium in a number of importing countries. Although its eventual report concluded that the current system in India should be continued, and lessened the pressure for the British Government to take significant anti-opium action for at least a decade, it nevertheless ensured that the issue of the production of opium by the Government of India remained

nineteenth century, in 1858, 1880, 1881, 1887, 1891, and 1898. (Lodwick, *Crusaders*, p. 51)

[23]Berridge and Edwards, *Opium and the People*, pp. 180–183

[24]Lodwick, *Crusaders*, p. 56

[25]*House of Commons Debate, (10th of April, 1891).* Vol. Third Series, Volume 352. Col. 304. The motion was proposed by Sir Joseph Pease, one of the leading supporters of the Society.

a highly politicised one in Britain and India.[26] If nothing else, the fact that the S.S.O.T. and its supporters could effectively challenge Indian opium policy in the House of Commons raised the prospect that more substantive legislation against the trade in opium in the British Empire might follow.

As the anti-opium movement in Britain gained momentum, the Government of India was faced with the very real possibility that it might very suddenly be forced to give up the roughly 80 million Rupees it got from exports of opium and the internal excise taxes on the drug. Given that this still represented somewhere between ten and fifteen percent of British India's tax receipts, there was an extremely strong fiscal incentive for the officials to avoid this scenario. However, the question was not merely a financial one. There was also substantial internal political pressure for the maintenance of the opium revenue on pragmatic grounds. While some nationalist leaders, notably Naoroji and Dutt, morally objected to the extraction of revenue from opium, the majority were opposed to any changes to the revenue system which would lead to greater internal taxation in India.[27] The latter opinion was also heavily reflected in the Indian-owned press, which for the most part advocated the idea that if British public opinion thought the opium revenue immoral, then it should be British rather than Indian taxpayers that bore the cost of abolishing it.[28]

Faced with its own fiscal self-interest and domestic public opinion on the one hand, and an increasingly influential metropolitan political movement on the other, the Government of India sought to pursue a middle policy: avoiding actions which might bring further criticism, while continuing to collect what was still its second-largest source of revenue. Giving evidence to the Royal Commission, Sir David Barbour, the head of the Financial Department, explained this shift in the government's opium policy: "in very recent years we have rather avoided any appearance of an increase because we were liable to be be attacked on account of the increase. We were liable to have it said... that we were stimulating production and consumption, and therefore during the last few years we have rather avoided any appearance of an increase in

[26]Richards, "Opium and the British Indian Empire", pp. 377–381; and Richards, "Moral Economy", pp. 77–79

[27]B. Chandra. *The Rise and Growth of Economic Nationalism in India: Economic Policies of Indian Nationalism Leadership, 1880–1905.* New Delhi, 1966, pp. 563–571

[28]Gilbert, "Empire and Excise", pp. 128–132

the cultivation."[29] Whereas previously the Government of India had been fairly free to set the amount of opium to be sold and the area to be licensed for cultivation without outside influence, and did so largely on the basis of commercial and revenue considerations, officials now had to shape revenue policy around political conditions in both Britain and India.

3.3 Constraints, Crisis, & Cultivators

3.3.1 Reforming Cultivation

The result of the sudden increase in public and parliamentary interest in Indian opium in Britain immediately before the onset of the production crisis was that the Government of India's response to the latter was considerably more constrained than had been the case in similar situations previously. When it became clear in 1891 that after three years of bad harvests the reserve was close to exhausted, the Board of Revenue was quick to recommend the traditional solution of expanding cultivation to guarantee production. However, in forwarding this suggestion to the central government, the Lieutenant-Governor appended the comment that while this would be the most effective thing to do, it was almost certainly politically inexpedient to put more land under poppy in the face of growing pressure around the opium question in Britain.[30] The response from the Financial and Commerce Department agreed with this view and ordered that there should be no efforts made to expand production, rather: "the cultivators should be left free to decide for themselves whether it is or is not profitable for them to cultivate opium on their land in preference to other crops."[31] Instead, the amount put up for sale should be cut from 57,000 to 54,000

[29] Evidence of the Honourable Sir David Barbour, Financial Member of the Governor-General's Council, *Royal Commission on Opium, Volume II*

[30] "C.E. Buckland, Officiating Secretary of the Government of Bengal Revenue Department to the Secretary of the Government of India Finance and Commerce Department, 10th of June, 1891 (No. 477)". In: *Proceedings of the Government of India Department of Finance and Commerce, January to December, 1891.* Vol. IOR/P/3958. India Office Records, British Library, p. 562

[31] "J.F. Finlay, Secretary of the Government of India Department of Finance and Commerce to the Secretary of the Government of Bengal Revenue Department, 13th of July, 1891 (No. 483)". In: *Proceedings of the Government of India Department of Finance and Commerce, January to December, 1891.* Vol. IOR/P/3958. India Office Records, British Library, p. 565

chests, as the maximum which could be sustained at the present outturn.[32].

The next year, with no sign of any improvement in yields and the reserve almost completely empty, the same point was made even more forcefully:

> His Excellency the Governor-General in Council is opposed to the adoption of any measures intended to induce the cultivators to cultivate poppy in preference to other crops and cannot under any circumstances sanction a permanent increase in cultivation in excess of the average of past years... [However, the Agents should not refuse] any offers made voluntarily by the cultivators to increase the area of poppy cultivation.[33]

This approach, while it avoided unfortunate questions at home, was extremely damaging to the stability of the opium revenue system. The opium reserve, and to a lesser extent the rest of the Monopoly, were designed to prevent sudden and unpredictable changes in the quantity of opium sold. By the middle of 1892, rumours were already beginning to spread that the government sale quantity would be changed once again.[34]

However, besides the issue of short-term fluctuations in the market, the government was concerned with a more long-term question. While acknowledging that so far exports of Bengal opium to China had held up relatively well, its continued consumption was viewed as matter of "force of habit and acquired tastes."[35] Reductions, even temporary ones, in the quantity of provision opium were seen as running the risk of permanently loosing consumers to domestic or international competition, a consideration that led to a preference for keeping sale quantities as high as possible, even at the cost of stability.[36]

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[32] IOR/P/3958/483, p. 565

[33] "J. F. Finlay Secretary of the Government of India Department of Finance and Commerce to the Secretary of the Government of Bengal Revenue Department, 6th of July, 1892, (No. 657)". In: *Proceedings of the Government of India Department of Finance and Commerce, January to December, 1892.* Vol. IOR/P/4179. India Office Records, British Library, p. 691

[34] "Radhakissen Petty and Others to the Honourable Sir D. Barbour, Finance Minister, June, 1892 (No. 648)". In: *Proceedings of the Government of India Department of Finance and Commerce, January to December, 1892.* Vol. IOR/P/4179. India Office Records, British Library, p. 648; and "The Opium Merchants of Calcutta to the Honourable Sir D. Barbour, Finance Minister, 13th of June, 1892 (No. 651)". In: *Proceedings of the Government of India Department of Finance and Commerce, January to December, 1892.* Vol. IOR/P/4179. India Office Records, British Library, p. 684

[35] "K.G. Gupta, Secretary to the Board of Revenue, Lower Provinces to the Secretary of the Government of Bengal Revenue Department, 1st of May, 1891 (No. 478)". In: *Proceedings of the Government of India Department of Finance and Commerce, January to December, 1891.* Vol. IOR/P/3958. India Office Records, British Library, p. 562

[36] See for example: "L.P. Shirres, Officiating Secretary to the Board of Revenue, Lower Provinces

The countervailing force of these two beliefs — that it was politically impossible to mandate an increase in cultivation and that any significant reduction in the Bengal provision might put it onto the same downwards track as Malwa — presented the Government of India with a particularly difficult problem: how to restore production without appearing to want to expand the scale of production by the Monopoly. Since directly government-driven expansion was impractical, the focus instead shifted to making opium more attractive to cultivators so that they would spontaneously ask to be licensed to put more land under poppy.

The government's first step was to ensure that opium was more generally remunerative than other crops. Competition for prime land from wheat, rice, potatoes, indigo, and sugarcane had long been regarded as harmful to opium yields.[37] However, this concern had not led to action. By 1894, the price paid to cultivators for opium had remained the same for thirteen years, having been last raised in 1881, while at the same time the prices of some other crops had increased significantly over the period. As the harvest in that year fell below even the reduced average of the preceding few years, it was felt by almost everyone involved in opium policy to be necessary to raise the cultivator price to prevent further reductions in opium. The advice of the Lieutenant-Governor and the Board of Revenue was that an increase to at least Rs.6 per seer was necessary to effect a general increase, although Rs.5.08.00 might be effective in the Benares Agency alone.[38] Even this step had to be justified by the Governor-General to the Secretary of State for India as one of stabilisation rather than expansion:

> Our reserve is exhausted, and all authorities agree that the opium revenue is in imminent peril unless this remedy [raising the cultivator price] be applied. We have no intention of increasing our standard of

to the Secretary of the Government of Bengal Revenue Department, 16th of May, 1893 (No. 778)". In: *Proceedings of the Government of India Department of Finance and Commerce, January to December, 1893.* Vol. IOR/P/4396. India Office Records, British Library, p. 864.

[37] *Report of a Commission Appointed by the Government of India to Enquire into the Working of the Opium Department in Bengal and the North-Western Provinces.* Calcutta, 1883, pp. 217–18

[38] This second amount is equal to $5\frac{1}{2}$ rupees; a seer here is equivalent to 2.06 lbs. or 0.93 kg. "C.E. Buckland, Secretary to the Government of Bengal Revenue Department to the Secretary of the Government of India Department of Finance and Commerce, 11th of May, 1894 (No. 1287)". In: *Proceedings of the Government of India Department of Finance and Commerce, January to December, 1894.* Vol. IOR/P/4396. India Office Records, British Library, p. 717.

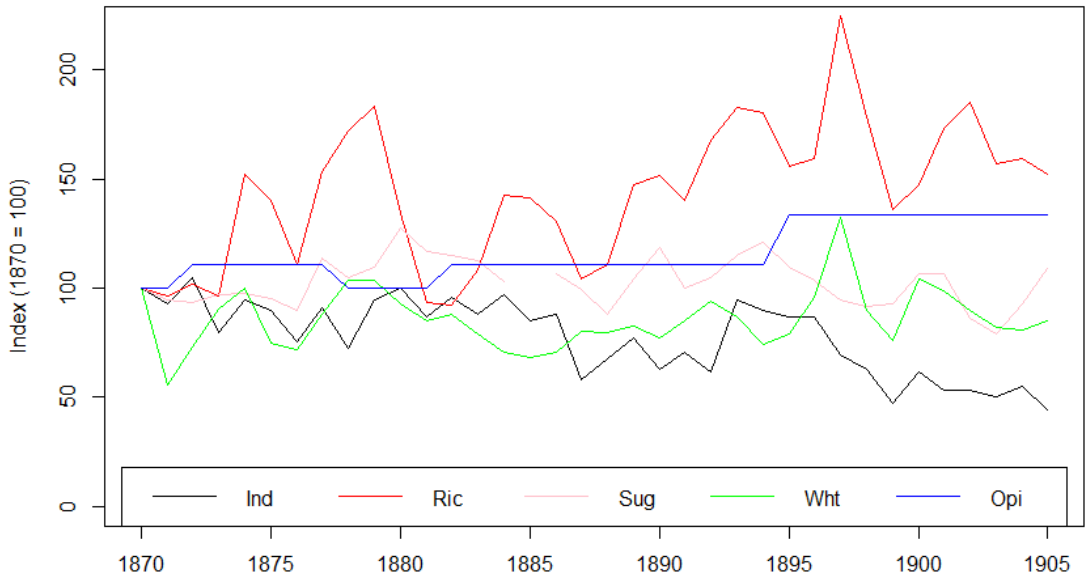

Figure 3.4: Index of cultivator price for Benares opium and Calcutta wholesale prices of selected other crops (indigo, rice, sugar, and wheat), 1870–1905 (1870 = 100). *Calculated from data in: Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce.* Financial and Commercial Statistics of British India. *Calcutta, 1907, pp. 80–1; Department of Statistics.* Statistics of British India: Volume II: Financial Statistics. *Calcutta, 1918, pp. 164–5; and* Prices and Wages in India. *Calcutta, 1906, pp. 207–215.*

> production or sale, and we are not likely even to maintain it.[39]

This change in policy had its effect. As Figure 3.4 shows, the increase in the amount paid to the cultivator meant that opium prices had increased relatively more than most other comparable crops.[40] This was important since although in absolute terms the return on growing opium was almost always higher than other crops, it also tended to be a lot less certain in outturn, meaning that it was also a more risky crop for cultivators.

The government's efforts to encourage increased production of opium were not limited to purely commercial lines. The differing systems by which cultivators were actually paid also came under scrutiny. While the operation of the assamiwar system

[39] "Telegram from the Viceroy to the Secretary of State for India, 24th of May, 1894, (No. 1290)". In: *Proceedings of the Government of India Department of Finance and Commerce, January to December, 1894.* Vol. IOR/P/4396. India Office Records, British Library, p. 726

[40] Given that the prices for the other crops given in Figure 3.4 are wholesale prices, the difference may in fact have been even larger.

in the Benares Agency was generally looked on a being the fairest and least open to abuse of the two, the drive to make opium an attractive crop led to close scrutiny of both systems. The apparent necessity of doing so, especially in the Bihar Agency was emphasised in 1896, in fairly typical terms, by G. A. Grierson, the Bihar Opium Agent: "There is no more industrious cultivator in India, or one more deserving of encouragement, than the average Indian opium cultivator. There is hardly a more uncertain crop, or one more subject to the vicissitudes of the season, than the opium poppy; and it is a fortunate circumstance for us that the ever-hopeful character of the Bihar raiyat [cultivator], with his memories of past years of successful poppy cultivation, has saved us from heavy loss." He went on to suggest that conditions for those growing opium continued to be relatively unfavorable, "unless we can devise some means to make the position of the opium cultivator more attractive, we must look forward to a considerable decrease in our cultivation in the near future." The solution, he suggested was that the government "must make our system of doing business more agreeable to our clients."[41]

The problem which concerned Grierson as well as the opium administration at large was the potential, especially under the khattadari system, for the license-holders and other intermediaries to extract excessive payments from the cultivators, thereby nullifying the effects of the higher price of opium and further limiting the degree of direct control which the government had over how much poppy was actually grown. So far as the opium administration was concerned, the lack of formal separation between the produce of different cultivators within each license and the absence of oversight over how (or whether) the khattadars distributed payments were major disincentives to expanded cultivation. With the need to encourage renewed cultivation now higher than ever, the government arrived at a solution that had been discussed a number of times previously but never carried out: transplanting the successful assamiwar system from the Benares Agency to Bihar.

However, while there was a strong impetus for the government to introduce

[41] "G.A. Grierson, Opium Agent of Bihar to the Secretary to the Board of Revenue, Lower Provinces, 22nd of December, 1896, (No. 724)". In: *Proceedings of the Government of India Department of Finance and Commerce, January to June, 1898*. Vol. IOR/P/5489. India Office Records, British Library, p. 1039

the assamiwar payments into the Bihar Agency, this proved much more difficult in practice. As a first step towards extending the system, in 1896 a trial was carried out in three sub-divisions, one in north Bihar, one in south Bihar, and one in the parts of Chota Nagpur covered by the Bihar Agency. In this experiment the cultivators who came to deliver their opium to be weighed were given the choice to either be paid individually or through the khattadars as normal. However, although almost all the cultivators in each of the three sub-divisions attended the weighment, in the two in Bihar proper, only an extreme minority chose the new system. For example, in Phulwari (near Patna) only 374 cultivators out of 13,186 stayed to receive their payments the next day, and they all left when it was explained to them that they still had the choice to by paid through the khattadars. Similarly, when it came to the final settlements at the end of the opium year, only 26 assamis (cultivators) attended, while the rest paid or received the outstanding balances through their khattadar.[42] Although the results in Chota Nagpur were much more successful (65% of cultivators chose individual payments there), this response was interpreted by the government as a general rejection of the full assamiwar system in most of Bihar.[43]

These results were interpreted within the opium administration as a consequence of local variations in the way the khattadari system operated. A.G. Tytler, the sub-deputy Agent who had overseen this set of experiments, put the relatively high acceptance of the assamiwar system in Chota Nagpur down to the "dishonest and oppressive practices of the khattadars" in that region and the high level of payments they levied from the assamis.[44] However, leaving aside the issue of whether intermediaries in Chota Nagpur were actually more abusive than those in the rest of Bihar, it is also not clear that charges were especially lower elsewhere in Bihar; the Rs. 1.8.0 (Rs. $1\frac{1}{2}$) per bigha that Tytler cited as typical of Chota Nagpur is comparable to the range of between Rs. 1 and Rs. 2 per bigha in the rest of Southern

[42] "A.G. Tytler, Sub-Deputy Opium Agent of Aliganj to the Opium Agent Bihar and Attachments, 16th of November, 1896, (Nos. 725–749)". In: *Proceedings of the Government of India Department of Finance and Commerce, January to June, 1898.* Vol. IOR/P/5489. India Office Records, British Library, p. 1042

[43] "M. Fircane, Secretary of the Government of Bengal to the Secretary of the Government of India Department of Finance and Commerce, 18th of June, 1897, (No. 722)". In: *Proceedings of the Government of India Department of Finance and Commerce, January to June, 1898.* Vol. IOR/P/5489. India Office Records, British Library, p. 1031

[44] IOR/P/5489/725–749, p. 1042; and IOR/P/5489/722, p. 1031

Bihar that Tytler himself cited in a related memorandum.[45]

Given that the assamiwar system was, at least notionally, supposed to be more advantageous for cultivators, perhaps the more difficult fact to explain is the apparent lack of enthusiasm for the it in other parts of Bihar. Although it is probably impossible to come to a conclusive answer using the available evidence, there are at least some reasons to believe that village economies within Bihar had adapted to the role of the khattadar in the government's procurement of opium in such a way that payments to the khattadar for the opium produced in his license had become interlinked with other kinds of transactions. In turn this may have meant that not only khattadars, but cultivators also may have been unwilling to acquiesce to changes that altered these relationships. In fact, as early as the late 1880s the Board of Revenue was arguing that only partial reform of the khattadari system would not work in Bihar, since: "The khattadar and his assamees [sic] have probably innumerable debtor and creditor accounts to adjust, separate from the opium account.[46]

While, again, the nature of these transactions are difficult to decisively determine, but as the people who acted as khattadars were generally amongst the economic elite of a village, there are several reasonable possibilities. In the first place, it seems especially likely that transactions related to opium could mediate the availability of credit for cultivators. Although he did not explicitly make a connection to the khattadari system, a similar link was drawn by Tytler in his evidence to the Royal Commission on Opium: "The vast majority of ryots [cultivators] live and die in debt," but whereas poppy cultivators could borrow in cash at a mere 12–20% a year, most other peasants had to "...borrow in grain to be repaid in kind, the terms of their loan comparing disastrously with those allowed to the poppy ryot, bad as they are."[47] As well as the security given by the cash income, in cases where the khattadar and the moneylender were the same person, the fact that the khattadar could take payments directly from the money paid by the government for the cultivator-borrower's opium

[45] "Memorandum by A.G. Tytler on the Alternative Assamiwar System for the Bihar Agency, 16th of November, 1896, (No. 757)". In: *Proceedings of the Government of India Department of Finance and Commerce, January to June, 1898*. Vol. IOR/P/5489. India Office Records, British Library, p. 1079

[46] IOR/P/3270/14, p. 81

[47] Evidence of A.G. Tytler, *Royal Commission on Opium, Volume III*, p. 50

may also have contributed to lower interest rates those who grew opium. On a connected note, in the historical literature on the topic it is commonly asserted that khattadars often acted as agents for landlords, taking directly taking rent payments out of opium advances.[48] Certainly it was quite common, in some areas, for the landlord to farm out the right to collect rents to a "petty local capitalist" in each village, who might have also been the khattadar.[49]

Whether these phenomena represented the results of compulsion, market failures, or free negotiation is not particularly germane to the argument presented in this paper. Instead the essential point is that the Opium Department's use of the khattadari system in Bihar created new economic links between assamis (cultivators) and khattadars that reinforced the position of the latter over time. Whatever the reason for the failure of the Opium Department's experiments with assamiwar payments in Bihar, the end result was that the Government of India had to adapt its plans for rationalisation to the relatively strong position of intermediaries in Bihar. The reforms that were actually implemented across most of the Agency were suggested by Tytler, who outlined an 'alternative assamiwar' system under which khattadari payments would continue for any cultivators who wanted them, but all accounts and payments were to be made out and settled for each individual cultivator, rather for the license as a whole. Additionally, payments by the cultivators to the khattadar were formally limited to 8 annas ($\frac{1}{2}$ of a rupee) per bigha.[50] However, this proposal did little to solve the main issues with the existing khattadari system. In the first place, since payments continued to be distributed through the khattadars the destination of the money remained just as uncertain as before. Controls on intermediary payments were similarly notional; the Opium Department had substantial difficulties in monitoring even the activities of its direct employees, and it seems unlikely that there was

[48]See for example: Bauer, *Peasant Production of Opium*, pp. 30, 184–192. It is difficult to find concrete examples of this occurring in Bihar, however there exist a couple of references to a not dissimilar practice in Oudh (within the assamiwar system) where an agent of the landlord would accompany those cultivators who were known as unpunctual rent payers to the opium weighments to receive the money directly as soon as the cultivator received it (Evidence of the Honourable Sri Rai Bahadur, Member of the Lieutenant-Governor's Council, Honourary Magistrate, Government Pleader, Public Prosecutor, Talukdar, and Member of the British Indian Association of Oudh, *Royal Commission on Opium, Volume III*, p. 121; and Evidence of Babu Ram Singh, Deputy Collector and Manager of the Court of Ward's Estates in Rai Bareli, N.W.P.O., ibid., p. 146).

[49]Grierson, *Notes*, p. 78

[50]IOR/P/5489/757, p. 1079

ever a realistic prospect of government officials being able to monitor transactions between assamis and khattadars well enough to enforce the 8 anna limit.[51] In fact, in proposing the idea Tytler himself acknowledged these problems, but said that he felt that with individualised accounts the khattadars could be trusted to pay cultivators correctly.[52] Nevertheless, following a further round of testing in selected sub-divisions, this alternative system was extended to most of the rest of the Agency in 1901.[53] Only in Chota Nagpur, where the initial experiments had been more successful, was the full assamiwar system implemented.

By contrast, in the Benares Agency efforts to reform the system of opium procurement were much more limited but at the same time were executed much more straightforwardly. The relative success of the assamiwar system in previous years meant that changes were primarily directed towards increasing the degree of oversight mid-level officers could exercise over transactions with cultivators. For example, at about the same time that the 'alternative' scheme was being trialled in Bihar, in Benares it was ordered that in areas with relatively low cultivator attendance at the final settlements, engagements, weighments, and settlements would take place only 10–15 miles from the furthest cultivator and when dealing with cultivators each gazetted officer should see no more than 400 cultivators per day.[54] While this was a relatively minor policy development when compared to those in Bihar, nevertheless it did tend to further limit the role of intermediaries. However because mid-level officials were much more involved in transactions with cultivators and the role of intermediaries was consequently that much less, regulating the former was perceived as a more effective strategy than regulating the latter. As a result the successful introduction of these reforms was less contingent on the state's ability to alter intra-village relationships between lambardars and assamis, but instead the

[51] For a details discussion of the Department's monitoring problems, see Paper 2.

[52] IOR/P/5489/757, p. 1079

[53] "W.S. Meyer, Deputy Secretary to the Government of India Finance and Commerce Department to the Secretary to the Government of Bengal Revenue Department, 6th of February, 1901, (No. 153)". In: *Proceedings of the Government of India Department of Finance and Commerce, January to December, 1901.* Vol. IOR/P/6180. India Office Records, British Library, p. 489

[54] "W.S. Meyer, Deputy Secretary to the Government of India Department of Finance and Commerce to the Secretary of the Government of Bengal Revenue Department, 22nd of May, 1899, (No. 512)". In: *Proceedings of the Government of India Department of Finance and Commerce, January to June, 1899.* Vol. IOR/P/5719. India Office Records, British Library, p. 825. Gazetted officers included the Opium Agents, Sub-Deputy Agents, and Assistants.

structure of the opium administration itself.

The other main area of reform in Benares also illustrates this point. Until the end of the nineteenth century lambardars were paid for the scrapings from all the opium jars delivered by their assamis.[55] Although considered preferable to the unregulated system of informal payments in Bihar, as the amount which needed to be scraped was poorly defined and was effectively a direct loss to the cultivator who had produced the opium, this system was considered: "injurious to the interests of Government,... causes discontent amongst the cultivators, and affords the subordinate staff opportunities for plundering them."[56] Consequently, in 1903 a flat commission of 2.5% on the value of the opium, to be paid directly by the government, was introduced.[57] Although certainly not proof against lambardars demanding illicit payments from cultivators, this innovation did represent a significant attempt to regularise the position of intermediaries with respect to the state; as the Opium Department already had much more control over how lambardars were paid than they did for khattadars, it was much easier to introduce changes which further increased the power of the state in the Benares Agency than in Bihar.

While the introduction of the 'alternative assamiwar' system still represented one of the more significant alteration to the system of opium procurement in Bihar, the difficulty faced by the colonial state in overcoming the relative influence of intermediaries meant that these changes were ultimately unsuccessful. In practice, many of the central flaws of the khattadari system remained in place, a fact which, together with the effects of several years of disruption meant that the Bengal Monopoly never completely returned to the stability it had enjoyed before the 1890s. As the next section will show, in following years the gap between the two agencies grew steadily wider. Although the price paid to cultivators had been increased by

[55] Since opium stuck to the sides of the jars in which it was transported, some it had to be scraped off, often bringing detritus with it. This imperfect opium was bought by the government at a lower rate than purer kinds.

[56] "A. Earle, Officiating Secretary to the Government of Bengal Revenue Department to the Secretary of the Government of India Finance and Commerce Department, 1st of June, 1903, (No. 485)". In: *Proceedings of the Government of India Department of Finance and Commerce, July to December, 1903*. Vol. IOR/P/6646. India Office Records, British Library, p. 1665

[57] "The Secretary of State for India to the Government of India, 13th of November, 1903, (No. 593)". In: *Proceedings of the Government of India Department of Finance and Commerce, July to December, 1903*. Vol. IOR/P/6646. India Office Records, British Library, p. 1977

the same amount in both places, the differing institutional settings meant that the response was very different. As cultivation underwent a significant expansion in Beanres, in Bihar the state-sponsored production of opium became less and less tenable as the twentieth century began.

3.3.2 The Recovery: A Return to Stability?

Although it is obviously unclear whether a successful implementation of the assamiwar system in Bihar would have entirely solved the Opium Department's problems there, the remaining history of that Agency does tend to indicate that it would at least have mitigated them to some degree. Initially the introduction of limited reforms to the khattadari system led opium officials to believe that the crisis might only be temporary, but this hope was quickly shown to be illusory. While overall production of provision opium rose from a low point of 33,329 chests in the 1893–1894 season to a peak of 64,739 in the year ending 1903, almost all of this growth came from increasing cultivation in the Benares Agency.[58] As shown in Figure 3.5, the expansion of the area under poppy there was sufficient to raise the combined area in both Agencies to 260,144.5 hectares in 1904 — the highest ever total. However, at the same time cultivation in Bihar was shrinking to levels not seen since the early 1860s. The sole exception to this trend was Hazaribagh, the division newly created as the only part of the Bihar Agency in which the full assamiwar system would be introduced. Here, and here only, was there a consistently higher areas under poppy from the reforms of 1898 to the start of more general reductions after 1905.[59] While not as successful as some parts of the Benares Agency, the contrast between the fate of the assamiwar and 'alternative assamiwar' divisions in Bihar is nevertheless suggestive.

Certainly there are no other obvious reasons for such a divergence to emerge when, or a suddenly as it did. In particular, the different outcomes were probably not driven by variation in the returns to cultivating opium; Figure 3.6 shows that while (as in the 1880s) on average slightly more opium was produced per hectare

[58] Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce, *Financial and Commercial Statistics (1907)*, p. 79

[59] *Report on the Administration of the Opium Department, Inclusive of the Opperations of the Behar and Benares Opium Agencies, Vrs.* Calcutta, 1893–1909

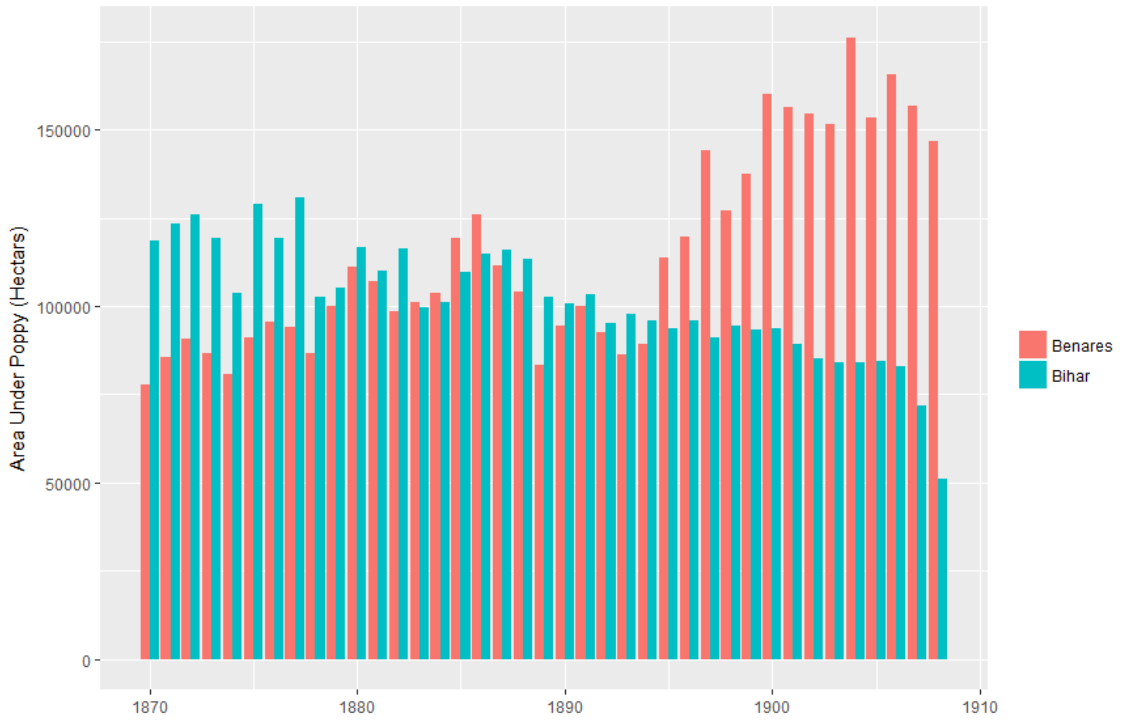

Figure 3.5: Area under poppy in the Bihar and Benares Agencies, 1870–1908 (hectares). *Sources: Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce.* Financial and Commercial Statistics of British India. *Calcutta, 1907, p. 78; and Department of Statistics.* Statistics of British India: Volume II: Financial Statistics. *Calcutta, 1918, p. 164.*

in Benares, the gap between the two was relatively small, and the range between the best and worst performing sub-agencies in each was quite similar. In the same way, within Bihar yields in Hazaribagh generally remained close to the median for the agency and the division was never among the highest performers in that agency. Since the profitability of opium cultivation was closely tied to yield, it seems unlikely that the expansion of opium cultivation in some regions and its contraction in others simply reflected higher returns.

There are of course other factors which also contributed to the differing responses between the two agencies. To begin with, poor food crop harvests and concomitant famine in the N.W.P.O., the province which contained the Benares Agency, also probably contributed to the extension of opium lands in that region. The advances paid to cultivators under opium licenses, together with the interest-free loans for the repair and expansion of irrigation works related to the cultivation of the drug, no doubt proved especially attractive in a period when even agricultural districts were

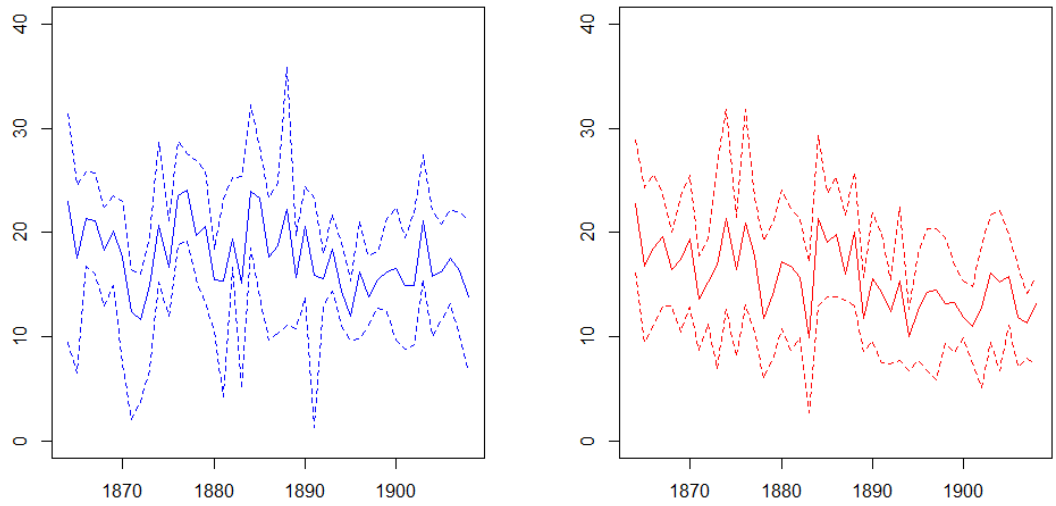

Figure 3.6: Maximum, minimum, and average opium yield by sub-agency in the Benares (left) and Bihar (right) Agencies (kgs per hectare), 1864–1908. *Calculated from data in:* Finance and Revenue Accounts and Miscellaneous Statistics Relating to the Finances of British India, Part 3: Miscellaneous Statistics. *Calcutta, 1870-1893; and* Report on the Administration of the Opium Department, Inclusive of the Opperations of the Behar and Benares Opium Agencies, Vrs. *Calcutta, 1893–1909.*

having to make extensive imports of grains to make up short harvests. The $168\frac{1}{2}$ lakh rupees paid out in advances and settlements by the Benares Agency between July 1896 and October 1897, largely in famine-affected districts, was particularly noted by the Scarcity Department of the provincial government.[60] Wider commercial forces also may have played a role in the divergence of the two opium agencies. Demand for other cash crops, in part associated with the fall in the gold value of the rupee which had occurred in the preceding decades, was growing rapidly during the 1890s. This effect was especially acute in Bihar; the growth of the railway and other transport networks meant that other high value crops, especially indigo, were expanding there potentially taking both land and the labour and attention of cultivators away from opium.[61] Part of the stagnation in Bihari opium production may have simply been the result of the substitution of opium with crops that gave a higher return. However,

[60]Government of the North-Western Provinces and Oudh Scarcity Department. "Narrative and Results of the Measures Adopted for the Relief of Famine During the Years 1896 and 1897, (No. 2469)". In: *Further Papers Regarding the Famine and the Relief Operations in India During the Years 1896-97, No. V: Resolution on the Administration of Famine Relief in the North-Western Provinces and Oudh.* Command Paper 8739, p. 25

[61]Robb, "Peasants' Choices", pp. 105–106; and Ram, "Land and Society", p. 135.

while changing cash-crop demand and the increased need for ready money in famine-affected districts may explain some of the initial difference, they do not explain the timing or the permanence of the Benares Agency's ascendancy or the Bihar Agency's decline.

Conversely, the failure of the reforms of the late 1890s to remove the most important features of the khattadari system — that licenses and payments still went through intermediaries in almost all of Bihar — coincides much more satisfactorily with the continued decline in output of Bihari opium. In fact, it was precisely this difference in the relative power of cultivators and intermediaries between the two systems that led the Board of Revenue to suggest that a larger cultivator price increase would be needed to increase opium cultivation in Bihar than Benares in the first place.[62] Although considered an improvement, the 'alternate assamiwar' system failure to revive cultivation meant that it continued to be viewed as unsatisfactory; in the same year that the change was introduced the change in settlement systems was already being blamed for the continued lacklustre results in Bihar in the annual *Statement of the Moral and Material Progress and Condition of India* made to Parliament in London.[63] As a result, while the institutional developments (or rather the lack of them) within the Bengal Monopoly should be understood in the context events in the wider agricultural economy, the limited extent of the reforms in Bihar translated into permanent dislocation of the system of opium revenue.

Most importantly, the continuing decline in output in Bihar permanently disrupted the production of Patna opium. So parlous, in fact, were conditions there that production at the Patna factory was only maintained by the transfer of hundreds of tonnes of unprocessed opium from Ghazipore every year after 1891.[64] Although this step allowed the production of Patna opium to be maintained at a level roughly equivalent to Benares, it did little to help the long-term prospects of the Agency. By 1904 the Board of Revenue was very pessimistic about its future, reporting that there

[62] See Section 3.2.2.

[63] India Office. *Statement Exhibiting the Moral and Material Progress and Condition of India, During the Year 1900–01.* House of Commons Paper 180. 1902, p. 83

[64] *Report on the Administration of the Opium Department, Inclusive of the Opperations of the Behar and Benares Opium Agencies, Vrs.* Calcutta, 1891–1913

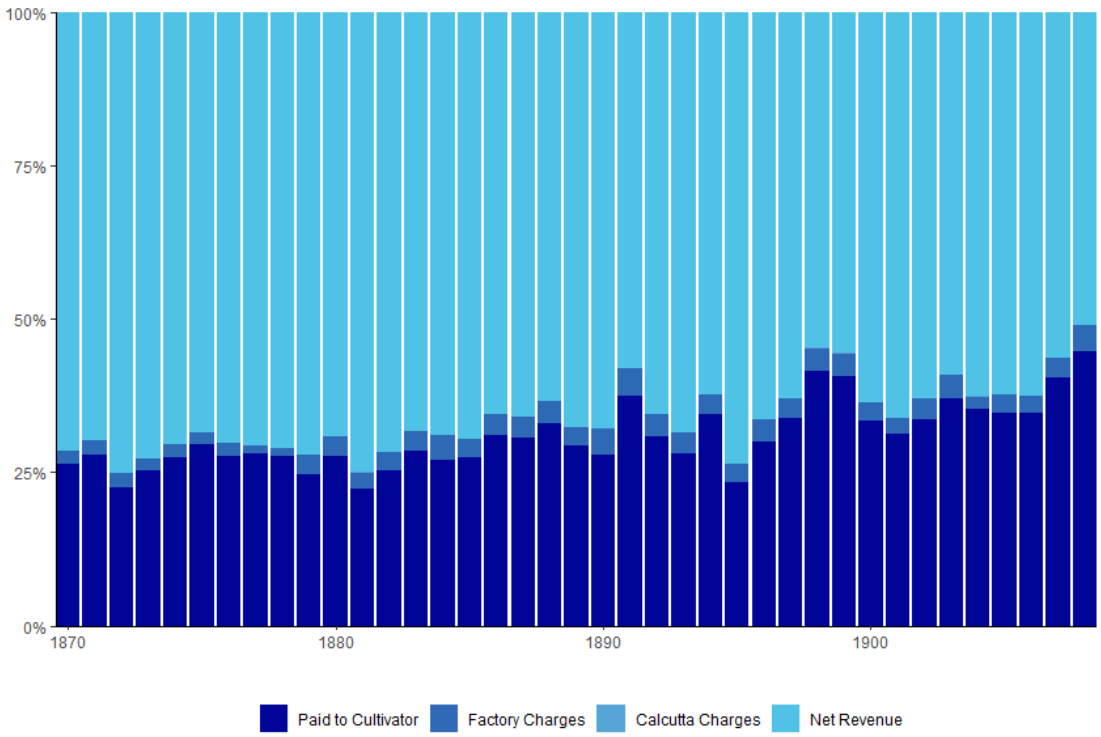

Figure 3.7: Production and Sale Costs as a Proportion of Gross Revenue from a Chest of Bengal Opium, 1870–1908. *Calculated from data in: Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce.* Financial and Commercial Statistics of British India. *Calcutta, 1907, pp. 80–81; and Department of Statistics.* Statistics of British India: Volume II: Financial Statistics. *Calcutta, 1918, pp. 164–165.*

was "little prospect of any recovery of opium cultivation in Bihar."[65] However, besides its direct effect on production, the increasing uncertainty around output had even more important implications for the future of the Bengal opium revenue as a whole. For some decades, relative production costs had been gradually rising. Figure 3.7 shows that out of the average gross revenue received from a chest of provision opium an increasing percentage was being spent on factory and administrative costs. However, the consequences of the events of the 1890s were significantly greater. The cost of purchasing the unprocessed opium from the cultivators, the largest single expense of opium production, now became substantially more variable, while at the same time tending to increase. Whereas in the pre-crisis period, it had represented slightly over a quarter of the average cost of a chest of opium, by the start of the

[65] "H. Wheeler, Secretary of the Board of Revenue, Lower Provinces to the Secretary of the Government of Bengal Revenue Department, 2nd of June, 1904 (No. 240)". In: *Proceedings of the Government of India Department of Finance and Commerce, January to June, 1904.* Vol. IOR/P/6820. India Office Records, British Library, p. 935

twentieth century it mostly stood at about a third, and in some years reached as high as forty-five percent.

As the cost of production became generally larger and less predictable, naturally the relative rate of profit per chest from the government opium sales was also generally smaller and more uncertain. Consequently the total net revenue which the state received from the Monopoly became even more contingent on the provision opium achieving consistently high prices at the government sales. This was partially achieved through the eventual restabilisation at a more sustainable but lower provision of 48,000 chests in 1901.[66] However, while higher, prices continued to be comparatively volatile, even before the general dislocation that accompanied the negotiation and conclusion of the Anglo-Chinese Agreements from 1906.[67] The almost decade-long violation of the rules under which the reserve system had been assumed to operate appears to have taken its toll upon price stability. That the predictability and consistency of supply upon which the market had come to depend would be maintained by the government must have appeared much less certain in the light of the extremely sudden reductions of the early-to-mid-1890s. This effect was compounded by the fact that although the amount of opium brought to auction had returned to relative stability, the amount of opium produced remained unpredictable because it was now even more dependent on the local agricultural economies of the producing regions. The size of the harvest was publicly available information, as was the fact that Patna production was only maintained with large transfers from Benares. The results was that a lack of trust grew in the Government of India's ability to successfully insulate the market from supply volatility, which tended to incentivise exactly the kind of speculative behavior the reserve system was initially designed to curb.[68]

[66] "W.S. Meyer, Deputy Secretary to the Government of India Finance and Commerce Department to the Secretary to the Government of Bengal Revenue Department, 30th of August, 1900 (No. 330)". In: *Proceedings of the Government of India Department of Finance and Commerce, January to December, 1900.* Vol. IOR/P/5944. India Office Records, British Library, p. 1001

[67] See Figure 3.2.

[68] Even before the crisis, opium merchants appear to have watched the size of harvests closely in forming their expectations and desires for the size of the Bengal provision (See for example: "Demi-Official from T.W. Rawlins, Accountant General, Bombay to the Secretary to the Government of India Financial Department , 15th of December, 1886 (No. 7)". In: *Proceedings of the Government of India Department of Finance and Commerce, January to December, 1887.* Vol. IOR/P/3032. India Office Records, British Library, p. 3).

3.4 Conclusion

Whether, eventually, the Opium Monopoly and opium prices would have returned to their former stability is something of an indeterminate point. The negotiation and conclusion of the Anglo-Chinese Opium Agreements between 1906 and 1908 meant that the system by which the Government of India raised revenue from opium exports had to all intents and purposes ended by 1913. However, as this paper has shown, its decline had already begun two decades earlier. The Government of India's inability to adapt local arrangements for the supply of opium to new external political constraints, together with the declining position of Malwa opium in international markets, brought about a transformation in the British Indian fiscal system. Whereas in the 1880s the various kinds of opium revenue had formed one of the main sources of tax income for the Government of India, by the early twentieth century they were marginal at best.

While political shifts in Britain can explain a part of this change, local conditions in India itself remained paramount. Above all local constraints limited the steps which the colonial state could take to ameliorate the crisis that beset Bengal opium from the late 1880s onwards. The Government of India's abortive attempt to rationalise its system of opium procurement under the assamiwar system is a case in point: the role of the khattadars as intermediaries for the Opium Department enhanced any existing influence they might have, further entrenching their position within the agricultural economy. This in turn made future changes more difficult, as the administration had essentially created a new group, whose interests were heavily bound up with the maintenance of the existing system. This kind of effect may be seen as a natural consequence of colonial rule; where the state was of any considerable size, it is almost inevitable that the introduction of alien fiscal institutions would have changed the socio-economic landscape. However, the relationship between opium intermediaries and the state is also interesting for another reason — it provides a clear case of a colonial government making considerable concessions on revenue policy, not to large zamindars (landlords), princes, or chiefs, but rather to much more humble

individuals. These village elites, whose power was largely economic, rather than formally political, still possessed sufficient influence to have a significant impact on fiscal policy.

While this paper has presented the 1890s as a period of turmoil for the opium revenue, many of the limitations on the colonial state mentioned in the two previous papers were key to this period also. As in earlier stages of the development of the Bengal Monopoly, the results of opium policy did not simply happen on their own, but rather followed from the knowledge and ignorance, the ideas and preconceptions, and the analyses and assumptions of those making the decisions. Implementation still rested on the state's ability to oversee its servants and prevent corruption, and any changes to the system were constrained by its power relative to other groups in society. Consequently, although this paper agrees with much of the existing literature on colonial fiscal capacity in its emphasis of conditions and constraints within colonies themselves, as in the rest of this thesis, the evidence presented here suggests that ultimately the costs and difficulties of imposing and managing such a system are only partially captured by broad economic variables. Particularly in the case of British India, these limitations were determined by more complex, more idiosyncratic, and often much more local features of the colonial economy.

Conclusion

The papers presented in this thesis reveal in practice the Government of India's fiscal administration was often quite weak and quite arbitrary. As Paper 1 showed, constraints on the colonial state's ability to collect and process information meant that even superficially simple taxes on export commodities could be difficult to collect in an efficient manner. However, domestically these problems had consequences beyond somewhat less than optimal revenue collection. The effect on the structure of fiscal administration, described in Paper 2, was, in the first place, to compromise the state's control over production — and therefore the costs of collection, and in the second, to drive corruption amongst minor officials and intermediaries and abuses of the cultivators themselves. Even when these kinds of problems were identified, solutions were not always easy to implement. In the case examined in Paper 3, when presented with strong external political pressure which necessitated substantial changes to the way the opium revenue was collected, variation in local conditions hampered effective reform, damaging the sustainability of the entire structure.

Returning, then, to the question raised in the introduction, the effect of the kinds of revenue raised by the Government of India on the quality of revenue policy and administration, a closer study of the Bengal Opium Monopoly does suggest that the former did have negative impacts on the latter. In the first place, the structure of the Monopoly meant that the state's efforts to collect revenue from opium were accompanied by various kinds of rent extraction. Many of the innovations which the Government of India made to the structure of the Bengal Opium Monopoly during this period were focused, directly or indirectly, on preventing this kind of extraction by outside actors. Most directly, this should be seen as one of the costs of the limited development of bureaucratic capacity, whether strategic or otherwise; the inability of

the Government of India to overcome the associated information asymmetries through improved measurement or monitoring not only made the introduction of other kinds of taxation more difficult, but also expanded the potential for corruption and other kinds of extraction, even in revenue sources that did not require broad-based contact with the mass of the population. At least within the framework in which the colonial state was constrained (voluntarily or otherwise) by the second half of the nineteenth century, lower gross receipts, corruption, and higher costs of collection associated with mis-allocation of resources were all the price of relying on sources of revenue that were politically and organisationally less costly, like the income from the Bengal Monopoly.

How far were these effects a consequence of the opium revenue coming largely from outside India? As seen in in Section 0.4, some of these features were not necessarily unique to opium, since similar issues emerged during earlier attempt to extract revenue from tobacco and salt even though these efforts represented domestic taxation rather than an external inflow. In nineteenth-century India the colonial government did draw quite a significant proportion of its revenue from domestic economic activity such as salt production and government forests, but such cases are rare today.[69] Typically when modern governments rely on a single commodity or a small number of commodities for a significant proportion of their revenue, that commodity is not typically primarily valuable because of domestic production and demand, but instead because of export demand. As a result, when foreign inflows like resource revenues and foreign aid have been studied, it tends to be in contrast to broader kinds of taxation, like income taxes, rather than domestic state rents. However, particularly in the context of the stability-revenue trade-off described in the introduction, it was not material whether the revenue came from inside or outside of India, only that it limited the further impositions which the Crown government had to make on the Indian population. As a consequence, it appears that for opium, like many of the other sources of revenue gathered by the Government of India, the key feature for these purposes was the organisational effort required, relative to the amount of revenue that they yielded that ultimately mattered the most.

[69]Moore, "Taxation", pp. 11–13

Additionally, especially considering the issues discussed in Paper 3, one must also consider the question of whether both the broad form in which the opium revenue was collected and the specific problems which went along with it were the result of some kind of path dependency. The Bengal Opium Monopoly as it operated under Crown Rule was, in most of its broad lines at least, essentially the same as under the East India Company. This in turn had emerged as the result of growing fiscal demands over the late eighteenth and early nineteenth centuries. To establish and maintain British rule in a country like India required very considerable commitments of state resources. The pretty continuous series of wars to conquer and consolidate the British possessions in India during the second half of the eighteenth and first half of the nineteenth centuries demanded considerable fiscal expansions, often in quite short order.[70] Additionally, even once conquest had occurred, imposing and maintaining a state in an Indian Empire of four and a half million square kilometers and containing a population (in 1901) of almost three hundred million people was a problem of a very different order than that encountered in European empires elsewhere. With this in view, it seems likely that the later tendency to exchange lower tax receipts for greater quiescence on the part of the population may have emerged from the sheer scale of the investment, borrowed or not, that would have been required for the Government of India to be able to undertake mass taxation in a more serious way.

However, contrary to a suggestion in one recent work on the subject, the relatively low share of trade and relatively high share of agriculture in India's economy did not incentivise the state to avoid administratively demanding forms of revenue.[71] Rather than simply pushing the colonial state away from information-intensive taxes, the desire to avoid the introduction of broad, but politically controversial forms of taxation drew the government towards complex sources of income that were less efficient, but produced more revenue in absolute terms. The majority of the kinds of taxation which the Government of India did undertake, such as the land revenue,

[70]The expense of this process for the British Indian state raises the intriguing possibility that things like pre-colonial fiscal and military centralisation, by increasing the cost of the initial conquest, actually drove the colonial state to adopt less-efficient-but-more-absolutely-remunerative forms of taxation in a similar manner to the threat of political instability.

[71]See: Roy, "Why Was British India a Limited State?", p. 90

opium revenue, and excise taxes did require a significant state presence across the country to enforce. However, while these kinds of narrow taxes were collected in ways that did require the collection of relatively large quantities of information, this was very different from the much more expensive, and much more intrusive, kinds of government action that would have been required for the development of broader taxes. A prime example of the former kind of behavior was presented in Paper 1: in the 1860s when the possibility of extending the Malwa system to cover production in the Bengal Presidency was raised, the proposal was rejected on the grounds that it would lead to a reduction in revenue; when given the choice between passively collecting an export tax with a small staff or continuing the very involved and expensive system of the Bengal Monopoly, the Government of India chose the latter.[72] In fact, the Government of India appears to have, if anything, under-collected some 'simple' taxes; although India very easily got the most revenue from customs of any colony outside of the Dominions of Canada and Australia at the beginning of the twentieth century, they remained relatively small compared with the overall size of Indian trade.[73] Certainly both Canada and Australia gained a larger amount of customs revenue from international trade sectors that were smaller both in terms of total value and the value of exports.[74] Clearly the relationship between trade (and agriculture) and the colonial state's fiscal structure were not all that straightforward.

Why, then, did British India adopt such a strategy when other colonies, given their higher tax receipts, apparently did not? After all, many of the same problems which faced the Government of India also faced colonial states elsewhere; in particular, the difficulty of gathering accurate information, and the extent of the knowledge gap between colonisers and colonized was surely one of the most significant barriers to colonial taxation in most places. This question is a difficult one to answer outside of a comparative setting. However, there are some general observations that seem

[72]See Section 1.2.

[73]Naturally 'customs' here excludes the Indian opium revenues which also were essentially taxes on trade.

[74]Compare the figures given for various British Colonies given in: *Statistical Abstract for the Several British Self-Governing Dominions, Colonies, Possessions, and Protectorates, in each year from 1901 to 1915.* Command Paper Cd. 9051. 1918, pp. 22, 54, 60

to indicate that here again the answer is that the specific features of the Indian economy may have mediated the process by which the fiscal structure of the colonial state developed there. In the first place, the availability of export resources, and the number and specific kinds of export resources at that, was key. Places which exported a wide range of different goods, or whose exports were produced in such a way that it was difficult for the colonial government to capture revenue from export commodity production were obviously unlikely places for a resource-revenue-reliant fiscal system to emerge.[75] Additionally, in colonies which were either geographically large, or, as in the case of India, both large and populous, the larger scale of investment in administrative capacity may have been decisive. In these contexts, expanding government control and maintaining the kind of bureaucratic capacity required for the collection of broad-based taxes would have been more difficult and, importantly, more expensive. By contrast, smaller, more densely populated colonies may either have been able to avoid having to make the same kind of investments in the first instance, or were better placed to mitigate their effects owing to lower monitoring costs.

A very rough idea of these relationships can be arrived at simply by comparing the situation amongst the different colonies in the British Empire.[76] In the census year of 1901, the commonly cited link between population density and gross public revenue (GPR) per capita is not significantly present in the data (Figure 4.1). By contrast, Figure 4.2 shows a clear positive relationship between exports and GPR per capita, suggesting that the relative exposure to international trade probably did have some impact on the development of relative fiscal capacity as described in the literature.[77] However, at the same time a contrasting negative correlation between a colony's area and its level of GPR per capita is also present (shown in Figure 4.3). Although obviously not conclusive, these results would be consistent with the idea that less administratively intensive taxes may have been more attractive

[75]See the discussion in: Isham et al., "Varieties of Resource Experience"

[76]No adjustment is made for inaccuracies in the population data or for differences in incomes between the various colonies. For a discussion of these issues in a similar setting, see: Frankema, "Raising Revenue", pp. 456–457, 460–463

[77]A graph showing similar results for a different group of colonies (many outside of the British Empire) is presented in: Frankema and Booth, "Fiscal Capacity and the Colonial State", p. 16

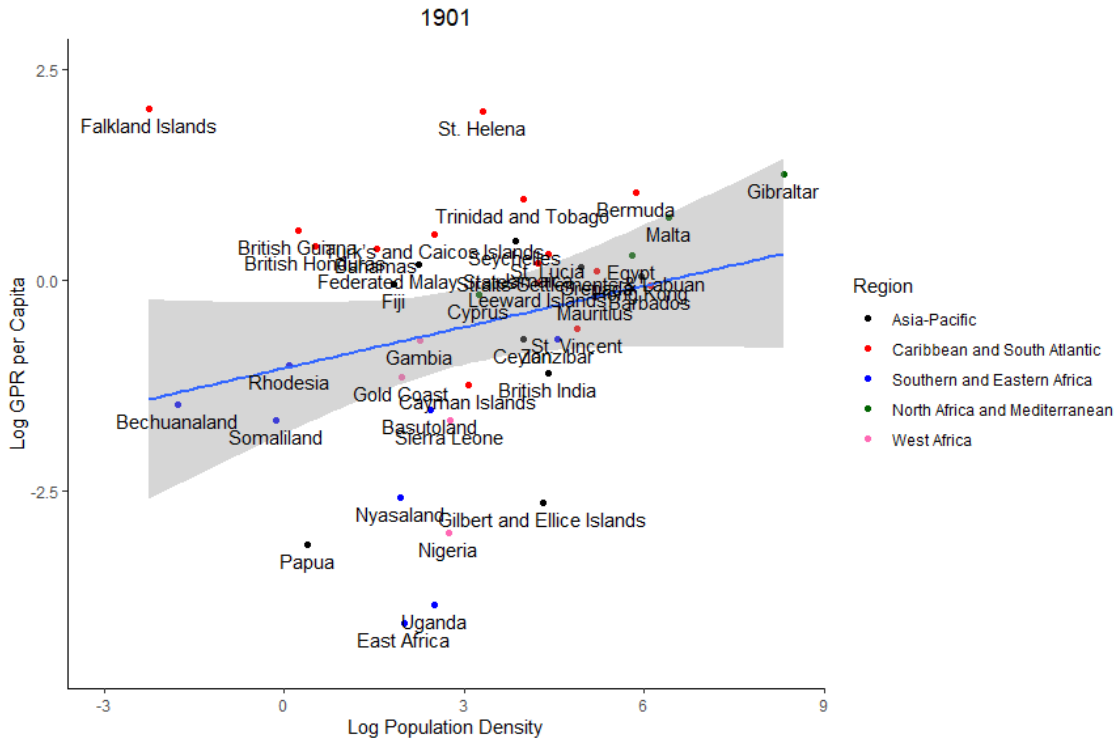

Figure 4.1: Correlation between Log Gross Public Revenue per capita and Log Population Density within the British Empire, 1901. *Calculated from Data in:* Statistical Abstract for the Several British Self-Governing Dominions, Colonies, Possessions, and Protectorates, in each year from 1888 to 1902. *Command Paper Cd. 1729. 1903, pp. 6–7, 11, 362, 370.*

for governments to collect across larger and more diverse areas in ways that are not necessarily visible in population adjusted measures. In larger colonies it was more difficult to gather the information required to raise revenue effectively and police its collection; this meant that the degree of co-operation that would be required from the general population if the colonial state was to try to introduce relatively broad-based taxes would have been higher, increasing the potential risk that the populace might demand greater democratic involvement in fiscal decision-making. Substantially the same relationships are found in the equivalent data for 1911.[78]

More detailed comparisons further suggest that the impact of the kinds of revenue governments collected might have been mitigated in places which were smaller and had diverse export structures. Two places which might almost be the poster-children for both measured fiscal capacity during the colonial period and post-colonial development, the Straits Settlements and Hong Kong, did not tax external trade at

[78]See the various data in: *Statisitical Abstract for the British Colonies, 1915*, pp. 6–7, 16–17, 60–61, 414–415, 417, 443

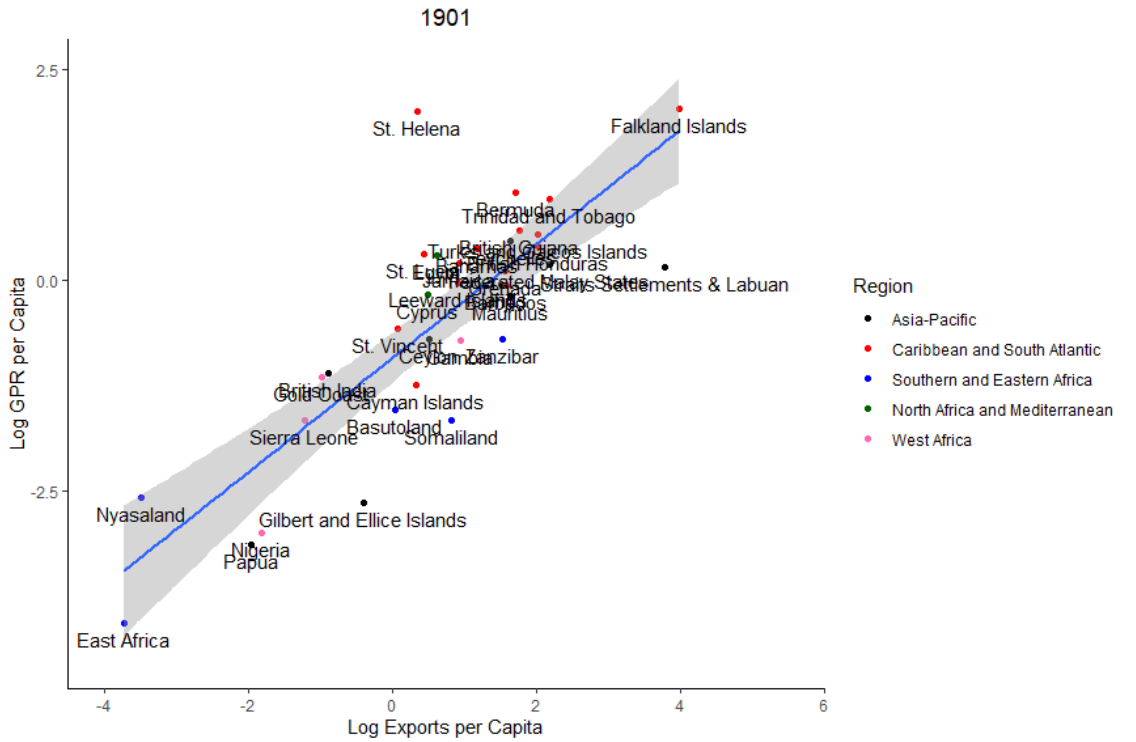

Figure 4.2: Correlation between Log Gross Public Revenue per capita and Log Exports per Capita within the British Empire, 1901. *Calculated from Data in:* Statistical Abstract for the Several British Self-Governing Dominions, Colonies, Possessions, and Protectorates, in each year from 1888 to 1902. *Command Paper Cd. 1729. 1903, pp. 6–7, 11, 44–45, 362, 370.*

all for much of their histories as colonies. In fact, during the nineteenth century and for several years into the twentieth, Hong Kong did not even collect regular import and export statistics. Instead, in both cases the mainstay of the fiscal state were a number of 'monopolies' on various petty commercial transactions (the largest being for opium retail), which well into the first decades of the twentieth century were sold to local elites who acted as tax farmers. Besides auctioning the monopoly rights and providing a judicial forum for the monopolists to prosecute unauthorised competitors, the state had very little to do with the actual collection of these kinds of revenue. For example, the opium farmers maintained their own preventative establishments, licensed retailers, and even processed the opium themselves.[79] That the farms were frequently associated with smuggling and sometimes violent confrontation between rival farmers suggests that even 'successful' colonial fiscal systems were not entirely free of the problems associated with the devolution of taxation powers to local elites

[79]There were however conditions attached to the monopoly, such as, for example, the minimum price at which retail opium could be sold.

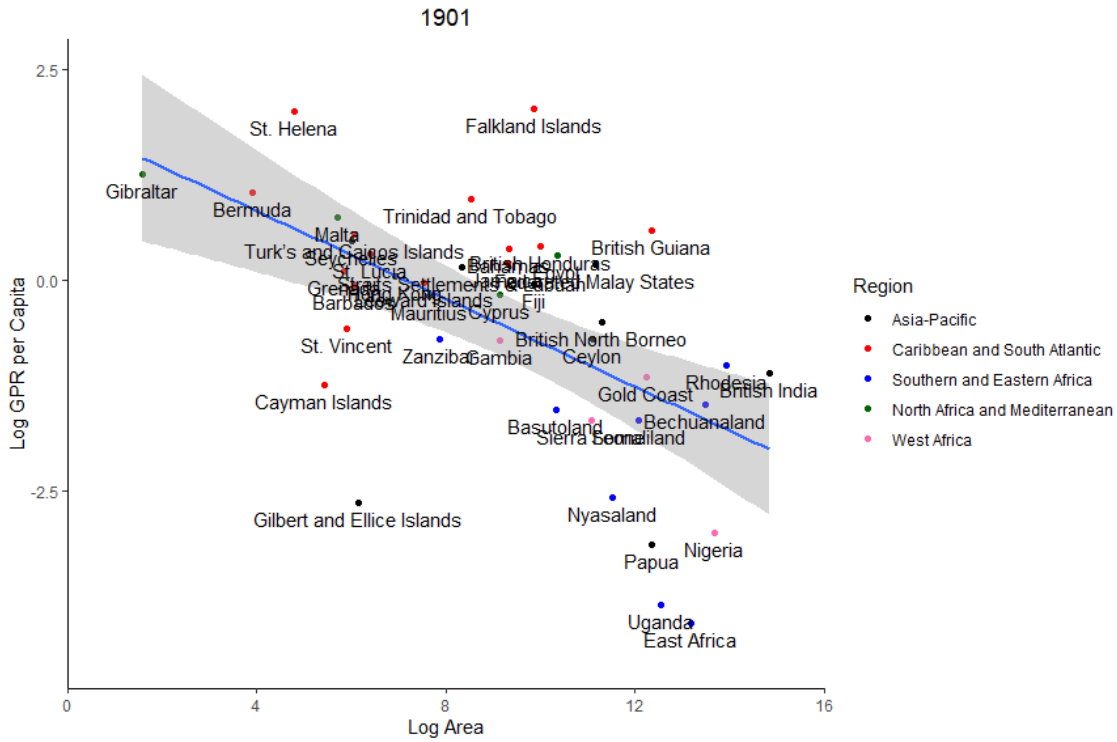

Figure 4.3: Correlation between Log Gross Public Revenue per capita and Log Area within the British Empire, 1901. *Calculated from Data in:* Statistical Abstract for the Several British Self-Governing Dominions, Colonies, Possessions, and Protectorates, in each year from 1888 to 1902. *Command Paper Cd. 1729. 1903, pp. 6–7, 11, 362, 370.*

elsewhere. [80] However, in contrast to India, these problems do not appear to have been associated with long-term negative effects.

These problems, whether encountered by the Singapore opium farm, by the Opium Department in Bihar, or by the High Commissioner of Northern Nigeria, appear to have been at least to some extent ubiquitous. As a result, it might be argued, at least during the nineteenth century, that colonial officials in these cases were simply more successful in offloading the cost and complexity of collection than their counterparts in larger colonies where monitoring and enforcement were more difficult; decentralisation and the problems of control and oversight that went with it was less necessary in more compact colonies.[81] Nevertheless, it is important

[80] For instances of conflict around the opium and spirit farms in the case of Singapore, see: Trocki, *Opium and Empire*, pp. 70–203

[81] That both size and diversity could influence the development of fiscal capacity is certainly not an entirely new idea. For the size and level institutional variation of polities as a cause of diverging paths of fiscal development in mediæval and early modern England and France, see: Levi, *Of Rule and Revenue*, pp. 113–115; for regional variation as a source of inefficiency in the Spanish Empire, see: Irigoin and Grafe, "Bargaining for Absolutism", pp. 185–195; and for the influence of scale effects as an explaination of differences in the fiscal capacity of British and French colonies in West Africa, see: E. Frankema and M. van Waijenburg. "From Coast to Hinterland: Fiscal Capacity

to distinguish between those causes which represent flaws intrinsic to the colonial mode of government and those which led to significantly different effects in different colonies. Had the formal British presence in India remained restricted to the areas immediately around the three presidency towns, it is not difficult to imagine that they would have looked fiscally very similar to the Straits Settlements, if not rather richer. As it was, presented with the choice between the politically risky option of attempting broad taxation of the Indian economy as a whole, the Government of India chose a safer, but more limited income. Speculatively, the comparison of India with the experience of other colonies would seem to suggest that the taxation strategy adopted by a colonial government was conditional on quite a number of economic variables. In particular, factors like the size of the colony, the level of urbanisation, and the relative shares of agriculture, manufacturing, and trade in the economy, as well as things like export concentration, all informed what kind of taxes could be imposed. On a more granular level, it also seems likely that differences in the modes of production also mattered significantly, with more concentrated, plantation-style agriculture being much easier to tax than either small-scale family-based farming or nomadic herding.

It is probably no coincidence that many of these things are correlated with many of the factors identified in the existing literature as important for the development of colonial fiscal capacity. Urbanisation, agricultural practices, and trade are probably in many cases associated with pre-colonial fiscal centralisation, and similarly, it seems likely that certain types of farming were likely to generate both more trade and more taxes than others. In that sense the conclusions of this thesis are fully in line with the existing literature: the development of colonial fiscal systems were fundamentally constrained by the available resources. Further, on a more mechanical level, shortages of manpower, the difficulties of offloading taxation powers to local elites, and the problems associated with very centralised decision-making existed to some extent in all colonial states, but were very much more severe in those places that required a greater bureaucratic capacity to government in the first place. However,

Building in British and French West Africa, c. 1880–1960". In: *Fiscal Capacity and the Colonial State in Asia and Africa, c. 1850–1960.* Ed. by E. Frankema and A. Booth. Cambridge, 2020, p. 163.

the concept of fiscal capacity is fundamentally intended for comparisons, and in this connection the approach presented here is rather more useful. If one wishes to know why the British state in India commanded relatively more resources than the one in East Africa, but less than that in the Federated Malay States or the Straits Settlements, the wide differences in the structure of the taxable economy and the divergent revenue strategies that colonial governments were led to adopt in these different places surely provide the most comprehensive answer.

Having now for several paragraphs considerably exceeded the evidence presented in the main empirical parts of the thesis, it would perhaps be as well if I said something about the limitations of this research, and suggested some ways in which they might be solved in future research. The most obvious of the former is, of course, that the scope of this thesis is limited to a single case study. Although the Bengal Opium Monopoly is, as I hope is now clear, a topic of infinite variety, nevertheless its usefulness for understanding fiscal capacity it necessarily somewhat circumscribed. A somewhat peculiar institution even at the time, it was in form, if not in the constraints that it faced, quite unlike most of the other ways colonial states sought to raise revenue. Consequently, there are a number of potential avenues for future research which this research suggests. Most obviously, applying a similar approach to other areas of the British Indian state would help to confirm and expand this thesis's conclusions with regard to the Indian case. However more broadly, most of the factors identified in the existing literature, like the amount of trade, population density, pre-existing fiscal centralisation, and the manpower of the colonial state are relatively quantifiable, and consequently the relationship between them and the development of fiscal capacity is eminently testable in the context of direct cross-country comparison. The overall structure of colonial economies, the concentration of exports amongst different commodities, the level of urbanisation, and the proportion of the population in different kinds of agriculture are more difficult, although certainly not impossible, to use in a similar way. Additionally, although comparisons at the level of the colony are useful for examining broad concepts, the issues outlined in this thesis raise the question of whether entire colonies are necessarily the best unit of

analysis for understanding fiscal capacity formation in a colonial context. As in other highly comparative topics in economic history, the heterogeneity within colonial economies, especially in the case of larger, more economically diverse colonies, means that direct comparison is not always appropriate. As a result, studying individual types of taxation or comparing smaller, similar regions within different colonies may also prove a fruitful approach, particularly with regard to the mechanisms driving differences in fiscal capacity. For example, comparing the relative success of different fiscal strategies (and tax mixtures) adopted by colonial states in taxing densely populated urban areas, places with similar sort of agriculture, or relatively monetised and commercialised could each be compared in a more rigorous way than is possible at the colony level.

Looking instead at the more specific topic of the Indian opium revenue, there are also several areas in which further research could substantially strengthen the findings in this thesis. In the first place, on a very practical level, most of the quantitative work in this thesis is correlative. To some extent, the statistical relationships presented as the main results of Papers 1 and 2 depend on coincidences of space and time, rather than allowing rigorous causal inference. This problem is to some degree inherent in studying such a topic primarily through colonial sources; the same informational limitations and biases that have loomed large in the discussion of colonial fiscal mechanisms also hamper precise statistical identification. However, in default of the discovery of better data, these issues could perhaps be mitigated by an alternative approach to research design, such as more in-depth comparison of those regions for which better data does exist.

Additionally, as well as being quite a specific case study in terms of the overall theme of colonial fiscal capacity, the topic covered here is also quite limited in time, covering only the second half of the nineteenth century and the first few years of the twentieth. Extending the period covered backward to include the development of the Opium Monopoly under company rule, or forward to look at its decline during the period dominated by increasing international prohibitions on the drug in the 1910s, 1920s, and 1930s, would both perhaps yield further interesting insights into

the determinants of fiscal policy in the Indian colonial context. In a similar way, concentrating on the Bengal Monopoly, largely in isolation from the rest of the Indian fiscal system also probably excludes some interesting phenomena. For example, the divided nature of the Indian opium revenue provides an opportunity to look at how governments co-ordinate fiscal policy between different kinds of taxation. Since the Government of India viewed the Bengal and Malwa systems as being to some extent in competition with one another, in choosing certain policies officials had to take account of the balance the revenue gains from one source of opium with its effects on receipts from the other.[82] Overall, then, these various extensions to the research presented here would provide a more complete picture of both the diverse roles of opium within the nineteenth century Indian economy and the development of colonial fiscal systems.

[82]As described in Section 0.7 the actual degree of competition was somewhat limited.

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Appendices

Appendix A

Introduction: Sources & Construction of Market Data

A.1 Imports & Exports

India

The data on exports of all kinds of Indian opium are taken from the *Financial and Commercial Statistics of British India*, published by the Government of India.[1] In each case, the figures correspond to a revenue year, from April to March, so that the 'year ending 1908' corresponds to the period from the 1st April, 1907 to the 31st March, 1908. The quantities are given in 'chests' each of which is taken to be equivalent to 140lbs (approximately 63.503kgs). In actuality the contents of Bengal chests weighed $140\frac{1}{7}$lbs and of Malwa chests $140\frac{1}{4}$lbs, however in both cases the fractional amount was made up of the weight of poppy leaves used to wrap the balls of opium and dust from those leaves, so the standardised 'Indian chest' I have used here and elsewhere corresponds to 140lbs of opium.

[1] Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce. *Financial and Commercial Statistics of British India.* Calcutta, 1907, p. 73; and Department of Statistics. *Statistics of British India: Volume II: Financial Statistics.* Calcutta, 1918, p. 162.

Persia

The main source for Persian opium exports used in this study are the various *Reports* on trade written by the British Consuls in the several regions of Persia.[2] These reproduce data collected by the Persian customs authorities, supplemented in some cases with further information supplied by private merchants. In general, both the quantities given in Table 0.6 and those used for the calculation of the unit values (for Bushire only) in Figure 0.12 (described further below), were calculated as follows.

By far the largest part of the total in every year came from the combined exports by sea from Bushire, Bunder Abbas, and the various Karun ports. In turn, of these, a majority went through Bushire, the statistics for which were also generally held at the time to be the most accurately measured. The next largest proportion represents opium shipped overland from Kermanshah via Basra and the Persian transit trade through Trebizond in northern Turkey, using the same sources as the rest of the Turkish data (described below).[3] Finally, the figure for 1908 also includes opium transported over the northern border of Persia into Russian territory. This is not factored into the estimate for 1888 because this part of the trade was not recorded in the source before 1890. Part of the reason for this is that opium had only begun to be shipped along this route relatively shortly before. The small size of this trade and the fact that before 1901 very little opium was recorded as being exported this way, mean that while there is still a general problem of under-reporting, this difference in the composition of the estimates, nevertheless probably reflects a genuine increase in exports rather than the effect of changing reporting criteria.

In most of the reports, the quantities of exports are given in standardised English units, generally tons, hundredweights, or pounds, which can be converted directly into Indian chests. Sometimes however the exports are given in local units, which could vary depending on context. Consequently, in the small number of cases where

[2]L. Pelly. *Report by Colonel Pelly to the Indian Government on Trade of the Persian Gulf.* House of Commons Paper 456. 1871; *Reports by H.M. Secretaries of Embassy and Legation on the Manufactures and Commerce of the Countries in which they Reside. Pesia.* Command Papers Vrs. 1872–1886; and *Diplomatic and Consular Reports. Persia.* Command Papers Vrs. 1886–1916.

[3]For some years the small amount of opium shipped via the latter route may be slightly overestimated as the drug is classed together with silk cocoons in the trade report.

Unit	*Indian Chests*	*lbs.*	*kgs.*
'Case'	1.0125	141.75	64.3
'Bale'/'Package'	0.928	130	58.967
Shah Man	0.096	13.5	6.123
Tabreezi Man	0.048	6.75	3.062

Table A.1: Assumed size of Persian units in default of specific definition.

their relative size was not otherwise specified in the source I have converted them according to the vales in Table A.1.[4]

As will be seen from the foregoing discussion, there are quite a number of potential sources of measurement error in this data. Besides any under-reporting as a result of things like smuggling, in some areas the Persian customs did not really attempt to capture all of the trade traveling through a specific route, and this was especially true in the case of overland trade. There is also a risk of double counting: as the figures are reported on the basis of consular districts, in some cases some opium may have been recorded as 'exported,' even if they were not directly shipped out of the country. While I have tried to exclude this where possible this cannot be done universally.

Nevertheless, in spite of these objections, the values given here are probably relatively close to the true ones. If one calculates an entire export series across the late nineteenth century by these methods it is internally consistent, with few sudden or inexplicable changes. Further, the figures given here unsurprisingly match well with others taken from similar sources.[5] More importantly, they also correspond well to qualitatively reported trends in production and appear reasonable when compared with the reported quantities of Persian opium imported in the receiving countries. As a result, although these export volumes should be taken as approximate, they

[4]The common values for the Iranian weights are relatively uncontroversial. Matthee in reproducing figures from one of the reports used to construct this data ("Report by Mr. Baring on Trade and Cultivation of Opium in Persia". In: *Reports by H.M. Secretaries of Embassy and Legation on the Manufactures and Commerce of the Countries in which they Reside. Persia.* C.3103. 1882, pp. 48–62), gives a 'case' as equal to 160lbs. Although the source in question gives a range a values for the weight of a 'case,' partially because of the difference between the weight of the opium as exported and upon its arrival at its destination in East Asia, none of them correspond to 160lbs, and it is unclear from where this value is derived (See: Matthee, *Pursuit of Pleasure*, p. 218).

[5]See, for example: Seyf, "Commercialisation of Agriculture", pp. 241–247; and Regavim, "Most Sovereign of Masters", pp. 33, 114. In both these cases, the authors only attempt to measure production and direct exports by sea.

remain useful as a point of comparison with the data for other countries.

Ottoman Empire

Compared even with those for Persia, the export figures for the Ottoman Empire must be regarded as even more uncertain and approximate. Although the sources used are essentially the same, that is the British Consular reports for the various regions of the Empire, the quality of the data that they contain varies considerably more by region.[6] The lack of consistently collected customs in many ports means that the information relayed by the consuls came almost entirely from consultation with the large merchants and shippers. This means that a great deal of trade may not be captured in the reported values. Even more disturbingly, the double counting problem is even harder to effectively adjust for: although a great deal of the opium mentioned in the reports was clearly shipped to intermediate ports within Turkey before being sent overseas, no systematic distinction is made between exports and re-exports, so that it is very unclear how shipments from the smaller ports should be counted.

Consequently, in estimating the total exports for the Ottoman Empire I have adopted a relatively conservative approach. Rather than attempting to reconstruct all of the trade flows involved, I have simply added together the total recorded exports from Smyrna, Constantinople, Samsoon (obviously excluding Persian re-exports), Alexandretta, and Salonica.[7] This approach is based on the assumption that most of opium from the areas around these ports, even if it went through another port first, was shipped via these places. So, for example, it appears that all or almost all of the opium produced in Macedonia and Kossovo was shipped through Salonica, so that by only taking the latter, one avoids counting the same opium twice. This does not remove all the potential for this kind of inaccuracy; for instance in several years at

[6]The sources used are: *Reports by H.M. Secretaries of Embassy and Legation on the Manufactures and Commerce of the Countries in which they Reside. Turkey.* Command Papers Vrs. 1865–1885; and *Diplomatic and Consular Reports. Turkey.* Command Papers Vrs. 1886–1914.

[7]For 1888 no opium is recorded as being exported from Alexandretta. By matching the 'arrivals' of opium in Constantinople from successive reports, it appears that the exports given as 1886–87 and 1887–88 are actually for the year following, so they have accordingly been used for 1887–88 and 1888–89.

least some opium from Salonica and Samsoon was shipped to Constantinople before being exported, however it does to a certain extent mitigate the problem.

In addition to these problems there are some categories of trade which are entirely excluded from the exports given here. No account is taken of overland trade as this is unreported in the original sources. Additionally, both Egypt and Cyprus, which each produced a small amount of opium, are excluded, largely because of a lack of data and because it is difficult to account for them consistently. Nevertheless, the totals provided by this method may be reasonably assumed to cover the majority of Turkish opium exports with some degree of accuracy.

As before, quantity conversions are made on the basis of the rates supplied in the original report. When these are not available, it is assumed that an average Anatolian chest contained 155lbs (70.307kgs or 1.107 Indian chests). This rate is based on the most commonly given value, and corresponds well to the relative weight when values in two units are given for the same year. As with the Persian 'case,' this is probably not completely accurate; quoted 'case' weights range from 140–160lbs.[8] Again however, choosing a different value would mean a revision downward of the estimate, it would not affect either of the total export figures very much.

In spite of all these issues, some support can be found for the approximate magnitude of these estimates. For instance, Schmidt gives an estimated total harvest for Anatolia of 1,800 baskets for 1887, 7,500 for 1888, and 4,770 for 1889 (about 1,680, 7,000, and 4,460 chests respectively).[9] Allowing for the fact that not all opium produced was directly exported, this means that, even with production outside of Anatolia, an export figure of about 6,000 chests does not appear unreasonable. Similarly, the Consular report for 1913 states that exports for all of Turkey were 306 tons (4,896 chests) in 1911–1912, again matching the 1908 figure of 4,258.7 chests given above relatively well.[10] However, given the difficulties with the method by which they have been calculated and the apparent variability of the size of the Turkish opium crop, the figures in Table 0.6 may still be a slight underestimate.

[8]The former is the value is close to what Schmidt suggests — 84.60 çeki, 65.077kgs., 143.470lbs, or 1.025 Indian Chests (see: Schmidt, *Anatolia to Indonesia*, p. 35).

[9]ibid., p. 190

[10]"Report for the Year 1913 on the Trade of the Consular District of Constantinople". In: *Diplomatic and Consular Reports. Turkey.* Cd. 7048-191. 1914, p. 20

Straits Settlements & China

By comparison with the export estimates, the numbers for the proportionate make-up of the opium imported into the Straits Settlements and China given in Figures 0.10 and 0.11 are straightforward in their construction. For the Straits Settlements the gross imports are drawn from Part 3 of the *Finance and Revenue Accounts and Miscellaneous Statistics Relating to the Finances of British India*, and, after 1891, directly from the *Straits Settlements Blue Books*.[11] Within the graph, the Persian, Turkish, and Chinese varieties are grouped together as these sorts were generally too small to be visible separately. As noted in the main text, gross imports are used to give an overall impression of the types of opium imported into Southeast Asia as a whole, for which the Straits Settlements formed major entrepôts. Smuggling of prepared opium, especially between Singapore, Johore in Malaya, and Riau in the Dutch East Indies, would in any case be a significant problem if one were to attempt to measure opium consumption in the Straits Settlements alone.[12] This is not so much of a problem when dealing with the unboiled drug as there were no duties on non-prepared opium being held in, or shipped through the ports, so there was probably little incentive to smuggle it.

Nevertheless, the decision to use gross rather than net imports does create some minor problems with the resulting data. There is some double counting from the relatively small amount of inter-port trade in opium, and possibly the limited re-exports of opium to China. However, in general the effects of these factors is relatively small: even if these are removed, the picture presented remains very similar, especially as regards the absolute dominance of Benares opium.

The data on the Chinese treaty ports are also drawn from the *Finance and Revenue Accounts*, together with the later *Financial and Commercial Statistics of British India*, both of which reproduce summaries of the statistics collected by the Imperial Maritime Customs Service (I.M.C.S.) in the ports themselves.[13] For 1867

[11] *Finance and Revenue Accounts, Part 3*; and Straits Settlements Statistical Office. *Straits Settlements Blue Book, Appendix: Imports and Exports.* Singapore, 1893–1909.

[12] For an idea of the relative scale of smuggling, see: Trocki, *Opium and Empire*, pp. 94–107.

[13] *Finance and Revenue Accounts, Part 3*; Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce, *Financial and Commercial Statistics*

Northern Ports	*Yangtze Ports*	*Shanghai*	*Southern Ports*
Newchwang	Kiewkiang	Shanghai	Wenchow
Tientsin	Chinkiang		Foochow
Chefoo	Hankow		Formosa
	Wuhu		Amoy
	Ichang		Swatow
	Ningpo		Canton
			Kowloon
			Kiangchow
			Lappa
			Pakhoi

Table A.2: Classification of the treaty ports of China in Figure 0.10.

the data for some ports is missing from the series published in India, so for those cases I have used the equivalent values from the original *Returns of the Trade* published by the I.M.C.S.[14] Unlike the equivalent data for the Straits Settlements, the data presented in this figure are net imports; as they are given by region, only using the net values avoids distorting the proportions by counting the same opium more than once. This is necessary in this case given the relative size of inter-port trade, which, for at least the larger ports, was much larger than was the case for the Straits Settlements.

The regional catagorisation of the ports is slightly different in the three different sets of sources. So that the graphs are consistent over time, for 1867 and the period from 1891–1908 I have used the disaggregated data in the same sources to produce a common catagorisation based on that used in the *Finance and Revenue Accounts* statistics. To avoid confusion, the various Treaty Ports are classified for the entire period as indicated in Table A.2. Additionally, the annexation of Formosa (that is, Taiwan) by Japan in 1896 means that the Formosan ports leave the original data at this point. However, I have added the Formosan imports back into 'Southern Ports' from the point they start to be listed separately from China (i.e. from 1905 onwards), again in order to maintain a constant unit of analysis.[15] As with the

(1907), pp. 91–92; and Department of Statistics, *Financial Statistics (1918)*, pp. 170–174.

[14]Imperial Maritime Customs Service. *Returns of Trade at the Ports in China Open by Treaty to Foreign Trade for the Year 1867*. Shanghai, 1868

[15]In the case of Formosa, there is an additional complication: the ports measured change, so that up to 1891 they are Tamsui and Takow, and after this point Tamsui and Tainan. The changed cities are adjacent and this is does not appear to materially alter the proportions imported. The

Straits data, Persian and Turkish opium are grouped together, owing to the often vanishingly small size of these categories on their own.

However, although quite widely used, this data has a number of defects. In the first place, by their very nature, they exclude all trade outside of the treaty ports. Additionally, even within those ports, they only include steam ships and foreign-type sailing vessels, loosing the potentially significant proportion of both domestic and external trade carried on Chinese craft. Smuggling may also be an important source of inaccuracy, although since all foreign opium imported into China was taxed and tariffed at the same rate, smuggled opium probably did not upset the relative proportions to any great degree. The magnitude of these problems can be gauged in a rough way by a comparison of the available statistics. For example, in 1880, 81,398 chests of opium were reported as being exported from India to China (including Hong Kong). For the same year, the statistics described here give a total import into China proper of 68,260 piculs of Indian opium. About 5,829 chests appear to have been imported into Hong Kong, leaving, at the standard equivalence of a chest in India to a picul on being imported into China, 7,309 chests unaccounted for.[16] That is a significant, although not overwhelmingly large proportion, and should be taken as a substantial caveat when looking at Figure 0.10. These problems also provide part of the reason for aggregating regionally; it is to some extent less likely that all the ports in a region will be equally affected by these problems. This means that the overall proportions may be less biased in this regard than those for any individual place would be.

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data for Formosa comes from the same sources as that for the rest of China.

[16]The majority of the numbers used in this calculation come from: *Finance and Revenue Accounts and Miscellaneous Statistics Relating to the Finances of British India, Part 3: Miscellaneous Statistics*. Calcutta, 1893, pp. 86–99. The figure for Hong Kong probably includes about 340 chests re-exported to the Straits, the United States, and Australia.

A.2 Price & Unit Value Data

Bengal & Malwa

The longest and probably the most consistent of the series presented in Figure 0.12 is that for Bengal opium, which represents the average price at the Government Sales for each official year (April to March) from 1787 onwards. These are again drawn from the same statistical collections as much of the other general data on India.[17] Although these sources also provide some annual average prices for Malwa from the middle of the nineteenth century, these are for calendar years. Consequently, so that at least the two Indian series are aggregated consistently, I have recalculated averages for each official year from the monthly averages used in the main analysis of this paper. For obvious reasons, this makes little difference to the data, except in a very small number of years.

Persian

The figures given for Persian opium are unit values based on the volume and value of opium exported from Bushire between 1872 and 1908. They are drawn from the same sources as the quantity data describe in the preceding section.[18] Again, where applicable, the quantities used to derive the unit values are converted into Indian chests by the same means described above. Between 1872–1881 the value of the opium exported is given in Rupees, so no conversion is necessary. From 1882 to 1908, it is given in pounds sterling, and so the values for this period are converted to rupees at the rates given by van der Eng.[19]

A significant problem is introduced into the data by the fact that the year of

[17] R.M. Dane. "Historical Memorandum". In: *Royal Commission on Opium, Volume VII.* Cmd. Paper C. 7723-I. 1895, pp. 61–62; *Finance and Revenue Accounts, Part 3*; Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce, *Financial and Commercial Statistics (1907)*, pp. 91–92; and Department of Statistics, *Financial Statistics (1918)*, pp. 170–174.

[18] *Reports on Manufactures and Commerce. Persia.* and *Diplomatic and Consular Reports. Persia.*

[19] P. van der Eng. "The Silver Standard and Asia's Integration into the World Economy". *Australian National University, Department of Economic History Working Papers* 175 (1993), pp. 27–28

report changes during the years covered by the series. Up to 1905, the data is given by calendar year, however, after that point they are given for the official year beginning in March. Although it is not possible to address this issue perfectly, I have attempted to minimise the issue as far as is practical. Up to the end of 1905, each Persian calendar year is matched to an April to March period for India starting in the same year. Following this, the first two-and-a-half months of 1906 are completely excluded from the reported data. The following three years of Persian data are then aligned so that they approximately match with the Bengal and Malwa data for the Indian official years 1906–7, 1907–8, and 1908–1909. This arrangement allows for closest possible correspondence between the periods covered by the different series, although it should be noted that it does still leave comparisons of individual year points as somewhat problematic. Additionally, there are three years for which the required data is missing: in 1902 the value of exports is not given, and for 1881 and 1904 no export volumes are provided and these years have consequently been omitted from the series.

Turkish

Before 1887, the price data for Turkish opium are calculated from those provided by Schmidt.[20] From 1825–1875, they represent the average of a range of prices at which representatives of the Dutch Trading Company bought opium at Smyrna. These are given per çeki, and I have converted them to Indian chests at the rate of 0.021 chests (1.3 kilograms or 2.866lbs) to the çeki.[21] Between 1876–1886, they are similarly averaged from the prices paid by various firms on account of the Colonial Ministry. After 1886, when Schmidt's data ends, I have substituted the unit values calculated for opium exports from Smyrna, described in the preceding section.[22]

To arrive at prices for the first period in Rupees, I converted kuruş to Pounds Sterling and then Sterling to Rupees. For the first step, the kuruş/Sterling rate are

[20]Schmidt, *Anatolia to Indonesia*, pp. 191–199

[21]Several units of weight were called 'çeki.' The one referred to here is the small one of 100 dirhems. The rate of conversion to kilograms is also taken from Schmidt.

[22]*Diplomatic and Consular Reports. Turkey.*

those given in Issawi (for 1825–1843) and Pamuk (after 1844).[23] For the other half of the calculation, before 1870, I have converted Sterling to Rupees at the at the rate of 2s. to Rs.1., which was the official rate of conversion during that period. However, following the fall of the Rupee, the value of that currency changed dramatically eventually settling at around 1s. 4d. to Rs.1 at the end of the century. As a result from 1870 to 1908 I have again used the exchange rates in van der Eng.[24] The same source is also used to convert Guilders to Rupees for 1874–1886.[25] The values given in the *Consular Reports* are given in Sterling and are consequently converted in the same way. All of the data so produced is for calendar years, so the years are matched to Indian official years in the same way as those for the Persian unit values (described above).

Encouragingly, the two sets of sources produces largely consistent data when treated in this way. For the period from 1869 to 1886 during which both Schmidt's prices and the unit values from the *Consular Reports* are available, the two series agree well. Although the precise timing of a couple of movements differ by a year, in the majority of cases they do match, and the direction and magnitude of changes are very closely congruent.

Szechwan & Yunnan

The unit values for Szechwan and Yunnan opium are both calculated from the volume and value data on those varieties of opium taken from the *Returns of Trade* for Shanghai.[26] The problems with this source as far as quantity coverage noted above are probably considerably worse for the Chinese varieties of opium. However, as in this case the concern is with unit values these questions are less likely to be an issue; the fact that the government impositions on opium were specific rather than

[23]C. Issawi. *An Economic History of Turkey, 1800–1914*. Chicago, 1980, pp. 329–331; and Ş. Pamuk. *A Monetary History of the Ottoman Empire*. Cambridge, 2000, p. 191.

[24]van der Eng, "Silver Standard", pp. 27–28

[25]I.e. the conversion is made on the basis of the Dutch East Indies Guilder, as most of the opium so purchased was exported to that colony. This is only a material distinction for the years 1875, 1876, and 1877, during which the Netherlands was on the gold standard and the D.E.I. was still on silver.

[26]Imperial Maritime Customs Service. *Returns of Trade at the Ports in China Open by Treaty to Foreign Trade: Shanghai*. Shanghai, 1870–1909

ad valorem means that the kind of under-reporting of value which is commonly observed in this type of data is unlikely to be much of a problem in this case. The figures are provided by calendar year, and are aligned with the official year data in the same manner as the data for Persian and Turkish opium. Furthermore, although elsewhere I have assumed picul-chest equivalence, in this case, to preserve comparability between the different export price series, I have converted the Chinese data from per picul to per chest. Obviously this is but a minor adjustment and in any case affects only the level of the unit values, not their relative movement. Currency conversion has been made on the basis of the Haikwan Tael-Rupee exchange rates given in the *Financial and Commercial Statistics of British India*.[27]

There there are some further problems with using these unit values to represent export prices beyond the ones regularly encountered. Although China did produce large amounts of opium, it did not export the drug in any appreciable quantities. Additionally, Shanghai, from where the values are taken, is far away from the points of production. However, an examination of the *Returns of Trade*, even though the quantity underestimation problem is probably many times worse for the internal trade of China than it is for foreign trade, shows that large quantities of both varieties arrived in Shanghai each year during the late nineteenth century, a fact which is consistent with the observation that a great deal of the opium produced in inland regions was shipped to the coastal provinces.[28] Consequently, although the distances involved are somewhat greater, this may not be so very different to using the Bombay price rather than that for Indore or Ahmedabad, or the price for Bushire rather than that for Ispahan. Finally, using Shanghai for this purpose also has the considerable advantage of the long period of time for which such data is available relative to the other coastal ports. Consequently, in default of alternatives, this data provides a not unreasonable substitute for the price at which these kinds of opium could have been exported.

[27]Department of Statistics and Commercial Intelligence Department and Departement of Finance and Commerce, *Financial and Commercial Statistics (1907)*, p. 85; and Department of Statistics, *Financial Statistics (1918)*, p. 169.

[28]See for example: Man-Houng Lin. "China's "Dual Economy" in International Trade Relations, 1842–1942". In: *Japan, China, and the Growth of the Asian International Economy, 1850–1949*. Ed. by Kaoru Sugihara. Oxford, 2005, pp. 182–191.

Appendix B

Introduction: Morphine Content & Opium Quality

When the idea of opium quality or the notion of differences between the varieties are brought up, they are commonly followed some reference to morphine content. Different kinds of opium contained different amounts of morphine. These variations appear to have been the consequence of differences in local conditions, the type of poppy used, and production methods.[1] That this connection is drawn is perhaps unsurprising; most modern consumption of opium derivatives is of pure opioids, such as morphine or heroin, and it to some extent natural that modern eyes view historical opium consumption in this context. Additionally, even at the time, much of the 'moral' discussion of opium and the opium trade took place in terms of the chemical effects of the drug consumption on the body and mind, so one does not have to go particularly far out of the way to conclude that consumers preferences were also chemically determined. These tendencies have been reinforced in at least one strand of the literature by the assumption that opium consumption was always synonymous with opium addiction.

Although it is difficult to view this state of affairs as consistent with the evidence of persistent, regionalised consumer preferences presented above, this is nevertheless an issue that must be addressed. If opium was used merely as an imperfect mechanism

[1]Experiments conducted at the time of growing varieties from one region in another tend to confirm this combination of factors (see for example: *Royal Commission on Opium, Volume II*, p. 405).

for delivering morphine, and was priced accordingly this would have important implications for the ability of the Government of India to control the opium price or extract monopoly profits from the market for the drug. Even if consumers did price on the basis of morphine content, these differences would not explain variations in relative price, except insofar as the prices of different kinds of opium were in ratio to the amount of morphine they contained. By way of illustrating this point, if one unit of *type a* opium contained 1 unit of morphine and one unit of *type b* contained γ units, where $\gamma > 1$, *type a* would be effectively a perfect substitute for *b* as γ units of the former could always replace every one unit of the latter. To put this another way, under this scenario the product being consumed is, to all intents and purposes, the morphine in the opium rather than the opium itself, and that morphine is *ipso facto* a homogeneous good. Assuming a competitive market, if the marginal costs of *type a* were $\frac{1}{\gamma}$ that of *type b*,

$$MC_b = \gamma MC_a, \tag{B.1}$$

firms producing *type a* and *type b* would essentially be the same, as both the price and the marginal cost of producing 1 unit of morphine would be the same. Both would produce until marginal revenue equaled marginal costs, that is a firm producing *type b*, again all other things being equal, produce $\frac{1}{\gamma}$ as much opium (but the same amount of morphine) as a firm producing *type a*. Since in this example the price of the opium is entirely determined by the amount of morphine in it, the price of *type b* would be γ that of *type a* ($P_b = \gamma P_a$). If the ratio of marginal costs for the opium was less than $\gamma : 1$ at any point, i.e.:

$$MC_b < \gamma MC_a, \tag{B.2}$$

this would mean the cost of producing morphine for firms making *type b* opium was less than that for *type a*. Again, firms making *types a & b* continue to produce until marginal revenue, $MR = MC$. However, the morphine in *type b* would now be cheaper than that in *type a*; $P_b < \gamma P_a$ even though there is γ times as much morphine in *b* as *a*. Consumers will consequently substitute *type b* for *a* and the

market would stabilise such that the price and production costs of all opium would again be strictly in proportion to their morphine content.[2]

Obviously, assuming perfect competition in the market for opium is somewhat questionable, not least because at least one market participant — the Government of India — did have the power to influence aggregate quantities to at least some significant degree (see Table 0.6 and surrounding discussion). However, while relaxing the assumption of perfect competition would allow different costs of production per unit of morphine to exist for different strengths of opium, at equilibrium the price per unit of morphine would be the same for all firms. Though that price would be above the marginal cost, the difference between producers would be in the mark-up of the firms, not in the relative market prices. That is to say, firms could use their market power to support less efficient morphine production by making lower morphine opium (although this would only occur if producers were not profit maximising or in the case that producers of *type a* cannot produce *type b*), but the differences in that case would be the result of the market power, not the morphine content. Consumers who want to buy morphine would buy it as cheaply as possible, independent of the market structure. Following from this, one may assume that the situation would be something like many models of oligopolistic competition (with morphine as homogeneous good); as the number of producers in the market increases, the price of opium would move closer to the competitive equilibrium, i.e. pricing by morphine content alone. Fundamentally, therefore, pricing different kinds of opium by their morphine content would still be differentiating them by price rather than non-price factors and the good which consumers are purchasing in this case (the morphine) is still homogeneous. Consequently, differences in morphine content alone do not explain differences in opium prices except insofar as the latter correspond to the

[2]Since, the price of the morphine in *type a* is P_a and that in *type b* $\frac{P_b}{\gamma}$, at the point where $P_a = MC_a$ and $P_b = MC_b$, as $MC_b < \gamma MC_a$, $\frac{P_b}{\gamma} < MC_a$. Consequently, as the producers of *type a* would have to sell at the market price $\frac{P_b}{\gamma}$, in order to be profitable they would have to reduce production to the point that $MC_a = \frac{MC_b}{\gamma} = \frac{P_b}{\gamma}$ (i.e. $MC_b = \gamma MC_a$). However, at this point, obviously Equation B.2 would no longer be true. Alternatively, if *type a's* costs were structured such that at no level of production would the marginal costs equal $\frac{P_b}{\gamma}$ producers of *type a* would be forced to exit the market. Again, as practically speaking the product in this case is the morphine in the opium, this is essentially the same as the standard situation in which firms in a competitive market must have the same marginal cost value at equilibrium.

	Patna		*Benares*		*Malwa*		*Persian*		*Turkish*		*'Chinese'*	
Source	*Mor.*	*Nos.*	*Mor.*	*Nos.*	*Mor.*	*Nos.*	*Mor.*	*Nos.*	*Mor.*	*Nos.*	*Mor.*	*Nos.*
Watt (1892)	3.86	5.91	4.58	5.91	4.92	6.81	—	—	—	—	—	—
Maynard (1894)	5.16	8.24	—	—	5.3	5.91	4.06	6.54	9.64	2.26	3.23	5.9

Table B.1(a): Morphine and Noscapine content in pure opium of various varieties (percent). *Sources: G. Watt.* A Dictionary of the Economic Products of India: Volume VI, Part I: Pachurhizus to Rye. *London, 1892, p. 89; and* Tables of Analysis of Opium Handed in by Surgeon-Captain Maynard *in* Royal Commission on Opium, Volume II. *Cmd. Paper C.7397. 1894, pp. 405–406.*

ratio of the former.

In actual fact there appears to have been but a relatively slight relationship between morphine content (and alkaloid content in general) of the different sorts of opium available in nineteenth-century Asia and their prices. A comparison of Table B.1(a), Table B.1(b), and Figure 0.12, for example, show that there is little evidence that varieties which contained more morphine were more expensive. In spite of significant differences in the amount of morphine they contained, the different kinds of opium were priced comparatively similarly. In particular, those varieties that appear to have been particularly high in morphine, such as Yunnan or Turkish opium, if anything had lower prices than the various kinds of Indian opium, which had comparatively moderate quantities morphine in them, but similarly to Persian and Szechwan opium which were both low in the chemical. The same lack of concurrence can also be seen for another alkaloid found in opium, Noscapine, which is also psychoactive but is considerably less addictive than morphine. At least on the basis of this evidence it does not appear that differences in alkaloid content was a significant factor in determining the relative price of the several kinds of opium.

The possibility of the morphine content of a specific variety changing over time is, as noted earlier, an important one. The nature of opium production inherently carried with it some degree of variability; even in the highly controlled government factories at Ghazipore and Patna, the morphine content of the opium produced varied

	Szechwan		*Yunnan*		*Kweichow*	
Source	*Mor.*	*Nos.*	*Mor.*	*Nos.*	*Mor.*	*Nos.*
Browne (1895)	4.32	1.968	9.49	6.15	11.27	6.12

Table B.1(b): Morphine and Noscapine content in pure opium of various varieties (percent). *Source: F. Browne. "Chinese Opium".* Pharmaceutical Journal. *4th ser. 1 (1895), pp. 493–494*

slightly from year to year.[3] Nevertheless, the relative alkaloid contents presented in Table B.1(a) and Table B.1(b) are probably at least broadly representative of much of the late nineteenth century; Turkish opium for example was generally taken to have a much higher morphine content than other varieties, and was the most commonly used for commercial production of pure morphine for medical and recreational purposes. Similarly, evidence that prices did not correspond to morphine content has been found even early in the nineteenth century, when Patna and Benares appear to have been consistently priced above Malwa in spite of the latter containing a larger amount of morphine.[4]

Part, if not all, of the reason for this may simply be that there were attributes other than price (either of the opium itself or the morphine within it) that differentiated the various kinds of opium from one another. Individual preferences for, and perhaps even more broadly the perceived 'quality' of, a certain type of opium were not a direct function of the amount of morphine that it contained. That is not to say that consumers did not value its presence; obviously, one of the most notable features of opium is the psychoactive effects of the various alkaloids that it contains. However, while the presence of these substances was probably important to consumers and may have even conditioned or moderated the way it was consumed, other attributes that have more to do with more abstract ideas associated with 'taste' may have been far more influential in the choice between different varieties of the drug. Not only does this match the evidence from the previous section rather better than a

[3]G. Watt. *A Dictionary of the Economic Products of India: Volume VI, Part I: Pachurhizus to Rye.* London, 1892, p. 89

[4]Farooqui, "Colonialism and Competing Addictions", pp. 28–29. Farooqui interprets this mismatch as a significant cause of the increased consumption of Malwa in preference to the Bengal varieties during this period, although it is not clear from his explanation why if this resulted in substitution between the two, it did not cause a corresponding adjustment in prices, or why such alleged mispricing should have persisted over many years.

Description of Samples of Prepared Opium submitted for trial:	*Opinion of a Chinese Expert in One of the Opium Firms, Hong Kong*	*Opinion of a Nine-Years' Opium Smoker*	*Experiment Number*
No. 1. Prepared opium from opium farm.	Is fairly good; is a mixture of Bengal opium and something else.	Good.	1
No. 2. Prepared opium minus morphine.	Is black and coarse; smell fairly good; is not opium.	Not very good.	1
No. 3. No. 1. with 10 per cent. morphine added.	Coarse, but can be smoked; contains opium with some other mixture; is not so good as No. 1.	Same as No. 1.	1
No. 4. No. 1 with 20 per cent. Morphine added.	Very coarse and black; burns like charcoal; contains no opium.	Fairly good, but not so good as No. 1 and No. 3.	1

Table B.2(a): Results of the first experiment on the effect of morphine content on opium quality, carried out by the Government Analyst of Hong Kong. *The first three columns are reproduced from an extract from a report of H. McCallum, Government Analyst, Hong Kong, in* Correspondence Regarding the Report by the Royal Commission on Opium. *Cmd. Paper C.7991. 1896, p. 196.*

model in which morphine content is the be-all-and-end-all of opium quality, it also intuitively matches common experience of, at least superficially, similar substances. The illegal nature of many such commodities in the modern world makes it difficult to speak authoritatively about the modalities of their consumption, which may in any case be altered by the fact and effects of prohibition. However, outside of these restrictions, there are substance that, even if chemically very different, perform a similar social role to opium. For example, while a somewhat imperfect analogy, consumers of alcoholic drinks generally care whether those drinks contain alcohol or not, and even how much alcohol there is in them, but the percentage alcohol content is not a particularly good predictor of the relative price (or quality) of any specific type of drink. Similarly, tobacco is rarely sold or priced with direct reference to its nicotine content and 'good' or 'expensive' coffee is not in general parlance synonymous with 'high in caffeine.'

Some more evidence of this dynamic can be found in sources that deal more

directly with the sale of the drug to consumers. In the case of Hong Kong a great deal of government revenue was drawn from a retail monopoly on opium called the Opium Farm.[5] Concomitant with this activity, in the early 1880s the Government Analyst carried out two experiments in which they added or removed morphine from several samples of prepared opium made by the Farm, with as little as possible being changed otherwise.[6] In each version of the experiment an opium expert and and experienced opium smoker were asked for their opinion of the quality of the various samples without being told what they were.[7]

Although this was not a particularly rigorous experiment, it can nevertheless provide some useful information about the way opium quality was perceived. First of all, the amount of morphine significantly affected the physical attributes of the opium; samples with no or high levels of morphine had noticeably different consistencies and appearances, and behaved differently when burnt.[8] However, when it came to the relative quality of the samples as smoking opium, there was no linear relationship between the amount of morphine and how good it was. It is also interesting that in both cases the expert's and the experienced smoker's opinions of the samples were not the same. This may of course simply reflect personal taste or experience. In the report no details of the smoker are given except for the length of time that he had smoked opium; it may be the case that while a habitual consumer he did not have the 'connoisseurial' or 'expert' knowledge of opium quality that the other tester did. Nevertheless, even this disagreement suggests a degree of ambiguity which would be unlikely to have existed if the assessment depended only on the strength of a narcotic effect. Finally, on a side note, it is notable that in both experiments in the case of the unaltered prepared opium the expert could identify both the main kind of opium it contained at least broadly (a Bengal variety in both cases) and could also tell that it was not pure. This in itself helps to corroborate the idea from the previous section

[5]'Farm' is here used in the sense of a 'tax farm'.

[6]'Prepared' meant that the opium had been boiled and mixed so that it was ready to be smoked, hence the higher morphine content given for it in Table B.2(a) than for the raw opium dealt with up to this point.

[7]*Correspondence Regarding the Report by the Royal Commission on Opium.* Cmd. Paper C.7991. 1896, pp. 195–196

[8]It should be noted here that directly burning opium is a different process than it undergoes when smoked. Unlike most other 'smokable' substances opium was (and is) consumed in this way by being heated over a flame so that it gives of a vapour which is then inhaled.

Description of Samples of Prepared Opium submitted for trial:	*Opinion of a Chinese Expert in One of the Opium Firms, Hong Kong*	*Opinion of a Nine-Years' Opium Smoker*	*Experiment Number*
No. 1. Opium farm prepared opium contains 7 per cent. Morphine.	Appearance coarse, and when burnt becomes black and hard; it is Bengal drug, but not pure; it is mixed with some other stuff and has no taste.	Very good.	2
No. 2. No. 1 with 15 per cent. Morphine added.	Burns very quick, and has no taste or smell of opium at all. Colour red and coarse when burnt; gives out plenty of smoke, and leaves simply ash and no opium to smoke.	Same as No. 1.	2
No. 3. No. 1 with 25 per cent. Morphine added.	Just like No. 2, only a shade better.	Not good.	2
No. 4. Prepared opium *minus* morphine.	When applied to the light burns like opium, but in a moment it burns quite black, and the dross leaves a bad smell; when burning, gives out a strong smoke.	Same as No. 1.	2

Table B.2(b): Results of the second experiment on the effect of morphine content on opium quality, carried out by the Government Analyst of Hong Kong. *The first three columns are reproduced from an extract from a report of H. McCallum, Government Analyst, Hong Kong, in* Correspondence Regarding the Report by the Royal Commission on Opium. *Cmd. Paper C.7991. 1896, p. 196.*

that the various types of opium were actually differentiable categories that people used, not just descriptions of geographical origin. In particular, in the results of the first experiment, the expert stated that the adulteration of the Bengal opium in the sample has removed its taste.

There are, however, broader reasons to doubt that a desire for morphine was the only reason people smoked opium. Compared with the 'opium eating' common in India and much of the world outside of Asia, opium smoking delivers a much smaller amount of morphine relative to the amount of opium used, although it does so comparatively quickly.[9] That this was the case was well known at least by the

[9]Farooqui suggests a figure of around ten percent of the morphine content in the opium being actually absorbed by the smoker as the modern consensus (Farooqui, "Colonialism and Competing Addictions", p. 29), although some works suggest as high as twenty percent(see for example: H. Kalant. "Opium Revisited: A Brief Review of its Nature, Composition, Non-Medical Use and Relative Risks". *Addiction* 92.3 (1997), pp. 267–277, p. 271). Interestingly, Kalant observes that

end of the nineteenth century; the chemist Henri Moissan, who would subsequently win a Nobel Prize for unrelated research, in his 1892 analysis of opium smoke's chemical constituents found that good quality prepared opium produced smoke which contained only a very little morphine along with various volatile oils with 'pleasing aromas.'[10] Even earlier, in the report cited above, McCallum was similarly critical of the relative merits of smoking as a morphine delivery system: "If the effects of opium smoking are similar to those of opium eating, and morphine the active agent, it can only be said, regarding the former mode of using the drug, that a more elaborate, troublesome, wasteful, and expensive method could scarcely be devised to obtain a minimum of effect from a maximum of power."[11] These are, of course, both observations made by relatively well-educated Europeans, nevertheless, given that there were a large number of places, especially in Southeast Asia, in which multiple forms of opium consumption were practised in the same place, their widely differing effects must have been clear to consumers, and yet smoking continued to be the most commonly practiced form of taking opium.[12] Even more directly, there is even evidence that high-morphine opium in Persia was adulterated by merchants when exported for smoking, as the former was found to be distasteful for smokers.[13] These are facts difficult to square with the idea that people smoked opium only to consume morphine.

The same point is made still more strongly if one considers that by the end of the nineteenth century pure morphine could be relatively easily produced, and was widely available in South, Southeast, and East Asia. Morphine for injection or oral consumption was also cheaper per dose relative to smokable opium, and was considered to be more convenient. However, although morphine imports to opium consuming areas grew rapidly during the 1890s and 1900s, so long as opium

reported typical doses for historical opium eating and opium smoking would consequently imply much higher morphine consumption in the former than the latter, of, in the examples given, between ten and four-hundred times.

[10] H. Moissan. "Ètude Chimique de la Fumèe d'Opium". *Comptes Rendus de l'Académie des Sciences* 115 (1892), pp. 991–992

[11] *Correspondence Regarding the Report by the Royal Commission on Opium*, p. 196

[12] Where a transition did occur, as in some parts of Persia and India, it tended to be from eating to smoking rather than the other way about (See for example, Matthee, *Pursuit of Pleasure*, pp. 211–213).

[13] Regavim, "Most Sovereign of Masters", pp. 17–19, 166–167

was generally legal there is no evidence of systematic substitution.[14] Again, it is difficult to see why individuals who were only interested in morphine content would not have immediately switched to purer, cheaper, and more efficient alternatives to smoking opium. While it may not be entirely unreasonable to question assumptions of consumer rationality, especially when dealing with addiction, such behavior would have required opium consumers not only to be 'not rational', but, in fact, peculiarly irrational.

At this point the reader may find that they feel rather skeptical. On the face of it, it may appear a rather unusual argument that people consume addictive, mood-altering substances for reasons other than those effects. However, it should be emphasised again that the intention of this section is not to argue that consumers did not care at all about morphine content or the psychoactive effects of opium consumption, rather, as suggested earlier, the point being made is merely that while the effects caused by the various alkaloids it contained might have been a key part of the experience of smoking opium, they were not what primarily defined the difference between separate varieties, or what determined what was 'good' opium and what was 'bad.' Consequently, not only does morphine content not explain variable persistent differences in relative price between the divers kinds of opium, but on both theoretical and historical grounds it should not be expected to do so.

[14]Interestingly, after serious suppression efforts began in China and elsewhere during the 1900s, consumption of morphine and heroin appear to have grown substantially faster. Before that point, more powerful opiates were frequently used as 'cures' for opium addiction, rather than substitutes. These facts further endorse the idea that consumption preferences may be systematically different under legal and prohibitionist regimes.(See for example: Dikötter, Laamann, and Xun, "China, British Imperialism and the Myth of the 'Opium Plague'", pp. 29–31; Zheng Yangwen, *Social Life*, pp. 190–194; and J.M. Jennings. "The Forgotten Plague: Opium and Narcotics in Korea under Japanese Rule, 1910–1945". *Modern Asia Studies* 29.4 (1995), pp. 795–815, pp. 797–799).

Appendix C

Paper 1: Model Selection

As noted in the main text, model selection is of considerable importance for the robustness of the results. Since the series of log returns (Figure C.1) appears to exhibit changing volatility structure with substantial clusters of more variable prices, it makes sense to consider modeling it as an ARCH or GARCH process. The autocorrelation (ACF) and partial autocorrelation functions (PACF) presented in Figure C.2 reject that the series is i.i.d., and also provide no evidence against the hypothesis of the presence of GARCH behavior. Additionally, consistent with a standard GARCH(1,1) model, the autocorrelations are overwhelmingly positive.

In practice there are a range of different model specifications could intuitively correspond to the narrative of historical events described in the main text. Since a regime-switching is being considered, the number of different volatility regimes in the model is important. As well as potential differences between the reserve period and the rest of the data, pre-reserve, reserve, and post-reserve could all exhibit differing variance structures, differing volatility regimes not associated with the opium reserve, or no significantly difference in volatility dynamics across the period at all. Additionally, since the entire family of ARCH and GARCH models are based on variable conditional volatility, return variance can still change significantly outside of a 'regime' shift. Three regimes is chosen as the maximum in part to mitigate the risk of over-fitting associated with comparing a large number of similarly specified models.

Within this type of model, it is also necessary to make an assumption about the

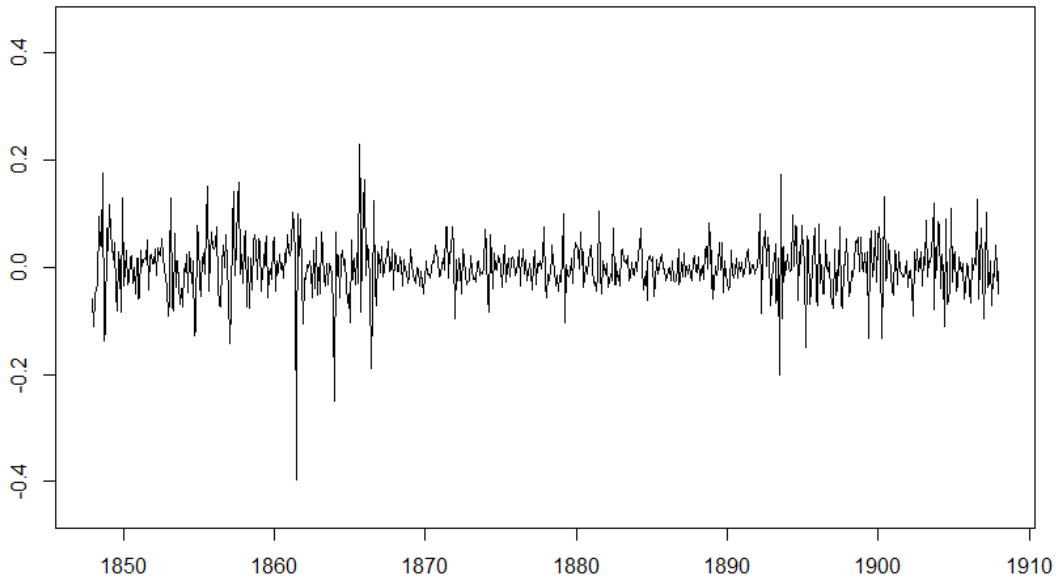

Figure C.1: Log returns series for Bengal Opium, 1848–1908.

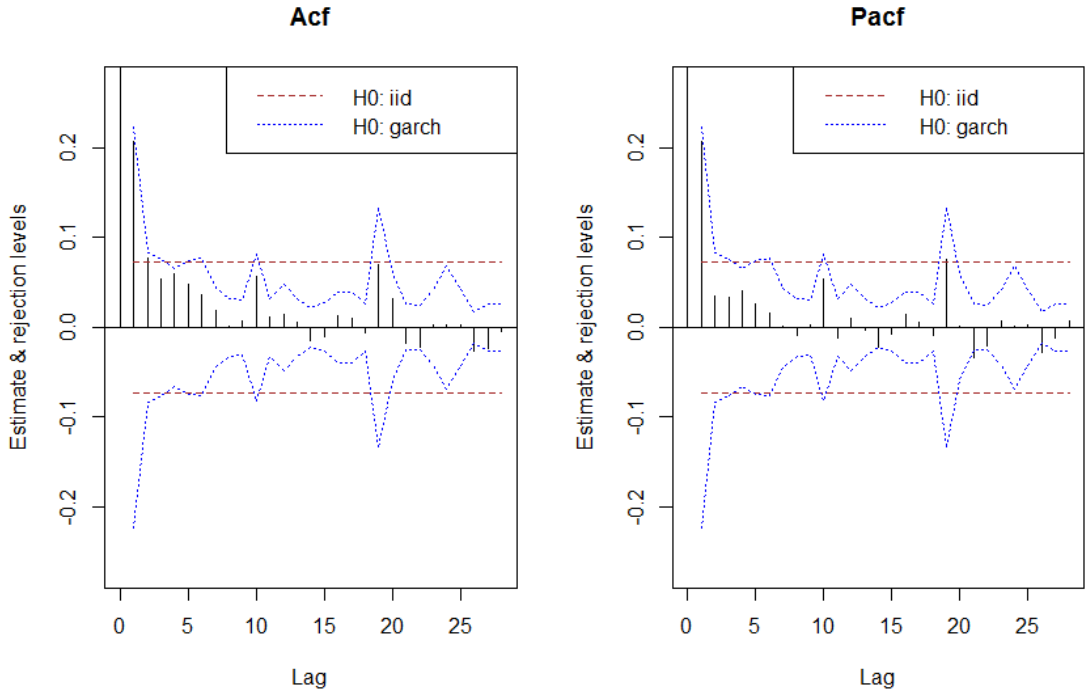

Figure C.2: Autocorrelation and Partial Autocorrelation Functions for the Squared Return Series.

distribution of the innovations in volatility. Commonly, financial and commodity time series exhibit errors in the variance equation that are not normally distributed; in this case specifications with normally and t-distributed innovations are considered.

Model	Regimes	Distribution	*Log-Likelihood*	*AIC*	*BIC*
ARCH	1	Normal	1143.9	-2283.8	-2274.6
ARCH	1	t	1215.9	-2425.9	- 2412.1
GARCH	1	Normal	1183.6	-2361.1	-2347.4
GARCH	1	t	1233.3	-2458.6	**-2440.3**
MSGARCH	2	Normal	1234.2	-2452.5	-2415.8
MSGARCH	2	t	1240.8	**-2461.6**	-2415.8
MSGARCH	3	Normal	1239.5	-2449.0	-2380.3
MSGARCH	3	t	**1243.2**	-2450.5	-2368.0
gjrGARCH	1	Normal	1183.6	-2359.1	-2340.8
gjrGARCH	1	t	1233.3	-2456.6	-2433.7
gjrMSGARCH	2	Normal	1234.4	-2448.7	-2402.9
gjrMSGARCH	2	t	1240.8	-2457.6	-2402.6
gjrMSGARCH	3	Normal	1235.8	-2435.6	-2353.2
gjrMSGARCH	3	t	**1243.2**	-2444.4	-2348.2

Table C.1: Information criteria of various GARCH model specifications, conditional distributions, and numbers of volatility regime. 'ARCH' and 'GARCH' indicate the standard single regime ARCH and GARCH models respectively, while those labeled 'MSGARCH' are multiple-regime Markov-switching GARCH models. The prefix 'gjr' indicates the use of the Glosten, Jagannathan, and Runkle modified GARCH model.

Additionally, the effects of positive and negative shocks on volatility do not have to be symmetrical; in fact the opposite is observed in several kinds of financial time series. Consequently, I have also included various specifications using the modified GARCH model of Glosten, Jagannathan, and Runkle, which allows for asymmetries in conditional volatility.[1]

Table C.1 reports the values of the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC) for a variety of models based on the above considerations. The former indicates two-regime Markov-switching GARCH model and the latter a single-regime GARCH model both with t-distributed innovations. For each information criterion the other model is the 'second best' of those evaluated, although by a very significant margin for BIC. This may possibly indicate that the single-regime model is under-specified or particularly, given the magnitude, the two-regime model is over-specified, so the results of both models are reported in the main text. For both models the standardised squared residuals no longer exhibit

[1]L.R. Glosten, R. Jagannathan, and D.E. Runkle. "On the Relation between the Expected Value and the Volatility of the Nominal Excess Return on Stocks". *Journal of Finance* 48.5 (1993), pp. 1779–1801

autocorrelation and the ACF and PACF also show a lack of GARCH effects.

Appendix D

Paper 2: Rent Comparisons

The two existing attempts to systematically quantify the costs and returns of opium production, Richards' *The Indian Empire and Peasant Production of Opium* and Bauer's *The Peasant Production of Opium in Nineteenth-Century India*, primarily draw upon statements made by opium officials, cultivators, landlords, and others in evidence before the *Royal Commission on Opium* during its tour of India in 1893–1894, supplemented by a couple of broadly contemporary works on agriculture in northwestern India.[1] Both authors select a few sets of costs from these sources on which to base their estimates; Bauer uses six and Richards, two.[2] To these I have added other rent rates from the same sources which are not directly used by these authors in their calculations (usually in the case where a rent rate is given, but other costs are not).[3]

The following tables consequently present eleven sets of rent quotations (sixteen distinct rates overall), classified according to which of the Opium Agencies they refer to.[4] In general, classifying rates of rent by location was relatively straightforward, as they were mostly given for a specific estate, locality, district, or, at worst, province. The only exception to this rule was the statement given by G.M. Gregory which

[1]The books in question are: Duthie and Fuller, *Field and Garden Crops of the North-Western Provinces and Oudh, Part I*, p. 67; and W. Crooke. *The North-Western Provinces of India: Their History, Ethnology, and Administration.* London, 1897, pp. 50–51

[2]For details of the basis upon which they make their choices, see: Richards, "Indian Empire", pp. 74, 77–79; and Bauer, *Peasant Production of Opium*, pp. 153–160.

[3]The *Royal Commission* evidence is taken from: *Royal Commission on Opium, Volume III*, pp. 3, 17, 19, 26, 34, 40–41, 62, 72–73, 76, 84, 89–91, 259, 273

[4]As noted in the main text, this is a different approach to that taken by Richards and Bauer, who both assume implicitly or explicitly that the quoted rent rates should be interpreted universally.

was merely presented as the result of his experience of opium production in general, rather than as representative of conditions in a specific place.[5] This is problematic as he served as an officer in both agencies, which makes directly classifying the figures he gives is difficult. However, at the same time, his statements provide the main source for Bauer's rent estimates (according to him the largest single cost item), so it is important to understand to what they refer.[6] Since the majority of Gregory's field experience of opium production took place in the Bihar Agency I have classified them accordingly, but they may also have referred to the area around Ghazipur and Mirzapur in N.W.P.O.[7]

On a similar note, since the date to which a given rent rate pertains is not always clear, when this information is lacking I have substituted the date at which the statement was made (1894 in the case of the *Royal Commission* witnesses) or published. These dates should therefore be regarded as, at best, the latest possible date to which the rent figures can directly refer. Where relevant, conversion has been made on the basis of the official bigha of $\frac{5}{8}$ of an acre unless the unit is defined otherwise in the source.

[5]See *Royal Commission on Opium, Volume III*, pp. 89–91.
[6]Bauer, *Peasant Production of Opium*, pp. 156–160
[7]This is in line with how Bauer uses it, since he implicitly takes it to refer to Bihar.

Table D.1(a): Bihar Agency

Name	*Date*	*Used By*	*Location*	*Description*	*Rate per Hectare (Rs.)*
G.M. Gregory, Sub-Deputy Opium Agent, *vrs.*	*c.*1873–*c.*1879	Bauer	Probably Saran, Champaran, Shahabad, or Chota Nagpur, Bihar	Rent, occupancy tenant	15.81–31.63
G.M. Gregory, Sub-Deputy Opium Agent, *vrs.*	*c.*1873–*c.*1879	Bauer	Probably Saran, Champaran, Shahabad, or Chota Nagpur, Bihar	Maximum rent, non-occupancy Tenant	59.31–98.84
A. Forbes, Commissioner, Patna	*c.*1894	Bauer	Muzafarpur, Bihar	Rent	21.23
Guru Prossad Sen, Barrister, of Patna	*c.*1894	Bauer, Richards	Patna, Bihar	Average Rent	39.54
Guru Prossad Sen, Barrister, of Patna	*c.*1894	—	Patna, Bihar	Range of Rents	27.68–79.07
Reverend Prem Chand, Missionary of Gya	*c.*1894	—	Gya or Monghyr	Rent for poppy land near villages	35.58
Babu Rasik Lal Ghosh, India Association	*c.*1894	Bauer	Shahabad, Bihar	Rent	26.69–35.58
Cultivators of Buxar, Shahabad District	*c.*1894	Bauer	Shahabad, Bihar	Gurastha (occupancy rent)	23.72–39.54
Cultivators of Buxar, Shahabad District	*c.*1894	Bauer	Shahabad, Bihar	Shikami (non-occupancy rent)	79.07
Assistant Surgeon Soorjee Narain Singh, of Patna	*c.*1894	—	Patna	Range of rents paid for poppy land	31.63–55.35

Table D.1(b): Benares Agency

Name	*Date*	*Used By*	*Location*	*Description*	*Rate per Hectare (Rs.)*
Miss Sturmer, Co-Proprietor, Kajha Estate	post-1877	—	Azimgarh, N.W.P.O.	Rent, high caste cultivator	21.00
Miss Sturmer, Co-Proprietor, Kajha Estate	post-1877	—	Azimgarh, N.W.P.O.	Rent, low caste cultivator	23.72
Duthie & Fuller	*c.*1882	Bauer	N.W.P.O. (unspecified)	Rent	24.71
Hon. Raja Rampal Singh, Talukdar of Kalakankar	*c.*1894	—	Partabgarh, N.W.P.O.	First-class land	31.63
Hon. Raja Rampal Singh, Talukdar of Kalakankar	*c.*1894	—	Partabgarh, N.W.P.O.	Second-class land	15.82
Lala Kashi Prasad, Zamindar	*c.*1894	—	Allahabad, N.W.P.O.	Rent for original tenant	15.81
Lala Kashi Prasad, Zamindar	*c.*1894	—	Allahabad, N.W.P.O.	Sublet rent between tenants	19.77
Ram Kali Chaudhuri, Retired Subordinate Judge	*c.*1894	—	N.W.P.O. (unspecified)	Rent for poppy land close to village	19.77–27.68
J.S. Meston, Settlement Officer, Budaun	*c.*1894	—	Budaun, N.W.P.O.	Rent for sugarcane, poppy, &c., for non-occupancy tenants in inferior areas	27.68–31.63
J.S. Meston, Settlement Officer, Budaun	*c.*1894	—	Budaun, N.W.P.O.	Rent for poppy,non-occupancy tenants in superior areas	59.31–79.07
J.S. Meston, Settlement Officer, Budaun	*c.*1894	—	Budaun, N.W.P.O.	Rent for poppy,non-occupancy tenants in superior areas preceded by an autumn crop	98.84
W. Crooke	*c.*1897	Richards	Aligarh, N.W.P.O.	First-class land used for poppy, sugarcane, fine cereals, &c.	29.65

Appendix E

Paper 2: Regional Data Aggregation

The problems caused by changing opium Division borders described in Section 2.4 means that in order to have a consistent unit of analysis some sort of grouping has to be used. At the same time, aggregating at the Agency or Provincial level is unsatisfactory since, besides heavily reducing the number of observations, these approaches would entirely excludes the kind of local variation which is key to the question being analysed. Consequently, in order to balance these two sets of considerations I have chosen to group them into a series of artificial 'Regions,' each of which contains 1–5 Divisions at the end of the period. The approach taken to aggregating is based on four considerations: that regions should have consistent, non-overlapping borders; that they should have comparable levels of opium output; that they be geographically compact; and that, where possible, they bring together divisions which were historically associated with one another. So, for example, the Regions called 'North-East Oudh,' 'North-West Oudh,' and 'South Oudh' in Table E.1 are the same as the real Faizabad, Lucknow, and Sultanpur Divisions in 1881, but by 1897 represent an aggregation of the six Divisions which Oudh had been divided into by that time.

Many of the aggregations used are to some extent forced by the structure of the Divisional reorganisations which took place over the period. To take one example in the south of the Benares Agency, the fact that Cawnpore, Fatehgarh, Aligarh,

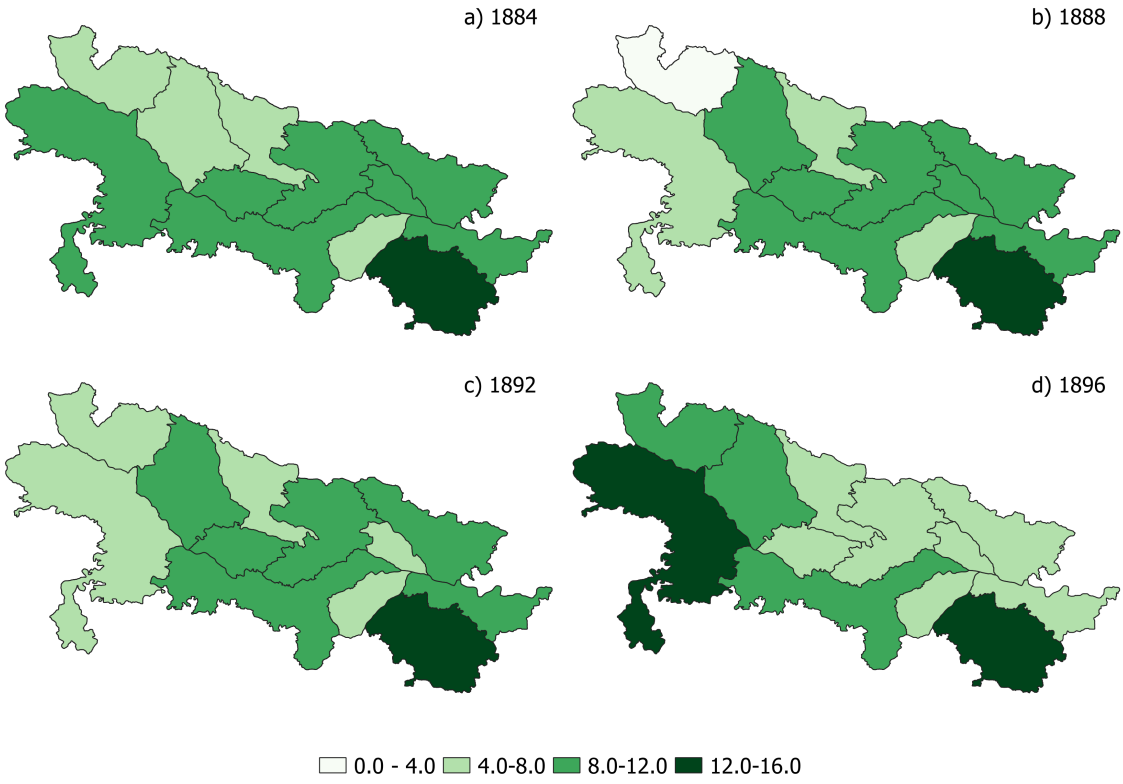

Figure E.1: Percentage of Annual Opium Output by Region, Selected Years. *Sources as described in Section 2.4.*

Mainpuri, and Etawah Divisions covered the same area at different times means that these Divisions have to be treated as a single unit for the duration of the analysis.[1] These problems are especially pronounced in the south and west of the Benares Agency where reorganisations were much more frequent.

While this method of aggregating the data does lead to some unavoidable anomalies, as Figure E.1 shows, the distribution of output is relatively even across the constructed regions. The region with fairly consistently the largest output is the one covering Gaya and Tehta Divisions, and extending south into Chota Nagpur. Similarly, the two Regions in the South of the Benares Agency are both consistently quite large both geographically and in terms of opium output. However, as shown in Appendix F, dropping these regions entirely from the regressions does have some effect on the magnitude of the coefficients, but does little to change the overall picture presented by the results.

Obviously this approach does lead to some rather more general questions about the

[1]To be more precise, this Region was divided into Cawnpore, Fatehgarh, and Aligarh Divisions from 1881–1884, Cawnpore, Fatehgarh, Aligarh, and Mainpuri from 1885–1888, and Fatehgarh, Mainpuri, and Etawah from 1889–1897.

results. Since the Regions used in this analysis do not correspond to actual historical administrative units it is possible that the way the Regions have been grouped may affect the results in the quantitative analysis. While for the reasons outlined above it is not possible to try alternative aggregations to check for consistency, some of the alternative specifications presented in the next appendix do provide a limited amount of comfort in this regard. Dropping the largest regions, and those with uncertain borders (Appendix F.1) actually increases the contrast between the results for the variable of interest between the two Agencies. Meanwhile, in Appendix F.3, repeating the two specifications for Bihar, but using the original divisions as the unit of analysis (as divisional borders were much more stable in the Bihar Agency) returns results with the same sign and significance as those presented in the main part of the paper, again suggesting that the general inferences drawn from these results are not a consequence of the ways that the regions are constructed. A complete list of the regions used is given in Table E.1.

Table E.1: [Following Pages] Opium Divisions and Revenue Districts in Each Region used in the Main Quantitative Analysis.

Region	*Opium Divisions*	*Revenue Districts*
North Bihar	Tirhut	Champaran
	Hajipur	Muzaffarpur
	Motihari	Darbhanga
	Bettiah	
Saran	Chuppra	Saran
	Aliganj	
Shahabad	Shahabad	Shahabad
Patna/Monghyr	Patna	Patna
	Monghyr	Monghyr
		Bhagalpur (south)
Greater Gya	Gya	Gya
	Tehta	Hazaribagh
Upper Purvanchal	Azamgarh	Azamgarh
	Gorakhpur	Gorakhpur
	Basti	Basti
		Jaunpur
Lower Purvanchal	Ghazipur	Ballia
	Allahabad	Ghazipur
	Mirzapur	Benares
		Mirzapur
		Allahabad
		Fatehpur
		Banda
Mid-to-Upper Doab	Cawnpore	Cawnpore
	Fategarh	Hamirpur
	Aligarh	Jhansi
	Mainpuri	Jalaun
	Etahwah	Etawah
		Farukhabad
		Mainpuri
		Agra
		Muttra
		Etah
		Aligarh

Region	*Opium Divisions*	*Revenue Districts*
North-East Oudh	Faizabad	Faizabad
	Gonda	Gonda
		Bahraich
North-West Oudh	Lucknow	Kheri
	Sitapur	Sitapur
		Hardoi
		Bara Banki
		Lucknow
		Unao
South Oudh	Sultanpur	Sultanpur
	Rai Bareli	Rai Bareli
	Partabgarh	Partabgarh
Rohilkhand	Bareilly	Moradabad
		Bareilly
		Budaun
		Pilbhit
		Shahjahanpur

Appendix F

Paper 2: Alternate Specifications

As outlined in the main text of the paper and in the preceding Appendix, the nature of the approach taken precludes strict inference. Additionally the lack of consistent data for many potentially confounding factors also means that rigorous testing of the robustness of the results is not really possible in any case. Consequently, the alternative specifications presented here are restricted to issues that result from the idiosyncrasies of the data itself. In particular, the following sections are focused on thre issues: the regions in which the area which could be licensed for opium cultivation contracted significantly across the period; the measure of the area under poppy used; and multicollinearity in the Bihar sub-sample. While the results given in this Appendix do give a number of reasons to be cautious about the specific results of the main specifications, the do little to contradict the overall conclusion that there were substantial structural differences in the relationship between cultivators and intermediaries between the two Opium Agencies (i.e. that these differences were correlated with the presence of the assamiwar and khattadari systems).

F.1 Regions with Changing Borders

Within the constructed regions, three are spread over a significantly larger area than the others and underwent a significant concentration over the period covered by the analysis. The three regions in question, labeled Greater Gya, Lower Purvanchal, and Mid-to-Upper Doab in Table E.1, are also all located in the south of the area

	Bih.	*Ben.*	*All*
C_{it}	1.010*	−0.477**	−0.091
	(0.069)	(0.011)	(0.667)
S_{it}	−2.078**	0.0617**	−0.393
	(0.011)	(0.031)	(0.208)
W_{it}	0.011	0.275*	0.085
	(0.963)	(0.069)	(0.556)
P_{it}	2.983***	0.834***	1.433***
	(0.000)	(0.000)	(0.000)
N	68	81	149
Adj. R^2	0.653	0.743	0.606
Rainfall		Yes	
Prices		Yes	
Irrigation		Yes	
Region FEs		Yes	
Year FEs		No	

Table F.1: Results of Alternate Specifications, Excluding those Regions with Uncertain Borders (Region Fixed Effects and Opium Price).

covered by the two agencies. Because of the idiosyncrasies present in these regions may have affected output in a way not captured by either set of fixed effects. If this were the case, it could potentially cause problems in the analysis since within these regions not only was the area which could be licensed reduced substantially over time, but also the land actually used to cultivate poppy also changed. Since both of these changes are difficult to control for directly, but might be closely correlated with both the number of intermediaries and opium output, it is important to see whether removing these three regions from the data materially affects the results.

Tables F.1 and F.2 present the results of both the main specifications with these three Regions removed from the data. While the removal of these regions has little or

	Bih.	*Ben.*	*All*
C_{it}	0.914*	−0.449**	0.106
	(0.051)	(0.010)	(0.549)
S_{it}	−1.805***	0.074	−0.762***
	(0.008)	(0.799)	(0.008)
W_{it}	−0.265	0.015	−0.237*
	(0.312)	(0.905)	(0.093)
P_{it}	2.441***	1.180***	1.584***
	(0.000)	(0.000)	(0.000)
N	68	81	149
Adj. R^2	0.286	0.736	0.514
Rainfall		Yes	
Prices		Yes	
Irrigation		Yes	
Region FEs		Yes	
Year FEs		Yes	

Table F.2: Results of Alternate Specifications, Excluding those Regions with Uncertain Borders (Region and Year Fixed Effects).

no impact on the results for the Benares sub-sample, the effect on the Bihar results is very notable: removing the Region around Gaya produces a much bigger and weakly significant coefficient. Although this result does seem to indicate that the inconclusive evidence of coercion in that agency may be driven by one particular region, the direction of the change is such that the results without it fit the conclusions of this paper even more closely. Excluding the Greater Gaya region from the data yields opposite results in the assamiwar and khattadari regions, suggesting that, if anything, the results presented in the main part of the paper understate the difference between the two sets of institutional arrangements. Combined with the results from Section F.3, this suggests that change in significance and the large increase in the

magnitude of the Bihar result is a consequence of collinear relationships between the variable of interest, C_{it}, and the other main variables.

F.2 Alternate Measures of Area

As described in Section 2.4, in annual *Reports* of the Opium Department, data for three different possible measures of area are available: the area engaged for by the cultivators, the area under poppy when initial measurements were undertaken in the winter, and finally the area actually harvested. Of these, the area harvested is the one actually used in the main analysis, since it fits most logically into the productivity framework on which the model is based. However, given that a much higher rate of failure is observable in some regions relative to others, especially in the less well irrigated parts of northern Bihar, it is useful to consider how the results of the quantitative analysis are affected if a variable closer to the area *planted* with poppy rather than the area *harvested* is used. While neither the area engaged for nor the measured area perfectly capture this they nevertheless represent the closest available proxy. Additionally, given that there were some issues in the main analysis with the land coefficient P for the Bihar sub-sample, substituting this data will help to test whether, in this case, using a model that includes land on which the opium crop failed altogether fits the data better than one which does not.

The results in Table F.3, do, as one might expect, indicate that changing the variable used to measure land has a significant impact on the results of the quantitative analysis. While the coefficients of interest for the Benares sub-sample and for all the regions taken together remain similar in magnitude to those presented in the main analysis, those for Bihar suddenly grown markedly in both magnitude and significance. At the same time, the coefficients for land shrink (in the case of engaged area becoming negative) and loose significance. Additionally, as shown in Table F.4, while adding time fixed effects does produce similarly large and significant coefficients for Bihar, examination of the R^2s reveals that the model no longer usefully explains any of the variation in this sub-sample. Given the multicolinearity problems present in the Bihar data (discussed in Appendix F.3), it seems probable that the changes

	1			*2*		
	Bih.	*Ben.*	*All*	*Bih.*	*Ben.*	*All*
C_{it}	1.144**	−0.506***	−0.257	1.023*	−0.394***	−0.187
	(0.029)	(0.001)	(0.125)	(0.053)	(0.004)	(0.240)
S_{it}	1.017*	1.055***	0.914***	0.897	0.541**	0.486**
	(0.076)	(0.000)	(0.000)	(0.128)	(0.025)	(0.050)
W_{it}	−0.264	0.290**	0.060	−0.203	0.262**	0.064
	(0.303)	(0.043)	(0.664)	(0.414)	(0.048)	(0.628)
P_{it}	−0.471	0.432**	0.311	−0.032	0.830***	0.637***
	(0.392)	(0.021)	(0.129)	(0.927)	(0.000)	(0.000)
N	85	115	200	85	115	200
Adj. R^2	0.480	0.715	0.527	0.474	0.757	0.557
Rainfall		Yes			Yes	
Prices		Yes			Yes	
Irrigation		Yes			Yes	
Region FEs		Yes			Yes	
Year FEs		No			No	

Table F.3: Results of Alternative Specifications, using Different Measures of Area (Region Fixed Effects and Opium Price). Results in the Columns Marked (1) use Area Engaged For, and those in (2) use Measured Area.

	1			*2*		
	Bih.	*Ben.*	*All*	*Bih.*	*Ben.*	*All*
C_{it}	1.027***	−0.530***	−0.250*	0.946**	−0.827*	−0.145
	(0.021)	(0.001)	(0.096)	(0.035)	(0.056)	(0.310)
S_{it}	0.368	0.754***	0.502**	0.270	0.031	0.166
	(0.449)	(0.009)	(0.037)	(0.585)	(0.910)	(0.474)
W_{it}	−0.446	0.150	−0.207	−0.439	0.060	−0.245*
	(0.101)	(0.312)	(0.144)	(0.110)	(0.644)	(0.072)
P_{it}	−0.453	0.685***	0.561***	0.020	1.152***	0.752***
	(0.407)	(0.002)	(0.005)	(0.949)	(0.000)	(0.000)
N	85	115	200	85	115	200
Adj. R^2	-0.033	0.566	0.320	-0.048	0.674	0.374
Rainfall		Yes			Yes	
Prices		Yes			Yes	
Irrigation		Yes			Yes	
Region FEs		Yes			Yes	
Year FEs		Yes			Yes	

Table F.4: Results of Alternative Specifications, using Different Measures of Area (Region and Year Fixed Effects). Results in the Columns Marked (1) use Area Engaged For, and those in (2) use Measured Area.

to the Bihar coefficients are the result of this kind of effect — as the land measure becomes less sensitive to the actual harvested area, some of the effects of changes in area are captured (spuriously) in the coercion variable. The results for the Benares

Agency and both agencies together remain similar. However, when engaged area is used, the coefficient of C_{it} for both agencies combined becomes significant at the ten percent level and when measured area is used its significance for Benares falls to the ten percent level (the size of the coefficient also increases markedly). This suggests that results for these samples may be sensitive to changes in the way land is measured, although this is not necessarily surprising given the importance of land as an input, and the results here are largely consistent with those presented in the main part of the paper. Finally, it is also worth noting, as in the previous section, the tendency of changing the data used appears to be to increase the contrast between the two agencies (and consequently between the two systems of managing opium procurement), not to decrease it.

F.3 Multicollinearity in the Bihar Sub-Sample

The large changes in the magnitude and significance of the coercion coefficients for the Bihar sub-sample across the preceding sections can largely be explained by the collinear relationships between the number of intermediaries, the amount of land used, and the number of cultivators within that Agency. Variance inflation factor testing reveals a significant degree of multicollinearity affecting the coercion variable within the Bihar sub-sample. This is probably the result of the small number of regions in the aggregated Bihar data. However, since the Bihar Agency was less affected by changes to the Division borders that Benares, it is possible to mitigate this effect by repeating the analysis using the original, unaggregated data (which does not have the same evidence of multicollinearity). Since most of the control variables are not available at sufficiently high resolution to allow different values for each division, those divisions which do not have direct observations for the controls use the values at the nearest place for which one is available. The results of doing this are presented in Table F.5.

Under both the specification with price and region fixed-effects and the one with region and time fixed-effects, the coefficients for C_{it} are, like the results of the main regressions, positive and insignificant. They are also, however, considerably smaller

	1	*2*
C_{it}	0.256	0.007
	(0.319)	(0.970)
S_{it}	-0.583^{**}	-0.477^{***}
	(0.013)	(0.005)
W_{it}	0.207	0.523^{**}
	(0.244)	(0.010)
P_{it}	1.162^{***}	0.903^{***}
	(0.000)	(0.000)
N	187	187
Adj. R^2	0.604	0.443
Rainfall	Yes	Yes
Prices	Yes	Yes
Irrigation	Yes	Yes
Region FEs	Yes	Yes
Year FEs	No	Yes

Table F.5: Results of Repeating the Main Quantitative Analysis with the Raw Division Data for the Bihar Sub-Sample. The column marked (1) contains the results for the specification with region fixed effects and opium price, and the column marked (2) those for the specification with region and year fixed effects.

than those presented in Section 2.5. Together with the earlier specifications using different (less direct) measures of land, these results would seem to suggest that the main effect introduced by the multicollinearity in this sub-sample is to make any coercion effect appear larger and more significant when the factors of production are poorly measured; that is to say it works against the conclusion argued in this paper. These results further help to confirm that the lack of significance in the Bihar coefficients is not driven by multicollinearity and that the raw data produces similar

results to the aggregation used in the main analysis.