The role of economic and institutional change in shaping social preferences

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Abstract

This thesis explores how economic and institutional changes shape social preferences, in particular attitudes of wellbeing and unrest. The first chapter explores whether the welfare of women increased following the extension of women's rights between the 1960s and 1990s in Europe. Using individual-level data on life satisfaction, it shows through differences-in-differences that the extension of birth control rights is strongly linked to an increase in the welfare of women of childbearing age, while mutual consent divorce and maternity benefits proved less beneficial. Birth control rights also increased women's investment in education, probability of working and income. The second chapter investigates whether the same link between individual rights and welfare holds in the context of India. Unlike in Europe, there is no strong evidence that abortion rights increased the wellbeing of women. Some positive association between rights and wellbeing is only found once the income, education and location of individuals are accounted for.

The third and fourth chapters examine which political and economic factors lead individuals to revolt against their government, creating conflict and property rights insecurity. Two innovative empirical approaches are introduced. Chapter 3 analyses the revolutionary preferences of over 100,000 people in 61 countries between 1981 and 1997. It uses instrumental variables to control for the possible endogeneity of economic and political variables. It finds that restricting the level of political and civil freedom has a strong impact on revolutionary support, which economic growth can only partly compensate for. Chapter 4 examines the interaction of preferences for revolt and actions combining the analysis of survey data with a laboratory experiment. The findings are consistent with the collective action problem. The feeling by citizens that the government "operates in the interest of the few" increases both revolutionary preferences and actions; political repression increases preferences for revolt but decreases actual opposition.

To my family, who gave me roots
To Filippo, who gave me wings

but the reverse is equally true

To my family, who gave me wings
To Filippo, who gave me roots

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Introduction

There is a consensus in the social sciences that institutions play a large role in shaping human actions. Economists recognise that it is fundamental to understand them in order to gauge the effects of economic policy on economic performance. In the words of North (1991), who gained the Nobel Prize for his study on institutions, they are "the humanly devised constraints that shape social interaction" and can be compared to "the incentive structure of an economy" for the actors playing in the various spheres of society. Countries with better economic and political institutions in the form of secure property rights, non-distortionary policies and competitive political processes tend to invest more in physical and human capital, use these factors more efficiently and achieve a greater level of income (Acemoglu, Johnson and Robinson, 2001). While North made his argument theoretically, a new wave of economists is applying modern empirical methods to understand the role of institutions. La Porta, Lopez-de-Silanes, Shleifer and Vishny (1999) showed the effect of institutional quality on growth using colonial origins and the adoption of different legal systems as indicators. Acemoglu, Johnson and Robinson (2001) made a further progress in disentangling the direct effect of institutions on economic performance from the effect of reverse causality. Focusing on countries formerly colonised by Europeans, they devised an innovative approach to distinguish deeply rooted institutions from contingent features observable today, which could be the result rather than the cause of greater economic growth. They traced back the origins of the quality of the institutions we observe today to whether the colonisers set up minimal institutions for exploitation or richer institutions for populating the former colonies, which in turn depended on the mortality of colonial settlers in the 17th-19th centuries. They find a positive direct effect of "good" institutions, namely those that protect against government expropriation, on a country's growth rate. These studies are part of a wider process in economics whose challenge is to build solid microfoundations

for theories on macroeconomic aggregates. The new theories shift their focus away from the cross-country analysis of aggregate measures of economic performance and direct it to the study of what individuals do when institutions, i.e. their incentives and set of choices, change. As a research agenda it requires a continuous process of linking the macro events in a country to changes in the behaviour of its citizens.

This thesis is a contribution to this literature. I investigate how changes in economic conditions and in the institutions of countries shape the actions and the attitudes of individuals. In particular, I am interested in how changes in individual rights affect the well-being of individuals and how these compare to changing the economic status of the same individuals. Understanding how well-being is affected allows us to build a measure of the stability and the potential for unrest within a country. Ultimately, we can map the effect of changes in institutions into the welfare and the political stability of a country through the channel of its citizens' behaviour. To assess these effects I take an empirical approach using surveys as well as data collected in laboratory experiments, which I analyse with advanced tools from microeconometrics, program evaluation and experimental economics.

Using micro data to understand macro phenomena can contribute to our understanding of why some countries enjoy social cohesion and stability and some do not. Some aggregate events are hard to understand and to predict. Although individual action may be worthwhile because it would entail an expected increase in utility, the possibility of free-riding may cause a collective action to fail. It is relevant to study how societal change affects individual preferences to the extent that they represent a prerequisite for collective action. Although the mapping of preferences into actions is less than perfect because of the possibility to free-ride, learning about preferences can help disentangle the role of individual incentives from that of external opportunities and constraints.

The study of reported preferences in surveys is also a useful complement to the classical study of "revealed preferences". The quality and the richness of the data available on preferences are often much greater than on standard actions. The Eurobarometer and the World Values Survey, which I use throughout this thesis, are among the most studied surveys in academia because of their completeness, reliability and rigor. The Eurobarometer is compiled every year by the European Commission and the World Values Survey is collected in periodic waves by the Institute for Social Research at the

University of Michigan. They contain an extensive list of questions on individual attitudes and preferences over several years, keeping a constant framing and collecting complete demographic characteristics of the respondent. The sheer number of observations (1,500-2,000) that they collect for each representative sample in a given country and year grants large statistical confidence on the significance of the effects found.

A burgeoning literature uses survey data to test for the determinants of individual preference parameters and much of it uses similar survey data. A number of papers focus on specific government policies. Di Tella, MacCulloch and Oswald (2001, 2003) infer welfare effects from policy changes (inflation, unemployment, GDP growth) using self-reported well-being answers. Gruber and Mullainathan (2002) analyse the impact of taxes on cigarettes or other addictive substances on the welfare of smokers. Frey and Stuzter (2000) show how institutional factors in the form of direct democracy and federal structure raise citizens' well-being. Alesina and La Ferrara (2004) study preferences for redistribution using a question that asks whether "the government ought to reduce the income differences between rich and poor". Luttmer (2001) uses the US General Social Survey to show that racial heterogeneity lessens support for welfare spending. Survey questions that ask people to judge the extent of corruption were exploited by Ades and Di Tella (1999) to study the effects of industrial policy.

One original contribution of this thesis is to enrich the study of public economics of an additional tool. Using self-reported indicators of welfare allows us to quantify more precisely the welfare effect from a policy on the individuals affected. Once it is known which individuals within a country were "exposed" to a certain policy, we can confront their self-declared welfare with that of individuals not affected by the policy. By computing differences-in-differences effects we can closely identify the effects of the policy on certain groups of individuals, defined by income, gender, education or other personal characteristics, as long as this information is available. The methodology and the identifying restrictions needed are explained in more detail in Chapter 1.

The study of institutions takes into consideration the role of religion, both as an institution and as an individual characteristic. Barro and McCleary (2002) study how economic performance and political institutions are related to religious participation and beliefs. Guiso, Sapienza and Zingales (2003) use survey data to identify the relation

between religion and attitudes judged favourable to growth. Iannaccone (1998) reviews a number of outcomes that in the literature are linked both with economically important social behaviour and religious attitudes. Religious beliefs are consistently associated with higher education levels, lower crime, good mental and physical health. One possible interpretation is that religious membership can be characterised as a club good. Rational individuals may wish to join the club even when self-sacrifice is demanded (in the form of restrictions on clothing and on other personal and social activities) in exchange for support, goods and services provided by other members. Similarly, Berman (2000) models social interactions within a religious community as a signalling device of commitment in order to participate in a mutual insurance arrangement. In this thesis the general finding is that people are worse off when their rights are restricted, regardless of whether they are imposed by religion or by the political power.

Two domains of social preferences and actions are investigated in this thesis: individual welfare and attitudes to conflict. I investigate how restrictions to freedom affect the well-being of individuals and whether and when they react to this. The first and the second chapters explore whether granting women individual rights affected their wellbeing as well as their investment in human capital and in the labour market. They study the effect of the same rights in two different institutional settings, developed and developing countries. The third and fourth chapters examine another indicator of well-being, i.e. the attitudes of unrest and dissatisfaction with the society the person lives in. I investigate how restrictions to political and civil rights affect attitudes of unrest, whether this effect is exacerbated by living in a fast or slow-growing country, and which pattern of revolt actions is likely to emerge.

The use of self-reported welfare allows us to build a richer model of the impact of institutions on welfare. As Gruber and Mullainathan (2002) stated, "To measure how policy changes affect social welfare, economists typically look at how policies affect behaviour and use a formal model to infer welfare consequences from the behavioural responses. But when different formal models can map the same behaviour to very different welfare impacts, it becomes hard to draw firm conclusions about many policies." An example of this dilemma is the extension of women's rights. Demographic statistics show that in the last thirty years in Europe women had fewer children, studied longer, worked more and earned a higher wage. The positive link between wages, education and welfare is generally assumed. The public debate instead tends to highlight

that rights have changed, but the institutions that should facilitate them have not. According to this debate it is still difficult for women to exploit the possibilities allowed by the new rights. As a result, possibilities have increased only potentially, but actual welfare may not have changed or may even have decreased. Examining directly the impact of the policy on subjective well-being allows us to give an informed answer, that is, women did increase their welfare as a result of some (but not all) women's rights. Similarly, in the area of conflict, the new approaches devised here help us understand the role of freedom and economic growth on the well-being of individuals, their acceptance of the society they live in and the potential for change arising from the individuals themselves. This is new in the existing literature on conflict and hopefully it will enrich the current debate.

The first chapter explores whether the welfare of women increased following the extension of women's rights between the 1960s and 1990s in Europe. There is no *a priori* expectation on the size and direction of this effect. Demographic data show that in the last thirty years women had fewer children, studied longer and earned a higher wage. The academic literature as well the public debate have highlighted some perverse effects by which the welfare of women may has not have necessarily increased and may have even decreased (Akerlof, Yellen and Katz, 1996). This has been confined so far to the realm of theoretical speculations and informal discussions but it has not been subject to a scientific scrutiny. A quantitative evaluation can establish the direction and the size of the welfare effect, if any. The answers of nationally representative samples of individuals about their current life satisfaction are used as revealed subjective utility levels and compared to traditional revealed preference indicators. I focus on changes in birth control rights[1], maternity protection and mutual consent divorce in twelve European countries. I focus on private benefits to individuals, rather than on societal or "public good" effects linked to assigning a moral connotation to these rights. Repeated cross-sections from the Eurobarometer provide demographic data and self-evaluations of life satisfaction of over 400,000 individual. After establishing with a number of robustness tests that the timing of the legislation can be reasonably treated as exogenous to the process determining women's life satisfaction, I exploit the variation given by this staggered and uncoordinated legalisation of the different rights as a natural experiment.

[1] The three main channels through which birth control rights can affect individual utility are a reduction in unwanted children, a general empowerment of women, and a better planning of education choices for women.

This creates natural treatment and control groups. At the same point in time it is possible to find women (comparable for age and personal characteristics) who have access or not to women's rights simply because of the country they live in. Similarly, when the analysis focuses on birth control rights, within the same country women coexist who could take advantage of the rights because they are of childbearing age and women who could not because they are over childbearing age. The treatment and control groups can be identified by the exogenous combination of gender, age and country of residence of the individual. Through differences-in-differences I show that the extension of both abortion rights and the pill is strongly linked to an increase in life satisfaction of women of childbearing age. The magnitude of the welfare gain is equivalent to the return from achieving higher rather than middle education and a third of the size of the gain from being married or cohabiting. It is approximately one tenth of the effect of going up one level on a 12-category scale of income, one tenth of the corresponding welfare loss from being unemployed and one seventh of the loss from being separated. Other women and men have not reported any significant change in welfare. The effect on women in the treatment group is stronger, the younger were the women when they received birth control rights and the longer they were exposed to them. Marginal returns start to decline after the woman is 35 years old, or after 21 years of pill/13 years of abortion rights.

Life satisfaction effects are consistent with changes operating through economic choices. The data strongly confirm that birth control rights caused an increase in women's investment in education, their probability of working and their income level. Women professing religions that are firmly against birth control rights did not exhibit a change in their welfare. At the same time, other women's rights have been less beneficial. The analysis shows that mutual consent divorce laws have decreased women's welfare (consistently with economic theories of divorce, see Becker, Landes and Michael, 1977), while granting high maternity protection in the workplace did not have significant effects, possibly because of negative feedback effects on the 'employability' of women.

This analysis suggests a crucial link between providing individual rights like birth control to women, favouring their empowerment in other fields (education, work) and ultimately increasing their welfare. This could be an important tool in development, where the empowerment of women is increasingly a priority of action. A third of the

countries in the world, mainly developing ones, representing a quarter of the world population, do not have birth control rights at all. If the link between birth control rights and increased wellbeing holds in a different institutional setting such as that of a developing country, then promoting individual rights for women would be a valuable policy for development.

The second chapter of this thesis carries out the analysis of the effects of birth control rights on women in India. The investigation yields different results from those found in the European setting. Analysing the self-reported life satisfaction and demographic characteristics of over 4,000 individuals in 1990 and 1996 with the same methodology used in chapter 1, we do not find strong evidence that abortion rights significantly increased the wellbeing of women in India. While a clear and robust effect was found in our analysis on European countries, the estimated effects are very weak in India. A significant association between abortion rights and higher wellbeing of women is only found when the income, education and location of the individuals are taken into account.

One possible explanation could be related to the gap between the legal guarantee of the rights and the effective access to them. In European countries the rights were granted at a null or symbolic cost for the individual. India instead is characterised by very unequal access to health services, even in comparison with other developing countries of similar level of development. In India income, education and location can constitute significant barriers to access health care. The fact that we find a positive association between birth control rights, a basic level of education, high income, living in a town, and a higher welfare may suggest some role for policy to improve access to the rights for the less favoured groups in society. However, these results must be taken with caution. The analysis has two limits: first, we cannot rule out at this stage that some of the gain in wellbeing stems from the direct effect of income and education on utility, and not through the fact that they enable access to the rights. Second, we cannot measure with certainty for how many women the factors of income and education can be truly considered exogenous to the set of available rights. Therefore given the data we have we cannot go beyond stating a correlation, and not a causation, between rights, higher wellbeing and higher income or education.

Chapters 3 and 4 apply a similar methodology to investigate whether changes in political and economic conditions affect the way people accept the society they live in or lead them to revolt against their government. Understanding what creates potential instability and how it breaks out in actual conflict is crucial for the protection of property rights and the good functioning of an economy. Whether restrictions of freedom and economic recession are the root causes of conflict and political instability is a fundamental and unresolved question in the literature. One strand of literature has argued that grievances (i.e., shared dissatisfaction of group members about their cultural, political and economic standing compared to other groups) and the lack of democracy play a fundamental role in creating the conditions necessary for civil conflict. These may stem from a failure to gain the expected benefits from modernisation, leading to 'relative deprivation', or from discrimination and denial of a group's rights and liberties (e.g., Gurr, 1971 and Gurr and Moore, 1997). Another strand of work describes conflict as a result of opportunities for rent-seeking by interested groups. Opportunities are given by the discovery of natural resources (Collier and Hoeffler, 2002), low economic growth, which may give incentives to invest in appropriative versus productive activities (Grossman, 1991, Acemoglu and Robinson, 2000 and 2001, Garfinkel and Skaperdas, 1996, and Hirshleifer, 1995), rough terrains and large populations (Fearon and Laitin, 2003). These papers emphasise the constraints that geography and money may place on the opportunities for rebels to overthrow a regime. Unless revenues from trading diamonds or oil, for example, are available to fund the rebels' movement and there is a reservoir of poor young men who can be recruited as foot soldiers, revolts may fail regardless of the grievance held. For instance economic and political liberalisation may increase the chances of a revolt occurring if they create opportunities for outsiders to gain influence on the government. These theories generally go further in arguing that there is no relationship between the lack of civil liberties or democratic freedoms and the likelihood of a civil war.

The existing literature is not conclusive because of several problems affecting the study of conflict. On one side are the sparse data on conflicts and the little knowledge of the underlying factors and preferences. Not all potential situations of unrest erupt in conflict, and because of the multiple equilibria possible in collective action, we miss an important piece of information on the nature and development of conflict. The lack of counterfactual is evident: we never observe the same situation with and without a

conflict erupting. Combined with the fact that revolts happen in small numbers, we also have very few events that are comparable. Furthermore, when we have enough detailed data on the circumstances of a conflict that has broken out, we usually lack the baseline data which describe the situation before the conflict was triggered. These difficulties translate in the empirical analysis into problems of measurement, endogeneity and omitted variables.

Two innovative approaches are designed to overcome these limits. The third chapter of this thesis, which is an account of joint work with Robert MacCulloch[2], presents the first approach. After providing evidence of how individual attitudes to revolt map into individual and collective action, I analyse micro-data on the revolutionary tastes. Over 100,000 people in 61 countries between 1981 and 1997 answered the question: *"On this card are three basic kinds of attitudes vis-à-vis the society in which we live in. Please choose the one which best describes your own opinion"*. The three possible response categories were: *"The entire way our society is organised must be radically changed by revolutionary action"*, *"Our society must be gradually improved by reforms"* and *"Our present society must be valiantly defended against all subversive forces"*. I relate each individual's attitude to society and preference for revolt to the level of political freedoms, civil rights, aggregate and personal income and religiosity that the person enjoys, combining individual level data with macro data relative to her country. There are various possible explanations as to why revolutionary support may increase as freedoms are taken away. First, freedom may have the quality of a public good and belong directly in people's utility function. Alternatively it may constrain the desired levels of consumption of other goods such as food, alcohol and clothing, so that it enters people's indirect utility function. To the extent that lower freedoms increase the expected gain from a revolution which would relax these restrictions, a greater proportion of the population may support a revolt.

Examining the effect of freedom and economic growth on attitudes to revolt cannot avoid taking into account the possibility of reverse causality. Increased unrest may result in changes to the freedom that the government allows, either towards more freedom if a revolt is successful or towards less freedom if repression prevails. Similarly, strong attitudes in favour of revolt may be disruptive for economic activity or deter foreign investment, ultimately undermining economic growth. To deal with these concerns I

[2] Now at Imperial College, but the paper was written when he was a postdoc at LSE with a desk next to mine.

draw on the literature that studies the determinants of the quality of government and institutions across countries. The relevant theories can be categorised along economic, political and cultural dimensions. The first holds that institutions are created when it is efficient to do so, the second that they are shaped by self-interested politicians to transfer resources to themselves, and the third that institutions reflect the beliefs and values of their society. La Porta, Lopez-de-Silanes, Shleifer and Vishny (1999) argue that political and cultural theories offer good prospects for finding reasonably exogenous sources of variation in country characteristics to identify institutional quality. One strategy they suggest is to use variations in the legal system, which can be viewed as an indicator of the relative power of the government versus the property owners. "Common law has developed in England as a defence of Parliament and property owners against the attempts by the sovereign to regulate and expropriate them. Civil law, in contrast, has developed more as an instrument... for state building and controlling economic life. Finally, socialist law is the expression of the ultimate control of the economy by the State" (as in La Porta *et al*, 1999). Socialist and French civil law tend to be more interventionist and to regulate more.[3] In this chapter I follow La Porta *et al* in using legal origin as an instrument for the degree of liberties and political freedoms that characterise the institutions of countries. In addition to legal origin I use the identity of the coloniser as an instrument to control for effects of reverse causality of the taste for revolt. Colonial origins are discussed by Acemoglu, Johnson and Robinson (2001) as a determinant of development. They argue that different institutions were set up in colonies depending on whether their purpose was to extract resources and transfer them to the colonisers (as the Belgians did in Congo) or of creating "Neo-Europes" where Europeans could migrate (like the US and Australia). In the latter type checks and balances against government expropriation were implemented. This affected in the long run the quality of institutions which are observed today. The authors explain GDP per capita by legal and colonial origins as well as an index of protection against government expropriation, which they instrument with settlers' mortality rates between 1600 and 1800. Their hypothesis is that high settler mortality led colonisers to implement "low-quality" institutions that subsequently slowed development. Across the countries in my study greater settler mortality is associated with lower political rights

[3] See Djankov, la Porta, Lopez-de-Silanes and Shleifer (2002), where regulations are proxied by number of procedures required to start-up a firm.

and democratic freedoms. It would be interesting to use it as an instrument in my exercise but, being available only for a subset of colonial countries, over half of the sample would be lost. Therefore I use legal and colonial origins as instruments. Controlling for the possible endogeneity of the economic and political variables, the level of freedom is found to have a strong and robust negative effect on revolutionary support. The denial of either civil liberties or political rights significantly increases the support for a revolt. On average within the same country a change of one standard deviation in civil liberties explains 41 of the standard deviation in revolutionary support. The size of the estimated effect for political rights is virtually the same.

High GDP growth can buy off part of the increase in revolutionary support that arises when freedoms are constrained.[4] I compute the marginal rate of substitution between democratisation and GDP growth that would on average keep revolutionary support constant. A one standard deviation decline in *Democracy* would have to be compensated by an increase in the GDP growth rate of 14 percentage points. For example, the growth rate would have to rise from -4% to 10% per annum in order to keep the proportion of people wanting a revolt unchanged in the face of a loss of *Democracy* of this magnitude. In other words, it seems feasible to fully offset a loss of democratic rights, but this requires rates of economic growth that are hardly sustainable over time. Finally, there is evidence that being religious reduces revolutionary tastes on average by 2.8 percentage points. The size of the effect varies with the extent of freedom and disappears entirely in non-free countries. In countries with the lowest levels of political rights there are no differences between the religious and non-religious. These findings do not hinge on being part of a religious minority.

The fourth chapter proposes a complementary approach to assess the determinants of conflict. It studies the role of freedom of communication, repression of opposition and the government's "selfishness" on preferences for revolt and revolutionary action. It combines econometric analysis of survey data with the observation of how individuals behave in a laboratory experiment. This is to my knowledge the first attempt to combine the two methodologies and it appears to be promising. Studying the preferences of over 50,000 individuals in a regression framework, I investigate the relative role of political and economic grievances in preferences for conflict. Survey data

[4] This is consistent with the result found theoretically by Bertocchi and Spagat (2001) that growth is a politically stabilizing force.

come from the World Values Survey as in Chapter 2. The previous analysis is enriched with further factors: the effect of freedom of communication, repression of opposition and the government's "selfishness" on preferences for revolt. Overall an investigation on preferences for revolt highlights that the existence of repression, the freedom to communicate through the press and the perception that the country is run for the interest of the few are important to explain attitudes to revolt within a country. Generally speaking, higher levels of political rights and press freedom weaken the taste for revolutionary action, while a feeling of appropriation by the ruling parties strengthens support for revolt.

In collaboration with Klaus Abbink from the University of Nottingham, I then address the mapping from preferences to actions observing the interaction between Citizens and Governor in a laboratory experiment. In a laboratory we recreate an analogous, although stylised, set of conditions and incentives where we can analyse whether some economic and political factors lead to revolutionary action. The controlled environment solves the conventional empirical problems of endogeneity and omitted variables. To study the strategic interaction that turns revolutionary tastes into actions, we introduce an experimental paradigm that captures the essential features of a real dictatorship, yet keeping the situation as simple as possible. We model the political scenario as a game of eight players: one Governor and seven Citizens. The game consists of three stages. In the first stage, the Governor makes a choice in two dimensions. First, he decides on the level of exploitation of society, where he can implement either a fair distribution or an allocation in which he keeps most of the income for himself. This feature allows us to concentrate on economic grievances that are directly caused by the government's behaviour. Simultaneously, he also decides on the punishment that Citizens will incur in case of non-obedient behaviour. This reflects the level of political repression. The second stage is essentially a communication stage. Citizens can send messages to fellow Citizens, indicating whether they are willing to support an uprising against the Governor. Sending a positive message, however, is risky. With a small but positive probability the message is intercepted and the messenger incurs a punishment. This reflects the freedom of communication in a country. At the third stage the Citizens decide whether to revolt against the Governor. To be successful, a sufficient number of Citizens must choose to revolt. If fewer than the critical number decide to do so, those who have revolted receive a punishment. If the critical mass of supporters is reached,

the Governor is overthrown and is replaced by one of the revolutionaries. In this case, those Citizens who did not support revolt are worse off than those who did (as they sympathised with the former Governor). If the revolt fails, the Governor stays in power in the following repetition of the game. In game theory, this creates a situation with two equilibria on the third stage subgame: one in which no-one supports revolution, and one in which everyone revolts. In reality, we observe what is generated as an equilibrium. The game is played repeatedly to model the long-term interaction between citizens and the government. The last round of each game is excluded to avoid interference by end-game effects on behaviour.

This experiment is useful to study the effect of political repression and economic grievance on revolutionary action by comparing the Citizens' actions as they follow the initial allocative choice by the Governor. It is possible to observe directly whether the choice of an exploitative rather than egalitarian allocation increases the number of Citizens actually choosing revolt. The messaging stage makes it possible to study the effect of communication and, in particular, the extent to which the Governor impedes free communication within society. This can be done by running control experiments without the communication stage (thus focusing on the co-ordination problem as such), in which risk-less communication is allowed. Finally, one can observe the extent to which repression is effective in breaking the coordination needed for a revolt to be successful. The experiment was carried out at the *Centre for Decision Research and Experimental Economics (CeDEx)* of the University of Nottingham. The results show that the feeling by citizens that the government *"operates in the interest of the few"* increases both revolutionary preferences and actions. The lack of freedom to communicate and political repression increase a taste for revolt but decrease actual opposition, consistently with the collective action problem encountered by any opposition to an autocratic government. Additional insights from the experimental data are that even benevolent autocratic governors face a severe threat to be forced out of power and tend to protect themselves with some form of repression. This indicates that to some extent revolts can be driven by the citizens' attempt to reach power themselves.

These findings have their limits. Being the first experimental study on revolutionary action, the model is kept simple and has to sacrifice some of the detail of real life. For example, the experiment cannot explain how the transition from one government to the

next takes place. Analysing the effects of different transition mechanisms is in the agenda for future research.

Another limit is the issue of external validity of experimental data. Field data have the advantage of being gathered in real life, but they suffer from noise, identification problems, and lack of control. The laboratory, on the other hand, allows the set up of a controlled environment in which individual factors can be tested while keeping all others constant. Endogeneity problems do not arise. The effects may also be affected by the fact that the experimental game is naturally played on a rather small scale, with stakes being relatively low. Previous evidence suggests that the qualitative effects observed in experiments are generally robust to transformations into environments with even very high stakes (Slonim and Roth, 1998, Fehr, Fischbacher, and Tougareva, 2002). So despite the small scale, the results should be informative for many political situations in question. The parallelism between the experiment and the real-world scenario may find its limits when the revolt turns into an open military conflict and the choice of behaviour becomes a question of life or death. Nevertheless, we have observed cases in history in which citizens forced their government out of office by means of civil disobedience, as it happened, for example, in the Eastern European revolutions of the late eighties and in the three recent cases discussed in the introduction.

The experiment identifies only qualitative effects of the relevant variables. The magnitude of these effects is bound to depend on the strength of the relative incentives. In the experiment those parameters were invented so we cannot derive stringent quantitative predictions. Hopefully future research will help shed light on the relative size of these effects.

The results found are relevant to a broader range of issues. Industrial action can be seen as a form of rebellion against the firm's management. Conflict can arise over wages, working conditions, or participation in the management's decision making process. Many companies try to impede workers' ability to go on strike, e.g. by refusing to employ workers organised in a union. The potential for dissent is also inherent to the relationships within firms (examples are the forced resignation of Michael Eisner from the position of chairman of Walt Disney in 2004 or the shareholder rebellion at Eurotunnel in 2003) and in other hierarchical organisations (e.g. dissent between players and the coach in team sports often leads to the forced resignation of the latter).

Despite these limitations, laboratory experiments can provide useful insights in the study of civil conflicts, both in gathering empirical data as well as testing theoretical models. The combination of field and experimental data seems to bear a fruitful approach. The methods are complementary and one method's weaknesses are the other's strengths. Together they can lead to deeper insights into the factors driving conflict and co-operation, shifting from the traditional study of aggregate variables at the macro-level to a more detailed microeconomic-founded analysis of how political and economic changes affect the behaviour of individuals.

Chapter 1

The effect of women's rights on women's welfare: evidence from Europe

This chapter opens the analysis of how extending or limiting individual rights affects the wellbeing of the people. The first question is whether women's parity rights have an effect on the wellbeing of women, and if so, in which direction. Between the late 1960s and the 1990s social norms and institutions related to women's role in society quickly changed. Women's rights became a political issue. Equal treatment and reproductive rights laws were enacted in the majority of Western countries with the goal of improving women's welfare. There is no bet *a priori* on the direction and the size of these effects. With some exceptions, economists generally expect an increase in welfare from policies that remove binding constraints on choices. In the public debate the opinion is fragmented. Some qualitative evaluations report that women ended up with a double burden from being both the primary caregiver in the family and a worker and that ultimately women "could not have it all". After ten to thirty years of such public policies, we can evaluate their effects.

The data show that in the last thirty years women had fewer children, studied longer, worked more and earned a higher wage. The positive link between wage, education and welfare is generally assumed. Instead of imposing this assumption, I directly explore the perception of welfare based on self-evaluation by the subjects treated. I focus on the policy of extending birth control rights, i.e. abortion rights and the pill, on women's welfare in Europe, and confront their effects with those from other women's rights.

Most Western countries legalised abortion between the late 1960s and 2000 with considerable variation of timing across countries.[1] The pill was invented in the 1950s, marketed for the first time in the US in 1960, and embodied in national health systems in Europe later (some countries never adopted it). Although contraception has always existed, "promoted as almost 100 per cent effective, the pill altered people's expectations about contraception and what it would achieve" (Marks, 2001). Its availability as part of the nationally financed public system meant that reliable information became available to all women and that they could have access to it regardless of age, marital status, and financial constraints.

I exploit the variation given by the staggered and uncoordinated legalisation of abortion and the pill in twelve European countries between the 1960s and 1990s. The timing of the legislation could in principle be related to national characteristics, like the dominant religion or the share of women in parliament, but none of these factors are by themselves good predictors of the actual law changes. A number of historical conditions have played a considerable part in the process. Therefore I can treat the legislation as exogenous to the process determining women's life satisfaction. In the course of the analysis I explicitly address this issue and conduct a number of robustness tests.

The recent availability of surveys of life satisfaction on repeated cross-sections of individuals makes it possible to directly evaluate the welfare effect of policies. The answers of nationally representative samples of individuals about their current life satisfaction are used as revealed subjective utility levels and compared to traditional revealed preference indicators. I focus on how women changed their set of incentives and choices and derived private benefits from the policy changes. The identification of the welfare effect comes from the fact that the exposure of an individual to birth control rights varied by gender, country of residence and date of birth. A differences-in-differences estimator allows me to identify the effect of laws passed at different times in each country and which affected particular groups of individuals, women of childbearing age, with respect to women who were not exposed to abortion rights. This could be either because they lived in countries and years with abortion rights, but had

[1] Reproductive rights were perceived as a path-breaking right in 1960s and 1970s but they had been a privately regulated issue for almost two thousand years, from the ancient Greek to the eighteenth century. Only in the nineteenth century abortion and contraception became discouraged if not prohibited in most Western countries.

completed the fertility cycle, or because their country did not legalise abortion. Treatment and control groups are comparable once age effects are controlled for.

The main finding is that women of childbearing age when the policy was introduced consistently show an increase in welfare, according to all specifications used. It is robust to a number of alternative specifications and the effect is sizeable. Additional sources of variation in the policies are considered, like the number of years that women have been exposed to them, their age when the rights were introduced, the distinction between partial and full abortion rights, and the possible role of religion in the adoption or the application of the laws. Concerns about the role of concurring policies in favour of women are addressed, examining the effect of changes to divorce law and the interaction of abortion rights with maternity leave policies.

The next section reviews how the paper relates to the literature and describes the channels through which birth control rights may affect welfare. Section 2 describes the data and the empirical strategy. Section 3 presents the main results and section 4 some extensions. Section 5 concludes.

1 Background

There are two opposing theoretical perspectives on the link between welfare and birth control rights. The prevalent one is that birth control and abortion rights have shifted out the frontier of available choices and increased women's welfare. Goldin and Katz (2002) describe the pill as lowering the cost of delaying marriage by allowing sex without commitments. It allowed young and single women to invest more in graduate and professional education and achieve better careers. At the same time it allowed them to keep a good match in the marriage market, and possibly an even better one, due to a "social multiplier effect" that made the market for "career women" thicker. They find evidence that in the US access to the pill by women when they were 18 to 21 years old increased the likelihood that they went to university and married later. In a theoretical model, Siow (2002) shows that the welfare of women always increases with birth control rights, except in the rare case that the supply of marriageable men is extremely scarce, as fewer transfers are needed to induce women into commitments.

The other strand in the literature emphasises the adverse welfare effects on women from birth control. Akerlof, Yellen and Katz (1996) set out to explain the "feminisation of poverty" in the United States. The idea is that birth control innovations weakened the

bargaining position of women in the marriage market. Losing the possibility of demanding a "shotgun marriage" and the associated transfers, women end up with out-of-wedlock children and lower income. Akerlof *et al* argue that ultimately all women lose welfare. In their framework, when birth control became available, women invested more in human capital because of lower expected rents from marriage.

In this paper I maintain the focus on private benefits to individuals, rather than on societal or "public good" effects.[2] The three main channels through which birth control rights can affect individual utility are a reduction in unwanted children, a general empowerment of women, and a better planning of education choices for women. In the first channel, birth control rights do not have any effect on the number of "planned" children and on the utility deriving from them (it does affect their timing and spacing only), while it affects the "production" of unplanned children. Introducing birth control rights reduces the probability of disutility from unplanned children. This prediction is difficult to test in the data for the lack of counterfactual.

The second channel is that of changing the benchmark of social norms. Akerlof and Kranton (2000) describe the way that identity depends on the assigned social categories and on the extent to which one's given characteristics match the ideal of the assigned category. Granting individual rights on birth control to women changed not only the individual choice of fertility, but also the benchmark itself. The social category of reference could then be different from the traditional one of primary caregiver in the family. A gain in utility arises when the distance between the actual choice and the benchmark diminishes. An attempt to identify this effect empirically is made when separating Catholic from Protestant countries, where social categories considered appropriate for women are likely to be different. Anticipating some results, the empirical analysis finds support for birth control rights changing the average welfare of all in Catholic countries, while in non-Catholic countries a significant effect is only found on treated women.

The third channel links birth control rights, education choices and welfare changes for women. It can be extended to include an effect on men and it lends itself to predictions that can be tested empirically. It is possible to write a simple model in which men and women derive utility from their income, which in turn depends on education. It is

[2] Deriving (dis)utility from these rights on moral ground or because someone has a taste for individual rights is not analysed here.

straightforward to show that without birth control rights (or when the woman does not want to exercise them) the optimal choice of education for women is lower than for men because the likelihood of unplanned fertility shortens the horizon over which to reap the benefits of education. Only if birth control rights exist and the woman is willing to use them, the optimal choice of education for men and women can be equal.[3] Under the standard assumption that income and welfare are positively related, the welfare of women increases with birth control rights.[4]

The effect on men is the result of two counteracting effects. A positive effect on welfare is given by the fact that, in an equilibrium based on assortative matching of income/education, their partner is more educated than without birth control rights. A negative effect on welfare could stem from lower bargaining power within the household as the partner's income increases.

To my knowledge this is the first empirical study on the link between reproductive rights and welfare exists yet, although there is a vast literature on unintended pregnancies and negative effects on the mental and physical well-being of children and families (Gruber, Levine and Staiger, 1999). Other studies have used the staggered timing of the legalisation of abortion in the US as a source of variation to study fertility effects (Levine *et al*, 1999), the impact on female labour supply (Angrist and Evans, 1998), and to examine the effect on criminality rates (Donohue and Levitt, 2001). This paper also connects to the literature on the analysis of the changing social structure of marriage. Edlund and Pande (2002) relate the decline in marriage to more left-wing voting for women through the shifting of the preference of the median female voter towards more redistribution. Finally, the paper relates to an emerging literature in economics that infers welfare changes from self-reported well-being answers. Among others, see Di Tella, MacCulloch and Oswald (2001) and Gruber and Mullainathan (2002).

[3] Assuming that women are the prime carers for children and that education does not affect their ability to care for them, the optimal choice of education for men and women is only equal when women choose not to have children.

[4] In the empirical analysis I avoid imposing this assumption and I explore it directly in the data.

2 Data and empirical strategy

2.1 Data description

I analyse individual-level data from the Eurobarometer survey for twelve European countries collected between 1975 and 1998. The Eurobarometer asks over 450,000 individuals in repeated cross-sections the same question: "On the whole, are you very/fairly/not very/not at all satisfied with the life you lead?". The answers are coded in four ordinal categories. The life satisfaction variable does not exhibit any systematic trend over the period, neither for men, nor for women. On whether subjective survey data can and do provide true signals of welfare (Bertrand and Mullainathan, 2001), the fact that the "treatability" is not systematically correlated either with other observable characteristics or with the measurement error of welfare allows predictive power in explaining an attitude. Moreover, the framing is constant and any additive bias is controlled for by country and year fixed effects.

Detailed data on abortion laws come from United Nations (2002). Precise and comparable data on contraception policies have proved more problematic to find, especially on the year of licensing of the pill in each country. Data on the year that the contraceptive pill started to be provided through the national public health system are used in the analysis. The fact that Western Europe is relatively homogeneous with regard to the actual use of birth control rights ensures comparability. Abortion is mainly used as a tool of family and career planning rather than as a means to control family size as among married couples (Henshaw, 1990). Moreover, abortion and the pill are provided at a symbolic or null cost in all of these countries (David, 1992), eliminating concerns of rationing or budget constraints.

2.2 Empirical strategy

By using the introduction of birth control rights as a treatment and the fact that such policies have been adopted at different points in time by the countries considered, the question can be addressed within the framework of a standard evaluation problem.[5] Since the policies exhibit a sizeable variation and affect a random selection of individuals chosen by demography, they provide a natural setting to estimate differences-in-differences effects.

[5] See Heckman, LaLonde and Smith (1999).

A concern is that there may be a unifying theme underlying legislation that could make the policies endogenous to the other variables considered. The idea that the timing of abortion legislation followed a very clear set of motives, be them political or societal, is not supported by the data. The correlation between the timing of adoption of birth control rights and the life satisfaction in the country, the dominant religion or the number of women in parliament is generally low, as shown in Table A.2 in the Appendix. Certainly these changes did not happen in a vacuum, but no single factor is by itself a good predictor of the law changes. Historical circumstances have played a large role.[6] Table A.1 reports the actual timing. In addition, most changes in laws occurred before the recording of life satisfaction and could not be affected by the dependent variable by way of reverse causation.

The combination of date of birth, gender and country of residence determine who is exposed to the treatment, such that individuals cannot self-select into the policy. Birth control rights can only affect individuals of a certain gender and age, that is, women of childbearing age. Matching this information with the temporal and spatial variation of birth control policies in Europe naturally creates a treatment group, i.e. women who were of childbearing age[7] when birth control rights were introduced, and a control group, which comprises either (i) women who were over childbearing age when the law changed or (ii) women of any age who were living in countries where birth control rights were not granted when they were interviewed.[8] Since the timing of policies is different, different cohorts are contrasted in each country. The treatment is to be able to take advantage of the rights, and not to actually use them. Being able to plan one's life with access to these rights is what matters.

The estimation compares the difference of self-reported life satisfaction between treated and control individuals when the policy was in operation to the same difference calculated at a point in time previous to the introduction of the policy. This is the effect

[6] Germany passed full rights as the outcome of a negotiation with the more liberal East Germany's legislation following the unification. In Greece, Spain and Portugal it was an adaptation of the national *corpus legis* to the European one at the time of the accession into the European Union (although it was not a required step, as the opposite behaviour of Ireland shows). In Italy a Constitutional Court ruling opened the way to a more open legislation.

[7] I follow the medical literature in setting the end of childbearing age at 50 years. The results hold if an alternative age of 45 is adopted, as shown in the final robustness checks.

[8] Distinguishing between these two sub-groups does not yield differences that are statistically significant and thus are gathered in the same group in the analysis.

of treatment on the treated, i.e. the average difference between treated and untreated outcomes across the population and over time within the same country.

It can be written as:

$$E(\Delta_t|\mathrm{R}=1)=E(W_t^{\mathrm{R}}-W_t^{NR}|\mathrm{R}=1)$$

where W represents the outcome of interest (welfare), R (for "Rights") is the treatment, the superscripts R and NR refer to the treatment status ("Rights" and "No Rights" respectively), and R is the indicator for treatment.

The identifying restriction is that the average outcomes for treated and controls would have followed parallel paths over time in the absence of the treatment, i.e. the mean change in the no-program outcome measure is the same for treated and non-treated.

$$E(W_{t_1}^{NR}-W_{t_0}^{NR}|\mathrm{R}=1)=E(W_{t_1}^{NR}-W_{t_0}^{NR}|\mathrm{R}=0)$$

where t_0 and t_1 are points in time before and after the introduction of the policy ($t_1 > t_0$).

The life satisfaction variable measured for women presents no cohort effects but marked age effects. The coefficients in a regression of life satisfaction on ten-year cohorts of women, plus the usual fixed effects, reveal that the effects from each cohort are not statistically different from one another. Figure 1 plots the of life satisfaction of women by ten-year cohorts, revealing a substantially flat pattern. Instead life satisfaction displays a U-shaped trend with respect to age, with a minimum around 55 years old, similar to previous studies.[9] Figure 2 provides a graphical representation of the systematic effect of age on life satisfaction.

If we estimate the effect of age on life satisfaction allowing it to be country-specific, the equality of the coefficients cannot be rejected at the 1 percent level. Welfare can thus be described as a function of age and the participation in the program:

$$W = g(age)+\beta I(\mathrm{R}=1)+u$$

where $g(\cdot)$ is a general function of age of individuals, common across countries, β is the change in welfare occurring for treated individuals, I is the indicator function for being in the treatment group and u is a country-specific unobservable.

[9] Blanchflower and Oswald (2004) report a minimum in the late 30s-early 40s in Britain.

The effect β is identified by the differences-in-differences estimator:

$$\left[E\left(W_{t_1}^{R}\middle|\, age_{t_1}\right)-E\left(W_{t_0}^{NR}\middle|\, age_{t_0}\right)\right]\middle|\,(\mathrm{R}=1)-\left[E\left(W_{t_1}^{NR}\middle|\, age_{t_1}\right)-E\left(W_{t_0}^{NR}\middle|\, age_{t_0}\right)\right]\middle|\,(\mathrm{R}=0)$$

which is equivalent to:

$$E\left(\Delta_t\middle|\, age_t, \mathrm{R}=1\right)=E\left(W_t^{R}-W_t^{NR}\middle|\, age_t, \mathrm{R}=1\right)$$

This measures the average gain in welfare for women who were exposed to birth control rights compared to what they would have experienced in the base state.[10]

In the absence of individual panel data, the distribution of the benefits within the treatment group remains unknown. Characteristics that could be endogenously affected by the previous extension of rights (marital status, education, occupation) are only used descriptively (without claiming causation) to identify groups of individuals who exhibit higher levels of life satisfaction.

The base specification for the regression model is the following:

$$\begin{aligned} W_{ict} &= \alpha + \beta_0 \cdot \varkappa_{ct} + \beta_1 \cdot g_{1ict} + \beta_2 \cdot g_{2ict} + \beta_3 \cdot \eta_{it} + \beta_4 \cdot \delta_c + \\ &+ \beta_5 \cdot \tau_t + \beta_6 \cdot (\delta_c \cdot Year) + \varepsilon_{ict} \end{aligned} \qquad (1)$$

where W_{ict} denotes a four-category indicator of welfare of individual i living in country c in year t, $\varkappa_{ct}$ is an indicator for living in a country that has birth control rights at time t, g_{1ict} identifies treated women, g_{2ict} is a dummy for the women in the control group and η_{it} are dummies for the age of the individual at time t in ten-year spans.[11]

To control for observed and unobserved heterogeneity, all regressions include country fixed effects (δ_c) to capture time-invariant differences between countries that passed such laws and those which did not; year effects (τ_t) to control for general trends in extending abortion; a country-specific linear trend to allow country effects to change over time, to capture country-specific trends in attitudes towards women's rights.[12] Since observations are independent but not identically distributed, to correct for aggregation

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[10] The differences-in-differences estimator gives an estimate of the direct effects of the policy on individuals explicitly treated. It is possible that the rights operate with network effects and that access to rights by one's neighbours affects one's welfare, for instance that the welfare of a woman in the control group is enhanced by her daughter's treatment. This idea is not developed here.

[11] Dummies for being ≤19, 20-29, 30-39, ... 60-69, ≥70 years old. The results are robust to the inclusion of the continuous variables "age" and "age squared" instead of the above.

[12] A quadratic trend yields no additional information.

bias (Moulton, 1990) standard errors are clustered by country and year in all specifications.[13]

The fact that women may travel to a different country to have an abortion could confound the identification. If concrete, this possibility would only induce a downward bias in my estimates, which would then be conservative, without affecting their direction. Despite the publicity surrounding these cross-border movements, they are costly in terms of money, time and information and are really only available to a small fraction of the population. The UK and Ireland can provide an idea of the relevance of this effect. Ireland has never allowed abortion while the UK has legalised it since 1967. Travelling costs are low and the collection of information is easy thanks to the same language. Yet, even if all abortion performed on non-residents in the UK were carried out on Irish women, this would amount to treating 0.4 to 0.7 percent of women in Ireland (ONS, 2001).

All regressions have been run both as an ordered probit and as a linear probability model (LPM). Since the categories of the dependent variable are ordinal, the coefficients from the ordered probit model are more correct than those from OLS. On the other hand marginal effects are difficult to report parsimoniously for a four-outcome variable. Angrist (2000) shows that if the focus is on directly interpretable causal effects rather than on structural parameters, the two approaches are largely comparable. Thus I report marginal effects when describing the magnitude of the effect and results from the linear probability model in all other cases.

3 Main results

3.1 The effect on welfare

Table 1 reports the estimates of the effect of birth control rights on life satisfaction from the linear probability model.[14] Column 1 shows the general result that women report on average more welfare than men, consistently with the previous literature.[15] Column 2 reports the differences-in-differences effect of having access to the pill. The estimated coefficients show that women in the treatment group systematically report

[13] The results are substantially unchanged when standard errors are clustered by country to address the other potential bias of potentially serially correlated outcomes (Bertrand, Duflo and Mullainathan, 2003).
[14] All regressions control for age, country and year effects, a country-specific linear trend, and cluster the errors on country and year to obtain robust standard errors. The F-tests on each set of controls, including fixed effects, reject throughout all regressions that they could be jointly null.
[15] See Blanchflower and Oswald (2003).

higher levels of life satisfaction than the rest of the population. This is not true of other women, who report a negative and significant coefficient.[16] The Wald test for the estimated difference between treatment and control group of women is significant at one percent level. This suggests there is not a well-being "fixed effect" from being a woman, but rather an historical effect of an increasing share of the women becoming more satisfied over time.

Column 3 investigates whether the treatment effect has been constant at the various ages at which women received access to the pill. Since younger women face a longer horizon over which to reap the benefits of education and fertility planning, the effect of birth control rights should be stronger, the younger the women when the rights are introduced. If instead the positive effect of birth control rights is merely one of psychological empowerment from having more individual rights, this effect should be constant at any age. Column 3 reveals that the largest part of the positive welfare effect is indeed on women who received access to the pill when they were less than 35 years old (the difference between receiving them before being 25 or 35 is small). Women who received the pill between 35 and 50 years old do not report any significant change in welfare. This is consistent with an effect going through better life planning of investment in education and desired fertility more than through a psychological empowerment of women.

In an alternative specification, column 4 defines the treatment group by the number of years that a woman had access to the pill while of childbearing age. Both a linear and a quadratic term are introduced. The estimates show that the welfare effect of having access to the pill is increasing and concave in the number of years. The maximum is reached after 21 years of access to the pill; after that it declines slowly. In Figure 2 the effect of birth control rights is plotted against the length of treatment.

Columns 5 to 7 apply the same regressions to the treatment "having access to abortion rights". Both quantitatively and qualitatively the results are very similar to those of the pill. The main difference is that the women in the control group report a negative but not significant change in welfare. The coefficients on the treatment and control group are statistically different.

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[16] Estimates of the same specification where the control group of women is broken down between women who did not enjoy abortion rights because of their age and those whose country did not provide abortion rights show that there is no difference in the welfare of the two groups.

Table 1: The effect of abortion rights on welfare, differences-in-differences estimates

Depvar: Life Satisfaction		Pill			Abortion rights		
(mean=3.043)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Pill in public policy at time of	-0.165	-0.196	-0.196	-0.185			
survey	(3.79)	(4.52)	(4.54)	(4.29)			
Abortion rights at time of survey	0.080				0.076	0.077	0.083
	(3.91)				(3.74)	(3.76)	(4.11)
All women	0.016						
	(4.19)						
Treatment group: women with		0.027			0.028		
rights when childbearing age		(6.75)			(6.90)		
Control group: women without rights		-0.028	-0.034	-0.031	-0.005	-0.007	-0.005
or not of childbearing age with rights		(4.14)	(4.80)	(4.62)	(0.72)	(1.02)	(0.73)
Treatment group: women who received			0.041			0.039	
rights when less than 25 years old			(8.98)			(7.81)	
Treatment group: women who received			0.031			0.042	
rights between 25 and 35 years old			(5.39)			(7.30)	
Treatment group: women who received			-0.002			0.002	
rights between 35 and 50 years old			(0.26)			(0.42)	
Treatment group: No. years that				0.004			0.007
women enjoyed rights				(5.61)			(7.00)
Treatment group: No. years that				-9.40e-5			-2.71e-4
women enjoyed rights - squared				(3.51)			(5.39)
Age effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country effects, Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-specific linear trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes
P-value of Wald tests:							
H_0: Treated women = Control women		0.00			0.00		
H_0: Treated (<25) = Control women			0.00			0.00	
H_0: Treated (25-35) = Control women			0.00			0.00	
H_0: Treated (35-50) = Control women			0.00			0.22	
H_0: Treated (<25) = Treated (25-35)			0.08			0.58	
H_0: Treated (<25) = Treated (35-50)			0.00			0.00	
H_0: Treated (25-35) = Treated (35-50)			0.00			0.00	
H_0: Treated (no.yrs) = Control women				0.00			0.07
H_0: Treated (no.yrs) = Treated (no.yrs sq)				0.00			0.00
R2	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Obs	459,953	459,953	459,953	459,342	459,953	459,953	459,476

Notes: t-statistics in parentheses from standard errors adjusted for clustering (250 country-year clusters). Sample period is 1975-1998 for 12 countries. Fixed effects are jointly significant at the 1% level in all specifications. The bottom of the table reports the p-value of the Wald tests for the null hypothesis that the coefficients of the various treatment groups are not statistically different from one another and from the coefficient on the control group.

As with the pill, women reaped the maximum effect on welfare if they had abortion rights before being 35 years old. After that the effect is negligible. The effect is concave,

but with earlier gains and a faster decline with respect to the pill. The maximum effect of having access to abortion rights is after 13 years of treatment (see Figure 3 in the Appendix).

In all regressions, the estimated effect of abortion being allowed at the time of the survey is positive and significant whereas the effect of the pill being available is negative and significant. These effects are analogous to those of general public goods affecting the average level of satisfaction, independently of the private benefits at the individual level, but cannot be explained without further assumptions.

3.2 Economic significance

To describe the order of magnitude of the effect on welfare, I report the marginal effects from an ordered probit computed at the mean. Table 2 shows that being treated with access to the pill during childbearing age increases the probability of declaring to be very satisfied with one's life by 1.5 percentage points. It decreases the probability to be fairly satisfied by 0.4 percentage points, to be not very satisfied by 0.8 points and to be not at all satisfied by 0.3 percentage points.

Table 2: The size of the effect of the pill on welfare

	Marginal effects from being...			
Depvar:	**Women in treatment group**	**Women in control group**	**Married or cohabiting**	**Separated**
Y_4: Very satisfied	0.015	-0.014	0.040	-0.101
Y_3: Fairly satisfied	-0.004	0.003	-0.008	-0.003
Y_2: Not very satisfied	-0.008	0.007	-0.022	0.069
Y_1: Not at all satisfied	-0.003	0.003	-0.009	0.036
Depvar:	**Unemployed**	**Going up one income level**	**Having higher education***	**Having low education***
Y_4: Very satisfied	-0.047	0.173	0.016	-0.021
Y_3: Fairly satisfied	0.010	-0.040	-0.004	0.005
Y_2: Not very satisfied	0.026	-0.093	-0.009	0.011
Y_1: Not at all satisfied	0.011	-0.039	-0.003	0.006

Notes: marginal effects from two probit estimations, one on treatment and control groups and one on personal characteristics. Both include age effects, country and year fixed effects, country linear trend. *=compared to middle education.

Comparing the estimated effect with those obtained from personal characteristics, the welfare gain from access to the pill is equivalent to the return from achieving higher rather than middle education and a third of the size of the gain from being married or cohabiting. It is approximately one tenth of the effect of going up one level on a 12-

category scale of income. It is one third of the corresponding welfare loss from being unemployed and one seventh of the loss from being separated.

4 Extensions

In this section the basic specification is extended to take account of possible elements of heterogeneity and econometric concerns.

4.1 Consistency with the economic model

The data allow a test of whether declared welfare matches revealed preference indicators that are associated with it. I apply the same policy experiment with differences-in-differences to observe whether women with birth control rights exhibit different choices of education, work and income, using the same specification as in equation 1.[17] I use probit when the dependent variable is the probability to achieve higher education or to work. The effects are shown in Table 3 and are largely comparable for the three dependent variables. Women always show a lower probability than men to study and to work and a lower income, but treated women perform better than the average and the control women fare worse. The differences between treated and control women are all statistically significant at the one percent level. Being a woman decreases the marginal probability of attaining higher education by 5.5 percentage points but this probability falls to 3.2 and 4.1 percentage points for women who respectively had access to the pill and to abortion (columns 1 to 3). Control women are the least likely to achieve higher education.

In the second set (columns 4 to 6), women in general have 35.8 percentage points lower probability to be working than men, but this probability reduces to 34.9 for women with the pill and 32.3 for women with abortion rights. In the third set (columns 7 to 9) the dependent variable is personal income on a 1 to 12 scale. Women are more likely to end up in lower classes of the income ranking. Again, women with birth control rights have a much better standing compared to control women.

The estimates show that women who had access to birth control rights when they were "young enough" changed their education and work choices. The empirical results are consistent with the economic framework according to which birth control rights are expected to raise female investment in education, labour supply and income.

[17] The only difference is that 20 years is the threshold age chosen for being "treated" when analysing education. This is to keep consistency between the timing of opportunities and choices.

Table 3: Consistency with the economic model: the effect of birth control rights on education, probability of working and level of income

Depvar:	Prob(having higher education)			Prob(working)			Personal income position		
Treatment:		Pill	Abortion rights		Pill	Abortion rights		Pill	Abortion rights
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Pill in public policy at the time of the survey	-0.015	-0.016		0.004	-0.003		2.561	2.291	
	(1.49)	(1.30)		(0.26)	(0.20)		(4.26)	(3.97)	
Abortion rights at the time of the survey	0.011		0.011	-0.026		-0.061	0.820		0.640
	(1.44)		(1.48)	(2.62)		(5.37)	(2.99)		(2.40)
All women	-0.055			-0.358			-0.507		
	(24.50)			(48.35)			(27.57)		
Treatment group: women with birth control rights when		-0.032	-0.041		-0.349	-0.323		-0.411	-0.402
childbearing age (or when <20 years old for education)		(11.66)	(13.67)		(44.94)	(39.33)		(18.69)	(17.99)
Control group: women without birth control rights or had		-0.063	-0.056		-0.382	-0.378		-0.858	-0.687
them past childbearing age (or >20 years old for education)		(29.24)	(22.87)		(26.20)	(40.65)		(19.81)	(16.02)
Age effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country effects, Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-specific linear trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
P-value of Wald tests:									
H_0: Treated women = Control women		0.00	0.00		0.00	0.00		0.00	0.00
Pseudo-R2/R2	0.12	0.12	0.12	0.26	0.26	0.26	0.19	0.19	0.19
Obs	445,706	445,866	445,866	459,953	459,953	459,953	337,017	337,017	337,017
Clusters	238	238	238	250	250	250	228	228	228

Notes: t-statistics reported in parentheses, from standard errors adjusted for clustering on country and year. Sample period is 1975-1998 for 12 countries. Columns 1-6 report marginal probabilities from probit estimations, columns 7-9 estimates from Linear Probability Model regressions. The personal income position is on a scale 1 to 12. The bottom of the table reports the p-value of the Wald tests for the null hypothesis that the coefficients of the various treatment groups are not statistically different from one another and from the coefficient on the control group.

4.2 Men as a control group

To the extent that they are the partners of the treatment group, men could be affected by the policy changes and thus exhibit indirect welfare effects. An additional men control group can be identified, comprising men in the same cohort of age as the treatment group. They are directly comparable to women in the treatment group for being at the same stage of the life cycle, while they may differ for gender effects. When included in the base specification they do not show any significant difference with respect to other men, while the effects on treated and control women are unchanged. This could be interpreted as an indication that there is no effect, or alternatively that two effects counterbalance: higher welfare from more educated and more satisfied partners, lower welfare from lower bargaining power in the household.

4.3 Distribution of gains and losses

It would be useful to derive some results on the distribution of the welfare gain within the treatment group. Unfortunately we do not know the characteristics of the same women before and after the treatment, thus we cannot say whether their choices of marital status, education, occupation were endogenous to the set of available rights. In the absence of longitudinal data on life satisfaction of individuals, it is only possible to give a descriptive, not causal, representation of some categories of women who have gained or lost from the institutional change.

Under both sets of birth control rights, women who are married or cohabiting, women who work and women with high or middle education ("women who could have it all") gained the most in terms of life satisfaction. Treated women who are single are no different from the control group with regard to welfare. Treated women with low education and/or who do not work have lower welfare than average. Treated women in the two lowest categories of income show the biggest loss of all (-0.24 percentage points), treated women in the two average categories report the average coefficient and treated women in the two highest categories report the largest gain (20 to 21 percentage points). All effects are statistically significant.

4.4 Other policies in favour of women

The possibility of omitted variable bias is investigated by including other policies in favour of women that changed in the same years: mutual consent divorce laws and

maternity benefits. Treatment and control groups are re-computed in an analogous way to birth control rights, according to whether women could take advantage of them when the law changed.[18] The base specification is the same as in equation 1.

No-fault, or mutual consent, divorce laws removed the disparities between men and women in the event of a divorce. These laws might have increased women's life satisfaction by removing a constraint on choices. On the other hand, since the existence of divorce is associated with being able to renege on a previous choice, its welfare effects may also be negative. Becker, Landes and Michael (1977) point out some ambiguous effects of marital instability on utility maximisation. If marriage is a contract with various non-contractible elements, making it easier to break leads the couple to be "reluctant to invest in skills or commodities specific to their marriage if they anticipate dissolution: having children and working exclusively in the nonmarket sector are two such marriage-related activities" (Becker *et al*, 1977). Less time and fewer resources invested both in the search and in the marriage itself eventually lead to lower utility from marriage at the time of dissolution than expected at the time of marriage. Table 4 shows that the effect of no-fault divorce is negative and significant on treated women, and positive and significant on society as a whole.

For maternity protection policies, I examine how benefiting from "full-pay maternity leave"[19] interacts with birth control rights. In principle, the two could be substitutes.[20] Women who benefit from good maternity protection do not need birth control rights to optimally plan their education and work choices because children, even if unplanned, would be neutral with respect to the decision to study for higher education and work. In this context birth control would be superfluous unless there is a taste for planning the timing and spacing of children. Table 4 shows scarce evidence that the two policies acted as substitutes. High maternity protection did not affect the welfare of women receiving it and no specific effects arise from the interaction of birth control rights with "high" maternity protection (where high means "above the average"). Nevertheless their effect should be seen in the context of a general equilibrium model, where disincentives

[18] For divorce law there is obviously no threshold age for being treated.

[19] Computed as the number of weeks of paid leave times the average wage replacement rate. The results are robust to alternative indicators of maternity protection (wage replacement rate, number of weeks of job-protected as well as non-protected leave).

[20] Women are expected to bear the main impact of maternal leave changes as, even where parental leave equally applies to fathers, it is them who take the majority of the leave (95%).

for firms to hire women of childbearing age are more relevant, the more generous maternity policies are.

Table 4: Other policies in favour of women

Treatments:	Mutual consent divorce	Maternity policies	Abortion. rights *and* maternity policies	All rights
Depvar: Life Satisfaction	(1)	(2)	(3)	(4)
All women	0.043	0.011	-0.003	0.006
	(3.99)	(1.94)	(0.41)	(0.44)
Abortion rights at the time of the survey			0.085	0.069
			(4.36)	(3.19)
Treatment group: women with abort. rights when childbearing age			0.031	0.016
			(3.38)	(1.99)
Pill in public policy				-0.136
				(3.41)
Treatment group: women with pill in public policy when childbearing age				0.055
				(7.95)
Mutual consent divorce rights	0.172			0.127
	(4.48)			(3.21)
Treatment group: women with mutual consent divorce rights	-0.034			-0.056
	(2.98)			(3.62)
High maternity protection		0.040	0.050	0.044
		(1.14)	(1.73)	(1.46)
Treatment group: women with high maternity protection when childbearing age		0.004	-5.73e-4	-0.003
		(0.69)	(0.05)	(0.34)
T group (Abortion rights) * T group (Maternity protection)			-0.005	
			(0.35)	
Age effects	Yes	Yes	Yes	Yes
Country effects, Year effects	Yes	Yes	Yes	Yes
Country-specific linear trend	Yes	Yes	Yes	Yes
P-value of Wald tests:				
H_0: All women = Treated women	0.00	0.00		
H_0: Treated (abort) = Treated (maternity)			0.01	0.00
H_0: Treated (abort) = Treated (pill)				0.00
H_0: Treated (abort) = Treated (divorce)				0.00
H_0: Treated (pill) = Treated (divorce)				0.00
H_0: Treated (pill) = Treated (maternity)				0.00
H_0: Treated (divorce) = Treated (maternity)				0.09
R2	0.13	0.15	0.15	0.15
Obs	459,953	414,351	414,351	414,351
Clusters	250	227	227	227

Notes: t-statistics in parentheses, from standard errors clustered on country and year. Sample period is 1975-1998 for 12 countries. Fixed effects are jointly significant at 1 percent level in all specifications. The indicator of maternity protection used is the number of weeks of job-protected paid leave times wage

replacement rate and "high" means above the average. Definitions of all variables are provided in the Appendix. The bottom of the table reports the p-value of the Wald tests for the null hypothesis that the coefficients of the various treatment groups are not statistically different from one another and from the coefficient on the control group.

When the four policies are included as different treatments in the same regression they show little collinearity. The welfare effect of birth control rights over and above the others remains positive and significant. The two effects of abortion and the pill are also statistically distinct.

Another possible factor affecting the life satisfaction of women could be technological progress, which decreased the effort required to perform most tasks, including household tasks. This effect is captured by the country-specific linear time trend that all regressions control for. On the possibility that it is "feminism" that drove both women's life satisfaction and the adoption of birth control rights, Becker (1981, p. 251) argues "the [women's] movement is primarily a response to other forces that have dramatically changed the role of women rather than a major independent force in changing their role." Without giving it empirical content, it is not observationally distinguishable from that of a general or country-specific linear trend.

4.4.1 Individual religiosity information as a test for omitted variable bias

Catholic, Greek Orthodox, Orthodox Jewish and Muslim religions explicitly ban birth control in the form of pill and abortion in all circumstances. The fact that some religions oppose outright birth control rights and that religious women may voluntarily give up these rights even when their country allows them provides another interesting natural experiment. Within the same country we can find otherwise comparable women whose religion exposes them to different sets of rights. If treated women from these religions do not exhibit higher life satisfaction than the control group, while the rest of the treated women does, it further proves the causality of birth control rights on welfare.

The results in Table 5, column 3, confirm that treated women who define themselves as Jewish are not any more satisfied than the control group, i.e. women without rights. Muslim women report an additional loss of welfare compared to the control group. Greek Orthodox women report a positive but only weakly significant effect. This can be consistent with the idea of Akerlof, Yellen and Katz (1996) that women who choose not to take advantage of rights may be worse off than without rights. Catholic women

instead report a higher welfare, in line with rest of the treatment group. This is also in line with findings from the sociology of religion that on family planning even the most fervent Catholic women adopted a stance of independence from the doctrine and took advantage of these rights when their country allowed them. These results may be a further test that the effects found so far truly arise from birth control rights and not from omitted underlying variables.

4.5 Variations in treatment effects by religion

The effect of the treatment may differ across institutional settings. Europe has deep institutional roots in Christianity. While the Roman Catholic and the Greek Orthodox Churches see the pill as not acceptable and abortion as a crime to be punished with excommunication, the Protestant Church and the Church of England leave it to conscience. Consequently societies that are predominantly Catholic or Orthodox tend to have a polarised view of reproductive freedom. In the same countries may coexist non-religious people who abide to the laws of the state, Catholics who abide to the Catholic Church law and Catholics who despite their religion choose to follow the state laws on this issue. Since the starker contrast between state and church law is on abortion, I examine whether the effect of abortion rights differs across the two settings.

Table 5, columns 1 and 2 show that, while the main results are unchanged in both sets of countries, Catholic countries (Belgium, France, Italy, Luxembourg, Ireland, Greece, Spain, and Portugal)[21] present a much larger general effect of abortion rights at the time of the survey. The difference between treated and control women instead is not statistically different from zero. It may suggest that these countries, where women achieved economic and political rights later, experienced a wider societal effect of break up of social norms from the law change.

In non-Catholic countries (Netherlands, Germany, Denmark, and United Kingdom) instead the effect was focused on private gains to the treated individuals. Concerns about whether the Catholic church has retarded the timing or the content of laws instead do not hold, as predominately Catholic countries are equally present among early adopters (France, Italy), as among late adopters (Belgium, Greece) in granting full rights, i.e. abortion on demand.

[21] The classification is based on data from the *CIA Intelligence Factbook 2002.*

Table 5: Variations in treatment effects by religious variables

	Depvar: Life Satisfaction		
	Non-Catholic country (1)	Catholic country (2)	Individual religious denomin. (3)
Abortion rights	-0.033	0.126	0.081
	(1.50)	(4.93)	(3.91)
Treatment group: women with abort. rights	0.049	0.010	
when childbearing age	(11.27)	(1.72)	
Treatment group and Catholic			0.032
			(5.77)
Treatment group and Greek Orthodox			0.041
			(1.71)
Treatment group and Jewish			-0.036
			(0.80)
Treatment group and Muslim			-0.130
			(2.61)
Treatment group and Protestant			0.044
			(5.34)
Treatment group and other Protestant			0.074
			(7.40)
Control group: women without abort. rights or	-0.014	-0.002	-0.006
not of childbearing age with abort. rights	(1.32)	(0.19)	(0.91)
Age effects, Country effects, Year effects	Yes	Yes	Yes
Country-specific linear trend	Yes	Yes	Yes
P-value of Wald tests:			
H_0: Treated women = Control women	0.00	0.16	
H_0: Treated & Catholic women = Control women			0.00
H_0: Treated & Greek Orth. women = Control women			0.00
H_0: Treated & Jewish women = Control women			0.72
H_0: Treated & Muslim women = Control women			0.04
H_0: Treated & Protestant women = Control women			0.00
H_0: Treated & other Protest. women = Control women			0.00
R2	0.09	0.09	0.13
Obs	178,618	281,335	459,953
Clusters	92	158	250

Notes: t-statistics reported in parentheses, from standard errors adjusted for clustering on country and year. Sample period is 1975-1998 for 12 countries. Countries are classified as Catholic is they have a relevant majority of Catholics. Fixed effects are jointly significant at one percent level in all specifications above. The bottom of the table reports the p-value of the Wald tests for the null hypothesis that the coefficients of the various treatment groups are not statistically different from one another and from the coefficient on the control group.

4.6 Robustness checks

Table 6 reports some further tests.

1) Table 1 reports the basic regression where the control group is broken down between the women who were over childbearing age when the law changed, and the women of any age living in countries where birth control rights were not granted when they were interviewed. Distinguishing between these two sub-groups does not yield differences that are statistically significant once the effect for having abortion rights at the time of the survey is accounted for; thus they are gathered in the same group in the analysis.

2) United Nations (2002) states that before abortion laws changed, Greece, Belgium and the Netherlands were known to have widespread underground abortion and not to enforce the ban. Thus we can distinguish "false" from "true" law changes. Indeed, a regression of the basic model on these three countries in columns 2 and 3 shows that neither treated women, nor control women exhibit any significant effect of abortion. On countries where the law change was effective, instead, the basic model yields an even stronger positive welfare effect on the treatment group.

3) Abortion rights have been granted in two basic forms, "partial rights", i.e. effective only in case of a health threat to the woman or to the child, and "full rights", i.e. the right to abort on socio-economic grounds or simply on request. Some countries have granted partial rights only, others have later moved to full rights, others have leapt directly from no rights to full rights. A regression with an indicator for each set of rights shows that the effect is positive and not statistically different on the women treated. This is not surprising as partial rights often allow women to obtain full rights in practice. Once abortion is seen as a socially acceptable course of action and some rights are allowed for, the "mental health" protection ground for abortion can be extended to include wider reasons.[22]

4) Column 5 runs a sensitivity check on the age chosen as a threshold for childbearing. Setting it at 45 rather than at 50 does not alter the results. The same check has been run setting the age at 40 and the results are unchanged.

[22] This is often argued in the case of Spain nowadays, which only grants partial rights, but where abortion is effectively available on demand in private clinics.

Table 6: Robustness checks

Depvar: Life Satisfaction	Breakdown control groups	"False" law changes	"True" law changes	Partial vs. Full rights	Sensitivity: end childb. age at 45
	(1)	(2)	(3)	(4)	(5)
Abortion rights at time of survey	0.118	0.178	0.033		0.075
	(5.82)	(5.77)	(1.42)		(3.70)
Treatment group: women with	0.023	-0.006	0.065		0.033
abortion rights when childb. age	(5.92)	(0.36)	(4.65)		(7.93)
Control group: women without abort.		-0.005	0.001	-3.78e-4	-0.008
rights or not of childb. age with abort. rights		(0.49)	(0.13)	(0.05)	(1.27)
1 Control group: women in	0.055				
countries with no abort. rights	(5.61)				
2 Control group: women with	-0.057				
abort. rights only after childb. age	(8.05)				
Partial abortion rights				0.086	
				(2.29)	
Full abortion rights				0.064	
				(2.69)	
Treatment group with partial abortion				0.049	
rights				(3.98)	
Treatment group with full abortion rights				0.040	
				(3.19)	
Age effects, Country effects, Year effects	Yes	Yes	Yes	Yes	Yes
Country-specific linear trend	Yes	Yes	Yes	Yes	Yes
P-value of Wald tests:					
H_0: Treated women = Control women		0.94	0.00		0.00
H_0: Treated women = Control women 1	0.00				
H_0: Treated women = Control women 2	0.00				
H_0: Treated women w/ partial r = Control women				0.00	
H_0: Treated women w/ full r = Control women				0.00	
H_0: Treated w/ partial r = Treated w/ full r				0.17	
R2	0.13	0.15	0.13	0.13	0.13
Obs	459,953	122,867	337,086	459,953	459,953
Clusters	250	63	187	250	250

Notes: t-stats in parentheses, from standard errors clustered on country and year. Sample period is 1975-1998 for 12 countries. In column 1, I create two separate control groups. In columns 2 and 3, I separate countries that did not have an effective law change because had widespread underground abortion before the law changed (Greece, Belgium and the Netherlands). Column 4 examines whether partial and full rights have the same effect. In column 5, I check the sensitivity of results to the threshold set for the end of childbearing age. The bottom of the table reports the p-value of the Wald tests for the null hypothesis that the coefficients of the various treatment groups are not statistically different from one another and from the coefficient on the control group.

5) Donohue and Levitt (2001) argued that the crime rate in the United States has declined significantly as a result of the legalisation of abortion as fewer unwanted children were born. This could suggest that as a result the population contained a higher

proportion of "happy" people, biasing the results. The positive effect of abortion rights on the treated is robust to excluding from the sample individuals born *after* abortion rights were introduced.

5 Conclusion

This paper evaluates the private benefits to women arising from changes to their set of incentives and choices from birth control policies: abortion rights and the endorsement of the pill in national public policies. It analyses answers by over 450,000 individuals from twelve European countries between 1975 and 1998 reporting a self-evaluation of their life satisfaction. The main finding is that following the introduction of birth control rights, women who could take advantage from the policy (that is, they were of childbearing age at the time the policy was introduced) consistently registered an increase in welfare. The magnitude of the welfare gain is equivalent to the return from achieving higher rather than middle education and a third of the size of the gain from being married or cohabiting. It is approximately one tenth of the effect of going up one level on a 12-category scale of income. It is one third of the corresponding welfare loss from being unemployed and one seventh of the loss from being separated. Other women and men have not reported any significant effect. The effect on women in the treatment group is stronger, the younger were the women when they received birth control rights and the longer they were exposed to them. Marginal returns start to decline after the woman is 35 years old, or after 21 years of pill/13 years of abortion rights.

Life satisfaction effects are consistent with changes operating through economic choices. The data strongly confirm that birth control rights caused an increase in women's investment in education, probability of working and income level. Women professing religions that deny birth control rights did not exhibit a change in their welfare. At the same time, other women's rights have been less beneficial. The analysis shows that mutual consent divorce laws have decreased women's welfare, while granting high maternity protection in the workplace did not have significant effects, possibly because of negative feedback effects on the 'employability' of women. Econometric concerns of endogenous legislation are discussed but they do not appear to apply. A series of robustness checks and sensitivity analysis is presented.

A question not addressed in this paper is why birth control rights are not always granted, if it is true that they generally improve welfare. It would be interesting to endogenise the law as part of a political economy process. One possible explanation could be linked to the median voter having different preferences from the "average" one, motivated by a political system where men are over-represented. Another extension of the analysis is to identify the distribution of the gains and losses from the policy. Panel data at the individual level would be required to estimate this effect.

The next question which will be addressed in this thesis is whether these results hold in the context of developing countries.

Appendix 1: History of legalised abortion

From classical antiquity to 19th century

Abortion was commonly accepted in the classical world, both by the Greeks, the Roman Empire and throughout the Middles Ages (David, 1992). David (1992) recounts that "in the Old Testament, abortion was a crime to be punished by a fine; it was not considered murder (Exodus 21:22)". The early Christians followed in this route. In 13th century Pope Innocent III wrote that abortion prior to quickening, i.e. until the moment the first movements of the foetus could be felt, was a minor sin, and only after quickening it became homicide. "Quickening" was usually around the sixteenth to eighteenth week of the pregnancy, but ultimately it was a distinction relying on a woman's subjective experience. Pope Gregory XIV in 1591 wrote that early abortion did not constitute grounds for excommunication.

The first law restricting abortion was adopted in Great Britain in 1803. The concern at the time was not with the foetus, but with the dangers to the woman's life from life-threatening abortions, which ended in death about thirty percent of the times (David, 1992 and Brookes, 1988). Until then, and since 1307, common law had allowed women to have an abortion at will until quickening. In 1861 Great Britain further tightened the law by decreeing abortion at any stage a criminal offence, punishable by life imprisonment. For the first time, the woman herself was liable for prosecution. This was the most severe law in Europe, but similar laws restricting abortion were soon introduced in Europe and North America throughout the second half of the 19th century. In 1869 Pope Pius IX promulgated a marked change in Church law by eliminating any distinction between formed and unformed foetus and punishing any abortion, even if necessary to save the life of the woman, with excommunication.

Europe in the 20th century

At the beginning of the 20th century, abortion was restricted by law throughout the Western countries at any stage of the pregnancy. Nevertheless, the gap between statute law and accepted social practices started to widen. Abortion was increasingly a relatively safe and accepted social practice. Prosecution was only weakly enforced.[23] Families from

[23] Brookes (1988, p. 22, 26) reports that "the small number of convictions for the crime stand in sharp contrast with contemporary estimates of its prevalence". In England, "although the death sentence was mandatory when the woman died, those convicted of murder resulting from a procured miscarriage were given reprieves."

all backgrounds were using fertility regulation, including abortion, to limit family size. Potts and Campbell (2002) report that "in Britain, 25% of women marrying in 1860 had eight or more children; by 1925, 40% were to have one or no children." Middle and upper classes started to adopt long-term family planning in association with (men's) career patterns and financial conditions, and the working class experienced a costly increase in the time-span of child dependency, due to compulsory schooling, restrictions on child labour, and the decline in infant mortality (Brookes, 1988).

Faced with the gap between statute law, which solved the moral problem of abortion, and the unfastened control of women over their fertility in practice, European countries' legislation started to evolve in very distinct ways, related to their peculiar history, culture and ideology. The first effort at abortion liberalisation emerged in 1920 in the Soviet Union, which enacted a short-lived liberalisation of abortion aimed to recognize the equal status of women. It was overturned in 1936. In the other countries, "its association with Bolshevism could only confirm most doctors' suspicions that it was immoral" (Brookes, 1988). In the 1930s some openings happened in Iceland (for medico-social conditions), in Great Britain (with the *Rex vs. Bourne* case there was the first recognition of "therapeutic" abortion to save the woman's physical and mental health after a rape), in Denmark and Sweden (for socio-economic indications). The climax of anti-abortion laws was during the Second World War, when all countries banned abortion in fears of decline of the national population and promoted family rhetoric, or "compulsory maternity" (Brookes, 1988, p. 91). Germany was the paradox, which forbad abortion on all grounds except eugenetic ones. After the end of the war, all countries in the socialist bloc except Albania liberalised abortion. In Western Europe starting in 1967 with the United Kingdom a new wave of liberalisation started. The timeline and a description of changes to legislation are given in table A.1 and Appendix 2.

The rest of the world in the 20th century

The vast majority of changes to birth control rights in the past fifty years have been towards liberalizing it, not towards restricting it. In the United States, abortion was legalised in two stages, first in 1970 in five states and in 1973 in the rest of the nation with the *Roe vs. Wade* Supreme Court decision. In Canada it is legally permitted on request following a 1988 Supreme Court's decision. Eastern European countries considered abortion as a fundamental societal right under the socialist regimes. People

in East Germany indeed saw this right restricted when they adopted the West German code of law following the unification. Interestingly, the only East European country with a strong Catholic tradition, Poland, voted an Anti-Abortion Act in 1993 after it had been legal since 1956.

In India it was legalised in 1972 but its actual provision is highly unbalanced between urban and rural settings. The same is true in Bangladesh. In China abortion is explicitly linked to family planning and population control. In most African countries, abortion is still hampered by very restrictive laws. Legal systems are often still inspired by the British Law of 1861 or by the French law of 1920, in which abortion was condemned and persons performing it were prosecuted. In 1999, out of 54 African countries, 26 allowed abortion only to save the mother's life, in one country it was permissible in case of threat to the mother's physical health, and 23 also contemplate threats to the mother's mental health. Only in Zambia abortion is permitted for socio-economic reasons. Three countries, Tunisia, Cape Verde and South Africa pose no restrictive conditions to the termination of pregnancy. Among Latin American countries, most of them put stringent legal limitations on abortion, often reflecting the Spanish colonial heritage in their legal codes. Induced abortion is punishable by law in almost every country except Cuba and a few other Caribbean nations, although in most countries it can be performed on the doctor's initiative for health reasons or for victims of sexual crimes.

For Islam, the Koranic condemnation of killing children is generally understood as applying to abortion as well, although the majority of scholars usually interpret it after some "ensoulment stage". Muslims are also commonly opposed to contraception. For Judaism, abortion for therapeutic reason is mandatory when the woman's life is in danger, as her life takes precedence on the still potential life of the foetus. Beyond this, there is no unified Jewish position on abortion and rabbis' positions may vary. Orthodox Jews strongly oppose it. Among Protestant denominations, there are deep divisions, which make it difficult to determine an official church policy.[24]

[24] Childbirth by Choice Trust (1995), *Abortion in Law, History and Religion*, at www.cbctrust.com/abortion.html.

Appendix 2: Summary of abortion laws in Europe in 1975-1998

Belgium: The abortion law in Belgium was significantly liberalized in 1990, when the Belgian Parliament approved a law amending the 1867 Penal Code. Attempts to liberalize the abortion law of Belgium had begun in 1971. Between 1971 and 1990, various legislative proposals to permit abortions were introduced, always to be rejected or allowed to expire. Although the law remained unchanged, prosecution was rare, and those prosecuted were most often given short or suspended sentences or, in some cases, acquitted. The 1990 law permits abortion to be performed in the first 12 weeks of pregnancy when a woman who is "in a state of distress as a result of her situation" requests a physician to terminate her pregnancy. The woman is the sole judge of whether she is in distress.

France: France liberalized abortion in 1975. The law allows an abortion to be performed before the end of the tenth week of pregnancy by a physician in an approved hospital when a woman who is "in a situation of distress" because of her pregnancy requests it.

Denmark: Until 1937, abortion was illegal in Denmark. In 1937, the Parliament enacted legislation allowing abortion to be performed in cases of a threat to life or health, rape or incest, and foetal impairment. The law was further liberalized in 1956 and 1970 to allow abortions for various social reasons, such as having four or more children or being over thirty-eight years of age. In 1973 the law was again liberalized to allow abortions to be performed on request during the first twelve weeks of pregnancy.

(West) Germany: The life satisfaction data refer to West Germany before the unification and to united Germany thereafter, and so the law changes. In 1975 the German Parliament voted to liberalize the country's abortion law to permit abortions on request during the first 12 weeks of pregnancy, but shortly after the German Federal Constitutional Court held that it violated constitutional provisions protecting the right to life of the unborn. In response, the Parliament adopted legislation allowing abortion to be legally performed according in case of health reasons, rape or incest, or of intolerable distress for the woman, which could encompass socioeconomic grounds. The state of intolerable distress was to be determined by a physician other than the one performing the abortion and not by the pregnant woman herself. As a result of the requirement of the physician's approval, access to abortion and abortion rates differed

substantially in the country. In the North, physicians routinely approved and performed abortions on socioeconomic grounds, while in the South, in states such as Bavaria, the performance of abortions was less frequent. Following the unification, the problem was how to harmonize the law of West Germany with that of East Germany, which fully supported the cause of women's rights and guaranteed abortion on demand during the first 12 weeks of pregnancy and thereafter for serious reasons. A compromise was reached in 1992 under which West German law would apply, but the pregnant woman was allowed to make the final decision, and not the physician, as was previously in East Germany. Abortion was also legal up to 22 weeks of pregnancy in case of child's serious defects, and at any time to prevent a serious threat to the pregnant woman's life or health. In 1993, the Constitutional Court of Germany gave an ad hoc ruling, which the Parliament embodied in the new legislation in 1995. It was declared that this law violated the right to life explicitly guaranteed by the German Constitution and that all abortions except those performed for therapeutic reasons were unlawful. At the same time, however, it ruled that if the woman was in state of distress, an abortion was illegal but not punishable. The implication was that abortions would not be paid for by state health insurance, as was the case under the previous laws of both parts of Germany, except when the woman's income fell below a certain threshold.

Greece: Until the Second World War, the government of Greece was strictly opposed to induced abortion. Under the Greek Penal Code of 1950, heavy penalties were imposed on both the woman consenting to the abortion and the person performing it. Abortion was permitted only for physical health reasons or in case of rape or incest. The Greek Orthodox Church considers abortion to be a crime. The law was liberalized in 1978 to include risks for the mental health of the mother and serious foetal abnormalities as grounds for abortion within 12 to 20 weeks of pregnancy, but they had to be determined by a psychiatrist on the staff of a public hospital. In 1986 the legal framework for abortions was further liberalized, granting the right to abortion on request during the first 12 weeks of pregnancy and within 24 weeks in case of serious foetal abnormalities. It is believed that the liberalization of the abortion law in Greece has made little difference in the abortion rate because, prior to its liberalization, a person performing an abortion or a woman undergoing an illegal abortion was rarely prosecuted.

Ireland: Abortion in Ireland has been illegal since the founding of the Republic. After 1967, when England liberalized its abortion law by statute, women could easily travel to England to have an abortion performed legally and safely. Approximately 4,000 Irish women did this each year, with a significant number of them aided by Irish family planning associations. A constitutional amendment in 1983 placed the lives of the mother and the unborn child on an equal level and obligated the State to adopt measures to protect the latter. In 1988 and 1990, the Supreme Court of Ireland issued permanent injunctions against the provision of information services on abortion in England by Irish family planning groups and student groups. In 1995 this decision was upturned following a referendum by which the Irish public approved the rights to information and to travel, but defeated the proposed wording on exceptions to the ban on abortions, thus allowing the decision of the Supreme Court on this issue to stand.

Italy: Until the 1970s, the Penal Code of 1930 prohibited publicity on contraception and the performance of abortions, except when the life of the pregnant woman was threatened. In 1971, however, the Constitutional Court ruled that the provisions of the Code relating to contraception were unconstitutional, and in 1975 it held that the abortion provisions were also unconstitutional in so far as they prohibited it in case of a serious threat to the pregnant woman's health. A new law was enacted in 1978, regarded at the time as one of the most liberal abortion laws in Western Europe. This law provides such broad grounds on which abortion is permitted that it effectively allows abortion on request because it is the woman herself who attests that she is in one of the situations described by the law and the primary role of the physician is to certify the existence of a pregnancy. In practice, however, the situation varies to some extent from one region of the country to another. A major reason is the strong influence of the Holy See. When the 1978 law was approved, the Holy See immediately issued a warning that any person performing an abortion and any woman obtaining an abortion would be excommunicated. A large number of physicians have invoked the conscience clause.

Luxembourg: Abortion law was liberalized in 1978. Prior legislation dated from 1879 and was based on the Napoleonic Penal Code of 1810. Both a person who performed an abortion and the woman consenting to the abortion were subject to severe penalties, including imprisonment. Under the 1978 law, abortion is legal during the first 12 weeks of pregnancy in case of risk for the physical or mental health of the woman; of child's serious disease or malformation, or in case of rape. Despite the passage of a more liberal

abortion law, there has been some reluctance on the part of physicians in Luxembourg to perform abortions, owing in part to the prevailing religious conservatism.

Netherlands: Under the Penal Code of the Netherlands (1886) and its 1911 amendment, abortion was illegal except when performed to save the life of the pregnant woman. However, the law was not strictly enforced and abortion services were readily available. In 1981, a new law was enacted that permitted abortion on request at any time between implantation and viability if performed by a physician in a hospital or licensed clinic.

Portugal: The Portuguese Criminal Code of 16 September 1886 prohibited abortion in any circumstance. Termination of pregnancy was in practice permitted to save the life of the mother, despite the fact that there was no specific provision for such cases in the Criminal Code. The law was liberalized in 1984 to permit "partial rights". Abortion could be performed in case of serious risk for the physical or mental health of the mother, child's serious or incurable disease or malformation, or rape. In June 1996 the Communist Party proposed legislation to liberalize abortion and to make it legal up to 12 weeks on demand, but the proposed law was narrowly defeated in February 1997.

Spain: Under Spanish criminal law provisions first enacted in the 1800s and in effect until 1985, abortion was prohibited without exceptions, except to save the life of the pregnant woman. After an attempt to introduce a more liberal legislation in 1983, immediately opposed by the Constitutional Court on the ground that it did not adequately protect prenatal life, in 1985 new abortion legislation was adopted. Under the legislation, an abortion can be legally performed in case of serious risk for the physical or mental health of the mother, child's physical or mental defects, or rape. In reality, it is often argued that abortion is effectively available on demand in private clinics.

United Kingdom: Abortion in England, Scotland and Wales is currently regulated by the Abortion Act of 1967, as amended in 1990, which permits abortion to be performed on broad grounds, as certified by two physicians, of risk for the physical or mental health of the woman or any existing children of her family, or in case of child's physical or mental abnormalities, within 24 weeks and the pregnancy. In assessing the risk to the health of the woman and her existing children, physicians may take into account the woman's "actual or reasonably foreseeable environment". Owing to this provision and a broad interpretation about what constitutes a threat to health, abortions are available

virtually on request in the United Kingdom. The Abortion Act of 1967 does not apply in Northern Ireland. There the provisions of the "Offences Against the Persons Act" of 1861 are still in effect, which rule out abortion unless necessary to save the life of a pregnant woman.

Largely adapted from United Nations (2002), *Abortion Policies. A Global Review.*

Appendix 3: Data description and sources

Eurobarometer (version Mannheim Eurobarometer Trend File 1970-99)

Countries: Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, United Kingdom.

Years: 1975-1998 except Greece (1981-1998) and Spain and Portugal (1985-1998).

Life satisfaction: four-category variable based on the question: "On the whole, are you very/fairly/not very/not at all satisfied with the life you lead?". The distribution of the answers is "Very satisfied" 27.63%, "Fairly satisfied" 54.09%, "Not very satisfied" 13.63% and "Not at all satisfied" 4.65%.

Personal characteristics: dummies on gender, whether the person is working, married/cohabiting or single, level of education[25], personal income on a 12-point scale.

Age: dummies for age less than 20, 20-29, 30-39, 40-49, 50-59, 60-69, over 70.

Religious denomination: the Eurobarometer asks: "Do you regard yourself as belonging to a religion?". Answers are coded separately for Catholic, Greek Orthodox, Jewish, Muslim, Protestant and Other Protestant (including Church of England).

Sources of policies

Abortion laws: United Nations (2002).

Date of inclusion of pill in national health planning: Jones *et al* (1989), United Nations (2002).

No-fault divorce: Edlund, Haider and Pande (2003).

Maternity leave benefits: data kindly provided by Christopher Ruhm.

Percentage of women in parliaments: Inter-Parliamentary Union (1995), *Women in Parliaments 1945-1995*, Geneva.

[25] Based on age when finished full-time education: low ≤15, middle 16-19, high ≥20.

Table A.1: Women's rights in Europe, 1960-1998

	Abortion partial rights (health grounds)	Abortion full rights (on request)	Pill as part of public policy	No-fault divorce
Belgium		1990	1973	1975
Denmark		1973	1973	1969
France		1975	1967	1975
West Germany	1976	1995	1975	1976
Greece	1978	1986	1980	1983
Ireland	no	no		1995
Italy		1978	1971	1971
Luxembourg	1978			1975
Netherlands		1981	1969	1971
Portugal	1984		1976	1975
Spain	1985		1978	1981
United Kingdom		1967	1961	1971

Table A.2: Correlation matrix

	Abortion rights	Pill in public policy	Life satisfaction	Women in parliament	High maternity protection at work	No-fault divorce
Pill in public policy	-0.054					
Life satisfaction	-0.059	-0.051				
Women in parliament	0.307	-0.023	0.267			
Majority of Catholics	-0.220	-0.316	-0.243	-0.718		
High maternity protection at work	0.489	0.040	-0.011	0.356	-0.333	
No-fault divorce	0.341	0.161	0.039	0.330	-0.347	0.786

Figure 1: Cohort effects on life satisfaction for women

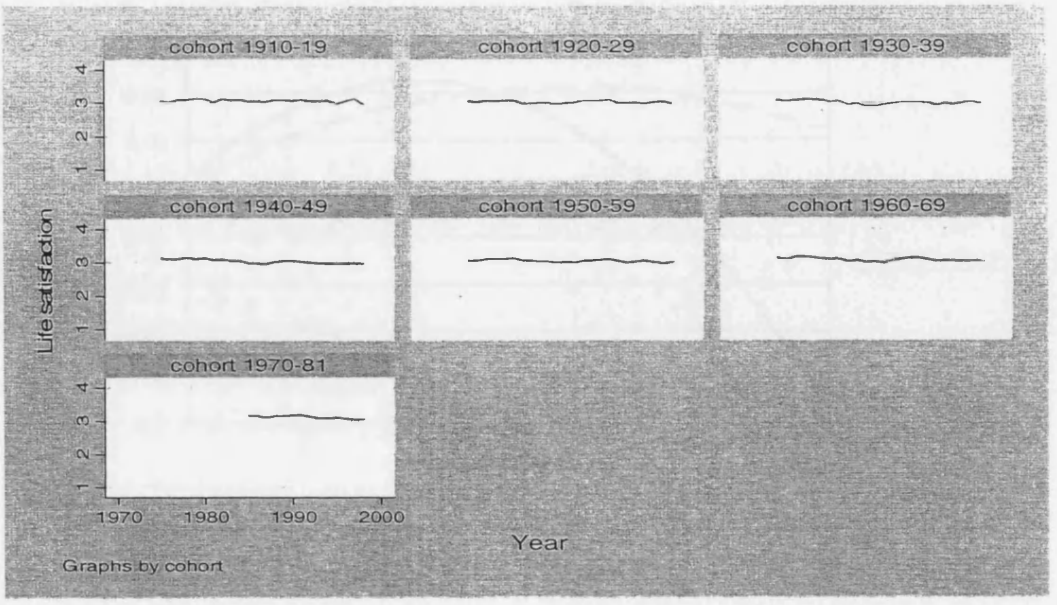
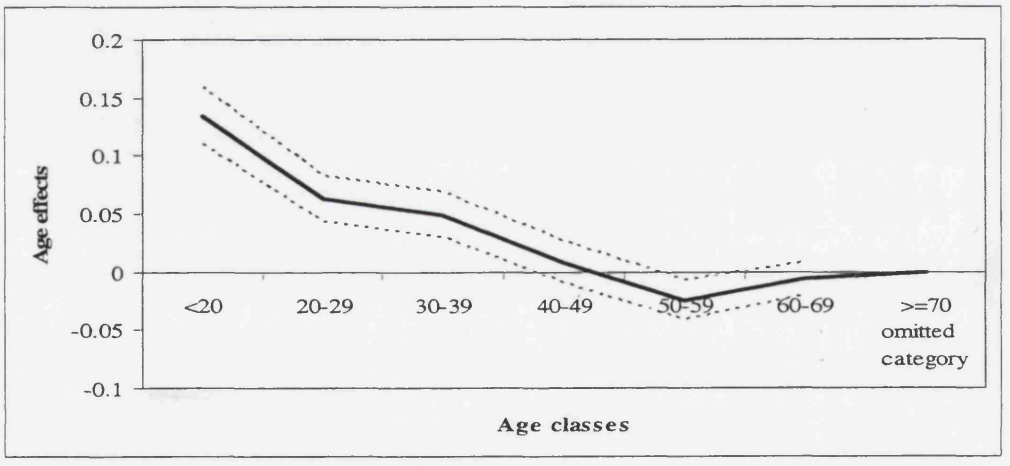
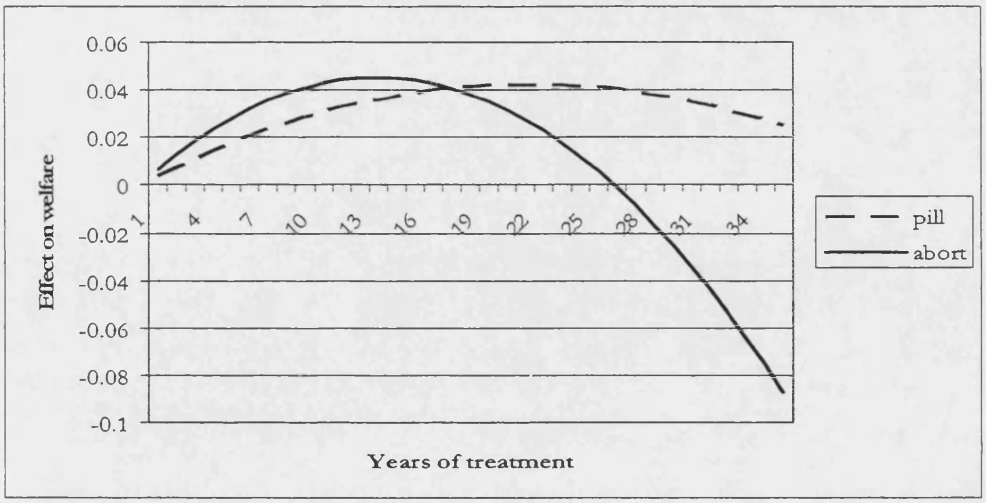


Figure 2: Age effects on life satisfaction for women



Notes: coefficients from regression including personal characteristics and fixed effects as in main specification.

Figure 3: The effect of birth control rights over time



Note: effects computed on the basis of the coefficients estimated in Table 1, columns 4 and 7.

Chapter 2

Women's rights and wellbeing in India

This chapter studies the link between women's rights, empowerment and wellbeing in India. Tracking the changes in women's roles and rights within society in the last fifty years, development policy has elected female empowerment as a goal for the advancement against poverty. Increasing pressure has been exerted by the international donors' community on developing countries to introduce programs targeted to women's rights. Our evaluation carried out in the European context has shown a sizeable positive effect of birth control rights on the wellbeing of women, while maternity protection in the workplace seems to be neutral and no-fault divorce appears to have even worsened their position. These results seem to suggest that not all parity rights may be equally welfare-enhancing. Each legal right should be studied in its own respect defining explicitly its implications on preferences and behaviour. Moreover, rights may have different effects in varying institutional settings. Some countries may guarantee a legal right without putting in place the conditions for effective access. In this case a welfare-enhancing policy may have no effect in practice.

As part of a wider research agenda on whether and how individual rights affect wellbeing, this chapter carries out an assessment of the effects of abortion rights in India using individual-level data. The answers of nationally representative samples of individuals about their current life satisfaction are used as utility indicators and are compared between cohorts of women who had access to birth control rights at different stages of their life.

Between the end of the 1960s and the 1970s a significant number of countries have granted abortion rights. The first piece of international legislation explicitly affirming "the reproductive rights of women" was the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), adopted in 1979 by the United Nations. The Cairo Conference in 1994 mentioned explicitly for the first time the problem of the high mortality rate among women due to unsafe abortion. The summit promoted the concept of making "reproductive health" a priority for development, without calling it a right. This was acceptable for the many countries where abortion was not legal. The Beijing conference in 1995 then made the connection between reproductive health and "physical, mental and social" wellbeing and promoted "the capability to reproduce and the freedom to decide if, when and how often to do so"[1]. By 2000 two thirds of the world countries, covering 75 percent of the world population, had enacted reproductive rights laws.

The previous chapter has shown that birth control rights have played an important role in increasing wellbeing among women in European countries. In particular, having access to abortion rights during childbearing age has increased the probability for a woman to declare to be "very satisfied" with her life by 1.5 percentage points. It has decreased the probability to be "fairly satisfied" by 0.4 percentage points, to be "not very satisfied" by 0.8 points and to be "not at all satisfied" by 0.3 percentage points. Having access to birth control rights also enhanced the probability for women to study longer, to work and to earn a higher income. However, it is not clear whether these results could equally apply to developing countries, which typically have different institutions.

An important factor in the extension of birth control rights in Europe was the consensus in keeping the monetary costs for the individual at the lowest possible level and to encourage the dissemination of the information about their availability. Besides setting similar time limits across countries (12 weeks for voluntary abortion and 20 to 24 weeks for late abortion), abortion rights and the pill are provided to everyone within public facilities at a null or symbolic cost. The distribution of public health facilities is extensive and the basic level of education approaches 100 percent. Effective access to the rights is very high.

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[1] "Strategic objective C3", *Fourth World Conference on Women Platform for Action*, Beijing 1995, as reported in http://www.un.org/womenwatch/daw/beijing/platform/health.htm.

In the context of developing countries access to information is known to be a crucial divide. There are substantial inequalities among the population in levels of education and access to newspapers, radio and television. These inequalities often run in parallel to inequalities in income. Lack of access to information frequently translates into unequal access to public policy facilities. Jalan and Somanathan (2004) find in the context of India that "being informed matters" even in the adoption of basic hygienic norms, and that being informed is a function of three factors: education, wealth and the existence of specific programs to disseminate information. Therefore in the analysis of the effects of birth control rights, attention is given to the role of barriers that impede access to these rights in the form of income constraints, lack of information and regional disparities.

The first section describes the status of abortion rights in the law in India and how access to health services is effectively distributed among the population. Section 2 explains the methodology used to study the effect of birth control rights on welfare, as measured by their self-reported satisfaction with life. Section 3 describes the results and section 4 concludes.

1 Background on India

1.1 Abortion laws

Abortion was liberalised in India following the Medical Termination of Pregnancy Act of 1971, which took effect in 1972[2]. Prior to this, abortion was only permitted to save the life of the woman according to the Indian Penal Code of 1860. Having an illegal abortion or performing one was subject to three years of prison (seven if the pregnancy was at an advanced stage) and a fine.

The 1971 Act formally allows abortions to be performed only if the life of the woman or her physical or mental health are at risk, if there is substantial risk that the child would be seriously handicapped or if the pregnancy follows from a rape. In practice the jurisprudence allows to take into account the woman's actual or reasonably foreseeable environment, as well as "the anguish caused by a failure of the contraceptive method used" as long as it is within the context of a married family.

The consent of the woman is always required. A pregnancy may be terminated within the first 12 weeks of pregnancy on the opinion of one registered medical practitioner

[2] The reference used for this section is United Nations (2002).

and between 12 and 20 weeks on the opinion of two. Abortions can only be performed by a registered medical practitioner in a public hospital or in a facility approved by the Government, or anywhere if the life of the woman is considered to be in serious danger by a registered medical practitioner.

The purpose of the legalisation of abortion was to reduce the incidence of illegal abortion and the related maternal mortality. However, United Nations (2002) reports that, according to government data, only about 1 million of legal abortions are performed each year, while the number of illegal abortions is estimated to be between 2 million and 6 million per year and is thought to account for 20 percent of maternal deaths in India. Although the government repeatedly emphasises that abortion should not be viewed as a method of family planning, most women who have obtained an abortion (legal or not) tend to have at least two living children and to be non-users of contraception. One study estimated that up to 80 percent of abortion patients were not using any contraceptive method (United Nations, 2002).

While increasing women's rights and their freedom from unwanted pregnancies, granting legal abortion has had in some regions the perverse effect of making sex-selective abortion more easily available (i.e. the choice to terminate a pregnancy if a girl is expected). Although forbidden by law, some private clinics provide cheap prenatal gender tests and then offer an induced abortion if the parents are dissatisfied with the sex of the foetus. This practice is more widely available in the states in the north and in the east and they are common even among the rural poor. A country-wide legislation enacted in 1994 restricts prenatal diagnostic techniques to cases involving serious diseases and abnormalities and prohibits entirely the advertising and the use of such techniques to determine the sex of a foetus. Facilities performing prenatal diagnostic techniques must be registered and it is prohibited to reveal the sex of a foetus in any manner. The law also prohibits family members of a pregnant woman from seeking or encouraging her to undergo prenatal testing to determine the sex of the foetus. Penalties for contravening the law include imprisonment and fines and, in the case of a registered medical practitioner, loss of registration, which can be permanent in the case of repeat offences.

Until 1996 women's birth control rights have been strongly promoted as a means to reduce the overall country's fertility rate, with targets like the two-child family and implicit sanctions for those exceeding the target (like not receiving maternity benefits

after the second child or being excluded from political participation). The 2000 National Population Policy aims at increasing the outreach of reproductive services while eliminating the target component on those administering family planning services.

1.2 The use of health services as a function of status, access to information and location

There is evidence that inequalities in access to health are very pronounced in India, even with respect to countries with comparable levels of development. Dreze and Sen (2002) recount that health inequalities are based on region, class, caste and gender. They report the finding from a study by the National Council of Applied Economic Research (2000) which suggests that for every rupee of public expenditure on health services that reaches the poorest 20 percent of the population, three rupees reach the richest 20 percent. Table A.1 in the Appendix reports selected statistics on access to health facilities collected by the World Bank.[3] These data are broken down by gender, by income quintile and by urban and rural setting. There is a clear divide in the access to various measures of health facilities along the dimensions of income, location, education and access to information. Among lower income classes and in rural settings the fertility rate is generally higher and the use of contraceptives is lower. This could suggest that women from lower income classes and from rural areas have less access to health facilities, but it may also be consistent with them having different preferences over the ideal number of children.

Looking at how access to health is distributed among private and public facilities shows that a two-tiered system of health provision is effectively in place. Women from upper quintiles and from urban settings obtain a higher proportion of contraceptive care as well as ante and postnatal care from private rather than public facilities. The divide along income, education and location is also present regarding access to information, power in decision-making and freedom of movement. Women from lower quintiles and from rural settings consistently show worse outcomes in terms of use of newspapers, radio and television. They have a lower probability than their counterparts in urban settings or from upper income quintiles to seek their own health care, to make large household purchases and to travel to visit family or relatives. On the other hand, in terms of education (i.e. completing fifth grade), women from rural settings seem to

[3] www.genderstats.worldbank.org.

perform better, although income still plays a strong role in favouring access to education.

On access to abortion services we lack precise statistics. United Nations (2002) reports that the implementation of the law has been slow and geographically uneven. Abortion services are often hard to access in rural areas and women are reluctant to utilize those services because of the lack of anonymity and confidentiality. It appears that the women who make use of legal abortion in hospital facilities are mostly educated, from an urban middle-income family, married and between 20 and 30 years of age. In contrast, the women admitted to public hospitals with complications from illegal septic abortions are more often illiterate and from poorer segments of the population. These observations are consistent with other findings that the level of awareness of the legality of the procedure is fairly low, and the existing facilities for the legal medical termination of pregnancy are either not available or not utilised by women who seek illegal abortions.

2 Analysis

2.1 Data on wellbeing in India

The source of data on individual wellbeing is the World Values Survey[4]. This is a long-standing project by Prof. Ronald Inglehart at the Institute of Social Research at University of Michigan designed to monitor changes in values and attitudes across the world. The survey was carried out in India in 1990 and in 1996.[5] A representative sample of 4,540 adults aged at least 18 were interviewed face-to-face in the two waves. Of these, 4,386 individuals answered the question: "All things considered, how satisfied are you with your life as a whole these days?" and the person was shown a card with the numbers between 1 and 10, where 1 corresponded to "dissatisfied and 10 to "satisfied".

Table 1: Summary statistics on life satisfaction

Life satisfaction	Obs	Mean	Std. Dev.	Min	Max
Men	2,398	6.612	2.487	1	10
Women	1,988	6.643	2.396	1	10

Source: World Values Survey.

[4] Version obtained by the UK Data Archive.

[5] A more recent wave was carried out in 2000. It has just been made available to the public and we plan to incorporate it in the analysis.

Table 1 presents the summary statistics for life satisfaction. The mean life satisfaction is 6.61 for men and 6.64 for women. The answers came from 2,461 individuals in 1990 and 1,925 in 1996.

2.2 Identification of the wellbeing effect from abortion laws

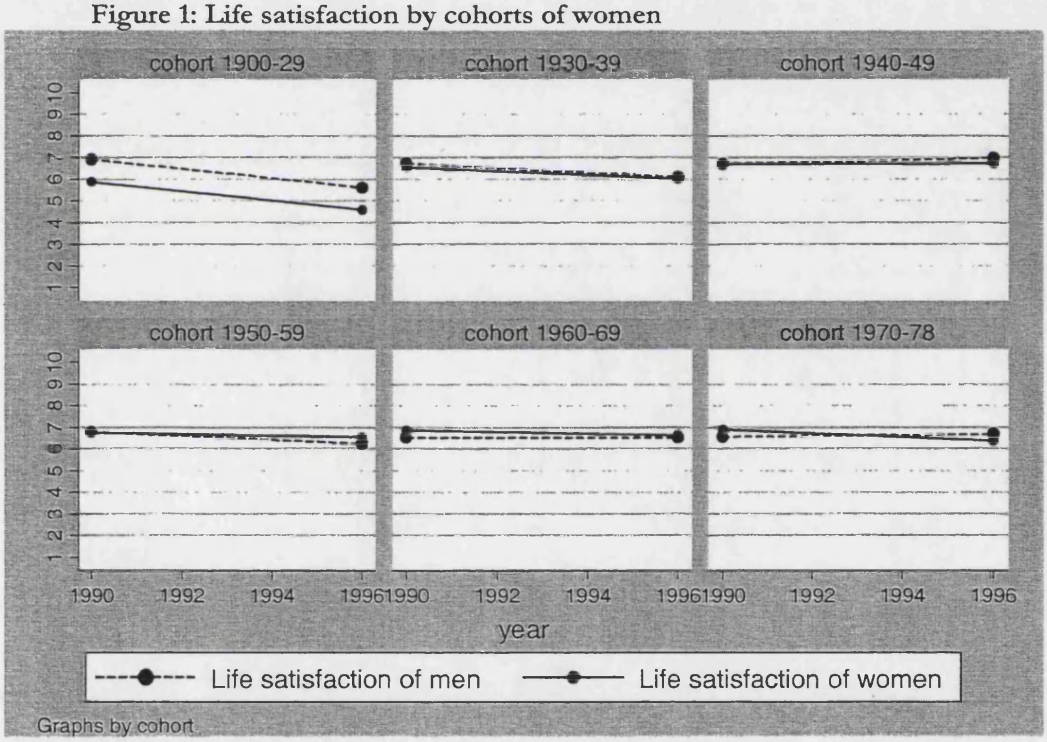
We focus on how women changed their set of incentives and choices and derived private benefits from the policy change. The technique chosen is the estimation with differences-in-differences, following the original framework developed in chapter 1. As before, we estimate an average effect of treatment on the treated. The treatment is to be able to take advantage of the rights when planning one's life, and not to actually use them. Nevertheless, we do not know which women effectively took advantage of the possibility to control their births and which ones did not. In the absence of individual panel data, the actual distribution of the benefits within the treatment group is unknown.

The identification of the welfare effect comes from the fact that birth control rights can only affect individuals of a certain gender and age, that is, women of childbearing age. An individual cannot self-select into the policy. We want to set the threshold age for taking advantage of these rights to the time in life when *having abortion rights or not does not matter anymore.* The standard in the medical literature is to take 50 years old as the threshold for childbearing age. In the previous chapter we have found that the effect is relevant in Europe if women receive the rights before being 35 years old. However this could still be relatively high in the context of a developing country where life expectancy is lower than in Western countries. In the 1990s Indian women had a life expectancy of 60 years and English women had 78 years. Moreover, fertility takes place much earlier than in the Western context. In India on average 70 percent of women less than 20 years old have one child and 20 percent have two children; 10 percent of the women between 20 and 30 years old have at least three children. Following this consideration we have chosen the age of 30 years old as the threshold where most women have completed their decisions on education, work and first child. The treatment group of the policy is constituted by women who received the rights before being 30 years old and the control group by women who received the rights after being 30. If the main effect of birth control rights on welfare is assumed to pass through a better planning of life choices, these are probably already set by the age of 30 in the Indian context for the

vast majority of women. Sensitivity tests show that the results are robust to using different age limits.

As we focus only on one country and one law change, confronting women who received the rights up to a certain age versus those who received them after that age yields an effect that might be overlapping with cohort or age effects. Figure 1 plots life satisfaction separately for men and women born in different cohorts. The cohort of men and women born between 1900 and 1929 shows a parallel and decreasing trend, with women on a lower level. All other cohorts show very little changes around the mean. It does not appear that younger men and women are happier than their parents. If anything, we observe a slightly decreasing trend in life satisfaction for women born between 1970 and 1978.[6]

Figure 1: Life satisfaction by cohorts of women



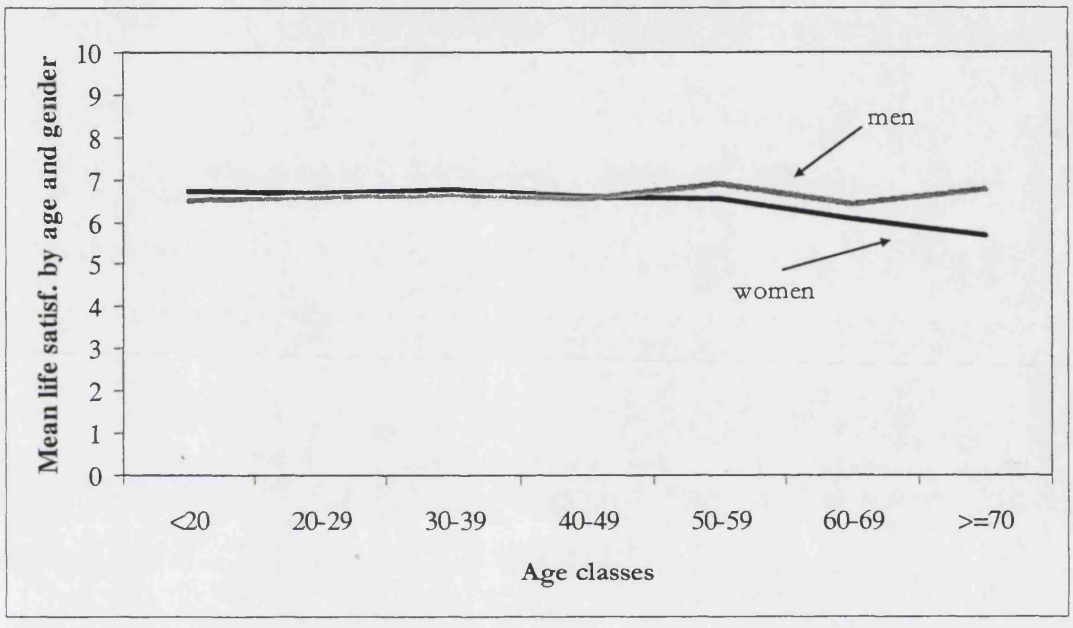
Source: World Values Survey.

The pattern of cohort effects is consistent with that of age effects. Figure 3 shows a very flat trend, identical for men and women, apart from some divergence between their life satisfaction after 50 years old, when men are significantly more satisfied than women and women's wellbeing declines. This has probably to do with a higher probability of

[6] The cohort born between 1900 and 1929 contains 4.6% of the sample, 1930-1939 contains 6.8% of the sample, 1940-1949 contains 12.7% of the sample, 1950-1959 contains 26.5% of the sample, 1960-1969 contains 31.9% of the sample, 1970-1978 contains 17.5% of the sample.

widowhood at this age and the fact that widows tend to receive little support, but further research is needed to explore this issue. The profile of wellbeing as a function of age stands in stark contrast to that found in European countries (Blanchflower and Oswald, 2004, own research in chapter 1), which shows that life satisfaction displays a U-shaped trend with respect to age with a minimum around 55 years old.[7] To ensure the comparability of the treatment and the control groups and guarantee the robustness of the identification, we control for the age of the individual in the analysis.

Figure 2: The pattern of life satisfaction following age



Source: World Values Survey.

The base specification for the OLS regression model is the following:

$$Wellbeing_{it} = \beta_0 + \beta_1 \cdot Tg_{it} + \beta_2 \cdot Cg_{it} + \beta_3 \cdot Age_{it} + \beta_4 \cdot Year + \beta_5 \cdot Controls_{it} + \varepsilon_{it}$$

where $Wellbeing_{it}$ is an ordinal variable that measures the wellbeing of individual i in year t on a 1 to 10 scale, Tg_{it} identifies treated women and Cg_{it} is a dummy for women in the control group. The continuous variable Age_{it} is taken in logarithm. *Year* introduces a control for the year in which the survey was taken. The vector $Controls_{it}$ includes personal characteristics such as income, education and location. In order to account for

[7] Another difference is that women in India are not any more or less satisfied with life than men, while in Europe women are on average more satisfied than men.

the possibility of heteroskedasticity we use robust standard errors. The baseline in comparison to which the coefficients are estimated is the omitted category of men, since the sum of the women in the treatment group and those in the control group exhausts the universe of women.

3 Main results

Table 2 shows the results of the analysis. In the first column the welfare of women exposed to abortion rights is compared to that of women without legal access to the rights. The coefficients show a positive welfare effect on women with rights and a negative welfare effect on women without rights, but they are not statistically significant. Their difference is also not significant. This result is not sensitive to the threshold chosen for childbearing age. We have experimented with thresholds from 20 to 50 years old and no effect has been found.[8]

Column 2 introduces controls for the level of family income (high versus low[9]), the level of education (high/middle/low education[10] versus none) and living in a village or in a town versus living in a city[11]. In principle these variables could be endogenous to the set of available rights, but India has relatively little vertical mobility. The overlapping between the distribution of assets and the position in the caste system, which is assigned by birth, is still very strong. This suggests that to a great extent the fact that a woman reports a large household income and a high level of education is more related to her family background than to her individual choices. Therefore in this particular context we can consider these variables exogenous to the existing rights. Once account is taken for these potential barriers to access abortion rights, it appears that women in the treatment group, who have received abortion rights before the age of 30, exhibit a

[8] Also, a regression not reported here investigates whether the treatment had an effect only at a particular age. Breaking down the treatment group between women who received abortion rights before being 20 years old, between 20 and 25 or between 25 and 30 does not uncover any significant pattern. None of the subgroups exhibits a welfare effect.

[9] High income is measured as being in the sixth to tenth categories of the income ladder, which cumulatively comprise 23.8 percent of the sample, and low income is given by the first to the fifth categories of income.

[10] Low education is measured by leaving school at the age of 14, middle education before the age of 18 and high education by leaving school after turning 18 years old.

[11] A village is defined by having less than 10,000 people, a town between 10 and 50 thousand people and a city over 50 thousand people.

positive change in welfare, significant at the 10 percent level. Women who received the rights after that age do not show any significant effect.

Table 2: The effect of abortion rights on wellbeing in India

Depvar: life satisfaction	(1)	(2)	(3)	(4)	(5)
Treatment group: women with abortion rights before 30 years old	0.071	0.150*			
	(0.93)	(1.82)			
Treatment group with high income			0.171		
			(1.19)		
Treatment group with low income			-0.01		
			(0.11)		
Treatment group with high education				0.128	
				(1.21)	
Treatment group with middle education				0.183	
				(1.16)	
Treatment group with low education				0.383**	
				(2.06)	
Treatment group living in a village					-0.001
					(0.00)
Treatment group living in a town					0.270*
					(1.70)
Treatment group living in a village					0.011
					(0.11)
Control group: women with abortion rights after 30 years old	-0.292	-0.002	-0.381**	0.068	-0.236
	(1.61)	(0.01)	(2.01)	(0.37)	(1.24)
Dummy: High income		0.656***	0.766***		
		(7.14)	(6.71)		
Dummy: High education		1.064***		1.183***	
		(7.55)		(9.50)	
Dummy: Middle education		1.114***		1.015***	
		(7.52)		(6.78)	
Dummy: Low education		0.552***		0.460***	
		(3.55)		(2.90)	
Dummy: Living in a village		0.228*			0.052
		(1.90)			(0.37)
Dummy: Living in a town		0.606***			0.499***
		(6.36)			(4.17)
Controls:					
Age	Yes	Yes	Yes	Yes	Yes
Year of the survey	Yes	Yes	Yes	Yes	Yes
Observations	4,386	3,643	3,883	4,386	4,137
R-squared	0.002	0.055	0.024	0.031	0.012

Note: Robust t statistics in brackets. * denotes significant at 10%; ** significant at 5%; *** significant at 1%. The baseline category for income is "low income", for education is "no education" and for location is "living in a city".

Columns 3 to 5 in Table 2 run the base specification breaking down the treatment group according to income, education and location. The specification in column 3 shows that, once personal income is taken into account, women with abortion rights are not significantly different in welfare than men, while women who received the rights too late exhibit a lower welfare than the other men and women.

In column 4, controlling for the level of education, it appears that women with rights and a basic level of education (up to fifth grade) have a higher welfare than the remaining men and women. Finally, column 5 highlights a positive welfare effect on women who had abortion rights and live in a town as opposed to those living in a city or in a village. A medium-sized town may offer the balance of a good provision of health care services, good physical access (i.e. lower travel costs) and anonymity, whose lack is often cited as an impediment to using public facilities in rural settings.

Two main findings emerge. First, there is no welfare effect in India on the group of women who had legal access to abortion rights by the time they were 30 years old. No effect is found using other thresholds of age. Second, some positive effects can be found once account is taken for income, education and location of the individual. In particular, it appears that there is some correlation between having the legal rights, enjoying a basic level of education, high income, living in a town, and a higher welfare. This may suggest some role for policy to improve access to the rights for the less favoured groups in society. Nevertheless these results must be taken with caution. As we cannot measure with certainty for how many women the factors of income and education can be truly considered exogenous to the set of available rights, we cannot go beyond stating a correlation, and not a causation, between rights, higher wellbeing and higher income or education.

4 Conclusion

This paper studies the link between women's rights, empowerment and wellbeing in India. India is characterised by a particular set of conditions whereby access to health services is very unequal even in comparison with other developing countries of similar level of development. From the analysis of the self-reported life satisfaction and demographic characteristics of over 4,000 individuals in 1990 and 1996, we do not find strong evidence that abortion rights significantly increased the wellbeing of women in India. While a clear and robust effect was found in our analysis on European countries,

which was conducted with the same methodology, the estimated effects are very weak in India. A significant association between abortion rights and higher wellbeing of women is only found when the income, education and location of the individuals are taken into account.

One possible explanation could be related to the gap between the legal guarantee of the rights and the effective access to them. In European countries the rights were granted at a null or symbolic cost for the individual, while in India income, education and location can constitute significant barriers to access health care. The level of awareness of the existence of reproductive rights appears to be rather low. If this is true, then lowering the cost to the user and improving the dissemination of information could be as important as granting the rights in the first place. Nevertheless, it is hard to rule out at this stage that some of the gain in wellbeing stems from the direct effect of income and education on utility, and not through the fact that they enable access to the rights.

The issue of which rights are beneficial to individual wellbeing is an aspect that is little studied in development. At first sight birth control rights appear important to the goal of empowerment, because fertility decisions impinge directly on the freedom of action of the woman. In addition, they have significant spillovers on infant mortality rates and children's health. This paper sheds light on the fact that we need to ascertain under which conditions they are beneficial.

Moreover, this reinforces the argument that the comparison of the quantitative effects of different interventions should be an important tool of public policy. If the normative objective is to promote individual and societal welfare, granting individual rights and promoting access to them might be found to be more effective than policies that aim at raising aggregate economic growth. These constitute at the moment very different priorities for development practitioners and are treated as separate spheres with different types of returns.

In the wider context of our study on the effect of institutional change on wellbeing, this analysis leads to two considerations. First, changes in institutions have to be effectively felt by individuals in order to change their incentives and preferences. Here we have seen that granting a legal right while leaving the individual either uniformed or bearing the associated costs largely limits the effects of the institutional change. Second, a change which has proven beneficial in one particular context may yield different effects in another environment, characterised by different strengths and problems.

Appendix 1: Empowerment as a priority for development

The trend in the world has been towards liberalizing abortion rights for the past fifty years. Between 1985 and 1997, 19 nations in the world have significantly liberalised their abortion laws; only one country, Poland, has substantially restricted legal access to abortion (Rahman *et al*, 1988). Despite the difficulty of operating with over 180 countries showing different and sometimes clashing sensitivities, the United Nations has proved an effective forum in gathering a consensus on the issue of human rights and women's rights. The first piece of international legislation explicitly related to women and discrimination affirming "the reproductive rights of women" was the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), adopted in 1979 by the United Nations. The Cairo Conference in 1994 mentioned explicitly for the first time the problem of the high mortality rate among women due to unsafe abortion. The summit promoted the concept of making "reproductive health" a priority for development, without calling it a right. This was acceptable by the many countries where abortion was not legal. The Beijing conference in 1995 then made the connection between reproductive health and "physical, mental and social" wellbeing and promoted "the capability to reproduce and the freedom to decide if, when and how often to do so"[12]. These actions of moral suasion by the international community have been effective both in exerting social pressure on those countries without rights, as well as in renewing the attention by those countries where family planning was already granted (like India) to devote resources to make it effectively accessible.

Over time, it is becoming an accepted notion that "the expansion of family planning facilities may appear to be just a demographic intervention, but the importance of improved family-planning opportunities can also be seen in the broader light of the decisional freedom of families in general and of vulnerable women in particular" (Dreze and Sen, 2002).

The following step was to make gender equality an acquired principle and not a goal in itself. In 2001 the United Nations declared gender equality and the empowerment of women "fundamental elements in the reduction of the vulnerability of women and girls

[12] "Strategic objective C3", *Fourth World Conference on Women Platform for Action*, Beijing 1995, as reported in http://www.un.org/womenwatch/daw/beijing/platform/health.htm.

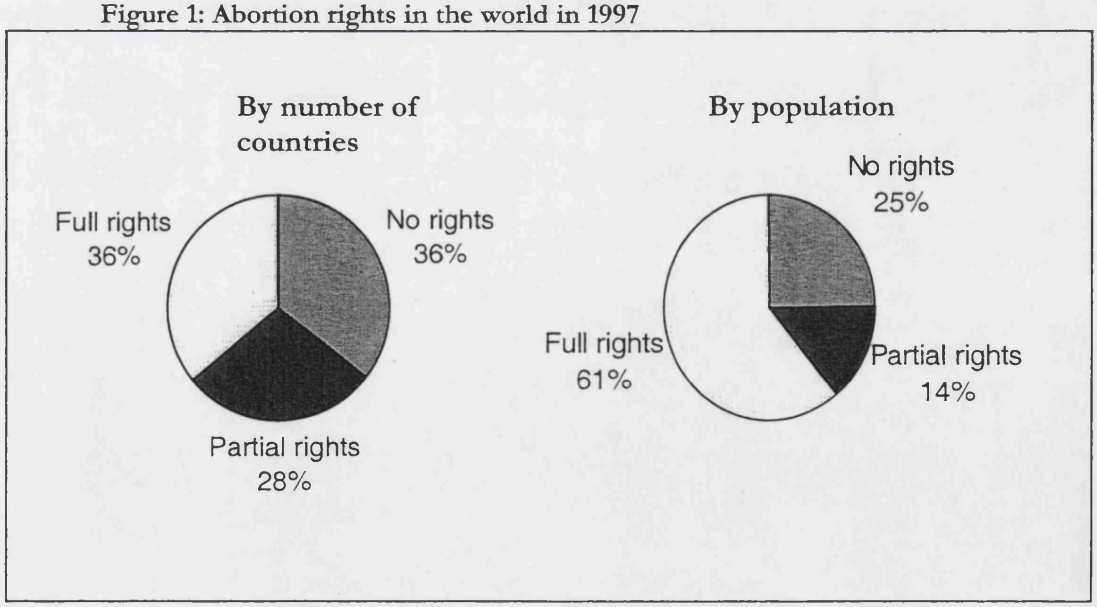
to HIV/AIDS" [13]. The empowerment of women became an *instrument* of public policy, whose validity was not put in discussion anymore.

Appendix 2: The distribution of birth control rights in the world

Today the spectrum of the legislation can be broadly grouped under three positions, following Rahman, Katzive and Henshaw (1988): whether abortion is banned altogether, it is only allowed for health reasons, or also on socio-economic grounds or on request.

The most restrictive legislation puts a ban on abortion that descends from the universal criminal code provision of not killing. The only exception, stemming from criminal law general principles, is that it can be permitted when the life of a pregnant woman is in concrete danger. In 1997 this stance was held by 54 countries covering a quarter of the world's population, mainly in Africa and Latin America (see Figure 1). In addition, there are two general juridical indications for obtaining legal abortion that are often conceded (but not granted as a right). These are when a pregnancy results from rape or incest and on foetal impairment grounds.

Figure 1: Abortion rights in the world in 1997



Source: Rahman, Katzive and Henshaw (1988).

[13] Declaration of the General Assembly Special Session on HIV/AIDS, 2001.

A second group of countries allow abortion for health concerns relating either to the woman or to the child. We label these "partial rights". Within this group, some countries only protect the woman's physical health (23 countries, 10 percent of the world's population) while some also her mental health (20 countries and 4 percent of the world's population). In practice and on a discretional basis, the category of "mental" health may or may not allow for some role to socio-economic circumstances in causing distress, but it is always the doctor to decide.

The third group comprises countries that allow abortions on socio-economic grounds, such as the woman's economic resources, her age, marital status, and children. India is one of the six countries in the world taking this stance and together they cover 20 percent of the world's population. The group of "full rights" also contains countries where abortion is permitted on request of the woman, without restrictions as to the reason. This comprises 49 countries (including China) and represents 41 percent of the world's population. Even where abortion is allowed on request, access to it is generally subject to medical limitations that apply to other types of medical care, such as to be provided by licensed medical personnel, with the consent of the woman, within gestation limits, with waiting periods, with varied costs and subject to counselling. In practice, a narrow or a liberal application of the law can lead to different actual levels of access to abortion services even within the same countries.

Appendix 3: Data description and sources

World Values Survey (version provided by the UK Data Archive)

Years: 1990, 1996.

Life satisfaction: ten-category variable based on the question: "All things considered, how satisfied are you with your life as a whole these days?". The person was shown a card with the numbers between 1 and 10, where 1 corresponded to "dissatisfied and 10 to "satisfied".

Age: continuous variable (taken in logs in the analysis).

Income: "high income" is a dummy for being in the sixth to tenth categories of the income ladder, which cumulatively comprise 23.8 percent of the sample, and "low income" is given by the first to the fifth categories of income.

Education: dummies for high/middle/low education, where the omitted category is no education. Low education is measured by leaving school at the age of 14, middle

education before the age of 18 and high education by leaving school after turning 18 years old.

Location: dummies for living in a village, in a town or in a city. A village is defined by having less than 10,000 people, a town between 10 and 50 thousand people and a city over 50 thousand people.

Abortion laws: United Nations (2002).

Appendix - Table A1: Status, location and use of health services. India, 1999

Indicator	Description	URBAN Quintiles						RURAL Quintiles					
		Lowest	Second	Middle	Fourth	Highest	U-Avg	Lowest	Second	Middle	Fourth	Highest	R-Avg
Total fertility rate	Births per woman age 15-49	(3.1)	2.9	2.6	2.3	1.7	2.3	3.4	3.2	2.6	2.3	2.0	3.1
Use of health services:													
Contraceptive prevalence among women:	% of married women aged 15-49 who use a modern method of contraception	37.3	40.4	43.4	49.4	54.9	51.2	29.1	34.6	45.1	49.8	53.7	39.9
Source of contraception: public sector:	% of women users who obtain method from a public sector program	87.0	85.9	83.8	75.0	48.0	60.1	92.1	89.5	86.3	76.9	60.5	83.2
Source of contraception: private sector:	% of women users who obtain method from the private sector	13.0	12.9	15.4	23.7	49.8	38.1	7.1	9.4	12.6	21.6	37.9	15.6
Antenatal care visits:													
To a medically trained person	% of women with a recent birth who had 1+ visits	64.6	74.1	76.2	83.4	94.1	86.4	43.5	54.2	67.3	78.5	90.1	59.8
3+ visits to a medically trained person	% of women with a recent birth who had 3+ visits	31.5	43.4	52.9	65.3	83.6	70.1	20.8	29.8	42.4	57.4	75.3	36.9
Delivery attendance:													
By a medically trained person	% of births assisted by...	43.4	39.6	55.2	68.3	88.0	73.3	15.6	25.1	39.7	56.1	76.6	33.5
In a public facility	% of births at a public facility	23.8	21.7	30.6	35.3	25.7	29.1	6.9	11.0	15.7	19.0	19.0	12.6
In a private facility	% of births at a private facility	8.7	11.4	15.9	24.0	54.7	36.0	3.4	6.3	13.2	25.1	42.2	12.1
At home	% of births at home	66.4	66.4	52.7	40.3	19.2	34.5	88.9	82.0	70.5	55.6	38.4	74.7
Postnatal care visits:													
To a medically trained person	% of women with recent birth who had 1+ visits	76.5	75.3	81.8	87.5	94.7	90.4	46.1	55.2	66.7	80.1	87.5	65.9
In a public facility	% of women with recent birth who had 1+ visits	62.0	59.8	60.4	57.5	31.8	43.6	49.2	49.8	50.4	42.1	33.4	46.2
In a private facility	% of women with recent birth who had 1+ visits	34.3	34.3	36.0	39.4	66.9	54.2	33.4	36.4	40.0	52.8	63.4	43.6
Household decision-making and freedom of movement:													
Can seek own health care	% of women age 15-49 who can decide to seek their own health care	33.1	32.2	33.3	34.6	35.8	35.0	24.2	24.1	25.7	27.9	30.6	25.7
Can make large household purchases	% of women age 15-49 who can decide to make large household purchases	49.2	47.9	48.9	48.4	49.5	49.0	38.5	37.4	39.0	39.8	42.8	38.9
Can travel to visit family/relatives	% of women age 15-49 who can decide to visit family/relatives	29.7	30.4	31.3	31.9	37.8	35.0	19.1	17.9	21.5	22.5	27.7	20.6
Education													
School completion among women:	% of women in household age 15-49 who have completed fifth grade	38.3	49.4	62.9	78.0	94.9	83.8	35.9	53.7	70.2	83.7	94.8	62.4
Exposure to mass-media													
Newspaper readership among women:	% of women age 15-49 who read a newspaper at least once a week	1.9	6.4	11.3	25.1	63.9	43.5	1.7	4.4	11.5	24.8	53.8	12.8
Radio listenership among women:	% of women age 15-49 who listen to the radio at least once a week	16.6	25.7	33.7	40.3	54.8	46.4	14.2	27.0	39.3	49.0	60.3	33.0
Television listenership among women:	% of women age 15-49 who watch the television at least once a week	27.6	32.9	50.1	76.7	94.7	80.6	9.0	14.9	35.3	68.1	91.0	33.4

Notes: ( ) indicate large sampling errors due to a small number of cases. Source: www.genderstats.worldbank.org

Chapter 3

The role of freedom, growth and religion in the taste for revolution

This chapter analyses how restrictions of individual rights affect the wellbeing of individuals from a different perspective. The first and second chapter have explored whether granting women individual rights affects their wellbeing, defined as satisfaction with one's life. We have found that more personal freedom translates both into higher wellbeing and into higher investment in human capital and in the labour market. Here we investigate whether and how restrictions to political and civil rights affect individual wellbeing as defined by one's satisfaction with the society he or she lives in. If dissatisfied, the person can express either a willingness to gradually change society by reforms or to radically engage in revolutionary action. In both cases the effect of individual rights translates into attitudes and actions which can be relevant for the stability and the aggregate welfare of society.

There is a certain typical degree of dissatisfaction within each society. In 1995 in Australia 5.7 percent of the people expressed the desire to radically change society by revolutionary action (which we will call from now on a "revolutionary preference"). In 1990 this view was shared by 5.1 percent of the population in the UK, 2.1 in Japan, 4.5 in Spain and 6.1 in Sweden. However some countries exhibit a much higher average of preference for revolt. This proportion varies over time even within the same country. For instance, in Argentina preferences for revolt were expressed by 12.4 percent of the people in 1984, 7.5 percent in 1991 and 5.1 percent in 1995. In South Korea they were

shared by 22.3 percent of the people in 1982, 7.3 percent in 1990 and 12.5 percent in 1996 (see Table A.5 in the Appendix for further comparisons).

The aim of this chapter is to we examine whether and how restrictions to political and civil rights affect attitudes of unrest, whether a lack of political rights can be compensated by economic growth (i.e. whether the threat of instability can be bought off) and at what cost. At all steps the analysis will only look at changes within the same country, in order to avoid contamination from unobserved heterogeneity across countries The previous chapter has shown that the repression of some (but not all) individual rights undermines the efficiency of individual choices and ultimately wellbeing. Here we investigate whether and how the repression of political and civil rights affects the satisfaction with the society the person lives in and how this translates at the country level into political instability, lower protection of property rights and less efficiency of a market economy.

The paper is organized as follows. Section 1 describes the related literature. Section 2 illustrates the data and reports several different validation tests in which we correlate tastes for revolt with personal and government actions. Section 3 outlines the empirical strategy and section 4 the main results. Section 5 concludes.

1 Related literature

The approach taken in this paper differs from previous studies in the conflict literature by focusing on the micro-structure of revolutionary tastes, rather than studying the effect of freedom on conflict at an aggregate level.[1] In terms of Hirshleifer's (1995) distinction between preferences and opportunities as two of the basic ingredients for conflict (the third being misperceptions), we seek to identify the determinants of preferences. The data come from a survey that asks individuals whether they want the entire way their society is organised *"to be radically changed by revolutionary action"*, putting the focus on people whose dissatisfaction is so extreme that it threatens to overturn the entire organization of their country.

Previous empirical studies have produced a diverse array of ambiguous findings on the relationship between freedom and civil conflict. Sambanis (2001) reviews the recent literature and states that *"a number of possible causes of civil war are still being debated"*. One

[1] An exception is Johnson *et al* (2000) who use surveys to measure the security of property rights in order to estimate the effect of the threat of appropriation on firms' decisions to reinvest profits.

strand of literature argues that grievances (i.e., shared dissatisfaction of group members about their cultural, political and economic standing compared to other groups) and the lack of democracy play a fundamental role in creating the conditions necessary for civil conflict. These may stem from a failure to gain the expected benefits from modernization, leading to 'relative deprivation', or from discrimination and denial of a group's rights and liberties (see Gurr, 1971 and Gurr and Moore, 1997). Although differential treatment of groups may diminish a regime's legitimacy, greater democratization and political institutions that channel and respond to grievances may be able to avoid civil conflict. Hegre *et al* (2001) use cross-sectional evidence to argue that the most stable regimes lie at the extremes of autocracy and democracy, with intermediate ones being the most prone to conflict (possibly because they allow more opportunities for rebels to exploit). Glaeser (2004) combines the role of grievance with rent-seeking by politicians. He describes how a "market for grievances" may operate when self-interested politicians have incentives to supply unpleasant tales about minority groups to a public that has a taste for 'hatred'.

Another strand of work describes conflict as a result of opportunities for rent-seeking by interested groups. Opportunities are given by the discovery of natural resources (Collier and Hoeffler, 2002), low economic growth, which may give incentives to invest in appropriative versus productive activities (Grossman, 1991, Acemoglu and Robinson, 2000 and 2001, Garfinkel and Skaperdas, 1996, and Hirshleifer, 1995), rough terrains and large populations (Fearon and Laitin, 2003). These papers emphasise the constraints that geography and money may place on the opportunities for rebels to overthrow a regime. Unless revenues from trading diamonds or oil, for example, are available to fund the rebels' movement and there is a reservoir of poor young men who can be recruited as foot soldiers, revolts may fail regardless of the grievances held. The political processes and structures that can be exploited by rebels may also influence their chances of success. For instance economic and political liberalisation may increase the chances of a revolt occurring if they create opportunities for outsiders to gain weight in the government. These theories generally go further in arguing that there is no relationship between the lack of civil liberties or democratic freedoms and the likelihood of a civil war. For example, Miguel *et al* (2004) find from panel evidence that although economic growth has a negative effect on the likelihood of civil conflict in Africa (using rainfall variation as an instrument) the relationship does not vary with the level of democracy.

They conclude that institutional characteristics have a minimal impact in mitigating the effect of economic shocks, although they acknowledge that the countries in their sample show little variation as they are all relatively autocratic.

There are several reasons why a consensus is not reached in the literature. The data are noisy and sparse. Whether more civil conflict in fact erupts depends on variables that may be difficult to measure (such as efficiency of the security services) and also highly unpredictable factors. For example, 'revolutionary bandwagons' and 'information cascades' appear common whereby each people's decision whether or not to join a revolt depends crucially on what they observe doing. These effects, studied by Kuran (1991) and Lohmann (1994) using the 1989 uprising in East Germany, imply that it is possible for many people to privately support revolt but to be unwilling to act unless they observe others doing so. Movements may have to rely on charismatic leaders to make them cohesive. Olson (1965) describes how the free-rider problem undermines collective action. There are other issues that may have obscured the identification of the causes of civil conflict. These include *"disagreement [surrounding] the very definition of a civil war"*.[2] The dependent variable used in most studies has been a threshold absolute number of battle deaths (usually 1,000 but it can be 25 in some datasets). This is often not scaled by population size and is hard to measure accurately. Only limited time variation in the dummy "occurrence of civil conflict" can usually be exploited. Omitted variables may be determinant in explaining why autocracies experience relatively less civil conflict even when grievances may be at the highest point. The possibility of endogeneity of civil liberties and democratic freedoms to the occurrence of a revolt has also so far been ignored. If, for example, people obtain the freedoms that they want by rebelling, then a positive relationship between these variables may be observed. The present paper can be seen as an attempt to change the approach of studying conflict from a broad, macro perspective to a context of micro-economic preferences and attitudes, where effects can be more accurately identified.

A growing literature in economics has also addressed the link between religion and the economy. For example, Iannaccone (1998) reviews a number of outcomes that in the

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[2] Sambanis (2001) discusses the idiosyncratic definitions. Since there are many different objective measures that could be used (such as sabotage, rallies and terrorism) it is difficult to choose between them. Events such as political strikes are hard to classify. Francisco (1993) uses person-days of protest per 100,000 people per week, although he notes that most studies "of protest and revolt use other measures, especially political deaths".

literature are linked both with economically important social behaviour and religious attitudes. Religious beliefs are consistently associated with higher education levels, lower crime and anti-social behaviour, good mental and physical health. The rationale could be explained by characterising religious membership as a club good. Rational individuals may wish to join the "club" even when self-sacrifice is demanded (in the form of dress, diet, grooming, sexual conduct, entertainment and social activities) in exchange for support, goods and services provided by the other members. Iannaccone (1998) also reviews Adam Smith's (1776) arguments in favour of 'religious competition' and claim that civil strife may arise from regulation and suppression of religious freedoms. Similarly, Berman (2000) models social interactions within a religious community as a signalling device of commitment in order to participate in a mutual insurance arrangement.[3] In this paper we test not only whether religious people are more or less inclined to revolt but also whether they respond differently to a denial of their freedoms (compared to non-religious people). To the extent that they may have willingly given up freedoms to join a religious 'club' they may rebel less; to the extent that their freedoms to practice religion are constrained, they may rebel more.

2 Data description and validation

2.1 Data description

The source of data on revolutionary tastes is the World Values Survey which interviewed a representative sample of 168,482 people in 64 countries in three waves (1981-84, 1990-92, 1995-97).[4] Of these, 130,278 individuals in 61 countries answered the question: *"On this card are three basic kinds of attitudes vis-à-vis the society in which we live in. Please choose the one which best describes your own opinion"*. The three possible response categories were: *"The entire way our society is organised must be radically changed by revolutionary action"*, *"Our society must be gradually improved by reforms"* and *"Our present society must be valiantly defended against all subversive forces"* (The *"Don't know"* and *"Not asked in this survey"*

[3] Barro and McCleary (2002) study how economic performance and political institutions are related to religious participation and beliefs. Guiso, Sapienza and Zingales (2003) use survey data to identify the relation between religion and attitudes judged favorable to growth. See also Glaeser and Sacerdote (2002), Montalvo and Reynal-Querol (2002) and Fox (1999). Huntington (1991) discusses how cultural and ethical norms affect the legitimacy of democratic practices.

[4] The countries surveyed include almost 80 percent of the world's population. The World Values dataset was also used to obtain indicators of trust and civic norms in Knack and Keefer's (1997) study of the determinants of social capital.

categories are not included in our data set). Appendix 1 contains a summary of the survey.

In Appendix 1, Table A1 shows the proportion of individuals who desire revolutionary action versus those who do not (i.e., the ones who desire either gradual reforms or the present society valiantly defended) for the entire sample, the unemployed, religious persons (broken down by whether they are part of a minority), by income quintile and freedom status. Of the full sample, 9.8% of respondents declare a preference for revolution in their country, rising to 14.1% for the unemployed. A share of 9.2% of those who belong to a religious denomination and 10.3% of atheists want a revolution. In the sample, 13.5% of the people belong to a religious minority. Among them, the taste for revolt is 11.9%, while among religious people who do not belong to minorities this amounts to 9.9%. The proportion of people who support a revolution monotonically declines as their income increases, ranging from 10.8% in the bottom category to 6.9% in the top one.

The freedom data come from two sources. The first is *Freedom House*, an independent institution that monitors political rights and civil liberties in countries across the world and each year publishes a rating. We use a composite measure of freedom obtained by averaging two separate indices, *Political Rights* and *Civil Liberties*. *Political rights* take account of the extent to which voters can make a free choice among candidates and to what extent the candidates are chosen independently of the state. *Civil liberties* evaluate the degree of freedom of expression, assembly, association and religion. Each country is ranked on a seven-point scale from 1 (most free) to 7 (least free), recoded here such that a higher rating corresponds to greater freedom. The second source of data on freedom is the *Polity IV Project*, which measures the degree of democratization in nations. It focuses on the authority patterns that characterize different countries, based on the state of executive recruitment, executive constraints and political competition. This index is on a 21-point scale and ranges from the most autocratic (-10) to the democratic ones (+10).

2.2 Data validation

There are some potential problems in using survey data. Although all interviews are conducted under anonymity, the interviewed may not be able to respond truthfully.[5] Furthermore, preferences for revolt may not be consistently associated with actions that pose a credible threat to the government. They may simply reflect a general disaffection with society. Some of these issues can be addressed empirically and in this section we present several pieces of evidence that lend support for taking these data seriously.

First, Table A1 shows how tastes for revolt are correlated with the level of freedom. *Freedom House* presents a simple three-way classification of countries using their 1-7 scale, ranging from *Not Free* (1-2.5) to *Partly Free* (2.5-5.5) to *Free* (5.5-7). Using this split, the average revolutionary support recorded in the survey varies from 18.1% in *Not Free* countries to 6.2% in *Free* countries. The fact that *Not Free* countries systematically report a higher taste for revolt suggests that censorship may not be a limit of this survey. Second, the framing of the survey is constant across countries and over time. Third, surveyed preferences for revolt are significantly correlated with observable measures of rebellion. The World Values Survey contains information on the rebellious actions that our sample of 106,170 individuals has undertaken, which include *Joined boycotts*, *Attended demonstrations*, *Joined unofficial strikes*, *Occupied buildings/factories* and *Signed petitions*. The correlations of preferences and actions of revolt for the same individual are reported in Panel A of Table A4. The coefficient of correlation of the taste for revolt with *Joined boycotts* is 0.07, with *Attended demonstrations* is 0.08, with *Joined unofficial strikes* is 0.07 and with *Occupied buildings/factories* is 0.06 (all significant at the 1 per cent level). The fact that the mapping from preferences to actions is far less than one-to-one is consistent with the free-rider problem; that is, despite many people wanting a radical change of government, costly participation is not individually rational (particularly when the benefits from a revolt may not be excludable). Interestingly, the coefficient of correlation between preference for revolt and *Signed petitions* is not significantly different from zero, consistently with the fact that signing a petition is a reformist and not a revolutionary act. The correlation coefficients between the measures of actual protest themselves are high. For example, the correlation between *Joined unofficial strikes* and

[5] If the social norm is not to support revolt, subjects may bias responses towards maintaining the status quo. However psychologists have found evidence that indicates this concern may be exaggerated (e.g., Rorer, 1965 and Bradburn, 1969). Furthermore, at least part of the effect of social norms is able to be controlled for in our regression evidence by country fixed effects.

Occupied buildings/factories equals 0.32. Each of these actions can be regressed on the corresponding individual's taste for revolt (controlling for country and year fixed effects). Wanting to revolt is a factor that significantly explains the subversive actions of individuals at the one per cent level across all measures of actual protest. People wanting a revolt have a 9 percentage point higher probability of joining in boycotts, 12 percentage point higher probability of demonstrating, 7 percentage point higher probability of joining unofficial strikes and a 4 percentage point higher probability of occupying buildings.

A related issue concerns whether or not a self-reported preference for revolt is just symptomatic of a general attitude of disaffection with society. For example, the same people who have a revolutionary preference may be pessimists who hold negative beliefs about the ability of the government and the economy to deliver favourable social and private outcomes. We address this issue by observing the correlation of revolutionary tastes with beliefs that the environment needs protection, that the country has been captured and is run for the benefit of a few, that corruption is prevalent, that the authorities should not be respected, and that the future is bleak for all. The results are reported in Panel B in Table A4 (full variable definitions are given in Appendix 3). The correlation coefficient between *Taste for Revolt* and *Environment Needs Protection* is -0.001, indicating that those individuals who want a full-scale revolution in their country are not the same ones who feel concerned about industrial threats to the environment. The correlation between having a revolutionary taste and holding a belief that the *Country is run for the few* is 0.05 and with a belief that *Corruption is Prevalent* is 0.09. The latter may be related to the association of high corruption with a loss of regime legitimacy.[6] The strong correlation between the belief that corruption is prevalent and that the country is being run for the few (=0.24) suggests that there are many disaffected people who nevertheless do not favour a revolt. There are low correlations between wanting a revolt and other indicators of more general pessimism, *Don't Respect Authority* and *Bleak Future*, equal to 0.006 and -0.02, respectively.

The relationship between revolutionary preferences and personal characteristics has a similar structure across the different regions of the world (i.e., OECD, Asia, Africa and South America). In every region, men are more likely, on average, to desire a revolt than

[6] A literature in political science has focused on the role of corruption in determining legitimacy in political representation. Della Porta (2000) and Seligson (2002) provide empirical evidence.

women. People who are on higher incomes, older and married are less likely, on average, to want a revolt. Unemployed people are more likely to want one (with the exception of Africa and France). Retirement has a negative effect and self-employment has no effect. We can test whether the same characteristics that predict revolutionary tastes predict beliefs that the environment needs protection, the country is being run for the benefit of a few and that corruption is prevalent. There is little support for this view. For example, wanting more protection for the environment is significantly correlated with being on a *high* income (so the concern for a polluted environment appears to be shared more by the rich than the poor). The unemployed tend to be less concerned about environmental problems. Therefore, those individuals who are worried about the environment are not the same ones wanting to revolt, at least in terms of their income and job status. A belief that the country has been captured by the few is not significantly correlated with personal income, whereas a belief that corruption is prevalent is negatively correlated with it. The self-employed and retired perceive there to be more corruption than the employed, and men are less likely to think that it is widespread than women. The evidence does not suggest that a common set of (observable) personal characteristics can describe a type of person who not only wants to revolt but also suffers from disaffection on a range of social issues.

We explore whether there is any evidence of different governments policies in countries where the taste for revolt is higher. It appears that high revolutionary support is correlated to the weight of the military in the government, but it is not clear whether as a cause or as an effect. The correlation across 40 countries between the average level of revolutionary support and arms imports (as a proportion of total imports) is 0.47, between taste for revolt and military spending (as a proportion of GDP) is 0.20. High revolt countries also tend to spend less on education as a proportion of GDP (correlation=-0.57). One would be tempted to think that then main explanatory variable for the taste for revolt is the lack of education. On the contrary, previous studies have found participation in terrorism and political violence to be either unrelated or positively related to an individual's education. Russell and Miller (1983) report that about two-thirds of the 350 individuals engaged in terrorist activities in their sample were persons with some university training, university graduates or postgraduate students. Palestinian suicide bombers have been found to be at least as likely to come from high education backgrounds as low ones (Kruger and Maleckova, 2003).

We test for the relationship between actual civil wars and revolutionary tastes using a data set of all civil wars in the world between 1944 and 1999 (Doyle and Sambanis, 2000). A civil war is defined in this data set as a conflict between a government and a non-government claimant that resulted in at least 1,000 deaths per year. Out of the 40 countries in the sample, we know the taste for revolt in 20. The average level of support for revolt is 15.9%. Another observable measure of internal conflict is the level of criminal activity. An advantage of using crime as a proxy for rebellion is that it does not necessarily rely on solving the collective action problem. A drawback is that the causes of crime may be unrelated to an individual's total rejection of the organization of society. For European countries we have consistent time series that measure levels of serious assaults and car thefts. The partial correlation coefficient between the proportion of people wanting a revolt and assaults is 0.26, significant at the 1 per cent level, and for car thefts it is 0.20, significant at the 5 per cent level (all measured at the national level and controlling for country and year fixed effects).

3 Empirical strategy

3.1 Framework

We relate the individuals' taste for revolt to their freedoms, aggregate and personal income and religiosity. The sample includes 20 countries in 1981-84, 36 countries in 1990-92 and 45 countries in 1995-97. There are various possible explanations as to why revolutionary support may increase as freedoms are taken away. First, freedom may have the quality of a public good and directly enter people's utility function. Alternatively, freedom may constrain the desired levels of consumption of other goods such as food, alcohol and clothing and as such enter people's indirect utility function. To the extent that lower freedoms increase the expected gain from a revolution which may relax these constraints, a greater proportion of the population may support one. Appendix 2 describes a simple model that captures these effects. Our empirical specification exploits both cross-country and time-series variation. The probit regressions are of the form:

$$Taste\ for\ Revolt?_{ict} = \alpha\ Freedom_{ct} + \beta\ GDP\ per\ capita_{ct} + \chi\ \Delta GDP\ per\ capita_{ct} + \delta\ Personal\ Income\ Position_{ict} + \gamma\ Religion_{ict} + \varphi\ Macro_{ct} + \lambda\ Micro_{ict} + \eta_c + \mu_t + \varepsilon_{ict}$$

where $Taste\ for\ Revolt?_{ict}$ is a dummy that takes the value 1 when individual i living in country c and year t holds a belief that *"The entire way our society is organised must be radically changed by revolutionary action"*. The variable $Freedom_{ct}$ is measured in different ways. First, we take the simple average of the two variables *Political rights* and *Civil liberties* from *Freedom House.*[7] We also run regression with these two variables entered individually. Second, we use the Polity measure of a country's level of political democratization (from -10 to +10). The coefficient of "between" variation for these aggregate variables is 61 and that of "within" variation is 1.7.

The variable $GDP\ per\ capita_{ct}$ is measured as per capita income in 1992 US$ (in logarithms) and $\Delta GDP\ per\ capita_{ct}$ is its first difference (i.e., $\Delta GDP\ per\ capita$=log(1+*GDP growth rate*)≈GDP growth rate). These data come from the World Development Indicators of the World Bank. A person's relative income position within his country is proxied by five dummy variables corresponding to the income ladder in the country ($Personal\ Income\ Position_{ict}$). $Religion_{ict}$ is a dummy indicating whether the person declares to be religious in the same survey.

The vector $Macro_{ct}$ refers to a set of aggregate variables at the country level. These include *Trade openness* and *Social security*. The former is measured by the sum of imports and exports divided by the country's total GDP and the latter by the level of social security taxes as a proportion of GDP. We also experimented with measures of inequality as proxied by the Gini coefficient from the World Bank Deininger and Squire (1996) 'high quality' data set. The vector $Micro_{ict}$ refers to a set of personal characteristics of the respondents including their age, level of education, employment and marital status. Appendix 3 contains a complete set of data definitions. To control for unobserved heterogeneity at the country and time level, we add country (η_c) and year (μ_t) fixed effects. The error term ε_{ict} is clustered at the country level to control for correlation of the error term across observations that are contained within each cross-

[7] We remind that the *Freedom House* indices are rescaled such the lowest value, 1, is assigned to countries with the lowest political rights/civil liberties and the highest value, 7, is assigned to the countries with the most.

sectional unit (Moulton, 1990). Table A2 provides summary statistics of the variables used and table A3 reports the correlation coefficients among them.

The World Values Survey collects representative samples of about 1,500 respondents per country. By giving each respondent an equal weight in our regressions we tend to underestimate the weight of large countries and overestimate the weight of small ones. To control for this issue we have re-estimated all regressions using weighted least squares with sampling weights equal to the inverse of the probability that a person is included in her country's sample. The results remain virtually identical to those presented below.

3.2 The potential for endogeneity of freedom

Examining the effect of freedom and economic growth on attitudes to revolt cannot avoid taking into account the possibility of reverse causality. Increased support for revolt may result in changes in the level of freedom that the government allows, either towards more freedom if a revolt is successful or towards less freedom if repression prevails. Examples of regimes' attempts at self-preservation in the theoretical literature include how political elites may extend voting rights to prevent revolt (e.g., Acemoglu and Robinson, 2000 and 2001) and how land reform can be an optimal policy response to the threat of appropriation of the landed class' income (e.g., Grossman, 1994).[8] The former Communist block is also generally viewed as having opened up as a response to growing rebellion. These examples suggest that greater revolutionary support can lead to a greater freedom (i.e., a positive correlation). However there are other cases where regimes appear to have become more repressive in response to rebellions (e.g., China in the aftermath of the Tiananmen Square protests). The sign of the effect of reverse causality is thus uncertain. Similarly, strong attitudes in favour of revolt may be disruptive for economic activity or otherwise deter foreign investment, ultimately undermining economic growth. Alesina and Perotti (1996), Perotti (1996) and Rodrik (1999) study how political instability may affect investment and growth. Gupta *et al* (2002) show that terrorism is associated with lower tax revenues, higher inflation and lower tax across 22 episodes of conflict. Fording (1997) provides some empirical

[8] An historical example comes from early seventeenth century England where the Crown's fiscal needs led to *"expropriation of wealth through redefinition of rights in the sovereign's favor"* and subsequently civil war. However after the Glorious Revolution of 1688, the winners (i.e., the Whigs) sought to redesign government

evidence that the welfare state has expanded in the US during the 1960 in order to reduce protests from the civil rights movement. None of the prior empirical studies of the determinants of conflict have controlled for the endogeneity of variables that proxy for civil liberties and political or democratic rights (see Sambanis, 2001) while only Miguel, Satyanath and Sergenti (2004) have dealt with the possible endogeneity of economic growth using rainfall as an instrument in the specific context of a rain-fed economy like the one of Sub-Saharan Africa.

To deal with these concerns we draw on the literature that studies the determinants of the quality of government and institutions across countries. The relevant theories can be categorized along economic, political and cultural dimensions. The first holds that institutions are created when it is efficient to do so, the second that they are shaped by self-interested politicians to transfer resources to themselves, and the third that institutions arise to reflect the beliefs and values of their society. La Porta, Lopez-de-Silanes, Shleifer and Vishny (1999) argue that political and cultural theories offer good prospects for finding reasonably exogenous sources of variation in country characteristics that affect institutional quality. One strategy they suggest is to use variations in the legal system, which can be viewed as an indicator of the relative power of the government versus the property owners. "Common law has developed in England as a defence of Parliament and property owners against the attempts by the sovereign to regulate and expropriate them. Civil law, in contrast, has developed more as an instrument... for state building and controlling economic life. Finally, socialist law is the expression of the ultimate control of the economy by the State." (as in La Porta *et al*, 1999) Socialist and French civil law tend to be more interventionist and to regulate more.[9] In our regressions we follow La Porta *et al* in using legal origin as an instrument for the degree of liberties and political freedoms that characterize the institutions of countries.

In addition to legal origins we use the identity of the coloniser as an instrument. Colonial origins are discussed by Acemoglu, Johnson and Robinson (2001) as a potential determinant of development. They argue that different institutions were set up in colonies depending on whether their purpose was to extract resources and transfer

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institutions in such a way as to control the problem of *"the exercise of arbitrary and confiscatory power by the Crown"* (see North and Weingast, 1989).

[9] See Djankov, la Porta, Lopez-de-Silanes and Shleifer (2002), where regulations are proxied by number of procedures required to start-up a firm.

them to the colonisers (as the Belgians did in Congo) or that of creating "Neo-Europes" where Europeans could migrate (like the US and Australia). In the latter type checks and balances against government expropriation were implemented. This affected in the long run the quality of institutions which are observed today. The authors explain GDP per capita by legal and colonial origins as well as an index of protection against government expropriation, which they instrument with settlers' mortality rates between 1600 and 1800. Their hypothesis is that high settler mortality led to the implementation of "low-quality" institutions that subsequently slowed development. Across the countries in our study greater settler mortality is associated with lower political rights and democratic freedoms. It would be interesting to use this idea as an instrument in this study but being available only for a subset of colonial countries, over half of the sample would be lost. Similarly, Rodrik, Subramanian and Trebbi (2002) use legal origin and identity of coloniser to explain the determinants of development, in addition to measures of geography and openness.

Other exogenous factors that could be used to explain institutions include ethno-linguistic fractionalization, since in ethnically heterogeneous societies it is common for groups who come to power to enact government policies that restrict the freedoms of the opposition. Mauro (1995) argues that this variable can be used as a determinant of corruption in growth regressions. However we do not use ethnic fractionalization as an instrument since it is unlikely to be excludable from revolutionary support regressions (these kinds of societies may be characterized by ethnic fighting, atrocities and expropriations that are unrelated to the shape of institutions). There also exist various explanations as to how the dominant religion of nations may have affected the shape of their institutions (for example, Putman, 1993, argues that the Catholic Church has fought the government to regulate the citizenry). However we avoid using religion as an instrument due the possibility (originating from Marx's idea of religion as "the opium of people") that it may have a direct impact on revolutionary tastes, unrelated to its effect on institutional quality.

4 Main results

4.1 The effect of freedom and growth

In Table 1, columns 1 to 5 present results from probit regressions. Marginal probabilities are reported and standard errors are adjusted to take account of clustering

at the country level. The regressions control for both country and year fixed effects. Column 1 shows the relationship between the taste for revolt in a country and the corresponding levels of freedom and GDP, controlling for personal income. Here freedom is measured by a simple average of political rights and civil liberties. The coefficient on *Freedom* is negative and significant at the 1 per cent level. An individual living in a country that loses one point of freedom on the 1 to 7 scale (equivalent to a shift from the United States to South Korea in 1995) experiences an increase in their probability of supporting a revolt by 2.1 percentage points. Across all countries and years a change in freedom of one standard deviation (equal to 1.5 points on the 1-7 scale and equivalent to a shift from the United States to Argentina in 1995) explains 38% of the standard deviation in revolutionary support.[10] The level of *GDP per capita* is not significant in this specification, suggesting that the level of development may not be an important factor in explaining revolutionary pressures. We do, however, observe a monotonically declining chance of wanting a revolt as one's place *within* the income distribution of a particular country increases. Going from the bottom to the top in the income ladder implies a 2.1 percentage point lower probability of desiring revolt, significant at the 1 percent level.

Column 2 controls for the change (rather than the level) of GDP per capita. Growth rates, rather than levels, of GDP are the dominant factor explaining civil war onset in, for example, Miguel *et al* (2004). Our results are similar in finding that ΔGDP per capita has negative and significant effects (at the 1 percent level) on revolutionary tastes, i.e. a negative income shock increases the average support for revolution. This is consistent with the result found theoretically by Bertocchi and Spagat (2001) that growth is a politically stabilizing force. The coefficient on Freedom is now equal to -0.020 (i.e., of similar size to the previous specification) and retains significance at the 1 per cent level. In the next two columns we repeat this base specification but we separate the two components of the Freedom index, *Civil Liberties* and *Political Rights*. Denial of either of these dimensions of freedom significantly increases the support for a revolt. Focusing on within-country variation, a one standard deviation change in civil liberties (equal to 0.5 points) explains 41 percent of the standard deviation in revolutionary support (the

[10] This calculation is based on the overall standard deviation in support levels across countries and years, equal to 0.082.

within-country standard deviation of the taste for revolt is 0.023). The size of the estimated effect for political rights is virtually the same.

Table 1: The effect of freedom and growth on the taste for revolt

Dep. Variable: *Taste for Revolt?*	(1)	(2)	(3)	(4)	(5)
Freedom	**-0.021****	**-0.020****			
	(0.004)	**(0.003)**			
Political Rights			**-0.017****		
			(0.003)		
Civil Liberties				**-0.019****	
				(0.003)	
Democracy (Polity Score)					**-0.009****
					(0.001)
GDP per capita	0.006				
	(0.013)				
ΔGDP per capita		**-0.051****	**-0.042****	**-0.062***	**-0.092****
		(0.017)	**(0.017)**	**(0.021)**	**(0.035)**
Personal Income Position: Second	-0.004	-0.004	-0.004	-0.003	-0.001
	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)
Third	**-0.009***	**-0.009**	**-0.009***	**-0.008**	-0.006
	(0.004)	**(0.004)**	**(0.004)**	**(0.004)**	(0.004)
Fourth	**-0.013***	**-0.013***	**-0.014****	**-0.012***	**-0.009**
	(0.005)	**(0.005)**	**(0.005)**	**(0.005)**	**(0.005)**
Fifth (top)	**-0.021****	**-0.020****	**-0.021****	**-0.019****	**-0.017****
	(0.006)	**(0.006)**	**(0.006)**	**(0.005)**	**(0.005)**
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.09	0.09	0.09	0.09	0.09
Observations	106,170	106,170	106,170	106,170	103,222

Notes: 61 countries from 1981 to 1997. Marginal Probabilities from Probit regressions are reported. Standard errors are in parentheses. Bold-face denotes significant at the 10 percent level; Single-starred bold-face at the 5 per cent level; Double-starred bold face at the 1 percent level. The baseline category for the relative income position of the individual is the bottom quintile. Columns 1 to 4 use freedom data from Freedom House, column 5 from Polity IV.

Finally, column 5 uses the Polity measure of a country's level of political democratization. The controls, Δ*GDP per capita* and *Personal Income Position*, retain similar effects to the previous estimates. The coefficient on *Democracy* is negative and significant at the 1 per cent level. A country that loses two points of 'polity' on the -10 to +10 scale (equivalent to a shift from the United States to Brazil in 1995) increases the probability that its citizens want a revolt by 1.8 percentage points (on average). Focusing on within-

country variation, a one standard deviation decline in *Democracy* (equal to 1.3 points) explains 51 percent of the standard deviation in revolutionary support. We can compute the marginal rate of substitution between democratization and GDP growth that would on average keep revolutionary support constant. A one standard deviation decline in *Democracy* would have to be compensated by an increase in the GDP growth rate of 14 percentage points. For example, the growth rate would have to rise from -4% to 10% per annum in order to keep the proportion of people wanting a revolt unchanged in the face of a loss of *Democracy* of this magnitude. In other words, it seems feasible to fully offset a loss of democratic rights, but this requires rates of economic growth that are hardly sustainable over time.

4.2 The effect of religion

Table 2 investigates the role of religion on attitudes to revolt. Column 1 adds a dummy, *Religious,* for the individual stating that he belongs to a religious group. It also includes the basic set of variables measuring freedom and income that were used in the previous table, as well as country and year fixed effects. Being religious has a sizeable negative effect on wanting to revolt, significant at the 1 percent level. Being religious lowers the probability to want a revolt by 2.8 percentage points. The coefficients on the aggregate level variables, *Freedom* and *ΔGDP per capita*, remain similar in size and significance levels to their corresponding estimates in Table 1.

The next columns test for whether the taste for revolt amongst religious people differs according to the degree of freedom in their country. In column 2 the interaction term, *Religious*Freedom*, is negative but not significant at conventional levels. In columns 3 and 4 we test whether we can identify effects on either of the two separate components, *Civil Liberties* and *Political Rights*. Column 3 shows that there is evidence that being religious only diminishes revolutionary tendencies in countries that have relatively high levels of political rights. The interaction term is negative and significant at the 7 per cent level. For example, in countries with the highest political rights score, religious individuals have a 3.6 percentage point lower probability of wanting a revolt compared to non-religious people (=0.006-0.006*7). However in countries with the lowest levels of political rights there are no differences between the religious and the non-religious (=0.006-0.006*1). In contrast, column 4 shows that there is no evidence of religious

individuals becoming more inclined to revolt as their civil liberties are denied (i.e., the interaction term is not significant).

Table 2: The effect of religion on the taste for revolt

Dep. Variable: *Taste for Revolt?*	(1)	(2)	(3)	(4)	(5)
Freedom	**-0.018****	**-0.014****			
	(0.003)	**(0.004)**			
Political Rights			**-0.010****		
			(0.004)		
Civil Liberties				**-0.015****	
				(0.004)	
Democracy (Polity Score)					**-0.007****
					(0.001)
ΔGDP per capita	**-0.054****	**-0.057****	**-0.050****	**-0.067****	**-0.100****
	(0.017)	**(0.017)**	**(0.018)**	**(0.020)**	**(0.035)**
Personal Income Position: Second	-0.004	-0.004	-0.004	-0.003	-0.001
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Third	**-0.010***	**-0.010***	**-0.010***	**-0.009***	**-0.008**
	(0.004)	**(0.004)**	**(0.004)**	**(0.004)**	**(0.004)**
Fourth	**-0.013****	**-0.013****	**-0.014****	**-0.012***	**-0.009***
	(0.005)	**(0.005)**	**(0.005)**	**(0.005)**	**(0.004)**
Fifth (top)	**-0.020****	**-0.020****	**-0.021****	**-0.019****	**-0.017****
	(0.005)	**(0.005)**	**(0.005)**	**(0.005)**	**(0.005)**
Religious	**-0.028****	-0.002	0.006	-0.013	**-0.016***
	(0.006)	(0.019)	(0.019)	(0.018)	**(0.008)**
Religious * Freedom		-0.004			
		(0.003)			
Religious * Political Rights			**-0.006**		
			(0.003)		
Religious * Civil Liberties				-0.003	
				(0.003)	
Religious * Democracy (Polity Score)					**-0.002****
					(0.001)
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.08	0.08	0.08	0.08	0.08
Observations	100,620	100,620	100,620	100,620	97,794

Notes: 61 countries from 1981 to 1997. Marginal Probabilities from Probit regressions are reported. Absolute values of t-statistics are in parentheses. Bold-face denotes significant at the 10% level; Single-starred bold-face at the 5% level; Double-starred bold face at the 1% level. The baseline category for the relative income position of the individual is the bottom one and for the religious variable is declaring to belong to no religious denomination.

Column 3 has shown a differential effect between religious and non-religious people as their political rights change. This is confirmed when using the Polity index of democratization (on the -10 to +10 scale). In column 5, being religious decreases

revolutionary tendencies the most in countries that have the highest levels of *Democracy*. The interaction term is negative and significant at the 1 per cent level. In a country with the highest possible level of *Democracy* a religious person is 3.6 percentage points less likely to want to revolt compared to a non-religious person (=-0.016-0.002*10). However, in countries with the lowest possible Polity scores, being religious implies a 0.4 percentage point higher chance of wanting to revolt (=-0.016+0.002*10).

There is a possibility that belonging to a religious minority is the real cause of this effect. If we include in the regression an interaction term of freedom with being religious and belonging to a minority, there is some weak and not conclusive effect that people from a Christian or Muslim minority react more strongly to the denial of freedom than if they were part of the majority.[11]

It appears that religious individuals are more offended and inclined to rebel than others when their democratic/political freedoms are denied. One possible explanation for the effect of religion on the taste for revolt is that less political representation could limit their ability to practice their religion or could lead to discrimination in public activities. The result is ambiguous on the theoretical argument that religious people are unaffected by fewer freedoms since by joining a religious 'club' they have willingly given these up anyway (it is not clear which restrictions to freedom are voluntary and which are imposed). Finally, it supports the view of Adam Smith (1776) that religious competition benefits societies by providing less civil strife and more prosperity (reported in Iannaccone, 1998).

4.3 Robustness tests

Table 3 performs a set of robustness checks. It uses as a base specification the regression in column 2 of Table 1 with *Freedom*, Δ*GDP per capita* and *Personal Income Quintile* as explanatory variables. Column 1 tests for the possible non-linearity of the effect of freedom on the taste for revolt by including a squared term, which is not significant.[12] The next column includes both the *level* and the *change* in GDP in the same regression and again supports the view that economic growth is a more important determinant of revolutionary tastes than the level of development.

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[11] Regression not reported in the table for simplicity as it contains several interaction terms (*freedom x religious group x minority* and all the second-order interactions).

[12] A cubic term is also not significant.

Table 3: Robustness tests

Dep. Variable: *Taste for Revolt?*	(1)	(2)	(3)	(4)	(5)	(6)
Freedom	**-0.029****	**-0.021****	**-0.021****	**-0.017****	**-0.020****	**-0.009***
	(0.011)	**(0.004)**	**(0.003)**	**(0.002)**	**(0.003)**	**(0.004)**
Freedom Squared	0.001					
	(0.001)					
GDP per capita		-0.015				
		(0.013)				
Δ GDP per capita	**-0.055****	**-0.066****	**-0.035**	**-0.064**	**-0.049****	-0.027
	(0.016)	**(0.025)**	**(0.018)**	**(0.019)**	**(0.017)**	(0.030)
Personal Income Position: Second	-0.004	-0.004	-0.004	-0.005	-0.005	-0.002
	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.004)
Third	**-0.009**	**-0.009***	**-0.009**	**-0.010***	**-0.011****	**-0.011****
	(0.004)	**(0.004)**	**(0.005)**	**(0.004)**	**(0.004)**	**(0.004)**
Fourth	**-0.013***	**-0.014****	**-0.013***	**-0.013****	**-0.016****	**-0.016****
	(0.005)	**(0.005)**	**(0.005)**	**(0.005)**	**(0.005)**	**(0.005)**
Fifth (top)	**-0.020****	**-0.021****	**-0.021****	**-0.019****	**-0.024****	**-0.019****
	(0.006)	**(0.005)**	**(0.006)**	**(0.006)**	**(0.005)**	**(0.006)**
Trade openness			**-0.112**			
			(0.062)			
Social security				**-0.252****		
				(0.120)		
Employment status: Unemployed					**0.020****	**0.014****
					(0.006)	**(0.006)**
Self-employed					-3.0e-4	0.002
					(0.004)	(0.004)
Retired					**-0.027****	0.001
					(0.004)	(0.006)
Student					**0.019****	0.003
					(0.004)	(0.010)
Housewife					**-0.022****	**0.007**
					(0.004)	**(0.004)**
Religious						**-0.018****
						(0.006)
Marital status: Married						**-0.015***
						(0.007)
Divorced						1.9e-4
						(0.008)
Separated						0.001
						(0.008)
Widowed						-0.012
						(0.007)
Age						**-8.0e-4****
						(1.5e-4)
Male						**0.018****
						(0.004)
Education (Age finished school)						6.0e-5
						(2.0e-4)
Number of children						0.001
						(0.001)
Country and Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.09	0.09	0.08	0.07	0.09	0.09
Observations	106,170	106,170	102,059	88,486	105,484	61,466

Note: Marginal Probabilities from Probit regressions are reported. Absolute values of t-statistics are in parentheses. Bold-face denotes significant at the 10% level; Single-starred bold-face at the 5% level; Double-starred bold face at the 1% level. The baseline category for the relative income position of the individual is the bottom one and for the religious variable is declaring to belong to no religious denomination.

Column 3 tests for the importance of trade openness. Polachek (1980) first raised the idea that international trade would reduce conflict between countries by increasing mutual interdependencies. He found supportive evidence using a cross-section of 30 countries over 10 years. Here we check whether trade can reduce revolutionary pressures *within* nations. To the extent that civil conflict arises from rent-seeking behaviour, greater openness may have a beneficial effect by increasing the level of competitiveness in the domestic economy.[13] In column 3, *Trade openness* has a negative effect, significant at the 10 percent level. A one standard deviation change explains 39% of the standard deviation in revolutionary support.

Column 4 tests whether more social security (as a proportion of the country's GDP) can mitigate revolutionary pressures. The coefficient is negative and significant at the 1 percent level. A one standard deviation change in *Social security* explains 15% of the standard deviation in the support for revolt. This is consistent with historical evidence that the origins of social insurance lay primarily in defusing potential conflict and increasing the security of property rights.[14]

We also control for income inequality using Deininger and Squire's (1996) 'high quality' Gini coefficients. Due to limited availability our sample size falls to 69,963 people over 32 countries and we lose the variation over time. Controlling for country effects the coefficient on inequality is positive at the 5 per cent level and *Freedom* retains a similar negative and significant effect to the previous estimates.

Column 5 expands the set of personal controls to include a set of variables capturing the employment status. Compared to working, being unemployed or a student increases the probability of wanting to revolt by 2.0 and 1.9 percentage points, respectively. Being retired decreases it by 2.7 percentage points. These coefficients are all significant at the 1 percent level. The effects of the other variables remain largely unchanged. Column 6 adds more personal characteristics although doing so reduces the sample size by over 40%. The main effects are that married individuals are significantly less likely to want a revolution whereas being young and male increases this probability.

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[13] See also Ades and Di Tella (1999) who show that more openness reduces corruption by limiting opportunities for rent-extraction. Krugman (1995) argues that "trade politics is primarily about conflicts of interests within rather than between nations".

[14] A frequently cited example is the fact that the first mandatory old-age pension system was created in Germany in 1889 by Otto von Bismarck, who "was neither a reformer nor particularly liberal. The 'iron-chancellor' advocated social security in the hope of pacifying the proletariat and luring them away from socialism" (Carter and Shipman, 1997, p. 40).

4.4 Controlling for endogeneity

Table 4 reports the results from the two-stage regressions that control for the potential endogeneity of freedom and growth. In column 1 *Freedom* and ΔGDP *per capita* are instrumented with the legal and colonial origins of countries. As noted earlier, the literature describes several instances in which more revolutionary pressures have led to more freedom (see Acemoglu and Robinson, 2000 and 2001, on the extension of voting rights, Grossman, 1994, on land reform, and Fording, 1997, on the expansion of the welfare state as attempts of regimes at self-preservation). If this is the dominant form of endogeneity then we would expect the coefficient on *Freedom* to become smaller, i.e. more negative, after it is instrumented. This is what we find in column 1, in which freedom reduces revolutionary support by a greater amount compared to the OLS estimates. It also retains significance at the 1 percent level. GDP growth again has a negative effect, although its larger size is less easy to understand. Since the number of instruments is greater than the number of endogenous regressors, the equation is over-identified, which allows us to test for the exogeneity of the instruments using a Hansen test. The test statistic is distributed as $\chi^2(6)$, where the degrees of freedom are equal to the number of over-identifying restrictions. Exogeneity of the over-identifying restrictions could not be rejected with a p-value of 0.38.

The first-stage regressions are reported in columns 2 and 3. They show the same basic patterns that are reported in La Porta *et al* (1999). In particular, countries with Socialist legal origins have significantly lower levels of freedom compared to the base category of British origin. The effect of Socialist legal origins is exactly as predicted by political theories, which argue that interventionist policies are enacted to enhance the power of the state to the expense of the efficient level of freedom. These countries tend to regulate more and to be less democratic than common law countries. Scandinavian legal origins increase freedoms while there is weak evidence that French legal origins tend to suppress them (here significant only at the 15 percent level, while more strongly significant in La Porta *et al*, who use a larger cross-section of 125 countries).

The bottom panel of column 2 shows that countries once ruled by the main colonial powers (i.e., Britain, Spain and Portugal[15]) had lower levels of freedom between 1981 and 1997 compared to countries that were never colonized. There does not appear to be

[15] There are no former French colonies in the sample.

evidence of significant differences depending on the identity of the colonizer. However in the first-stage regression explaining GDP growth in column 3, being a Portuguese colony stands out as delivering relatively worse performance (the major colony of Portugal in the sample is Brazil). There are no significant effects on the rate of economic development depending on whether the origin of the coloniser was either British or Spanish.

Table 4: Exogeneity tests

Dependent Variable:	(1) *Taste for Revolt?* 2SLS	(2) *Freedom (1st* OLS	(3) *ΔGDP/capita (1st Stage)* OLS	(4) *Taste for Revolt?* 2SLS	(5) *Freedom (1st Stage)* OLS	(6) *ΔGDP/head (1st Stage)* OLS
Freedom	**-0.039****			**-0.034****		
	(0.010)			**(0.011)**		
Δ GDP per capita	**-0.455****			-0.020		
	(0.160)			(0.152)		
External Instruments:						
Legal Origins						
Scandinavian		**0.364**	-0.029		0.192	-0.056
		(0.190)	(0.027)		(0.157)	(0.034)
French		-0.600	0.020		-0.523	-0.012
		(0.416)	(0.029)		(0.397)	(0.032)
Socialist		**-2.489****	0.021		**-2.385****	-0.002
		(0.353)	(0.055)		**(0.356)**	(0.056)
German		-0.292	-0.017		-0.101	-0.038
		(0.190)	(0.037)		(0.208)	(0.040)
Colonial Origins						
British		**-1.539***	-0.015		-1.090	-0.009
		(0.698)	(0.029)		(0.674)	(0.033)
Spanish		**-1.392***	0.003		**-1.063**	-0.018
		(0.533)	(0.028)		**(0.564)**	(0.028)
Portuguese		**-1.129****	**-0.146****		-0.512	**-0.230****
		(0.402)	**(0.020)**		(0.422)	**(0.019)**
Other		**-1.193***	0.028		0.015	**0.051****
		(0.465)	(0.023)		(0.034)	**(0.017)**
Personal Controls	No	No	No	Yes	Yes	Yes
R^2	0.08	0.32	0.04	0.11	0.41	0.07
Observations	100,282	100,282	100,282	60,447	60,447	60,447

Notes: The Hansen test for exogeneity of the over-identifying restrictions for column 1 is $\chi2(6)=6.4$ (p-value=0.38). The corresponding test for column 4 is $\chi2(6)=9.5$ (p-value=0.14). The personal characteristic controls used in columns 4-6 are the same as in Table 3, column 6. Base legal origin is British and the base for colonial origin is not having been a colony.

In column 4 we use the same instruments and in addition we control for the complete set of personal characteristics that were included in column 6 of Table 3. The number of

observations falls by over 40% once this set of 18 additional controls is added. The coefficient on freedom retains its size and is still significant at the 1 percent level, whereas $\Delta GDP\ per\ capita$ maintains a negative sign and a magnitude in line with the OLS results but loses significance. The Hansen test of exogeneity of over-identifying restrictions shows that exogeneity could not be rejected (the $\chi^2(6)$ statistic is 9.5 and the corresponding p-value equals 0.14). In the first stage results reported in columns 5 and 6, Socialist legal origins and Spanish colonial origins have a negative effect on the level of freedom.

5 Conclusion

This paper takes a new approach to answer an unsettled question concerning whether the lack of civil liberties and democratic freedoms are a root cause of revolutionary pressures in nations. It also studies the role of religious beliefs. To do so, we introduce micro-data based on surveys of revolutionary tastes of 106,000 people living in 61 countries between 1981 and 1997. This approach differs from previous studies that have used aggregate level data on civil wars. We first provide different types of evidence that show how the support for revolution is correlated with observable measures of actions that both the people and their governments have undertaken. These include whether the individual has joined strikes and demonstrations, occupied buildings or factories, and the level of government spending on arms and in education. Levels of revolutionary support are also found to be significantly positively correlated with the country experiencing a civil war.

The paper then studies the determinants of revolutionary preferences. Controlling for the personal characteristics of respondents, country and year effects, less people want revolutionary change when their freedoms increase. A one standard deviation change in freedom explains 38% of the standard deviation in the proportion of people who want to revolt. Since governments may attempt to preserve themselves in the face of rising revolutionary threats, we also control for the potential endogeneity of freedom. The main result remains the same. The creation of institutions that promote civil liberties and democratic freedoms appear to be an important mechanism for defusing unrest and assuring the security of property rights. Without such institutions revolutionary pressures increase, opening up the possibility of an explosive bandwagon that can lead to a regime change. Higher GDP growth rates may be able to "buy off" part of the

increase in revolutionary support when freedoms are constrained. The paper also finds that being religious lowers an individual's chance of wanting to revolt in free countries, but the effect disappears entirely in non-free countries, where there are no significant differences between religious and non-religious individuals. There is also evidence suggesting a beneficial role for trade and social security in defusing preferences for conflict.

Appendix 1: Summary statistics

Table A.1: The taste for revolution across individuals

Taste for Revolt?	All	Unemployed	Religious? Yes	Religious? No	If religious: Minority	If religious: Majority
Yes	9.8	14.1	9.2	10.3	11.9	9.9
No	90.2	85.9	90.8	89.7	88.1	90.1

	Freedom Status			Income Quintiles				
Taste for Revolt?	Not free (1-2.5)	Partly Free (2.5-5.5)	Free (5.5-7)	1st (Lowest)	2nd	3rd	4th	5th (Highest)
Yes	18.1	13.1	6.2	10.8	10.4	10.2	9.3	6.9
No	81.9	86.9	93.8	89.2	89.6	89.8	90.7	93.1

Note: All figures are based on the full sample of 106,170 people in 61 countries from 1981 to 1997 and are expressed as percentages.

Table A.2: Aggregate variables

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Individual variables:					
Taste for Revolt?	106,170	0.098	0.082	0	1
Religious?	100,620	0.827	0.232	0	1
Religious Minority?	100,620	0.135	0.342	0	1
Macro variables:					
Freedom	102	5.62	1.52	1	7
Political Rights	102	5.80	1.58	1	7
Civil Liberties	102	5.44	1.54	1	7
Democracy (Polity Score)	102	6.83	4.95	-7	10
GDP per capita (raw level)	97	10,967	10,190	236	38,612
ΔGDP per capita (in logs)	97	0.03	0.14	-0.33	0.27
Trade openness	79	0.39	0.28	0.04	1.19
Social security/GDP	79	0.05	0.05	0	0.19

Table A.3: Correlation matrix

	Taste for Revolt?	Freedom	Political Rights	Civil Liberties	GDP per capita (logs)
Freedom	-0.55				
Political Rights	-0.53	0.99			
Civil Liberties	-0.54	0.99	0.96		
GDP per capita (logs)	-0.56	0.69	0.67	0.70	
ΔGDP per capita	-0.06	0.07	0.07	.0.06	0.07

Table A.4: The relationship between preferences for revolt and actions

Panel A: Correlation between individual preferences and individual actions

	Taste for Revolt?	*Joined boycotts?*	*Attended demonstrations?*	*Joined strikes?*	*Occupied or factories?*
Joined boycotts?	0.068				
Attended demonstrations?	0.082	0.366			
Joined unofficial strikes?	0.068	0.278	0.297		
Occupied buildings/	0.063	0.222	0.233	0.321	
Signed petitions?	0.004	0.271	0.311	0.154	0.111

Note: Data are from the World Values Survey Series and are based on a random sample of 106,170 people in 61 countries from 1981 to 1997.

Panel B: Correlation between individual preferences for revolt and five dimensions of general disaffection

	Taste for Revolt?	*Environment needs protect.*	*Country Run for the Few*	*Corruption Prevalent*	*Don't Respect Authority*
Environment needs Protection	-0.001				
Country Run for the Few	0.050	0.015			
Corruption is Prevalent	0.088	-0.033	0.243		
Don't Respect Authority	0.006	0.048	0.035	-0.038	
Bleak Future	-0.021	0.019	0.116	0.042	0.057

Note: Data are from the World Values Survey Series and are based on a sample of 42,856 people in 47 countries in 1995.

Appendix 2: A simple model

In this appendix we show how lower freedom and incomes may lead a greater proportion of the population who want a revolution. Let y_i be individual *i*'s income and F the level of freedom she enjoys. Let $U_i(c_i)$ be their utility function ($Uc'>0$ and $Uc''<0$). Assume that people face a standard utility maximization problem but that, in addition to their budget constraint, they also face a constraint on their attainable levels of consumption due to government laws (for example, outlawing alcohol or restrictions on type of clothing). The problem each individual solves is:

$$\text{maximize} \quad U_i(\underline{c_i}) \tag{1}$$

$$\text{such that} \quad \underline{p}.\underline{c_i} \leq Y_i \qquad \text{Budget Constraint}$$

$$\text{and} \quad \underline{c_i} \leq \underline{c}^{\max}(F) \qquad \text{Freedom Constraint}$$

where $\underline{c_i}$ is a vector of consumption goods and $\underline{p}$ is a vector of prices. The vector $\underline{c}^{\max}(F)$ specifies the maximum consumption level allowed for each good in the vector due to a restriction of freedom. From problem (1) we can define an indirect utility function, $V_i(Y_i, F, \underline{p})$. Let an individual have a rational preference for revolt if she would experience an expected utility gain from one:

$$\Delta_i = \mathrm{E}\{U_i(c_i^{Revolt})\} - U_i(c_i^{NoRevolt}) > 0$$

$$\Rightarrow \quad \Delta_i = \mathrm{E}\{V_i(Y_i^{Revolt}, F^{Revolt}, \underline{p}^{Revolt})\} - V_i(Y_i^0, F^0, \underline{p}^0) > 0 \tag{2}$$

where Y^{Revolt}, F^{Revolt} and $\underline{p}^{Revolt}$ are the levels of income, freedom and prices in the event of revolt and Y^0, F^0 and $\underline{p}^0$ are their initial levels. Equation (2) compares the expected utility deriving from a revolt with the utility from the status quo. If $\Delta_i > 0$ then an individual has a rational preference for revolt. Post-revolt income, Y^{Revolt}, may depend on each person's pre-revolt income (i.e. whether they are rich or poor) as well as on the moments of the income distribution. Post-revolt freedom, F^{Revolt}, depends on the policies of the new regime.

Assume that individuals have the following indirect utility function, $V_i(y_i, F_i) = \alpha_i \log y_i + \beta_i \log F$, where $\alpha_i, \beta_i > 0$ are individual-specific parameters

reflecting personal characteristics (such as sex, age, education level or religion). This functional form implicitly assumes that the freedom constraint is binding. Let $\overline{Y}^0$ be the initial mean level of income and $r_i^0 = y_i^0 / \overline{Y}^0$ be each person's relative income. In the event that a revolt occurs assume either that wealth is equally shared with no output loss (i.e., $y_i^{Revolt} = \overline{y}^{Revolt} = \overline{Y}^0 > 1 \quad \text{for} \forall i$) or that some output is destroyed leaving all incomes equal to unity. Assume without loss of generality that both outcomes occur with equal probability. Hence a rational individual has a preference for revolt if her expected utility gain is positive:

$$\Delta_i = -\alpha_i \log (r_i^0 \sqrt{\overline{Y}^0}) + \beta_i \log \left(\frac{F^{Revolt}}{F^0}\right) > 0 \qquad (3)$$

Comparative static conditions derived from equation (3) are:

1. $\partial \Delta_i / \partial F^0 < 0$
2. $\partial \Delta_i / \partial r_i^0 < 0$
3. $\partial \Delta_i / \partial \overline{Y}^0 < 0$

These conditions state that revolutionary preferences depend negatively on the initial level of freedom, on the individual's relative income and on average income. Since larger initial freedom implies greater utility relative to what one expects to receive in the event of a revolt, the effect is to decrease the utility gain expected from one. Each person's expected utility gain decreases with relative income due to the assumption that people end up with the same level of income after a revolt (so the more income one has initially, the less potential there is to gain). The reason for the negative effect of average income is that when people become absolutely better off, even relatively poor ones have more to lose if the revolt does not succeed. The size of all these effects depends on the individual parameters, α_i and β_i.

Preferences versus Actions

Having a rational preference for revolt should be distinguished from actual participation in one. An individual may only be willing to exert effort to achieve radical social change to the extent that the free-rider problem is overcome. To illustrate, assume that it costs an individual $c(e_i, F)$ to exert effort e_i on revolt (where $c_e' > 0$ and $c_F' \leq 0$). The latter

inequality represents a higher cost of acting against a more repressive government. Let the average revolutionary effort across the whole population be equal to $\bar{e}$ and the probability of a revolt actually occurring equal p, where p is a function of e_i and $\bar{e}$. Each person chooses effort to maximize her expected utility:

$$EW_i = V_i\left(y_i^0, F^0\right) + p\left(e_i, \bar{e}\right)\Delta_i - c\left(e_i, F^0\right).$$

The complementary slackness conditions are $p'_{e_i}(e_i, \bar{e}).\Delta_i - c'_{e_i}(e_i, F^0) \leq 0$ and $e_i \geq 0$. If the probability of a revolt occurring is independent of any individual's efforts then $p'_{e_i}(e_i, \bar{e}) = 0$ and so $e_i = 0$. In such a case each person hopes to free-ride on the efforts of others but in equilibrium there is zero average effort and no actual revolt, despite the existence of people who may have a preference for one (i.e., for whom $\Delta_i > 0$). Only when $p'_{e_i}(e_i, \bar{e}) > 0$ can an interior solution exist. Also note that although a reduction in freedoms may increase the expected utility gain from a revolt (i.e., Δ_i increases) people may be less willing to exert effort to achieve one due to the potentially higher costs of doing so (i.e., $c_{e_i}'\left(e_i, F\right)$ may also increase).

Appendix 3: Data description and sources

World Values Survey (version obtained by the UK Data Archive)

It is designed to enable cross-national comparisons on a wide variety of values and norms and to monitor changes in values and attitudes across the globe. The surveys were carried out through face-to-face interviews, with a sampling universe consisting of all adult citizens aged 18 and older designed to be representative at the country level. The 1981-83 survey covered 22 independent countries; the 1990-93 survey covered 42 independent countries; the 1995-97 survey covered 53 independent countries. In total, 64 independent countries have been surveyed in at least one wave of the investigation. The full set of countries covered is: Argentina, Armenia, Australia, Austria, Azerbaijan, Belgium, Bangladesh, Bulgaria, Bosnia-Herzegovina, Belarus, Brazil, Canada, Switzerland, Chile, China, Colombia, Czech Republic, East and Unified Germany, Denmark, Dominican Republic, Spain, Estonia, Finland, France, United Kingdom, Georgia, Ghana, Croatia, Hungary, India, Ireland, Northern Ireland, Iceland, Italy, Japan, South Korea, Lithuania, Latvia, Madagascar, Mexico, Macedonia, Mongolia,

Netherlands, Nigeria, Norway, Pakistan, Peru, Philippines, Poland, Puerto Rico, Portugal, Russia, Slovak Republic, Slovenia, Sweden, Turkey, Taiwan, Ukraine, Uruguay, United States of America, Venezuela, South Africa, Moscow, Tambov oblast, Montenegro, Nigeria, Romania, Moldova and Serbia.
Years: 1981-83, 1990-93, 1995-97.

Personal characteristics (source: World Values Survey)

Age: Dummies for age less than 20, 20-29, 30-39, 40-49, 50-59, 60-69, over 70.
Personal Income Position: A set of 5 dummy variables that represent the income position of the individual within the country's scale. The base category is the lowest one.
Religious: A dummy variable that equals 1 when the survey respondent answers yes to the question *"Do you belong to a religious denomination? If yes, which one?"*. The specific categories of religion listed in the remainder of the question were "1. *Roman Catholic,* 2. *Protestant,* 3. *Orthodox,* 4. *Jew,* 5. *Muslim,* 6. *Hindu,* 7. *Buddhist,* 8. *Other"*. The base category is people who answer "0. *Not a member"* or *"No religious denomination"*.
Employment status: A set of dummy variables for the respondent's employment status: "Unemployed", "Self-employed", "Retired", "Student", "Housewife" or "Other". The base category is "Employed".
Marital status: A set of dummy variables on the respondent's marital status: *"Married"*, *"Divorced"*, *"Separated"* or *"Widowed"*. The base category is *"Never Married"*.
Age: The respondent's age in years.
Male: A dummy variable taking the value 1 if the respondent is male and 0 if female.
Education (Age finished school): The age that the respondent finished full-time education.
Number of children: The number of children living in the household.

Attitudes and values questions (source: World Values Survey)

Taste for Revolt?: A dummy variable that equals 1 when the survey respondent answers that *"The entire way our society is organised must be radically changed by revolutionary action"*, and equals 0 when the respondent answers that either *"Our society must be gradually improved by reforms"* or *"Our present society must be valiantly defended against all subversive forces"*. The distribution of the answers in the general sample is "revolutionary" 9.85%, "reformist" 70.89%, and "conservative" 16.37% (2.89% say they do not know).
Country Run for the Few: A dummy variable equal to 1 when respondent agrees with the 1st answer to the question: "Generally speaking, would you say that this country is run by a

few big interests looking out for themselves, or that it is run for the benefit of all the people? 1. Run by a few big interests 2. Run for all the people".

Environment Needs Protection: A dummy variable equal to 1 if the respondent agrees with the 1st answer to the question: "Here are two statements people sometimes make when discussing the environment and economic growth. Which of them comes closer to your own view? 1. Protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs. 2. Economic growth and creating jobs should be the top priority, even if the environment suffers to some extent".

Corruption is Prevalent: A discrete variable ranging from 1 to 4 depending on the reply to the following question: "How widespread do you think bribe taking and corruption is in this country? 1. Almost no public officials are engaged in it, 2. A few public officials are engaged in it, 3. Most public officials are engaged in it, 4. Almost all public officials are engaged in it".

Don't Respect Authority: A dummy if the respondent agrees with the second answer to the question (rephrased here for clarity): "Please tell me, if it were to happen, whether you think that greater respect for authority in our way of life in the near future it would be 1) a good thing, or 2) a bad thing?".

Bleak Future: A dummy variable equal to 1 if the respondent agrees with the second answer to the question "For each of the following pairs of statements, please tell me which one comes closest to your own views: 1. Humanity has a bright future, 2. Humanity has a bleak future."

Sources of policies and macro variables

Freedom: An index measured on a one-to-seven scale assigning 1 to the least free countries and 7 to the most free. This index is a composite measure obtained by averaging the two separate indices, *Political Rights* and *Civil Liberties*. The source is *Freedom House.*

Political Rights: An index from *Freedom House* measured on a one-to-seven scale with 1 being assigned to the least free countries and 7 to the most free.

Civil Liberties: An index from *Freedom House* measured on a one-to-seven scale with 1 being assigned to the least free countries and 7 to the most free.

Democracy (Polity score): An index obtained from the Polity IV project whose focus is on the authority patterns that characterize states. The polity index is on a 21 point scale (-10 to +10) and ranges from the most autocratic and least democratic regimes (-10) to

the least autocratic and most democratic ones (10). It is computed by subtracting an index of Autocracy (0 to 10) from an index of Democracy (0 to 10 as well). For further information, see the *Polity IV Dataset Users Manual (2002).*

GDP per capita: The level of GDP per capita in constant 1992 US$, measured in logs, from the World Development Indicators of the World Bank.

Δ*GDP per capita*: The first difference of *GDP per capita.*

Trade openness: The sum of imports and exports divided by GDP. The source is the World Development Indicators, World Bank.

Social security: Social security divided by GDP. The source is the World Development Indicators, World Bank.

Inequality: Gini coefficient from the World Bank's Deininger and Squire (1996) 'high quality' data set.

Table A.5: Data summary on preference for revolt

Country	*Year*	*Freedom Status*	*Proportion of people with a Revolutionary Preference*
Argentina	1984	Free	12.4
Argentina	1991	Free	7.5
Argentina	1995	Free	5.1
Armenia	1997	Partly Free	16.0
Australia	1981	Free	4.4
Australia	1995	Free	5.7
Austria	1990	Free	2.2
Azerbaijan	1996	Not Free	23.5
Bangladesh	1996	Partly Free	10.8
Belarus	1996	Not Free	3.7
Belgium	1981	Free	6.7
Belgium	1990	Free	4.1
Bosnia-Herzeg.	1998	Partly Free	15.4
Brazil	1991	Free	16.4
Brazil	1997	Partly Free	18.1
Britain	1981	Free	4.8
Britain	1990	Free	5.1
Bulgaria	1990	Partly Free	22.1
Bulgaria	1997	Free	6.6
Canada	1981	Free	4.8
Canada	1990	Free	4.7
Chile	1990	Free	5.3
Chile	1996	Free	5.9
China	1990	Not Free	5.2
Colombia	1997	Partly Free	7.1
Croatia	1995	Partly Free	4.8
Czech Republic	1990	Free	44.9
Denmark	1981	Free	4.2
Denmark	1990	Free	1.6
Dominican Rep.	1996	Partly Free	12.6
East Germany	1990	Free	12.5
East Germany	1997	Free	6.1
Estonia	1996	Free	2.9
Finland	1990	Free	2.8
Finland	1996	Free	1.8
France	1981	Free	8.6
France	1990	Free	4.3
Georgia	1996	Partly Free	9.4
Ghana	1995	Partly Free	13.3
Hungary	1990	Free	6.2
Iceland	1981	Free	1.8
Iceland	1990	Free	3.2
India	1990	Free	14.0
India	1996	Partly Free	15.3
Ireland	1981	Free	4.4
Ireland	1990	Free	3.7
Italy	1981	Free	7.9
Italy	1990	Free	7.1
Japan	1981	Free	3.1
Japan	1990	Free	2.1

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Country	*Year*	*Freedom Status*	*Proportion of people with a Revolutionary Preference*
Japan	1995	Free	3.5
Latvia	1996	Free	10.9
Lithuania	1996	Free	9.7
Macedonia	1997	Partly Free	12.4
Mexico	1981	Partly Free	12.0
Mexico	1990	Partly Free	16.5
Mexico	1996	Partly Free	12.8
Moldova	1996	Partly Free	10.2
Netherlands	1981	Free	3.4
Netherlands	1990	Free	1.9
Nigeria	1990	Partly Free	28.1
Nigeria	1995	Not Free	31.6
Norway	1982	Free	2.0
Norway	1990	Free	2.4
Norway	1996	Free	2.7
Pakistan	1997	Partly Free	29.1
Peru	1996	Partly Free	8.2
Philippines	1996	Free	22.5
Poland	1989	Partly Free	22.9
Poland	1997	Free	8.9
Portugal	1990	Free	4.7
Russia	1991	Partly Free	17.2
Russia	1995	Partly Free	10.9
Serbia	1996	Not Free	12.8
Slovakia	1990	Free	37.3
Slovenia	1992	Free	14.3
Slovenia	1995	Free	7.1
South Africa	1982	Not Free	16.0
South Africa	1990	Partly Free	15.9
South Africa	1996	Free	12.1
South Korea	1982	Partly Free	22.3
South Korea	1990	Free	7.3
South Korea	1996	Free	12.5
Spain	1981	Free	7.9
Spain	1990	Free	4.5
Spain	1995	Free	4.6
Sweden	1982	Free	4.3
Sweden	1990	Free	6.1
Sweden	1996	Free	4.4
Switzerland	1996	Free	6.6
Taiwan	1995	Partly Free	2.9
Turkey	1990	Partly Free	13.8
Turkey	1996	Partly Free	21.2
Ukraine	1996	Partly Free	8.7
Uruguay	1996	Free	8.0
USA	1982	Free	5.0
USA	1990	Free	6.5
USA	1995	Free	4.8
Venezuela	1996	Free	11.4
West Germany	1981	Free	2.5
West Germany	1990	Free	1.7
West Germany	1997	Free	2.3

Chapter 4

An experimental investigation into the causes of civil conflict

In the previous chapter we have analysed attitudes to conflict and revolt from a large individual-level international survey to assess the determinants of preferences for conflict. We have found that the repression of political and civil rights strongly affects the acceptance of an individual of the society he lives in. In countries with lower protection of political rights, individuals declare more often the willingness to support revolutionary action to change society. We have also found that economic growth can partly compensate the lack of political rights in curbing the preference for revolution, but only at very high costs, hardly sustainable over time.

This chapter brings further the study of the determinants of unrest and conflict distinguishing the effects of economic and political grievances on preferences from the effects on actions. Individual revolutionary preferences may not translate into actions due to the co-ordination problem that undermines collective action. Thus, while support for revolution is a necessary condition for uprisings actually breaking out, it may not be sufficient. Forces may even work in opposite directions on preferences and actions. Repression, for instance, may enhance a taste for revolt but at the same time the fear of its consequences may inhibit actual revolutionary behaviour. This paper aims at disentangling how limitations of individual rights affect at the same time revolutionary preferences in one way and revolutionary action in another. We study the impact of three

* This chapter represents my own account of a joint investigation with Klaus Abbink.

potentially relevant factors: freedom of communication, political repression, i.e. the prosecution of political opposition, and the perception that the country is corrupted.

The study of the effect of these factors on preferences and actions runs in parallel, combining two distinct but complementary methodologies. Analysing the preferences of over 50,000 individuals in a regression framework, we investigate the role of political and economic grievances in preferences for conflict. We then address the interaction between preferences, actions and information observing the interaction between citizens and government in a laboratory experiment. In a laboratory, with the expertise of an experimental economist, Klaus Abbink from the University of Nottingham, we re-create an analogous, although stylised, set of conditions and incentives where we can analyse whether the same economic and political grievances lead to revolutionary action. The restricted environment also allows us to control for reverse causality and omitted variables, which constitute the most common limitations of empirical analyses.

We introduce a simple experimental model that captures some basic features of an autocatic government. The political arena is modelled as a game played by one governor and seven citizens. The game consists of three stages. At the first stage, the governor decides how to rule society on the three dimensions. He decides on the level of exploitation of the society choosing either an egalitarian or a selfish allocation. At the same time he decides on the punishment that the citizens will incur if they oppose, and chooses whether to restrict communication among them. At the second stage the citizens decide whether to communicate to their neibours that they accept the governor or that they intend to revolt. At the third stage the citizens decide whether to actually revolt against the governor. If a sufficient number of citizens oppose the governor, the revolt is successful; if not, those who opposed are punished. The game is played repeatedly to model the long-term interaction between citizens and the government.

Combining the analysis on survey data and on laboratory evidence allows us to ascertain the different effects that corruption, restrictions to freedom of communication and repression exert on preferences and actions.

The chapter is organised as follows. Section 1 presents the empirical evidence on revolutionary preferences derived from econometric analysis. Section 2 introduces the model and the experimental design. Section 3 presents the results of the experiment. Section 4 concludes.

1 Results on revolutionary preferences from survey data

In this section we investigate the role of economic and political motives on *preferences* for revolt. As later on in the experiment, we identify in the data factors that can be associated with economic and political grievances. The source of data on revolutionary preferences is the World Values Survey. Over 130,000 individuals in 61 countries were asked about their attitudes towards a wide range of issues. One question they answered was: *"On this card are three basic kinds of attitudes vis-à-vis the society in which we live in. Please choose the one which best describes your own opinion"*. The three possible responses are: *"The entire way our society is organised must be radically changed by revolutionary action"*, *"Our society must be gradually improved by reforms"*, and *"Our present society must be valiantly defended against all subversive forces"*.[2] Matching this information with country-level data reduces the sample to 52,616 individuals in 41 countries, covering both developed and developing countries from all continents[3], between 1990 and 1997. The reduced form of the probit regressions used to analyse the determinants of preferences for revolt is as follows.

$$\textit{Preference for Revolt?}_{ict} = a\ \textit{Country Run For The Few}_{ict} + \beta\ \textit{Political Rights}_{ct} + \gamma\ \textit{Press Freedom}_{ct} + \\ + \delta\ \textit{Personal Income}_{ict} + \eta\ \textit{GDP per capita}_{ct} + \theta\ \textit{interactions} + \lambda\ \textit{Micro}_{ict} + \eta_c + \mu_t + \varepsilon_{ict}$$

where $\textit{Preference for Revolt?}_{ict}$ is a dummy that takes the value 1 when individual i in country c and year t holds a belief that *"The entire way our society is organised must be radically changed by revolutionary action"*.

The first three independent variables capture the main factors that we focus on in the combined analysis. The variable $\textit{Country Run For The Few}_{ict}$ is a dummy that proxies the citizen's perception of the government's appropriation of the resources of the country. In the World Values Survey, participants were asked the question: *"Generally speaking, would you say that this country is run by a few big interests looking out for themselves, or that it is run for the benefit of all the people?"*. Possible answers were *"Run by a few big interests"* and *"Run for all the people"*. In the regression the variable takes the value 1 if the individual answered that the country is run by a few big interests. The influence of repression is captured by the variable $\textit{Political Rights}_{ct}$. To identify this factor, we use the *Freedom House* index of political rights, measured on a 1 to 7 scale. Finally, freedom of communication is re-

[2] "Don't know" answers are coded as missing.
[3] Admittedly Middle Eastern and African countries are underrepresented in the sample.

flected in the extent to which the country's media are free from restrictions (*Press Freedom*$_{it}$). This is represented by the *Freedom House* index of press freedom, which ranges from 1 to 3. Both indices are rescaled such that high scores mean high levels of freedom. Two independent variables describe the economic circumstances that the individual lives in. *Personal Income*$_{it}$ is the person's (self-reported) income position within the country on a 1 to 10 scale. *GDP per capita*$_{it}$ is measured as per capita income in 1992 US$ (PPP) in logs. To identify more precisely the role of these factors, we generate three interactions: *personal* and *aggregate income x the individual's perception that the county is run for the few*, and *political rights x press freedom.* All regressions include country and year fixed effects and cluster the standard errors by country and year. The sources of all variables are given in the Appendix.

Table 1 shows the regression results. Column 1 gives a cross-sectional view of the correlations within the data. The only adjustment is clustering the standard errors by country and year of analysis. Across countries, a higher aggregate income and more political rights are negatively correlated to a preference for revolt, while the individual perception that the country is run for the interest of the few increases the preference for revolt. Personal income and press freedom do not exhibit significant effects on the preference for revolt. Column 2 adds the interactions of the relevant factors: *personal* and *aggregate income x the individual's perception that the county is run for the few*, and *political rights x press freedom.* None of them is significantly different from zero. Only aggregate income maintains a negative effect on the preference for revolt.

Column 3 adds country and year fixed effects to explore whether a *change* of economic and political factors within the same country affects the preference for revolt among its citizens. Somewhat surprisingly, a growth in the aggregate income of the country increases support for revolt. This contravenes the findings in the previous chapter. On the other hand, communicating dissent reflects pure preferences after they are mediated by opportunities and circumstances to express them. The effect found here is likely to reflect higher capabilities (i.e. resources) to express dissent rather than a direct effect on preferences.[4]

[4] Another possibility is that the growth in aggregate income increases support for revolt through an increase in inequality. As highlighted in Chapter 2, the findings are limited by the scarcity of reliable "high-quality" data on equality, such that the World Values Survey sample is reduced by over 30 percent and is not very representative. There we found some positive effect of inequality on preferences for conflict. This does not rule out other channels, for instance that the positive effect of GDP on revolt may pass through unemployment status, or through low class mobility.

Table 1: Regression results

Depvar: Preference for revolt (mean=0.114)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Country run for the few	**0.034****	0.062	**0.028****	0.006	**0.029****	0.043	**0.030****	0.006
	(2.62)	(1.02)	**(3.90)**	(0.17)	**(2.95)**	(0.71)	**(4.13)**	(0.19)
Political Rights (1-7)	-0.016+	-0.014	**-0.020****	**-0.015****	**-0.027****	**-0.045****	**-0.022****	**-0.018****
	(1.65)	(0.74)	**(10.13)**	**(10.2)**	**(45.47)**	**(11.34)**	**(12.54)**	**(14.62)**
Press Freedom (1-3)	0.027	0.036	**-0.028****	0.009	**-0.038****	**-0.146****	**-0.021****	0.014
	(0.93)	(0.76)	**(6.33)**	(0.92)	(11.61)	**(9.61)**	**(5.05)**	(1.58)
Personal income (1-10)	-1.93e-4	0.003	-0.002	-0.002	-0.001	3.6e-4	**-0.003***	**-0.005***
	(0.09)	(0.95)	(1.52)	(0.77)	(0.59)	(0.14)	**(2.47)**	**(2.28)**
GDP per capita (logs)	**-0.023****	**-0.021****	**0.083****	**0.077****	**0.098****	**0.099****	**0.073****	**0.068****
	(3.46)	**(2.64)**	**(8.28)**	**(12.68)**	**(14.1)**	**(7.28)**	**(7.80)**	**(10.99)**
Pers. income*Country run for the few		-0.004		-2.77E-04		-0.001		0.002
		(1.39)		(0.13)		(0.3)		(1.10)
GDP per capita (logs)*Country run for the few		-0.002		0.003		-0.002		0.002
		(0.27)		(0.75)		(0.18)		(0.50)
Political rights*Press Freedom		-0.002		**-0.007****		**0.018****		**-0.006****
		(0.23)		**(4.01)**		**(7.98)**		**(4.28)**
Clustering by country-year	**Yes**	**Yes**	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	No	No	**Yes**	**Yes**	Yes	Yes	Yes	Yes
Year fixed effects	No	No	**Yes**	**Yes**	Yes	Yes	Yes	Yes
Countries	All	All	All	All	**Developing countries**		All	All
Personal characteristics	No	No	No	No	No	No	**Yes**	**Yes**
Pseudo R2	0.03	0.03	0.09	0.09	0.07	0.07	0.10	0.10
Observations	52,616	52,616	52,615	52,615	40,709	40,709	49,594	49,594

Note: Estimates from Probit regressions. Marginal probabilities are reported. Standard errors are in parentheses. Bold-face denotes significant at the 10 percent level; single-starred bold-face at the 5 per cent level; double-starred bold face at the 1 percent level. Standard errors are clustered by country and year. The baseline category for the relative income position of the individual is the bottom one.

A larger perception that the country is run by the few is associated with greater preference for revolt, as lower political rights and lower press freedom are. Column 4 adds the insight that holding political rights constant, a higher press freedom diminishes the sentiment of revolt.

Columns 5 and 6 run the basic specifications on the subset of developing countries. Most of the effects are unchanged but the size of the estimates is larger. A greater preference for revolt is associated with faster GDP growth, with the perception that the country is run by the few, with lower political rights and lower press freedom. The only difference is that the role of press freedom appears to be the opposite in developing countries.

Holding political rights constant, greater press freedom is associated with a higher preference for revolt. This suggests that in developed countries, having a free press is instrumental in defusing the dissent, while in developing countries it is one of the few channels to express it.

Finally, columns 7 and 8 add personal characteristics of the individuals (age, gender and unemployment) as controls. The basic results are comparable to those on the full sample of countries, with the difference that personal income acquires significance in explaining the preference for revolt. A lower personal income increases the sentiment of revolt. This also increases significantly when the person is young (less than 26 years old), male and unemployed.

Overall an investigation on preferences for revolt highlights that political rights, the freedom to communicate through the press and the perception that the country is run for the interest of the few are important to explain attitudes to revolt within a country. Generally speaking, a higher level of political rights and press freedom weakens the taste for revolutionary action, while a feeling of appropriation by the ruling parties strengthens support for revolt.

Like most empirical studies on civil conflict, these results are not totally immune from concerns of possible biases of endogeneity, here of press and political freedom to the preference for revolt itself. The previous chapter has assessed the causality of the effect of political rights on preferences for revolt using instrumental variables. Further effort should be devoted to finding an instrument for press freedom, which will be within the

scope of future work. Here we turn to the controlled environment of a laboratory experiment to assess the separate role of these factors on actions of revolt.

2 The experimental model and design

For the experimental part of this work we devise a model that captures the essential features of the political situation under study, yet is simple enough to be tractable in the laboratory. To our knowledge the use of laboratory experiments in the study of civil conflict is a novelty.[5] Some insights can be gained from previous experimental studies looking at the single influential factors we address. A dislike of exploitative distributions is a well-established finding in the large literature on the ultimatum game (see Camerer, 2003 for a recent survey). Communication is found to facilitate play of Pareto-superior equilibria in co-ordination games (Cooper *et al*, 1992) and an exogenous punishment opportunity can improve public good provision (Fehr and Gächter, 2000, Masclet, Noussair, Tucker, and Villeval, 2003). The particular situation that we intend to study raises the need for a new experimental design.

We construct a stylised game consisting of three stages. The players in the game are one Governor and a number of Citizens. The general outline is as follows.

1. At stage 1, the Governor decides on three policy issues. First he chooses the distribution of a fixed number of payoffs between himself and the Citizens. The sum of the payoffs is the wealth of the country. Second, he decides on whether to trigger an instrument impeding communication among Citizens. Third, he sets the penalty against opposing Citizens.

2. At stage 2, the Citizens can send messages to their neighbours indicating their willingness to oppose the Governor's policy.

3. Stage 3 is the actual revolt stage. Citizens simultaneously decide whether to rise up against the Governor. If sufficiently many Citizens do so, then the Governor is punished and moved out of office, and a new Governor is appointed. If the revolt fails, the Governor stays in power in the following round and those who have revolted may be punished.

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[5] Previous experiments on political systems focus on the emergence of regimes in a model in which citizens can devote their efforts to production or appropriation (Durham, Hirshleifer and Smith, 1998, Duffy and Kim, 2004).

We construct a dynamic game of eight players, one Governor and seven Citizens.[6] We aimed at having a relatively large group of players as the real-life interaction takes place between many citizens of a sizeable country. On the other hand, resources (in particular subject pool and laboratory space) are limited. The choice of seven citizens allows us to run two experimental countries in parallel, a measure that increases anonymity. Players play the game over several repetitions (so-called *rounds*). The last round of each game is eliminated from the analysis to avoid contamination from possible end-game effects. The game is dynamic in that the participant who plays the role of the Governor is determined by the outcome of the preceding round. Otherwise each round follows the same pattern. The detailed rules of the game are described below.

2.1 Stage 1

The first stage of the game is the one at which the Governor decides. As mentioned earlier, the Governor makes decisions in three dimensions. The first is to choose a payoff distribution between himself and the seven Citizens. In addition he decides the payoff received by Citizens opposing the government if the revolt is unsuccessful. In both dimensions the Governor has the choice between a "tougher" and a "softer" option. This leads to four possible combinations, which are labelled as policies A, B, C and D. Policies A and C are those with a more egalitarian distribution of payoffs, B and D are policies strongly favouring the Governor. Within these pairs, A and B are the policies in which the Governor is more lenient towards opposition, while in C and D rebels face a severe punishment. The precise distribution of payoffs in *talers*, the fictitious experimental currency, is described in table 2.

Table 2: Round payoffs for the different policies

Policy	Round payoff for Governor if < 5 Citizens oppose the policy	Round payoff for a Citizen if <5 Citizens oppose the policy		Round payoff for a Citizen if ≥5 Citizens oppose the policy	
		...if the Citizen accepts the policy	...if the Citizen opposes the policy	...if the Citizen accepts the policy	...if the Citizen opposes the policy
A	7	6	5	5	7
B	28	3	2	5	7
C	6	6	0	5	7
D	27	3	0	5	7

[6] The choice of a single governor to represent the ruling social groups is a simplification.

The second column indicates the payoff that the Governor allocates to himself with the policy chosen. The entries in the third and fourth column are the payoffs provided to each of the seven Citizens. The actual payoffs depend on each Citizen's action at the third stage. Note that the repressive policies C and D allocate one taler less to the government than their "softer" counterparts. This reflects the costs of running a repressive apparatus.

In addition to choosing one of the policies A to D (and therefore deciding on payoff distribution and political repression) the Governor takes a decision on a third dimension. He chooses whether or not to activate a so-called *deduction lottery*. If the lottery is activated, then Citizens' messages at the second stage are intercepted with some probability and those who have expressed opposition are penalised (see next subsection). Activating the lottery costs the Governor one taler, which again assumes that there are some costs attached to running a secret police or other surveillance measures.

2.2 Stage 2

The second stage is a communication stage. The seven Citizens are located on an ideal circle where each Citizen has a neighbour on the left and one on the right. Each Citizen has the opportunity to send a message to her right neighbour, and she receives a message from her left neighbour.[7] The circle and the left and right positions are merely figurative and not physical: they do not correspond to the seating in the laboratory.

With some simplification, a Citizen can send one of two messages: either "I intend to accept the policy" or "I intend to oppose the policy". If the deduction lottery has not been activated, sending a message is merely cheap talk in the game-theoretic sense, i.e. it may be useful as a co-ordination device, but it has no immediate consequences. If the Governor has activated the lottery, then each Citizen's message is intercepted with a probability of 0.2. If the message was "I intend to oppose the policy", then the citizen sending the message is punished with a deduction of 3 talers from her payoff. In no case a message establishes a commitment for actions at the third stage.

[7] We restrict the communication to one message to one neighbour for two reasons. First, we wanted to examine the effect of a network in which interaction is local, as would be the case in absence of free mass media. Second, this restriction limits the number of possible scenarios the game can reach, which is important when we conduct the experiment eliciting complete strategies from the players (see section 2.5).

2.3 Stage 3

At this stage Citizens make a decision on whether or not they will actually revolt against the Governor. All Citizens make this decision simultaneously without knowing what other Citizens decide. The simultaneous-move structure is an idealised model of a situation in which many Citizens need to take action at about the same time to gather a critical mass of opposition. The decision the Citizens need to take is, again for simplicity, binary. They choose to either "accept" or "oppose" the Governor's policy. The consequences an action has for a Citizen depends on how many fellow Citizens decide to oppose the policy. If fewer than five Citizens in total oppose the policy, then the revolt fails and the payoffs are implemented as determined by the Governor's chosen policy, with payoffs for Citizens accepting the policy being higher than for opposing Citizens. In this case the Governor stays in power in the following repetition of the game.

If at least five Citizens oppose the policy, then this has several consequences. First, Citizens who have opposed receive a payoff of 7 talers while Citizens who have accepted the policy receive 5. This difference reflects the negative consequences that "collaborators" with the former regime face after a successful revolution. Second, the Governor receives a payoff of zero. Third, the Governor is removed from his role and becomes a Citizen in the following repetition of the game.[8] There are a number of ways for how the replacement of the Governor can take place, as a leader may emerge among the rebels or through elections following the revolt. Here for simplicity the Governor is replaced by a new Governor randomly drawn from the group of Citizens who have opposed the policy. This reflects a situation in which the new leaders emerge only after the revolution, and ex-ante it is not known who will form the new government.[9]

When the Governor is replaced, all nodes on the communication circle remain unchanged. An exception needs to be made to add the old Governor and subtract the new one from the communication circle. The way this is implemented is that the players actually form a circle of all eight players (including the Governor), which does not

[8] We implement this rule for practicality rather than realism. We thought of excluding a toppled governor from further play, which arguably would be more realistic. However, this would have required either impractical replacement procedures or would have led to a changeable number of players. The latter would have affected all parameters of the game and would have made it impossible to obtain comparable results.

[9] The East German revolution of 1989 is an example of such a constellation. There was no single dominant leader; the new government was formed after the old government was forced out of office. As in our game, however, individuals associated with the former regime were excluded from leading positions.

change throughout the play of the game. In each repetition of the game the Governor is "skipped" when the connections between the players are set up. This is illustrated in figure 1. The left-hand side shows the constellation before, the right-hand side after the top-right player is replaced with the centre-left player as a Governor.

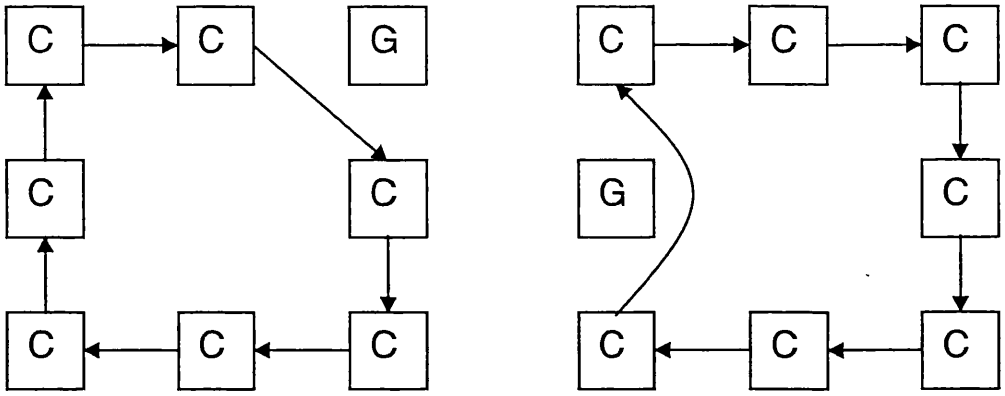

Figure 1: Order of the game

2.4 Game theoretic analysis

For the game theoretic analysis of the model we follow a standard backward induction approach to characterise subgame perfect equilibria[10] (Selten, 1975). Consider the last round of the experiment. The third stage of the game has two equilibria in pure strategies. If fewer than four other Citizens oppose, then a Citizen's best response is to accept the policy, as the revolution will be unsuccessful and a higher payoff is made by accepting. If four or more other Citizens oppose, then the best response is to oppose as well, since acquiescent Citizens are worse off after a successful revolution. Therefore, there are two "stage 3" equilibria in pure strategies: one in which no-one opposes, and one in which everybody opposes. This holds regardless of the policy the government has chosen. Stage 2, the communication stage, may be used as a co-ordination device to select among different equilibria, but since a message does not bear any commitment, it does not alter the set of subgame perfect equilibria.[11]

From the indeterminacy of the third stage it follows that every policy choice of the Governor is part of a subgame perfect equilibrium. The Governor will choose the policy that gives the highest payoff given the selected third-stage equilibria. This policy can be

[10] We focus only on subgame perfect equilibria in pure strategies. There are likely to be numerous equilibria in mixed strategies as well.

any of the four policies and either of his options on whether to activate the lottery. The indeterminacy unravels through all earlier rounds of the game to the first round.[12]

2.5 The conduct of the experiment

The experiment was conducted at the *Centre for Decision Research and Experimental Economics* (CeDEx) of the University of Nottingham. The software for the experiment was developed using the *RatImage* programming package (Abbink and Sadrieh, 1995). Subjects were recruited by e-mail from a database of students who had previously registered at CeDEx as potential participants in experiments. Each subject participated in one session only and no subject had participated in experiments similar to the present one. The subjects were undergraduate students from a wide range of disciplines. The majority of participants were British. Among the substantial fraction of foreign students the largest group were the Chinese. Virtually all subjects were aged between 19 and 25, with a balanced distribution between genders.

In each session two experimental countries were run in parallel. There was no migration between these countries and subjects interacted in fixed groups of 8 subjects. Subjects were not told who of the other participants was in the same group, but they knew that the composition of the groups did not change. Each session began with an introductory talk. A research assistant read aloud the written instructions (reproduced in the Appendix). The language used in the instructions was natural, i.e. it did not disguise the situation by using abstract terms. Players were labelled "Governor" and "Citizen", and they decided on whether to "accept" or "oppose" the Governor's policy. At first we had devised a set of instructions using abstract language, like "player A" and "player B" and "choose X or Y", but with the rather complex three-stage structure the game became

[11] In a game theoretical model similar to ours, Perez (2003) uses equilibrium selection criteria to identify plausible equilibria. His focus is on the effect of network structures.

[12] In earlier rounds there is an additional complication due to the dynamic character of the game. A Citizen may find it preferable to accept a policy even though five or six other Citizens oppose, in an attempt to *avoid* becoming the Governor. However, opposing yields an additional payoff of 2, which is higher than the highest possible expected loss. If *exactly* four fellow Citizens oppose, then a Citizen's decision becomes pivotal. The best response depends on the Citizen's expectations on the other Citizens' behaviour, and on the Governor's policy choice. Whatever the best response, the resulting strategy combination cannot be an equilibrium. If the Citizen accepts, then the remaining four rebels do not play a best reply, if she opposes, then – for the above argument – the two accepting Citizens are off equilibrium. Hence, consideration of the dynamic game does not change the set of third stage equilibria.

incomprehensible. Embedded in the natural context the game turned out to be relatively intuitive and easy to understand.[13]

We conducted 12 rounds of the stage game. These were divided into two phases. In phase 1, which comprised of the first nine rounds, participants played the game spontaneously, i.e. following the move structure of the game. In phase 2, which lasted for the remaining three rounds, we elicited complete strategies from the players. Instead of responding to a policy choice made by the Governor, they had to specify a decision for every possible scenario the game could enter before the Governor's decision was revealed to them.[14] Thus, citizens had to specify which message they would send to their neighbour for each of the eight combinations of policy and lottery activation and at the same time (thus before they received the message from their neighbours) they had to decide whether or not to revolt at stage 3. These decisions had to be taken contingent on (1) the Governor's policy choice, (2) the activation of the lottery and (3) the message received from the neighbour. If the lottery was activated and the citizen sent an "I intend to oppose" message, then the citizen had to distinguish the cases in which the message was intercepted or not. This results in between 16 and 24 decisions to be taken for the third stage. After all Citizens and the Governors (for whom both phases look the same) had submitted their strategies, the game was played following the instructions made in the strategies and the participants were informed about the outcome of the round.

Strategy elicitation has the great advantage of leading to a much richer data set. Unlike with spontaneous play, the experimenter can gather decisions for all possible scenarios of the game, including those that are reached less frequently.[15] If a policy is rarely cho-

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[13] Evidence for the effects of instruction framing has been very mixed so far. In a tax evasion experiment Baldry (1986) finds far more evasion if the task is presented neutrally as a gambling opportunity. Alm, McClelland, and Schulze (1992), however, do not find any differences. A study by Burnham, McCabe, and Smith (2000) reports significant less trustful choices in a reciprocity game when the other player is called "opponent" rather than "partner". On the other hand, Abbink and Hennig-Schmidt (2002) do not find significantly different behaviour between a neutrally and a naturally worded version of a bribery experiment.

[14] The idea of gathering complete strategies from subjects goes back to Selten (1967). The *strategy method* he proposes, however, is a much more complex set-up involving subjects returning to submit strategies and play tournaments over a long time. For our simple set-up we speak of *strategy elicitation.*

[15] It is sometimes argued that the elicitation of complete strategies triggers "cold" decisions, which may or may not be different from the "hot" decisions made when reacting to an act actually carried out by a previous mover. If this is the case we would expect less emotional reactions, which would make the effects possibly thinner. This may be a downside of the strategy approach. The upside is that the data become so much richer that even very subtle effects can be detected. Evidence for substantially different behaviour triggered by the two methods is sparse in any case. Brandts and Charness (2000) examine be-

sen, very few data points are available for Citizens' behaviour on that node, such that statistical analysis cannot be applied. Strategy elicitation avoids this problem. Therefore we decided to include a phase with strategy elicitation in our experiment.

Subjects were granted a capital balance of 15 talers at the outset of each session to accommodate for some losses, which were possible if messages were intercepted. The total earnings of a subject from participating in this experiment were equal to this capital balance plus the sum of all the payoffs he or she made during the experiment minus the sum of his or her losses. A session lasted for about 90 minutes (this includes the time spent to read the instructions). At the end of the experiment, subjects were paid their total earnings anonymously in cash, at a conversion rate of one pound sterling for 5 talers. Subjects earned between £6.13 and £21.20 with an average of £11.26, which is considerably more than students' regular wage in Nottingham. At the time of the experiment, the exchange rate to other major currencies was approximately US$1.80 and €1.50 for £1.

We conducted six sessions with 16 subjects each. Subjects interacted with each other within groups but not across groups so that each group can be considered a statistically independent observation. Thus, WE gathered 12 independent observations. This part of the analysis consists primarily of nonparametric tests performed on these data points.

3 The results of the experiment

At the heart of our data analysis is the Citizens' behaviour at the third stage, when they decide whether or not to take revolutionary action. Reversing the actual course of play we therefore begin with the analysis of stage 3. We focus on the second phase of play in which we used strategy elicitation. From this phase we have a much richer data set than from phase 1. However we also present the results from the first phase. The situation in the last round is different from the others, because there is no new Governor to be appointed. In order to ensure that possible end-game effects do not affect our results, we exclude the last round from the analysis.[16] Our focus is on the effect of appropriation,

haviour in different interactive games comparing spontaneous play and complete strategy elicitation, but find results to be unaffected. They suggest that both procedures are equivalent for low-complexity tasks.

[16] None of our conclusions changes if we include the data from the last round.

freedom of communication, and repression on Citizens' propensity to oppose the Governor's policy.

3.1 The Citizens' decisions

Figure 2 shows the citizens' decisions at stage 2. The figure shows the frequency of "I oppose" decisions, relative to all decisions made in that particular scenario. In the special case that the lottery was activated and a subject had sent an "I oppose" message we chose the case that the message was not intercepted, as this was more likely to occur (with p=0.8).

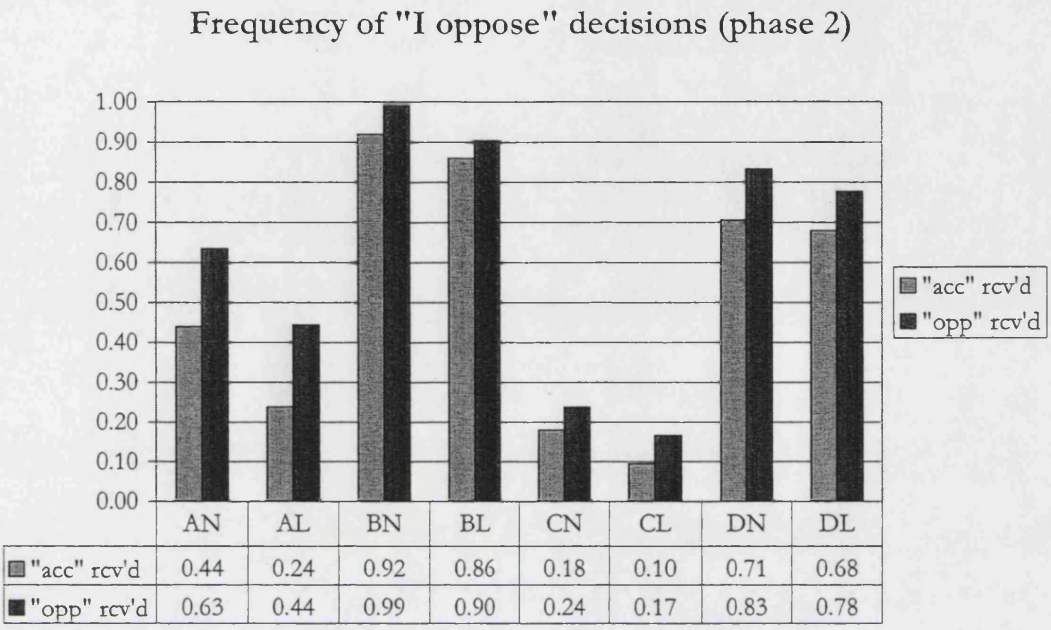
Each bar represents a different scenario, where the type of allocation, the level of freedom of communication and repression are combined differently. The graphic setup helps understanding the effect of the relevant variables by comparing two scenarios (=bars) which differ in only one variable.

We remind that:

- A, C represent egalitarian allocations chosen by the Governor.
- B, D represent exploitative allocations chosen by the Governor.
- A, B are regimes where weak repression is set up if a revolution fails.
- C, D are regimes where strong repression is set up if a revolution fails.
- L is a regime where Citizens can communicate freely.
- N is a regime where Citizens cannot communicate freely.

On the effect of the Governor implementing a non-egalitarian allocation (comparing the B with the corresponding A scenario, or D with the C scenario), it appears that for each comparison the frequency of "I oppose" decisions is substantially higher in the scenario with an unequal distribution of payoffs. Activating the random repression of communication among Citizens (i.e. comparing the bars with "L" with the corresponding ones with "N") has a consistently negative effect on opposition rates. The same holds for the punishment in the case of unsuccessful revolts. When a C policy is chosen rather than the corresponding A policy, this results in less opposition, and the same occurs when a D policy is compared to a B policy. Finally, comparing the two adjacent bars in each pair, we can see that having received an "I oppose" message increases a Citizen's likeli-

hood to oppose the Governor in all comparisons of scenario. This points to network or informational effects in moving from individual preferences to collective action.



	AN	AL	BN	BL	CN	CL	DN	DL
"acc" rcv'd	0.44	0.24	0.92	0.86	0.18	0.10	0.71	0.68
"opp" rcv'd	0.63	0.44	0.99	0.90	0.24	0.17	0.83	0.78

Figure 2

Note: "acc" rcv'd stands for when a Citizen has received a message from his neighbours saying "I intend to accept the Governor's policy." "opp" rcv'd stands for when a Citizen has received a message from his neighbours saying "I intend to oppose the Governor's policy".

There are 32 possible comparisons when only one dimension is allowed to vary (selfishness of the Governor, lottery activation, repression, and message received) while all others are held constant. We check all effects for statistical significance, disaggregating the data and looking at the independent observations. Recall that each group ("country") constitutes an independent observation in our experiment.

The results are listed in table 3. The odd columns show the 32 effects for which we test the significance. The direction of the comparison follows from the relationship shown in figure 2. Columns 2 and 4 show in how many independent observations the comparison is the same as in figure 2, which we call the "expected" direction. This is the number before the slash. We now compare this number with the number of observations in which we observe the opposite direction. This number is shown after the slash. For instance, "BN>BL(a) 8 / 1* " means that opposition rates were higher in BN than in BL in eight groups for the scenario in which a Citizen has received an "accept" message. In one group there were higher opposition rates in BL, in contrast to the relationship we observe in figure 2.

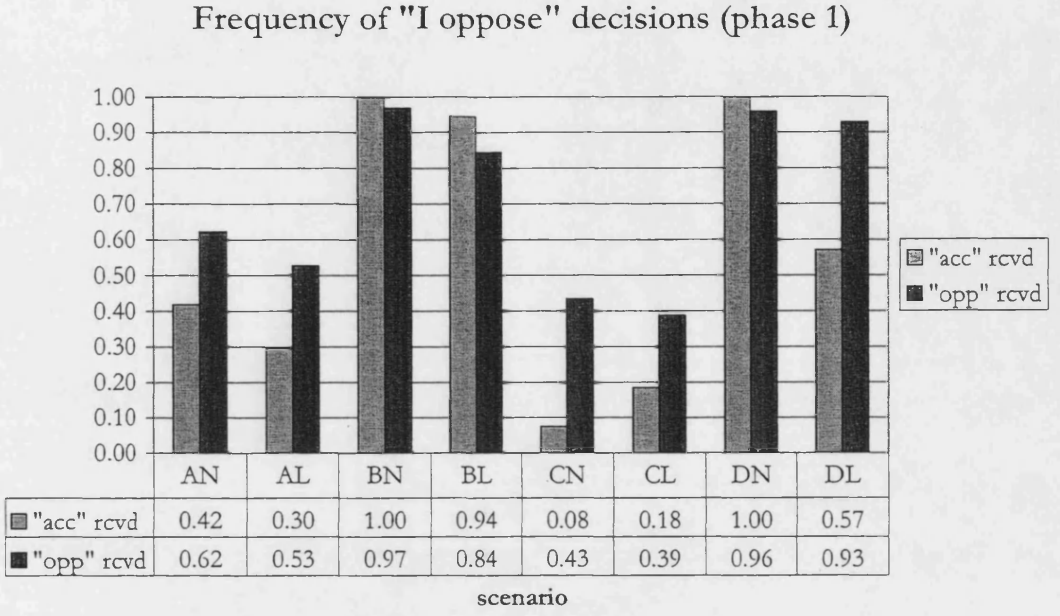
Table 3: Significance of effects on the propensity to oppose the Governor's policy

Freedom to communicate		Message received	
Comparison	exp / opp	Comparison	exp / opp
AN>AL(a)	10 / 0***	AN(a<o)	11 / 0***
BN>BL(a)	8 / 1*	AL(a<o)	10 / 0***
CN>CL(a)	5 / 0*	BN(a<o)	5 / 0*
DN>DL(a)	5 / 4	BL(a<o)	6 / 2
AN>AL(o)	9 / 1*	CN(a<o)	7 / 1*
BN>BL(o)	7 / 0**	CL(a<o)	7 / 0**
CN>CL(o)	5 / 0*	DN(a<o)	10 / 0***
DN>DL(o)	7 / 1*	DL(a<o)	9 / 0**
Repression		**Appropriation**	
Comparison	exp / opp	Comparison	exp / opp
AN>CN(a)	12 / 0***	AN<BN(a)	10 / 0***
AL>CL(a)	11 / 0***	AL<BL(a)	12 / 0***
BN>DN(a)	10 / 0***	CN<DN(a)	12 / 0***
BL>DL(a)	10 / 1**	CL<DL(a)	12 / 0***
AN>CN(o)	12 / 0***	AN<BN(o)	11 / 0***
AL>CL(o)	11 / 1**	AL<BL(o)	12 / 0***
BN>DN(o)	6 / 0*	CN<DN(o)	12 / 0***
BL>DL(o)	8 / 1*	CL<DL(o)	12 / 0***

* significant at $p < 0.05$ (one-sided)
** significant at $p < 0.01$ (one-sided)
*** significant at $p < 0.001$ (one-sided)

We then apply the binomial test to these counts in order to obtain the significance level. Under the null hypothesis there is no systematic effect of the variable in question, and the difference we see in figure 2 is due to random variation. So we should observe about as many groups exhibiting the expected as the opposite effect. In the above example, getting eight groups out of nine showing the expected effect happens with a probability of less than 5%, so we can reject the null hypothesis for this effect. In all comparisons we observe more counts in the predicted than in the opposite direction. The binomial test rejects the null hypothesis of no effect for all but two comparisons at a one-sided significance level of 5% or lower.

Most of the effects that we see in figure 2 are also evident in the data for phase 1. Figure 3 shows the corresponding picture, structured in the same way as figure 2.



	AN	AL	BN	BL	CN	CL	DN	DL
"acc" rcvd	0.42	0.30	1.00	0.94	0.08	0.18	1.00	0.57
"opp" rcvd	0.62	0.53	0.97	0.84	0.43	0.39	0.96	0.93

Figure 3

Note: "acc" rcvd stands for when a Citizen has received a message from his neighbours saying "I intend to accept the Governor's policy." "opp" rcvd stands for when a Citizen has received a message from his neighbours saying "I intend to oppose the Governor's policy".

Opposition rates are much higher after policies with an unequal payoff distribution (B and D) than after the egalitarian allocations (A and C). Further, at least in the scenarios with the policies A and C, having received an "I oppose" message increases the propensity to make an "I oppose" decision. We cannot identify such a clear pattern for the effect of repression if a revolt fails. However, it should be noted that some of these bars represent very few data points, such that random sampling variation might explain the absence of effects. For example, it happened only three times that the Governor chose the DN policy and a subject received a "we accept" message. Thus, although the picture is less clear in phase 1, we do not find statistically significant effects that contradict or negate the previous findings.

Figure 4 shows how the frequencies of "I oppose" decisions translate into successful revolutions, pooled for all rounds from both phases except the last round. As one would expect from the previous analysis, Governors rarely survive another term when they decide for very unequal allocations. All instances in which BN or DN were chosen ended in a successful revolution, as did the clear majority of BL or DL. Revolutions against AL, CN, and BN – egalitarian policies that include some form of repression – are rare. Interestingly, Governors choosing the AN policy, which can be seen as the most benevolent of all policies, are overthrown in almost half of all cases.

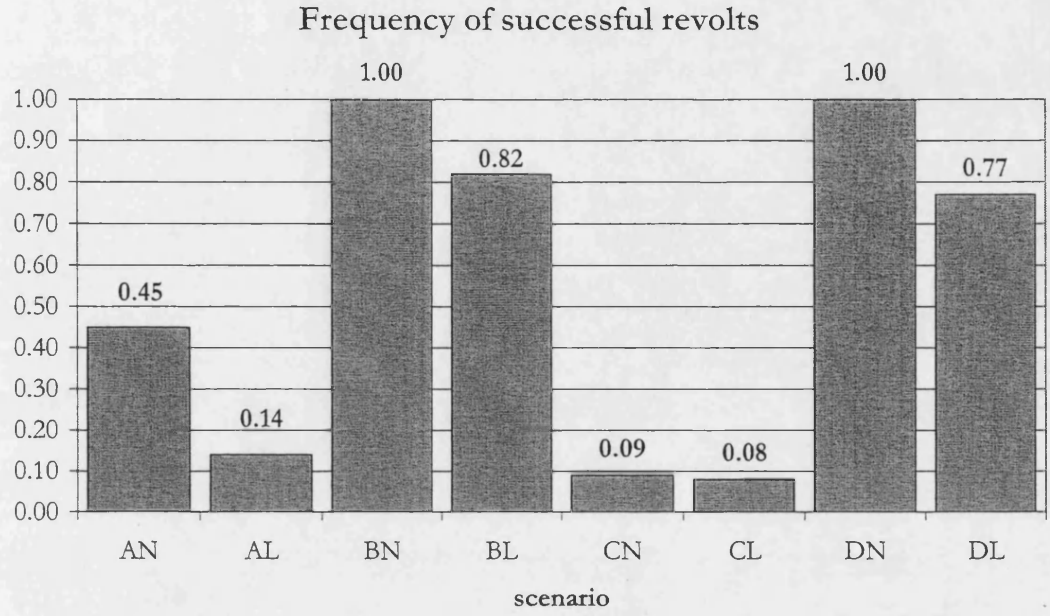


Figure 4

We can now complete the picture by relating these findings to the results from the survey data analysis presented in section 1. We find that the appropriation of the country's resources (proxied by the feeling by individuals that the government operates in the interest of the few in the empirical analysis) has an unambiguous effect on revolutionary preferences as well as actions. Individuals do not only become more willing to oppose, but they also engage in active opposition, as the experimental data show. Freedom of communication and political repression have opposite effects in the two data sets. Restrictions in both dimensions of freedom trigger stronger revolutionary preferences, but stronger preferences do not translate into more revolutionary action. While individuals in a more repressive environment have a stronger taste for revolt, the fear of negative consequences makes them less willing to actually engage in opposition. Table 4 summarises the effects.

Table 4: Effects on revolutionary preferences and actions

	Preferences	Actions
Appropriation	+	+
Freedom of communication	–	+
Repression	+	–

3.2 The Citizens' communication behaviour

The Citizens' decision to communicate their intention to revolt follows a pattern similar to that of actions of revolt, highlighting again the problem of the failure of collective action. Figure 5 shows the frequency with which the Citizens have sent the message "I intend to oppose the Governor's policy" to their neighbours. This figure comprises the data from the rounds with strategy elicitation (phase 2) except the last round.

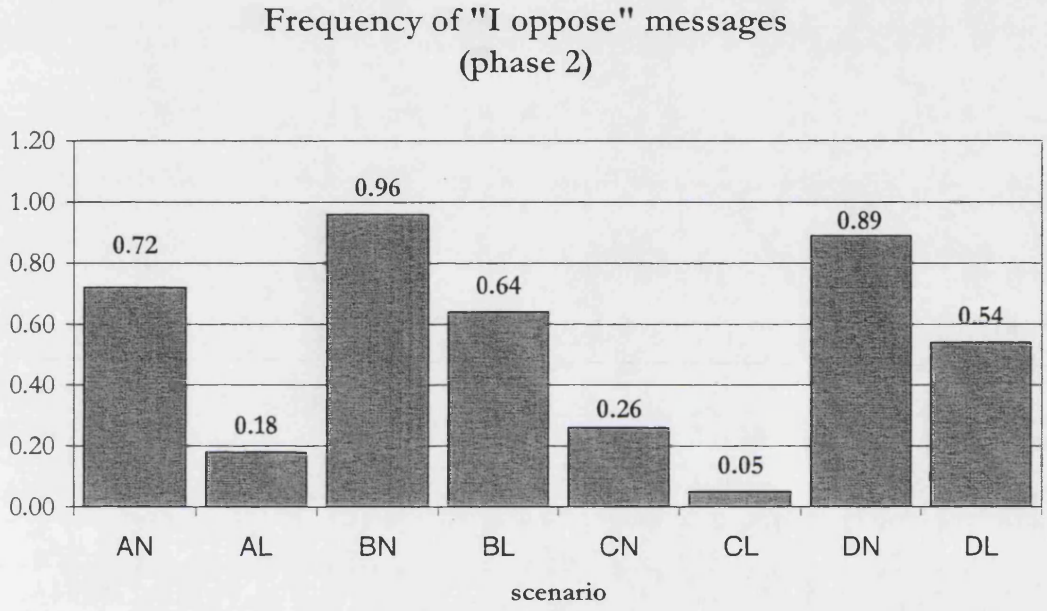


Figure 5

We can see that restrictions of freedom to communicate (i.e. activating the lottery) discourage Citizens from sending messages of the "I oppose" type, as indicated by the fact that in each scenario the bar with no lottery is higher than the one with the lottery. Comparing the frequencies under A versus B, as well as under C versus D, it appears that the Governor's non-egalitarian allocation of resources increases the frequency of such messages. The lower opposition that we observe in scenarios with high punishment for revolutionaries (C and D) as compared with the more lenient ones (A and B) are in line with the result we observed on actions.

Table 5 shows that all the differences except two are significant at least at the 5 percent level. The method is analogous to the one used in table 3. We compute the frequencies for the independent observations separately and we apply the binomial test to check for statistical significance.

Table 5: Significance of effects on the propensity to send an "I oppose" message

Freedom to communicate		Repression		Appropriation	
Comparison	pred / rev	Comparison	pred / rev	Comparison	pred / rev
AN>AL	12 / 0***	AN>CN	12 / 0***	AN<BN	10 / 0***
BN>BL	12 / 0***	AL>CL	7 / 1*	AL<BL	11 / 0***
CN>CL	8 / 0**	BN>DN	7 / 2^{+}	CN<DN	12 / 0***
DN>DL	12 / 0***	BL>DL	9 / 3^{+}	CL<DL	12 / 0***

+ weakly significant at $p < 0.10$ (one-sided)
* significant at $p < 0.05$ (one-sided)
** significant at $p < 0.01$ (one-sided)
*** significant at $p < 0.001$ (one-sided)

3.3 The Governors' policy choices

To conclude the analysis of the experimental results, we report the Governors' choices in the first stage of the game. Figure 6 shows the frequencies with which the possible policies have been chosen. Since the two phases are not different for the Governors, we pool the data for all rounds of the experiment except for the last one.

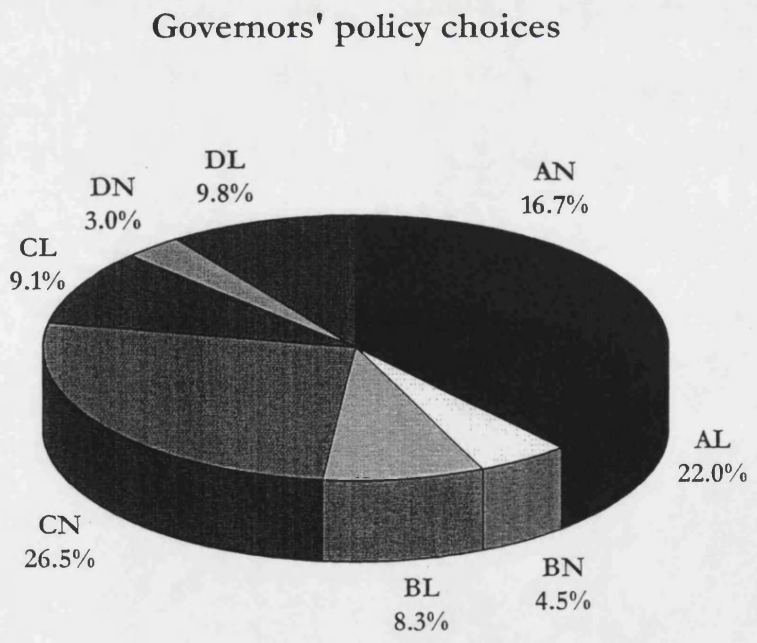


Figure 6

Two interesting facts emerge. First, the choice of egalitarian policies (A and C) far outweighs the choice of selfish ones by about three to one. The previous analysis of the

Citizens' behaviour indicates that the non-egalitarian choices are largely unsuccessful in our experiment, as Governors survive for another term only in a few cases. Second, even Governors choosing an egalitarian policy tend to protect themselves with some form of repression, either by activating the lottery (AL), by setting a punishment for opposition (CN), or both (CL). It seems that the fear to be overthrown prevails even when they choose a rather benevolent policy. The previous analysis has shown that this fear is not without reason: recall that Citizens rebelled against the AN policy (egalitarian allocation of resources with no repression and no limits to freedom of communication) in about half of the cases, making this choice very risky for Governors who wish to stay in power.

4 Conclusion

This study aims at identifying potential factors that contribute to the likelihood of revolutionary outbreaks in non-democratic countries. We are particularly interested in disentangling the relationship between revolutionary preferences (what makes people want to revolt) and revolutionary actions (what actually makes them revolt). This paper aims at contributing to solve this puzzle with a novel empirical approach. We use a combination of econometric analysis of survey data and the design of a laboratory experiment. Econometric analysis allows us to study the determinants of revolutionary tastes, but cannot extricate how these preferences turn into action. In the laboratory revolutionary actions can be observed directly. We set up a controlled environment that allows us to look at the influence of a particular variable while keeping everything else constant. The combined analysis shows that both revolutionary preferences and actions are exacerbated by the government's "selfishness". Restrictions to freedom of communication as well as political repression, however, work in different ways on preferences and actions. Freedom restrictions raise preferences for revolt but the likelihood of actual revolts decreases. This is the step that highlights the collective action problem inherent to rebellion. Though people would be willing to rise up, they need to co-ordinate their behaviour, which is impeded by the fear of the negative consequences. The experimental data lead us to additional insights. Even benevolent autocratic governors face a severe threat to be forced out of power and tend to protect themselves with some form of repression. This indicates that up to some extent revolts can arise because citizens attempt to seek power themselves.

These findings have their limits. Being the first experimental study on revolutionary action, the model is kept simple and has to sacrifice some of the detail of real life. Field data have the advantage of being gathered in real life, but they suffer from noise, identification problems, and lack of control. The laboratory, on the other hand, allows the set up of a controlled environment in which individual factors can be tested while keeping all others constant. Endogeneity problems do not arise. However, the data are gathered in an artificial environment, which inevitably raises the issue of external validity.

Another limit is that the experiment identifies only qualitative effects of the relevant variables. The magnitude of these effects is bound to depend on the strength of the relative incentives. In the experiment those parameters were invented so we cannot derive stringent quantitative predictions. Hopefully future research will help shed light on the relative size of these effects. The effects may also be affected by the fact that the experimental game is naturally played on a rather small scale, with stakes being relatively low. Previous evidence suggests that the qualitative effects observed in experiments are generally robust to transformations into environments with even very high stakes (Slonim and Roth, 1998, Fehr, Fischbacher, and Tougareva, 2002). So despite the small scale, the results should be informative for many political situations in question. The parallelism between the experiment and the real-world scenario may find its limits when the revolt turns into an open military conflict and the choice of behaviour becomes a question of life or death. Nevertheless, we have observed cases in history in which citizens forced their government out of office by means of civil disobedience, as it happened, for example, in the Eastern European revolutions of the late eighties and in the three recent cases discussed in the introduction.

Despite these limitations, laboratory experiments can provide useful insights in the study of civil conflicts, both in gathering empirical data as well as testing theoretical models. The combination of field and experimental data seems to bear a fruitful approach. The methods are complementary and one method's weaknesses are the other's strengths. Together they can lead to deeper insights into the factors driving conflict and co-operation, shifting from the traditional study of aggregate variables at the macro-level to a more detailed microeconomic-founded analysis of how political and economic changes affect the behaviour of individuals.

In addition, our results can be relevant to a broader range of issues. The potential for dissent is inherent to all forms of organised group with decisions taken by a leader and

applying to a number of members. Conflict can arise over wages, working conditions, or a company's management. Examples are the forced resignation of Michael Eisner from being chairman of Walt Disney in 2004 or the shareholder rebellion at Eurotunnel in 2003. Dissent between players and the coach in team sports can lead to the forced resignation of the latter. In much the same way as our "governor", some companies set up mechanisms that limit individual rights. For instance, a company may refuse to employ workers organised in a union to curb workers' ability to go on strike.

Appendix 1: Survey data

World Values Survey

Three waves are available (1981-83, 1990-93, 1995-97) but only the second and the third can be used in this analysis because of shorter time series on the macro data. In total, 64 independent countries have been surveyed in at least one wave of this investigation. The set of countries and years covered by this analysis is: Argentina 1995, Armenia 1997, Australia 1995, Azerbaijan 1996, Bangladesh 1996, Belarus 1996, Brazil 1997, Canada 1990, Switzerland 1996, Chile 1990 and 1996, China 1990, Colombia 1997, Czech Republic 1990, Dominican Republic 1996, Spain 1990 and 1995, Estonia 1996, Finland 1996, Georgia 1996, Ghana 1995, Croatia 1995, India 1990 and 1996, Japan 1995, South Korea 1996, Lithuania 1996, Latvia 1996, Moldova 1996, Mexico 1990 and 1996, Nigeria 1990 and 1995, Norway 1996, Peru 1996, Poland 1997, Russia 1995, Sweden 1996, Turkey 1990 and 1996, Taiwan 1995, Ukraine 1996, Uruguay 1996, United States of America 1990 and 1995, Venezuela 1996, Serbia 1996 and South Africa 1996.

Data definitions and sources

Preference for Revolt?: A dummy variable that equals 1 when the survey respondent answers a question on his attitudes to society by saying that *"The entire way our society is organised must be radically changed by revolutionary action"*, and equals 0 when the respondent answers either that *"Our society must be gradually improved by reforms"* or that *"Our present society must be valiantly defended against all subversive forces"*. The source is the World Values Survey. The share of people who state a preference for revolution in the sample is 11.4 percent, the share of "reformists" is 72.9 percent and the share of "conservatives" is 15.70 percent (based on the sample of 52,616 individuals used in this analysis).

Country Run for the Few: A dummy variable equal to 1 when respondent agrees with the 1st answer to the question: "Generally speaking, would you say that this country is run by a few big interests looking out for themselves, or that it is run for the benefit of all the people? 1. Run by a few big interests 2. Run for all the people". The source is the World Values Survey.

Political Rights: An index from *Freedom House* measured on a one-to-seven scale with 1 being assigned to the least free countries and 7 to the most free.

Press Freedom: An index from *Freedom House* measured on a one-to-three scale with 1 being assigned to the least free countries and 3 to the most free.

GDP per capita: The level of GDP per capita in constant 1992 US$, measured in logs and in PPP, from the World Development Indicators of the World Bank.

Personal Income Position: A set of 10 dummy variables that represent the income position of the individual on the country's scale. The baseline category used in the regressions is the lowest one. The source is the World Values Survey.

Unemployed: A dummy variable equal to one when the respondent is unemployed. The source is the World Values Survey.

Age dummies: Adult (26-50 years old) and *Old* (51 years old and over). The baseline category used in the regressions is *Young* (25 years old and younger). The source is the World Values Survey.

Male: A dummy variable taking the value 1 if the respondent is a man and 0 if a woman. The source is the World Values Survey.

Table 6. Summary statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Preference for Revolt?	52,616	0.114	0.318	0	1
Country Run for the Few	52,616	0.715	0.451	0	1
Political Rights	52,616	5.224	1.790	1	7
Press Freedom	52,616	2.298	0.781	1	3
GDP per capita	52,616	8,443	7,366	748	25,644
Personal Income Position	52,616	4.719	2.648	0	10
Unemployed	52,027	0.072	0.258	0	1
Adult	50,225	0.545	0.498	0	1
Old	50,225	0.252	0.434	0	1
Male	52,560	0.503	0.500	0	1

Appendix 2: Written instructions for the experiment

General information

We thank you for coming to the experiment. The purpose of this session is to study how people make decisions in a particular situation. During the session it is not permitted to talk or communicate with the other participants. If you have a question, please raise your hand and one of us will come to your desk to answer it. During the session you will earn money. At the end of the session the amount you have earned will be paid to you in cash. Payments are confidential, we will not inform any of the other participants of the amount you have earned. In the following, all amounts of money are denominated in talers, the experimental currency unit.

There are sixteen participants in this session. They are divided into two groups of eight participants. These two groups play completely independently. The composition of the two groups remains the same throughout the experiment. You do not know which of the other participants are in your group.

The experiment consists of two phases. In both phases you will interact with other participants according to the rules described below. These rules are exactly the same in both phases. The phases differ in that in the second phase you will be asked to make decisions for every possible situation you can be in, before the decisions are carried out.

The first phase consists of nine *rounds*, the second phase consists of three rounds of the same decision situation. Each round is structured as follows.

The decision situation

There are two types of players in this game: One Governor and seven Citizens. In the first round of the session, the Governor is drawn randomly.

Each round consists of three stages. At the first stage the Governor chooses a policy. At the second and third stage, the Citizens each make a choice between two alternatives. In particular, the decision the Citizens make at the third stage involves choosing either to oppose or to accept the Governor's policy. The outcome of the round is affected by the number of Citizens who have opposed. If fewer than five Citizens have opposed, the outcome is different from the case that five or more Citizens have opposed. This is explained below in more detail.

Stage 1:

At the first stage, the Governor makes two decisions. First, he chooses one out of four *policies*. Each policy provides a payoff for the Governor himself and each of the Citizens, distinguishing between different possible outcomes of the third stage. The policies the Governor can choose are as follows.

Policy	Round payoff for Governor if fewer than 5 Citizens oppose the policy	Round payoff for a Citizen if fewer than 5 Citizens oppose the policy		Round payoff for a Citizen if 5 or more Citizens oppose the policy	
		...if the Citizen accepts the policy	...if the Citizen opposes the policy	...if the Citizen accepts the policy	...if the Citizen opposes the policy
A	7	6	5	5	7
B	28	3	2	5	7
C	6	6	0	5	7
D	27	3	0	5	7

If five or more Citizens oppose the policy, the Governor's payoff is zero. This is so for all policies the Governor may have chosen.

Second, the Governor decides whether or not to activate the deduction lottery (see below). Activating the deduction lottery decreases the Governor's payoff by 1 taler.

Stage 2:

At the second stage, each of the Citizens can send a message to another Citizen. The message consists of one of the following statements:

"I intend to accept the Governor's policy" or

"I intend to oppose the Governor's policy"

Each Citizen sends a message to one other Citizen, and receives a message from a Citizen that is different from the one he/she sends a message to. More details are explained later.

Deduction Lotteries:

If the Governor has activated the deduction lottery, then for each Citizen who has sent the message "I intend to oppose the Governor's policy at stage 3" a lottery is played out. With a probability of 20%, 3 talers are deducted from this Citizen's round payoff. For those players who have sent the message "I intend to accept the Governor's policy at stage 3", no lottery is played out and no deductions are made. Further, if the Governor has not activated the deduction lottery, no lottery is played out and no deductions are made.

Stage 3:

At the third stage each Citizen chooses between two options: to **accept** or to **oppose** the Governor's policy.

If fewer than five Citizens oppose the policy, then this has the following consequences:

- The payoff distribution as implied by the Governor's policy is implemented.
- In the next round, the Governor retains the role as Governor.

If five or more Citizens oppose the policy, then this has the following consequences:

- The Governor receives a payoff of zero. Each Citizen who has accepted the policy receives 5 talers, each Citizen who has opposed the policy receives 7 talers.
- In the next round, the Governor becomes a Citizen, and a new Governor is selected randomly among those Citizens who have opposed the policy.

The phases

Phase 1:

In the first phase, nine rounds of the game described above are played, each according to the same rules. At the first stage, the Governor chooses an allocation. The Citizens are told which allocation the Governor has chosen, and send their messages at the second stage. They are then told which message they have received from the other Citizen, and proceed to stage 3. At the end of the round, they are informed about the outcome of the round.

Phase 2:

In the second phase, three rounds of exactly the same rules are played. In this phase, however, the Citizens must make all decisions for stage 2 and 3 at the very beginning of the round.

Imagine you have to play this game some other time, but you cannot be present in person. Thus, you send an agent who carries out all decisions according to your precise instructions. This agent must know which message you will send for each of the four possible policies that the Governor

may choose, each combined with the case for whether or not the Governor has activated the deduction lottery. Thus, you need to make 8 choices for stage 2.

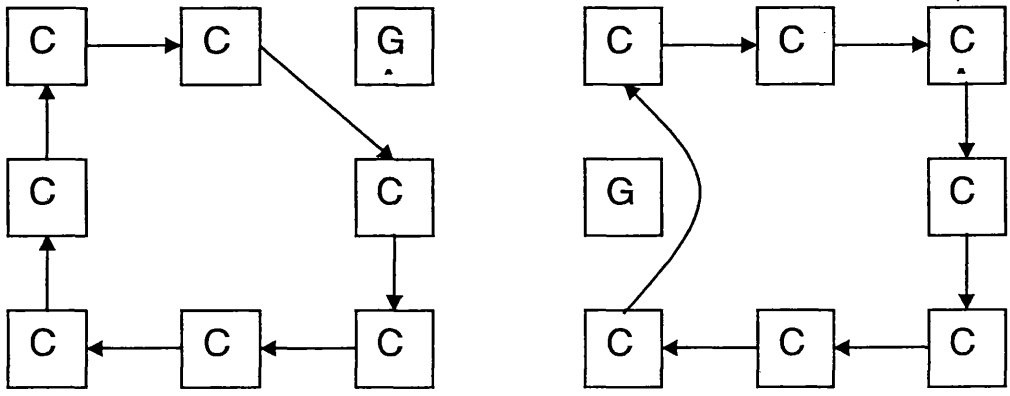
For stage 3, the agent must know whether you accept or oppose the policy, for each of the possible scenarios you may find yourself in at stage 3. There are between 16 and 24 such scenarios: Again, the Governor may have chosen four different policies, have or have not activated the deduction lottery, and in each of these eight cases you may have received an "I intend to accept the Governor's policy at stage 3" or an "I intend to oppose the Governor's policy at stage 3" message from the other Citizen. For some of the cases additional cases have to be considered. This happens when the Governor has activated the deduction lottery, and you have sent the message "I intend to oppose the Governor's policy". Then a lottery is played out determining whether or not 3 talers are deducted from your round payoff. For each of the two outcomes you need to specify separately whether you choose to accept or to oppose the Governor's policy. The computer will automatically select those scenarios that are relevant to you given your choices, and request your decision one after the other.

Further information

For stage 2 of the game (when the messages are sent) the eight players of a group are connected like on a circle.

Each Citizen sends a message to one neighbouring Citizen and receives a message from the other neighbouring Citizen.

The positions on this "circle" remain the same throughout the experiment. Thus, each Citizen sends messages to the same Citizen and receives messages from the same Citizen, with one exception: If the Governor is exchanged because five or more Citizens have opposed the policy in a given round, then the connections are reinstalled as illustrated below.



The left hand size shows the flow of messages in a given round. The player on the top right corner is Governor in this round. The arrows depict who is sending a message to whom.

Now suppose in some round five or more Citizens have opposed the policy. Therefore, the previous Governor becomes a Citizen, and a new Governor is drawn randomly, in this example the middle left player. The direction in which messages are sent is reinstalled in a way that all players retain their positions on the circle, but the respective Governor is skipped.

Notice that the "circle" is merely figurative and does not in any way correspond to the seating in the laboratory!

Payoffs

You start with an initial capital of 15 talers to which your round payoffs are added. At the end of the session the talers are converted into Sterling at an exchange rate of 20p per taler.

Conclusion

The study of the interaction between economics and institutions is increasingly important but still lacks substantial empirical testing. The purpose of this work is to contribute to the understanding of the determinants of well-being and instability across countries. In particular, I have analysed how the preferences and actions of individuals respond to economic and institutional changes.

Using various tools of analysis, program evaluation techniques, econometrics and experimental economics, I have explored in the four chapters how restrictions of individual rights affect the wellbeing of individuals. Wellbeing is a concept which can take many facets. In the first and second chapters I use measures of self-reported life satisfaction, level of education achieved, participation into the labour market and income attained. In the third and fourth chapters I use self-reported measures of satisfaction with the society the person lives in, of the willingness to change it and of actual actions taken to change it. The first chapter explores whether granting women individual rights affects their welfare as well as their investment in human capital and in the labour market in Europe. The second chapter confronts the estimates from European countries with those from India and find different results. The third and fourth chapters examine how restrictions to political and civil rights affect attitudes of unrest, whether this effect is exacerbated by living in a fast or slow-growing country, and, if any, which pattern of actions of revolt is likely to emerge.

The main finding is that restrictions to individual rights strongly affect the efficiency of individual choices and decrease wellbeing. This has important economic repercussions. When the rights of individuals are restricted, people invest less in human capital, participate less to the labour market, receive lower wages, and express attitudes of unrest. Under some conditions, restrictions of individual rights motivate the individuals

to revolt against the society they live in. Although these results appear intuitive to some extent, the added value of this analysis is that it specifies a complete, coherent and causal chain from institutional and economic changes to individual attitudes and actions. It links micro and macro factors in the framework of a positive behavioural model of what agents do when the institutional environment changes. The outcome is that some assumptions on behaviour that seem intuitive are supported in the data and some are not. For instance, we find that among the bundle of parity rights granted to reduce female discrimination, birth control rights increase welfare, maternity benefits are neutral and no-fault divorce rights actually decrease it. However, we also find that for rights to have an effect, individuals need to have actual access to them. We find that although individuals dislike both corruption and the repression of political rights, they are more motivated to revolt when they face corruption than when they face repression. We did not know this a priori, although we can understand it as part of the wider problem of the failure of collective action (repression increases the individual cost of revolutionary action, thus in equilibrium it lowers the effort devoted to the action itself).

Using real world data with statistical testing also allows us to define trade-offs in quantitative terms. For example, we find that birth control rights increase the likelihood to achieve a high life satisfaction by 1.5 percent. This can be then evaluated against the return from alternative available policies. Furthermore, in chapter 3 we compute the marginal rate of substitution between democratisation and GDP growth that would on average keep revolutionary support constant. We find that one standard deviation decline in *Democracy* would have to be compensated by an increase in the GDP growth rate by 14 percentage points. For example, the growth rate would have to rise from 0% to 14% per annum in order to keep the proportion of people wanting a revolt unchanged in the face of a loss of *Democracy* of this magnitude. We can conclude that although it is possible to fully compensate individuals for a loss of democratic rights, it requires rates of economic growth that are hardly sustainable over time.

We know from the previous literature that countries with better economic and political institutions in the form of secure property rights, non-distortionary policies and competitive political processes tend to invest more in physical and human capital, use these factors more efficiently and achieve a greater level of income (Acemoglu, Johnson and Robinson, 2001). It appears that individual rights are an important part of the general framework of "good governance". As much as property rights are needed for an

efficient market to develop, freedom of choice is necessary for the individuals to achieve the most efficient allocation of resources. Among institutions, individual rights can be considered as the political counterpart of economic competition in creating stability and efficiency. When individual rights are restricted, rising dissatisfaction can threaten the stability and the security of property rights. The results found are relevant to a broader range of issues. Dissatisfaction and conflict can arise in many domains, over wages, working conditions, or company management. These findings lead us to conclude that, similarly to what happens with the use of economic resources, it is most efficient to decentralise political rights and allow individuals to make choices responding as much as possible to their own incentives. Restrictions of individual rights introduce distortions to an efficient allocation of resources in the same way as tariffs do.[1]

This research has also shown that we can devise methodologies to map the effects of macro events in a country to changes in the behaviour of its citizens. First, learning about preferences can help disentangle the role of individual incentives from that of external opportunities and constraints in collective action. Understanding how wellbeing is affected allows us to build a measure of the stability and the potential for unrest within a country. This can contribute to our understanding of why some countries enjoy social cohesion and stability and some do not. Second, the study of survey data coupled with laboratory experiments can provide useful insights in the study of how society evolves. The two methods are complementary in the sense that the first brings the validation with real life data and the other the rigour of the controllability of the environment under test. Together they can lead to deeper insights into the factors driving conflict and co-operation, shifting from the traditional study of aggregate variables at the macro-level to a more detailed microeconomic-founded analysis of how political and economic changes affect the behaviour of individuals.

Finally, an original contribution of this thesis is to enrich the study of public economics of an additional tool, i.e. the scientific analysis of data on preferences as part of welfare analysis. Using self-reported indicators of wellbeing allows us to quantify more precisely the welfare effect from a policy on the individuals affected. Once it is known which individuals within a country were "exposed" to a certain policy, we can confront their self-declared welfare with that of individuals not affected by the policy. Since surveys on

[1] This holds if there are no significant spillovers involved, which are very limited in the rights analysed here.

preferences also include many personal characteristics (income, gender, education and others), by computing differences-in-differences effects we can closely identify the effects of the policy on certain groups of individuals, as defined by a combination of their demographic data.

Each chapter has suggested interesting extensions. In particular, two strands emerge as a promising agenda for future research: using new empirical methods focusing on individual preferences to understand how a status quo bias arises for specific reforms, i.e. why Pareto-improving reforms often fail to be adopted (Rodrik and Fernandez, 1991, Rodrik, 1993), and analysing the way institutional change is initiated and evolves.

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21 January 2005

I declare that the work presented in this thesis is my own except where the collaboration with coauthors is explicitly acknowledged.

Silvia Pezzini

I agree with the above statement.

Timothy Besley

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10 November 2004

To whom it may concern:

I have worked with Silvia Pezzini on the paper "The role of freedom, growth and religion in the taste for revolution", which forms chapter 2 of her PhD thesis. I declare that we have worked equally on the paper, conducting the whole analysis together at every step.

Kind regards,

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I agree with the above statement

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London

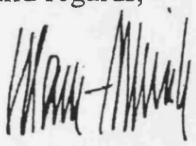
8 November 2004

To whom it may concern:

I declare that I have worked with Silvia Pezzini on the paper "Determinants of Revolt: Evidence from Survey and Laboratory Data", which forms chapter 3 of the PhD thesis that she has submitted to the University of London.

I also declare that we worked equally on the paper, conducting both the econometric and the experimental analysis together and discussing the research design and development at every step.

Kind regards,



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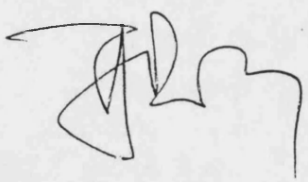
I agree with the above statement



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