

The London School of Economics and Political Science

The Political Economy of High Skills: Higher Education in Knowledge Societies

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Declaration

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Abstract

A successful transition into the knowledge economy is said to depend upon higher level skills, creating unprecedented pressure on university systems – as they expand across countries – to provide knowledge-based labour markets with the skills needed. But what are the political economy dynamics underlying national patterns of high skill formation? This thesis argues that existing theoretical approaches are not well-suited to answer the question: ideational and structuralist frameworks downplay persistent national differences, while institutionalist accounts assume that national differences rest upon the very lack of higher education expansion in some countries, downplaying the cross-national trend of higher education expansion. The thesis proposes a framework that accounts for distinct national trajectories of high skill formation within the convergent trend of higher education expansion. In particular, two crucial variables are identified to theorise the relationship between higher education systems and knowledge-based labour markets: (i) the predominant type of knowledge economy in a given country; and (ii) the degree of inter-university competition across different higher education systems. It is argued that the former explains what type of higher level skills will be sought by employers and cultivated by governments, while the latter helps understanding of why some higher education systems are more open at the outset to satisfy labour market demands compared to others, determining whether institutional change in a given higher education system is likely to be encompassing or marginal. Cross-national descriptive statistics and systematic process analysis across a set of diverse country case studies (Britain, Germany and South Korea) are used to test the theory. By highlighting the agency of universities, governments and businesses and by linking higher education policy with knowledge-based growth strategies, this thesis provides a theoretical and empirical contribution on processes of institutional change in higher education and on broader trajectories of institutional change across advanced capitalist countries.

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1 Introduction

Most advanced capitalist countries in the mid-1990s started transitioning towards knowledge-based economies, denoting “greater dependence on knowledge, information and high skill levels, and the increasing need for ready access to all of these by the business and public sectors” (OECD 2005, 28). Such transitions prompted significant processes of institutional change and realignment across major spheres of the advanced political economies (Thelen forthcoming, Ibsen and Thelen 2017, Thelen 2014, Hassel and Palier 2017, Iversen and Soskice 2015, Hall 2015, Baccaro and Howell 2017, Baccaro and Pontusson 2016). Institutions and policies that used to be central at times of industrial expansion, such as the industrial relations arena or consumption-oriented ‘passive’ social policies have been increasingly challenged by policy-makers (Baccaro and Howell 2017, Baccaro and Benassi 2017, Baccaro and Howell 2011, Iversen and Soskice 2015, Fleckenstein and Lee 2017, Culpepper and Regan 2014), who rather stressed the need for human capital formation over the life-course and, more broadly, investment-oriented ‘active’ social policies (Bonoli 2012, Bonoli 2006, Fleckenstein and Lee 2014, Fleckenstein, Saunders, and Seeleib-Kaiser 2011, Fleckenstein and Seeleib-Kaiser 2011, Morel, Palier, and Palme 2012, Hemerijck 2017, 2015, Esping-Andersen et al. 2001, Nikolai 2012, Ibsen and Thelen 2017).

One of the chief motivations behind policy-makers’ attempts to shift public and social policies ‘from consumption to investment’ has been to support the pursuit of the two following socio-economic objectives: “to cultivate the skills required for non-routine positions” and “to shift production toward high value-added links in the global supply chain” (Hall 2015, 26). Higher education has been identified across countries belonging to the Organisation for Economic Co-operation and Development (OECD) and beyond as a crucial policy area to achieve these objectives (OECD 2012a, 2008, Hall 2015, Schulze-Cleven and Olson 2017, Schulze-Cleven 2015, Regini 2011b). In this context,

governments and employers alike have been vocal advocates of an ever-closer alignment between higher education provision and labour market needs of knowledge-based sectors (Kottmann and De Weert 2013, De Weert 2011, Regini 2011b, OECD 2008). Yet, on both theoretical and empirical grounds, the relationship between higher education systems and knowledge-based labour markets remains for significant parts underspecified (Jakobi, Martens, and Wolf 2009) , leaving open a number of questions: how do policy-makers and business stir higher education systems to provide the high skills needed for countries to succeed in the knowledge economy? Why are national trajectories of high skill formation systematically different across advanced capitalist countries? And what analytical tools can be employed to understand the relationship between higher education systems and knowledge-based labour markets?

This introductory chapter sets out why these questions are important in the comparative analysis of contemporary advanced capitalist countries (section 1.1); it reviews existing literature theorising the dynamics underpinning the alignment between higher education systems and labour markets (section 1.2); it then moves on to show how existing theories – confronted with a set of empirical observations that cannot be easily accounted for – leave open a number of theoretical and empirical puzzles that this thesis seeks to address (section 1.3); finally, section 1.4 concludes the chapter by presenting the plan of the thesis.

1.1 Setting the socio-economic scene

Researchers on higher education policy have pointed to a number of prominent changes that have been taking place across university systems in the OECD world over the last two decades. One of the issues that in particular caught researchers' attention has been a shift in the balance of power between internal and external stakeholders in the higher education sector, whereby the latter have increasingly gained power vis-à-vis the former

(Regini 2011b, Amaral and Magalhaes 2002, Amaral, Jones, and Karseth 2002, Jongbloed, Enders, and Salerno 2008, Slaughter and Rhoades 2004, Slaughter and Leslie 1997, Slaughter and Cantwell 2012, Schulze-Cleven 2015). Internal stakeholders have been identified in the literature as those involved in the daily life of universities, namely: (academic and non-academic) staff and students (Amaral and Magalhaes 2002). External stakeholders, on the other hand, are actors that have an interest in higher education without being directly part of the higher education community, most prominently: governments, employers, tax-payers, and international organisations (Amaral and Magalhaes 2002). The role of governments has been particularly crucial in tipping the balance of power away from internal to external stakeholders. In the traditional Humboldtian and Newmanian¹ models of higher education that developed in 19th century Western Europe (Neave and Van Vught 1994, Bleiklie 1998, Neave and Rhoades 1987), the government acted as a guarantor of university autonomy from external stakeholders – *de facto* empowering internal stakeholders (Amaral and Magalhaes 2002). In contemporary higher education systems, governments take a decisively different role. They no longer seek to preserve universities' autonomy from external social and economic demands, but they are rather pro-actively incentivising university systems to respond to such demands (Amaral and Magalhaes 2002), and better aligning higher education provision with labour market needs has been a crucial demand that two powerful external stakeholders – governments and employers – have made on contemporary higher education systems across advanced capitalist countries and beyond

¹ These are commonly identified in the higher education literature as the historical models upon which Western European universities developed. Cardinal Newman, inspiring the British model of higher education, argued that the university was supposed to form a well-rounded person through a broad-based education, while the Humboldtian model, underpinning German higher education, aimed primarily at advancing scholarship and science (see e.g. Neave 1995, Zgaga 2009). Despite the differences underpinning the principles of the two models, both cases conform to a view of higher education as heavily geared towards 'internal' stakeholders.

(Sharma 2013a, b, 2014, 2012, Tolentino Frederiksen and Vuksanović 2013, MacGregor 2013, Humburg and van der Velden 2013, OECD 2012a, 2004, Dale 2005).

This trend started in the late 1960s and 1970s, when a first significant wave of expansion of higher education prompted fears of disconnect between higher education provision and labour market needs to which governments responded through the creation of a vocational and professionally-oriented sub-set of the higher education sector catering for labour market needs (e.g. polytechnics in the UK, universities of applied sciences in Germany and the Netherlands; see section 1.2 for details on this development). However, it was not until the late 1990s that systematic attempts to further universities' responsiveness to external socio-economic demands amounted to a 'change of paradigm' in higher education policy (Amaral and Magalhaes 2002, 11).

The growth of interest of external stakeholders in higher education in macro socio-economic terms is hardly surprising, given the steep expansion of university enrolments that all OECD countries have experienced over the last two decades, leading to a surge in interest from governments and employers on 'what' higher education systems deliver. On the side of governments, the massive expansion of higher education means that policy-makers "are expected to ensure that increasing public investment in higher education is justified in terms of the benefits accruing to the domestic workforce" (Tavoletti 2010, 361) and governments across OECD countries have promoted reforms to better align higher education provision with labour market needs (OECD 2008, Regini 2011b, Ballarino 2011, Kottmann and De Weert 2013, De Weert 2011).

Equally, employers have manifested a growing concern with the skills and competencies that graduates possess as higher education has rapidly become the locus where a *majority* of young people receive their initial education and training before entering the labour market (Warhurst 2008, OECD 2008). This holds true today even for those countries, such as Austria or Germany, where the bulk of initial training has

traditionally taken place in the domain of vocational education and training (e.g. the dual apprenticeship system) and the higher education system has historically accommodated a minority of each cohort of secondary school-leavers. Indeed, Continental European countries have been referred to in the literature as elite higher education systems (Ansell and Gingrich 2013, Ansell 2010, see also Baethge and Wolter 2015, and Powell and Solga 2011 on recent expansion and constraints to expansion respectively). In recent years, however, initial education and training, i.e. the last segment of education that young people receive before entering the labour market, has increasingly ‘moved up’ from the (post-) secondary to the tertiary level and *skill formation in higher education* has been gradually replacing skill formation in (post-) secondary vocational training.

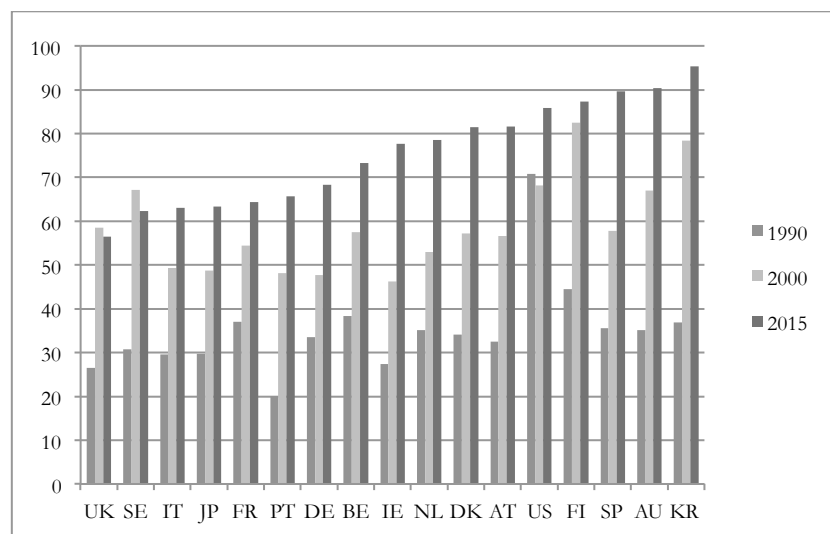
To clear a key definitional issue at the outset, it is instructive to spell out what is meant by skill formation and what is meant, specifically, by *skill formation in higher education* or *high skill formation*. The term skill formation, as used in the comparative political economy (CPE) literature, refers to the “*institutional set-up of education and training systems at the post-secondary educational level and its connections to labor market institutions such as collective wage bargaining and labor market policies*” (Busemeyer and Vossiek 2016, 151).

Yet, this definition has usually been employed to understand the relationship between the organisation of vocational training systems and labour market institutions, i.e. it focuses on *intermediate* skill formation. Narrowing down or, rather, transferring the concept of skill formation to the higher education sector, which is the phenomenon that this thesis is concerned about, I propose a re-interpretation of the above definition focused on skill formation in higher education as *the institutional set-up of a higher education system and its connection to the labour market, in particular those segments of the labour market that are reliant on high skills, such as high-tech manufacturing and high-end service*. In simpler terms, skill formation in higher education can be thought of as the alignment (or lack thereof) between the skills produced by higher education systems and the labour market. This

thesis is particularly interested in this phenomenon at the level of public-policy making and the ensuing patterns of institutional change, i.e. the chief focus of the thesis is on how governments, employers and universities interact to promote (or hamper) this alignment. The thesis does not focus on the individual-level transitions of graduates from higher education to the labour market, which is a topic that has been investigated at length elsewhere (see e.g. Leuze 2011, 2010, Schomburg and Teichler 2007, Kivinen and Nurmi 2003).

Figure 1.1 shows the spectacular rise in university enrolments that took place across most OECD countries highlighting how higher education, and therefore ‘high skill formation’, has become a defining feature of contemporary advanced capitalist countries.

Figure 1.1. Gross enrolment ratio in tertiary education² in selected OECD countries



Source: UNESCO (2017)

² The UNESCO defines gross enrolment rate (GER) as: “Total enrolment in a specific level of education, regardless of age, expressed as a percentage of the eligible official school-age population corresponding to the same level of education in a given school year” (UNESCO 2009, 9). GER is a measure subject to several criticisms, as aptly explained for instance in Ansell and Gingrich (2013, 209-210), but it is at the same time the only measure with wide cross-country availability that can provide reliable information on the ‘popularity’ of higher education in a given country, and as such it is also the measure that most comparative studies of higher education have used.

In the context of significant expansion, scholars and commentators noted that higher education has progressively shifted from an “idealistic position focused on the creation of knowledge” to “an increasingly instrumentalist position” (Charles 2003, 9) in which universities were asked to make an ever-growing contribution to national economic competitiveness (Schulze-Cleven and Olson 2017, Schulze-Cleven 2015, Reichert 2010, Prokou 2008, Capano and Piattoni 2011, Regini 2011b, Slaughter and Rhoades 2004, Slaughter and Leslie 1997).

Unsurprisingly, business associations have been strong advocates of a repositioning of higher education along these lines in Europe and beyond (Regini 2011b, van Santen 2014, Toens 2009, Witte 2006). Governments’ agendas have often been overlapping with those of businesses. Comparative accounts of policy initiatives and reforms aimed at bringing higher education closer to labour market needs show that governments have actively promoted the alignment of higher education provision with labour market needs, without substantive partisan distinctions (De Weert 2011, Kottmann and De Weert 2013, OECD 2008, Ballarino 2011).

Government orientation towards a more ‘practice-oriented’ higher education sector that sustains the supply of skills needed in the labour market has been intimately linked with the belief that success in knowledge-economies rests upon the availability of the optimal quantity and quality of high skills. Indeed, a defining feature of knowledge-based societies is to be found in the “greater dependence on knowledge, information *and high skills levels*” (OECD 2005, 28 emphasis added). In particular, the decline of employment in the traditional manufacturing sector and the rapid development of high-tech manufacturing and high-end services (Autor, Levy, and Murnane 2003, Oesch 2013) have placed education and skills policy high on the agenda of national and supra-national policy-makers (Olssen and Peters 2005, Marginson 2009, Marginson and Wende 2007, De Weert 1999). A knowledge-based labour market has been described as being in high

demand of analytical and generic skills (Mayer and Solga 2008), typically best delivered through higher education (Müller and Jacob 2008), which “has as its dominant goal the development of personality [...] and autonomy” as opposed to vocational training’s focus on “individual vocational competence and agency to carry out specific tasks” (Powell et al. 2012, 412). In this context, the vocational-specific skills that served well the purposes of industrial societies suffer from ‘inescapable weaknesses’ (Grubb and Lazerson 2006, 297) and are considered at major risk of becoming obsolete and losing importance vis-à-vis higher skills and social and cognitive skills (Morel, Palier, and Palme 2012). The intertwined development between ‘knowledge’ as an increasingly important ingredient of economic success and higher education as an increasingly important policy area is spelled out clearly in Ellen Hazelkorn’s analysis, where she notes that:

the positioning of knowledge as the foundation of economic, social and political power has driven the transformation of economies and the basis of wealth production from those based on productivity and efficiency to those based on higher valued goods and services innovated by talent. [...] This has placed higher education – a provider of human capital through education and training, a primary source of new knowledge and knowledge/technology transfer, and a beacon for international investment and talent – at the centre of policymaking. (Hazelkorn 2015, 9)

Hazelkorn’s assessment captures neatly what has been a prominent view in policy-making circles. For example, commenting on the changes in tasks and occupations triggered by an increasing use of ICT, the OECD Observer argues that:

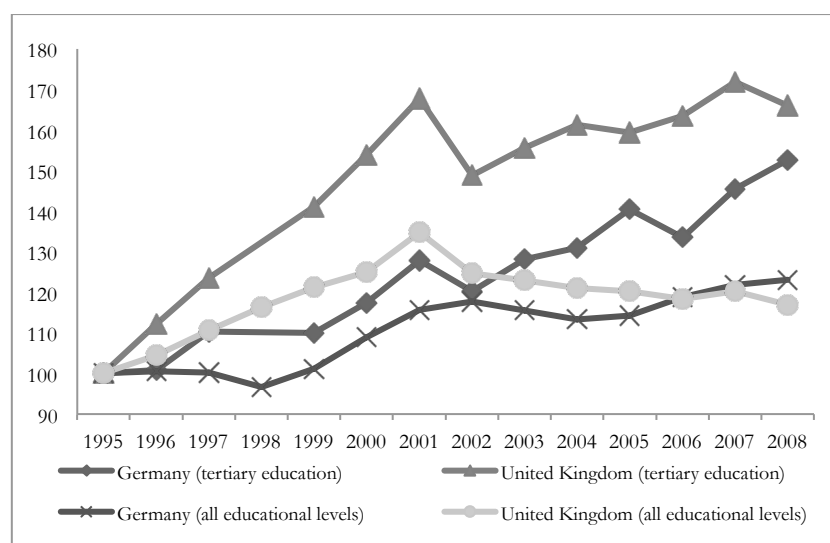
the new jobs enabled by digital technologies require different skills. Some of these skills are technical, such as software development, web management, etc., but others have little to do with technology. For

instance, higher frequency of digital information in firms calls for better planning and quicker responses, more cooperation across teams as well as stronger leadership. Marketing and selling over a social network require different skills than those involved in face-to-face sales. (Spiezia 2016)

In short, as put it by senior OECD analysts: “higher education [...] trains the highly-skilled workers and contributes to the research base and capacity for innovation that determines competitiveness in the knowledge-based global economy” (Vincent-Lancrin and Kärkkäinen 2009, 13).

In a systematic analysis of the interconnections between different growth regimes and the policies and institutions supporting them across advanced capitalist countries, Peter Hall shows, starting from the mid-1990s, parallel moves towards a knowledge-based growth regime in which governments showed growing concerns for education and skills policies which were seen as crucial ingredients to successfully compete in high-end sectors in the global supply chain (Hall 2015, 26). Consistently with the trend illustrated in figure 1.1, Hall further argues that in pursuing knowledge-based growth “many governments have devoted more resources to education; and rates of tertiary education have increased substantially across the OECD since 1990” (Hall 2015, 29). The parallel moves across countries towards knowledge-based growth regimes is exemplified by the trend reported in figure 1.2, which takes Germany and the UK, two countries commonly referred to in the literature as most different, and shows that both countries have experienced significant growth in employment in knowledge-intensive (manufacturing and service) sectors. A breakdown by educational attainment further highlights that in both countries employment in knowledge-intensive sectors of those with tertiary education (the two top lines) has significantly outpaced the growth of employment across all educational levels (the two bottom lines).

Figure 1.2. Increase in employment in high technology sectors³ by educational attainment in Germany and the United Kingdom (1995 = 100)



Source: own calculations based on Eurostat (2013)

But how do governments cultivate the high skills required to thrive in knowledge-based economies and ensure that the supply of high skills is in line with the demands of knowledge-based labour markets? As we turn to this question, we come across a curious *misalignment* between, on one hand, the significant emphasis placed on this issue by policy-makers as well as the vivid scholarly attention to the transition of advanced capitalist countries into the knowledge economy and, on the other hand, a lack of theorisation and empirical investigation of the dynamics behind the relationship between higher education systems and labour markets (Jakobi, Martens, and Wolf 2009) . The next section reviews the existing literature on the topic. It outlines why it comes up short of convincing explanatory frameworks to understand the alignment between higher education and knowledge-based labour markets, leading up to the theoretical and empirical puzzles that this thesis seeks to address.

³ These include high-technology manufacturing and knowledge-intensive high-technology services according to the classification detailed in Eurostat (2016).

1.2 A review of the literature

This section reviews existing theories that seek to explain the alignment between higher education and the labour market. Borrowing Craig Parsons' taxonomy (2007) as an organising principle, explanations based on structural, ideational and institutional factors will be reviewed in turn.

Structuralist explanations: higher education expansion and horizontal differentiation

The issue of how higher education systems align with labour market needs was first tackled by the educational literature of the 1970s. Structuralist explanations were prominent in this period. A particularly useful starting point in this respect is the seminal work by Martin Trow (1976, 1972, 1974), who analysed the process of 'expansion and differentiation' that was taking place in the 1970s across North American and Western European university systems. He focused in particular on the critical threshold of 15% of the relevant age cohort entering higher education, which he identified as the upper-bound of elite higher education systems (Trow 1976, 1974). As enrolments grew above the 15% threshold and therefore university systems were no longer elite systems, Trow theorised that two mechanisms of transformation of higher education systems would be set in motion:

One of these is the expansion of the élite universities – the growth of traditional university functions in traditional, if somewhat modified, forms of universities. The other is the transformation of élite university systems into systems of mass higher education, performing a great variety of new functions (at least new to universities) for a much larger proportion of the university age group. Up to the present, in Britain as on the Continent, growth has mainly been by expanding the élite university system. But the old institutions cannot expand indefinitely;

they are limited by their traditions, organization, functions and finance. In European countries, it is likely that an increase in enrollment in higher education beyond about 15% of the age grade requires not merely the further expansion of the élite university systems, but the development of mass higher education through the growth of popular non-élite institutions. (Trow 1972, 63-64)

In creating the conditions for a higher education system that was becoming more and more sizeable, labour market considerations played a prominent role. The policy translation of what Trow predicted as developing higher education beyond elite institutions was the establishment of vocationally-oriented universities in the 1960s and 1970s across a number of advance capitalist countries, such as the Polytechnics in Britain, the *Fachhochschulen* in Germany, the *hogescholen* in the Netherlands (Teichler 1998, Kyvik 2004). Research on the Dutch case, for instance, showed that the rationale for the establishment of vocationally-oriented universities in the context of expansion was that this type of institution “provided the kind of orientation perceived as beneficial to the growth of the Dutch economy” (Goedegebuure 1992, 59). Similarly, in the case of the establishment of the British Polytechnics, the then Minister responsible for higher education policy highlighted that “we live in a highly competitive world in which the accent is more and more on professional and technical expertise” which called for “a first class professional training” (Pratt 1992, 33-34). The British government, as expected by a theory of expansion and differentiation, explicitly linked higher education expansion with the establishment of vocationally-oriented higher education institutions as they committed “to an even greater expansion of higher education [...]” to be met by “developing ‘a distinctive sector of higher education’ to ‘complement’ the universities and colleges of education” (Pratt 1992, 33-34). The establishment of *Fachhochschulen* in Germany, later renamed universities of applied science, also fitted this model. This

development has been interpreted precisely “as an indicator of the value which politicians and employers place on a vocational emphasis” for higher education (Kehm and Teichler 1995, 408).

The broader theoretical point emerging from the structuralist stream of literature is captured by Norton Grubb, who identified what he calls ‘vocationalism’ as a crucial feature of convergence among university systems. Specifically, he notes in the process of expansion of education systems that:

There has been a substantial convergence in the educational systems of many countries. Starting with different educational backgrounds, political systems, and economies, both advanced and developing countries have developed similar educational ideologies, institutions, and curricula. *One link among some common developments is vocationalism – the orientation of education around preparation for labor markets.* (Grubb 1985, 526 emphasis added)

The main thrust of this stream of literature, therefore, was that as enrolments in higher education expanded above the critical 15% threshold identified by Trow (1972), governments would seek to include an increasingly diversified student body into the university system by differentiating the system itself. Establishing a vocational tier was the chief strategy in this respect as it allowed governments to pursue two goals simultaneously: firstly, they could create additional study places for a growing proportion of secondary school-leavers seeking a tertiary education; secondly, they could counter the fears of academic drift that an expansion of higher education located exclusively in research universities would lead to and therefore meet the growing demand for highly qualified personnel (Trow 1972, Teichler 2006, Grubb 1985). Because the higher education system was differentiated by means of creating a sub-system of institutions with a different function and pursuing different objectives compared to the research-

focused universities, the wave of higher education expansion through vocationally-oriented universities has been defined in the literature as ‘horizontal’ differentiation (Goglio and Regini 2017). Thus, in a structuralist framework, the dependent variable – namely the vocationalisation of higher education through the establishment of a tier of labour-market oriented higher education institutions – was seen as a function of the secular trend of higher education expansion, which was identified as the key independent variable by authors writing from this perspective.

What would the observable implications of the structuralist line of argumentation be? Crucially, if the alignment between higher education and labour markets were to be driven by structural developments and functional pressures, we should expect higher education across advanced capitalist countries to move towards a model of horizontal differentiation whereby the vocational sub-system accommodates the majority of the student population. However, these theoretical predictions do not travel well across time and space as empirical scrutiny only lends limited support to them. Indeed, as university systems kept expanding (recall figure 1), horizontal differentiation did not manifest as the univocal policy response. Rather, we observe a variety of disjointed developments. Some countries, e.g. the UK, abolished horizontal differentiation in the 1990s by granting the same status to polytechnics and universities (Pratt 2008, 1992). In this instance, therefore, horizontal differentiation based primarily on the function and objectives that different types of institutions were expected to perform, gave way to a purely vertical differentiation, where *individual* universities (as opposed to *groups of* universities) differ from each other primarily by virtue of their status, prestige and ranking (as opposed to their function or mission) (Goglio and Regini 2017). Yet, while the UK was abolishing the vocational tier, other countries, such as Austria, introduced it (Pratt 2004). Yet other countries, such as Germany and the Netherlands, maintained it (Kyvik 2004). Furthermore, even in countries where the binary system was maintained, we notice

importance differences. For instance, research universities have traditionally received the lion's share of students in Germany, while the opposite is true in the Netherlands where a majority of students (currently almost 70%) are enrolled in the vocational sub-set of institutions in higher education. Thus, a functional model of expansion and (horizontal) differentiation does not help us understand the dynamics of alignment between higher education and the labour market. While we do observe universal expansion of higher education, this is not coupled with a process of horizontal differentiation, but rather with non-linear patterns of simultaneous horizontal and vertical differentiation as well as de-differentiation (cf. Guri-Rosenblit, Šebková, and Teichler 2007, Teichler 2006, 1998, Goglio and Regini 2017).

Ideational explanations: neoliberal ideas and higher education policy

Following a decade in which structuralist explanations of institutional change in higher education were prominent, the 1980s saw a surge of interest in the role of ideas in explaining institutional continuity and change, which gained traction in the (higher) education literature in particular from the 1990s. Starting from Peter Hall's pioneering work on the political power of economic ideas (Hall 1989), ideational theories have now spanned three decades of social science research and they have been providing an ever more nuanced toolkit that links ideas to institutional continuity and change (Schmidt and Radaelli 2004, Schmidt 2008b, a, 2010, Blyth 2001, 2002, Béland 2007, 2009, Béland and Cox 2016, Campbell 2002, Hall 1993, Béland and Cox 2010, Goldstein and Keohane 1993). Béland provides a systematic assessment of the ideational literature and identifies the *mechanisms* by which ideas impact policies and institutional arrangements, namely: (i) they constrain the problems that enter the policy agenda; (ii) they shape the assumptions guiding policy-makers' proposals; and (iii) they are 'discursive weapons' used to (de-) legitimise some policy options over others (Béland 2009). Policy-makers and interest

groups at national and international level have been particularly successful at enacting these mechanisms to reframe policy issues in correspondence with ‘critical’ junctures, i.e. at times when existing institutional arrangements become delegitimised opening up significant windows of opportunity to propose alternative policy solutions based on new ideas (Blyth 2002, Hall 1993).

Higher education in the mid-1990s found itself in the ‘ideal’ position for an ideational reframing. Not only had the rise of knowledge economies made national and international policy-makers devote significant attention to this policy arena, but also a widespread perception that university systems were in crisis (see Blackmore (2001) for a review of the reasons behind this university crisis) made higher education highly susceptible to ideational contestation. At a broad level, scholars writing specifically on higher education from an ideational perspective have identified the advent of neoliberalism, understood as “a politically imposed discourse, which [...] constitutes the hegemonic discourse of western nation states” (Olssen and Peters 2005, 314), as a crucial driver of policy change. At the heart of this hegemonic discourse lies the idea of governments actively promoting the organisation of the public sector according to market principles. Scholars writing from an ideational perspective note that “current transformation of higher education forms part of a larger complex of neoliberal hegemony which asserts that public institutions are best operated on market principles” (Carroll and Beaton 2000, 72) and employ concepts like ‘new public management’ or ‘marketisation’ to make sense of the transformation of higher education systems (Peters 2003, Olssen and Peters 2005, Lynch 2006, Slaughter and Rhoades 2004, Slaughter and Leslie 1997). Zooming into this stream of literature in closer detail we discern two inter-related claims on the consequences for higher education of the hegemonic neoliberal discourse: the first one is that higher education systems have been redefined to serve the skills needs of knowledge-based labour markets (Olssen and Peters 2005, Prokou 2008,

Doyle 2003, Boden and Nedevea 2010, Moore 2010); the second one is that higher education systems have been themselves reshaped through market mechanisms in their internal workings, by fostering market-like interactions among universities, between universities and their faculties, or between universities and students, underpinning a secular convergence towards what the literature has labelled ‘academic capitalism’ (Slaughter and Rhoades 2004, Slaughter and Leslie 1997, Slaughter and Cantwell 2012). Here, we focus primarily on the former, as it directly speaks to the core topic of this research, namely the issue of skill formation in higher education. Olssen and Peters note in this respect that:

Universities are seen as a key driver in the knowledge economy and as a consequence higher education institutions have been encouraged to develop links with industry and business in a series of new venture partnerships. The recognition of economic importance of higher education and the necessity for economic viability has seen initiatives to promote greater entrepreneurial skills as well as the development of new performative measures to enhance output and to establish and achieve targets. (Olssen and Peters 2005, 313)

Radice makes a similar point in his analysis of the trajectory of British higher education since the 1970s when he highlights that by embracing a “new public management” approach:

the values, structures and processes of private sector management are imposed upon the public sector; key elements include a shift from professional to executive power, a focus on ‘performance’ as measured by quantitative targets, and the widespread use of financial incentives. Meanwhile, the purpose of the university has changed from the education of the elites in business, politics, culture and the professions *to*

the provision of marketable skills and research outputs to the “knowledge economy”.

(Radice 2013, 408, emphasis added)

Thus, one of the crucial differences between the ‘liberal university’ and its ‘neoliberal descendant’ is that in the former, pedagogy and teaching were primarily associated with the notion of ‘knowledge for its own sake’, while in the latter they are subordinated to the needs of the labour market and they take a strong vocational orientation (Olssen and Peters 2005, 229).

The literature identifies how national governments and international organisations (e.g. European Commission, OECD, World Bank) strategically used neoliberal ideas and discourse to frame, justify and promote the reform of higher education systems. For example, Doyle provides a constructivist account of education policy under New Labour by highlighting how the then Minister responsible for higher education policy, David Blunkett, put forward a “vision of higher education [...] rationalised and justified as a necessary response to globalisation and the knowledge economy” which was required “to be ‘innovative’ for the purposes of economic prosperity” (Doyle 2003, 283). He further points out that the “language of [Blunkett’s] speech in outlining the role and responsibility of higher education in equipping Britain to compete in a global economy is replete with the discourse of managerialism, modernisation [...] and ‘competitiveness’” (Doyle 2003, 283). Similar assessments of a firmly neoliberal framing on the side of policy-makers have been said to hold true across the OECD world. Case studies from countries as diverse as Australia, the Netherlands, Germany and South Korea among others show how governments promoted the marketisation of national higher education systems by embracing ‘new public management’ norms as guiding principles of their reform efforts (Marginson 1997, Karsten 1999, Chae and Hong 2009, Pritchard 2011).

When the analysis moves up from national governments to international organisations, a convergent discourse linking higher education, skill formation and the knowledge economy appears even more clearly. Although different organisations elaborated their policy prescriptions with slight variations on the theme, the central underlying argument that supranational actors such as European institutions, OECD and World Bank put forward is that there is a crucial link between human capital and success in the knowledge economy, and between higher education and human capital formation (Olssen and Peters 2005, Capano and Piattoni 2011).

The OECD, in particular, has been an early advocate of the importance of higher education for the knowledge economy. Since the late 1980s it put universities under the spotlight and prompted policy-makers to ensure that they provided the skills needed in the labour market (see e.g. OECD 1987). Several researchers noted how the OECD not only consistently provided a framing of higher education as a source of national competitiveness in the knowledge economy (Robertson 2005, Olssen and Peters 2005, van der Wende 2011), but also how it deployed several tools of soft power to stir national higher education systems in this direction. These include the publication of comparative educational indicators (e.g. the Education at a Glance series), thematic reviews of tertiary education and forecasting of the future of higher education – all these various publications have been seen as providing mechanisms of ‘naming and shaming’ that bear an impact on national higher education reforms (van der Wende 2011).

European Union institutions – and the European Commission in particular – went beyond soft power as they also kick started a prescriptive reform process undertaken through the Bologna Process since 1999 (Witte 2006, Corbett 2005). As part of Bologna, member states (and later also a number of non-European neighbouring countries) committed to the harmonisation of their higher education systems in terms of, initially, degree structure (namely: transitioning to a tiered structure composed of a three-

year undergraduate degree followed by a one- or two-year master programme) and easing the recognition of qualifications and study periods undertaken in different European countries. Yet, the harmonisation of degrees has not been the only focus of Bologna. Its focus on skills, in particular, stands out since 2007, when “the notion of employability [became] central to the *problematique* of the Bologna Process” (Prokou 2008, 387) together with a strong emphasis on the more general notion that higher education systems should serve knowledge-based labour markets. The stance taken by the Commission and embodied politically in Bologna led scholars to interpret it as a process fundamentally inspired by the neoliberal idea of a ‘market-oriented university’ altering the very role of universities in European societies (Prokou 2008, Slaughter and Cantwell 2012) along the lines of a transition from the liberal to the neoliberal university (Olssen and Peters 2005).

More recently, it has been noted that European higher education policy has ‘moved out’ of Bologna to be subsumed under the broader ‘Lisbon Strategy’, a package of policies and strategic objectives aimed at making Europe “the most dynamic and competitive knowledge-based economy in the world” (Capano and Piattoni 2011). In this respect, a set of ‘ideational components’ have been identified as part of the ‘Lisbonization of higher education’, such as the notions of competitiveness, institutional autonomy and accountability, which have been used as strategic framing by national policy-makers to drive institutional change in their higher education systems. This has been seen as a ‘discursive strategy’ that could help overcome entrenched interests that would be otherwise preventing change, and ultimately attuning higher education systems to the needs of the knowledge economy (Capano and Piattoni 2011). Thus, in line with the structuralist approach outlined earlier, scholars writing from this perspective are also interested in explaining the increasing links between higher education and the labour market but, differently from a structuralist perspective, their explanations bring to the fore as the crucial independent variable the role of ideas and the use that policy-makers at

national and international level have made of them to frame higher education as a component of national economic competitiveness.

But to what extent has the spread of neoliberal ideas, often heralded through national or supranational processes (as in the case of the Bologna process), actually led to policy change? As we turn to this question, the ideational literature becomes somewhat weaker. The literature just presented makes a strong case for a convergent ideational and discursive trend across advanced capitalist countries. However, when the analysis moves from the level of discourse to that of policy change, the convergent ideational trend does not seem to translate into a clearly convergent pattern of policy change. As Christine Musselin puts it, this literature convincingly shows convergence in what policy-makers think a higher education system *ought to be* but not necessarily on what a higher education system *is* (Musselin 2011, 461-466). Indeed, recent research shows that while higher education systems have been subject cross-nationally to ‘marketising pressures’, both the policies by which this has occurred and the responses of higher education systems to these demands have varied significantly. It could be argued that the degree of change can still be explained in ideational terms, for instance by tracking a ‘stronger’ or ‘weaker’ adoption of neoliberal ideas leading to more or less profound institutional change. However, this perspective is not corroborated by significant empirical support. Several scholars writing on comparative (higher) education from an ideational perspective have indeed grappled with the question of sustained policy divergence in the context of common neoliberal ideas, and they unanimously turned to domestic *institutions* to explain the persistent variation across higher education systems even when these are subject to similar (or – as in the case of countries engaged with the Bologna Process – the same) ideational pressures (Schweisfurth 2012, Dobbins 2011, Takayama 2012, Deem 2001, Halpin and Troyna 1995, Alexiadou and van de Bunt-Kokhuis 2013, Schulze-Cleven et al. 2017, Schulze-Cleven and Olson 2017).

The wide-ranging set of Western European country case studies collected in an edited book by Marino Regini is particularly instructive in this respect as they show that the relationship between universities and labour market actors – a core feature of the ‘neoliberal’ university (Olssen and Peters 2005) – varies widely across countries (cf. Regini 2011b). Regini and colleagues show that a closer relationship between universities and business – often directly inspired by government policy – has been a common feature across higher education systems over the last two decades. But they also point to a mix of top down and bottom up cooperation; they show that employers have a more or less strong role in higher education policy-making across countries; and they argue that different types of higher education systems mediate the relationship between universities and labour market actors (Ballarino 2011, Colombo 2011, Regini 2011c, a). Along the same lines, two reviews of policy initiatives aimed at aligning higher education and the labour market carried out by researchers at the Center for Higher Education Policy Studies (CHEPS) also return a significant degree of variety mirroring the evidence presented in Regini (2011b). In particular, they show how governments have taken a more or less hands-on approach across different countries and how in some countries the emphasis has been on general employability skills while in others on increasing the supply of Science, Technology, Engineering and Mathematics (STEM) skills (cf. De Weert 2011, Kottmann and De Weert 2013).

The following example helps illuminate further the problematic assumption of convergence that underpins ideational explanations. In 2012, a parliamentary inquiry in Britain on the supply of STEM skills, focusing in particular on the perceived under-supply of these skills, illustrated the government’s faith in market mechanisms to address the problem. The then Minister in charge of higher education policy declared that: “employers should send out a clear signal about how much they value people with these skills” and said that “in the time that I have been in Government alongside the

Secretary of State, I do not think that I have ever tried to specify what should or should not be a strategically important and vulnerable subject” (House of Lords 2012, 36-37). He highlighted, in other words, that the government believed the chief principle underpinning the allocation of STEM skills should be a market-based one: “In an open market for graduates and postgraduates, the onus is on employers to ensure that they pay the market rate, or provide other means of attracting STEM graduates to stay in STEM sectors” (House of Lords 2012, 36).

Only three years apart from this inquiry, a similar debate in the South Korean context led to radically different conclusions and policy prescriptions. Namely, the Ministry of Strategy and Finance, in the debate around the supply of STEM skills, introduced an upcoming reform that put the government firmly in the driving seat to shape the supply of STEM skills through the “release [of] 5 and 10 year labor force supply and demand outlooks by university major, in order for universities to refer to the outlooks when restructuring their programs” (MOSF 2015b, 2). Why did two ostensibly most similar higher education systems – both organised through a strong vertical hierarchy of universities and among the mostly strongly reliant on private finance in the world – pursue such different routes to align the supply of STEM skills with labour market demand? This example clearly shows that similar concerns – certainly influenced by a similar market-oriented frame – led to radically different policy prescriptions and trajectories of change. In Britain, a market-based allocation of skills was deemed the best option to mediate the relationship between higher education and labour markets; in the Korean case, the government seized the mediating role between higher education and the labour market to ensure that a certain supply of skills was guaranteed. What explains this variation? As it has been demonstrated that structural and ideational explanations have trouble accounting for persistent diversity across higher education systems, we now turn

to institutionalist frameworks in search of theories that might help us make sense of the observed variation.

Institutionalist explanations: the (mostly) lack of higher education in CPE

Looking for lenses through which to theorise ‘variation’ across advanced capitalist countries, the obvious starting point is the CPE literature and the varieties of capitalism (VoC) scholarship in particular. The VoC theory provided a paradigmatic change in the academic debate around the issue of divergence or convergence across advanced capitalism countries in the context of economic globalisation. Taking issue with the widely held view, particularly in the 1990s, that globalisation would necessarily lead to a convergence towards an Anglo-American model of capitalism, VoC scholars turned the convergence thesis on its head. They highlighted how distinct national institutional arrangements underpin systematic variation and they further submitted that divergence between (groups of) countries would increase – not disappear – in the face of profound and common structural changes as countries build on their respective and radically different institutional comparative advantages (Hall and Soskice 2001, Hall and Gingerich 2009, Soskice 1999). Stripped to the essential, the VoC approach assumes that “the political economy is actor-centred” and that actors (e.g. firms, governments) interact in different ways across political economies (Hall and Soskice 2001, 6). In particular, interactions are analysed and classified according to the degree of coordination among actors, with a particular focus on employers. Firms in Coordinated Market Economies (CMEs, exemplified by Germany but extending to most Continental Europe, Scandinavian countries as well as to East Asia) rely to a large extent on non-market relationships among actors (e.g. collective bargaining, labour-management cooperation), while in Liberal Market Economies (LMEs, exemplified by the US and broadly

encompassing the Anglo-Saxon countries) the market is the primary instrument to coordinate interactions among firms and other actors (Hall and Soskice 2001, 8).

Different modes of coordination lead to different types of comparative advantage: CMEs develop their comparative advantage in labour markets with specific skills with limited portability, largely in manufacturing sectors, producing high quality and high added value products (Streeck 1991) and characterised by incremental innovation in a framework of stable employment relationships and high employment protection (e.g. the German automotive industry). Conversely, LMEs build their strength on workers having general transferable skills, employed in service sectors, either characterised by radically innovative products (e.g. the IT sector) or by low quality and low added-value (e.g. the retail industry). In the VoC framework, both models are viable precisely because they lead to different types of comparative advantage, which in turn are based on a set of institutional spheres that complement each other and function effectively (institutional complementarities) (Hall and Soskice 2001, Estevez-Abe, Iversen, and Soskice 2001, Hall and Gingerich 2009).

The VoC approach has been crucial in bringing skill formation to the forefront of CPE. Skill formation has been identified as one of the sub-spheres of the political economy upon which CMEs and LMEs build their respective comparative advantages (Culpepper 2001, Culpepper and Finegold 1999, Busemeyer 2009a, Busemeyer and Trampusch 2012, Busemeyer 2015, Culpepper 2003). In particular, the VoC literature draws a key distinction between specific and general skills: the former are valuable either within a firm or within an industry and as such their portability is limited, while the latter have a value independent of the particular firm or industry and are as such more portable (Estevez-Abe, Iversen, and Soskice 2001, 148). Specific skills are predominant in CMEs, while general skills are chiefly found in LMEs. It is argued that the different institutional environment between CMEs and LMEs is conducive to different skill distributions

across countries. Specific skill formation requires a set of institutions that incentivises firms to provide training, and individuals to be willing to acquire specific skills. Such incentives are present in CMEs, but not in LMEs. The argument for investing in specific skills is twofold: first, firms will invest in training only if they know that poaching is unlikely to happen (e.g. through a collectively-set wage distribution guaranteed by collective bargaining) and if they know that other firms will participate in the training system as well (e.g. through an employer organisation that can sanction defecting firms) (Culpepper 2001, 2003); secondly, individuals will be willing to acquire specific skills if they know that these skills – that are of little value outside individual firms or sectors – are ‘protected’ against the risk of unemployment, through either employment or unemployment protection, or both (Estevez-Abe, Iversen, and Soskice 2001, Busemeyer 2009a). More specifically, in Western European CMEs, employers coordinate through strong sectoral associations leading to ‘dual’ training taking place both in schools and in firms and contributing to the creation of firm and sector specific skills (Busemeyer 2009a, Culpepper 2001). In the East Asian CMEs of Japan and South Korea, instead, the lack of sectoral coordination in favour of ‘group coordination’ (Soskice 1999) organised around individual large industrial conglomerates led to a predominance of in-firm training and, therefore, to firm-specific skill formation. Although, in both groups of CMEs, employers (individually and/or through their associations) play a key role in the organisation and delivery of vocational training, it has been noted that in East Asian CMEs, governments also played a critical role in setting the incentives for firms to train – notably through the extensive use of training levies (Green et al. 1999, Green 1999a, b). Thus, in CMEs we find a set of institutions, *complementary* to specific skill formation, insuring firms against poaching and individuals against skill obsolescence. As a consequence, vocational training systems providing specific skills have been thriving

(Estevez-Abe, Iversen, and Soskice 2001, Culpepper 2001, Soskice 1994, Busemeyer 2009a).

Conversely, deregulated labour markets and meagre welfare states in LMEs do not offer such insurance. Employers therefore prefer not to invest in the formation of specific skills (apart from narrow on-the-job training) because of the risk of poaching, and individuals will rather acquire general skills because they are not insured against the potential of losing their job and, if they possess general skills, they might have higher chances of landing a new job. This set of preferences translated into a traditionally larger reliance of LMEs in the higher education sector, which has been identified in the literature as providing general skills (Estevez-Abe, Iversen, and Soskice 2001, Finegold and Soskice 1988, Soskice 1993, Thelen 2014). Thus, the VoC literature predicts that skill formation would take place primarily in vocational training in CMEs and in higher education in LMEs and identifies these configurations as path-dependant, self-reinforcing equilibria (Pierson 1993, 1995).

Other researchers in the political economy and economic sociology fields have implicitly questioned the key role of education and skills policy identified by the VoC literature and they more broadly questioned the assumption that – to paraphrase the title of a book authored by Colin Crouch and colleagues – ‘skills are the answer’ to growth and prosperity in knowledge-based economies (Crouch, Finegold, and Sako 1999, see also Brown, Green, and Lauder 2001, Brown, Hesketh, and Williams 2003, Brown, Hesketh, and Williams 2004). These accounts in particular place education and skills policy in the broader context of employment creation in high-end sectors and they suggest that the potential for employment creation is limited unless education and skills policies are firmly coupled with industrial policies (see also Keep and Mayhew 1996, Keep 1999, Gleeson and Keep 2004, Keep and Mayhew 2010). Yet, while stressing the joint importance of and mutually-reinforcing relationship between supply and demand

side policies, these analyses do not challenge VoC's central tenets in terms of national models of skill formation for two main reasons. Firstly, they also focus empirically mainly on vocational education and training (rather than higher education); and, secondly, they also identify as a key source of cross-national variation the dominance of vocational training in some countries (broadly corresponding with CMEs) and of higher education in others (again, broadly corresponding with LMEs) (Ashton and Green 1996, Green 1999b, Green and Sakamoto 2001, Crouch, Finegold, and Sako 1999, Brown, Green, and Lauder 2001). Thus, taking into account both the VoC scholarship and its critical extensions, the majority of analyses of skill formation mostly treated higher education as a residual category (Jong 2012) , while focusing empirically on the historical institutional roots and contemporary dynamics of change of vocational training systems (Trampusch 2010, Thelen and Busemeyer 2012, Culpepper 2007, Busemeyer 2009a, Thelen 2004, 2007, Green and Sakamoto 2001).

Noting the lack of explicit theorisation on higher education, Ben Ansell first provided a full theoretical and empirical analysis of higher education in the CPE literature (Ansell 2010, 2008). However, Ansell's early research did not engage directly with the issue of complementarity between higher education and other spheres of the political economy. Rather, his initial work on higher education has been focusing on the partisan politics and redistributive implications of higher education across countries (see also Garritzmann 2015, 2016, Busemeyer 2009b). While these analyses have been enlightening with respect to (previously neglected) party preferences towards the desirable degree of expansion and private/public funding of higher education, a partisan political angle does not offer solid ground to theorise variation in the trajectories of high skill formation. Specifically, even if we assumed that right and left parties have systematically different preferences for labour market outcomes (e.g. if we assumed that the left was systematically more concerned about promoting employment than the right) (cf. Hibbs

1977), we would still expect both left and right parties to favour the alignment between higher education and labour market needs. For the former this could be seen as a way to avoid skill mismatches and favour higher employment rates, while for the latter it would be a way to satisfy business' skills needs and ensure that firms have the skillset needed to thrive.

Yet, following the logic of a partisan politics perspective, we could indirectly infer some insights that would conform to a 'VoC scenario', in particular as far as LMEs and Continental European CMEs are concerned. Indeed, Ansell showed that governments are faced with a 'trilemma' when it comes to the expansion of higher education, whereby only two of the three following objectives can be simultaneously achieved: keeping public cost low; increasing enrolments; and keeping private costs low. He notes how partisan politics played out differently across countries, leading to different equilibria. Nordic and Anglo-Saxon countries⁴ display a pattern of mass enrolment with high public/low private and low public/high private cost respectively; the Continental European model kept private and public costs low while also limiting enrolments (Ansell 2010, 2012, 2008). That is, he identified the Continental European countries as featuring an elite system of higher education, which was expected to stay as such due to political reasons.

Germany has been scrutinised at length as the archetypical elite higher education system. The failed attempt to introduce tuition fees in the early 2000s, together with the difficulties of reforming a policy area shared between the national level and the Lander level, hence particularly susceptible to veto points, seemed to sustain an equilibrium centred on elite higher education (Ansell 2012, Hüther and Krücken 2014). Critically, to the extent that the higher education system is limited in size, the apprenticeship system is

⁴ Although Ansell's work did not cover East Asian higher education systems, Japan and South Korea conform closely to the LME pattern, with mass enrolments and a very high share of funding coming from private sources.

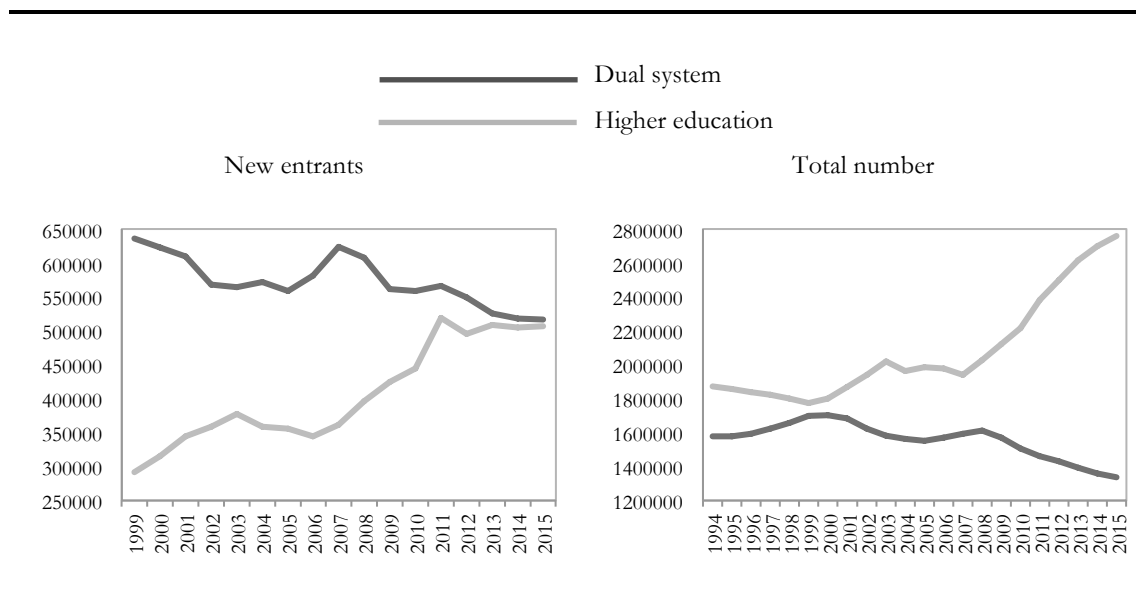
expected to keep performing the role of ‘main’ supplier of skills into the labour market, thus indirectly bringing support to the VoC expectation of countries like Germany or Austria relying on vocational training primarily (Ansell 2012, Powell and Solga 2011).

More recently, CPE analyses focusing on the transition to the knowledge economy have started explicitly embedding higher education as part of national production (or growth) regimes. But the shift from a partisan politics to a production regime angle did not substantively change the findings. In particular, it has identified, on one hand, a symbiotic relationship between large service sectors and mass higher education systems, and, on the other hand, between large manufacturing sectors and limited higher education systems. More specifically, in countries with partially private mass higher education, high-end dynamic services (e.g. finance, insurance) are expected to thrive, while public services are expected to develop significantly in the context of mass public higher education (Anderson and Hassel 2013, Ansell and Gingrich 2013, Hassel and Palier 2017). Conversely, where the dominant economic sector lies in the manufacturing industry, countries are thought to pursue an export-led growth in which there will be little expansion of higher education (Hassel and Palier 2017, 36, see also Anderson and Hassel 2013). A “manufacturing based export-led growth strategy”, leading to limited enrolments in higher education, has been identified as the “economic strategy” pursued primarily in Germany, Austria, Japan and Korea (Hassel and Palier 2017, 38).

But does the initial VoC dichotomy between higher education in LMEs and vocational training in CMEs – and the subsequent explicit CPE analyses of higher education – hold water today? Empirical evidence provides a rather different picture compared to the hypothesised ‘suppression’ of higher education in CMEs, and in particular in those CMEs pursuing an export-led growth strategy. Let us recall figure 1 and focus on the critical case of Germany, i.e. the country where the expansion of higher

education would be *least* expected, while the dual apprenticeship system is expected to dominate the skill formation system (Powell and Solga 2011, Ansell 2008, Soskice 1994). Figure 1 showed that Germany featured in 2014 a GER in tertiary education of above 65%, which is higher than two archetypical ‘mass’ systems, Sweden and the UK, where GER stood at just above 62% and 56% respectively. Indeed, the relative weight of higher education and the dual apprenticeship system was fundamentally altered in recent years (Baethge and Wolter 2015). The expansion of higher education, in particular, has been massive over the course of just fifteen years. It has outpaced the apprenticeship system in terms of ‘new entrants’ and has significantly outgrown it in size, as captured in figure 1.3.

Figure 1.3. New entrants and total number of students in the dual system and in higher education in Germany



Source: own calculations based on Statistisches Bundesamt

The cases of Korea and Japan are equally – if not more – telling: the East-Asian pattern returns a picture of spectacular expansion of higher education (GER stood at 95% in Korea in 2013) despite being included in the literature in the set of countries where higher education is not expected to expand. Thus, the existing CPE literature does not offer solid grounds to theorise variation in high skill formation across countries because

one of its central tenets underpinning variation is precisely that skill formation in higher education should not develop to a significant extent in those countries pursuing an export-led growth strategy, where vocational training is expected to dominate instead. Yet, it is in some of these countries that the expansion of higher education has been the steepest over the last two decades.

1.3 Beyond convergence and divergence: the puzzle of persistent differences within the convergent trend of high skill formation

Sections 1.1 and 1.2 identified the following stylised facts:

- Higher education has expanded enormously across all advanced capitalist countries over the last two decades;
- Governments and employers across the OECD world have been vocal advocates of the alignment of their higher education systems with labour market needs, in particular with respect to the high skills needed in knowledge-based labour markets;
- Existing explanations of this phenomenon suggest a convergent trend driven by either structural (functional) pressures stemming from higher education expansion or by an ideational re-framing of the goals and purposes of higher education rooted in neoliberal ideology; yet, we observe empirically large variation in the types of policies pursued across countries, as well as in the responses of the higher education sector to such policies, that a functional or ideational explanation runs into problems accounting for;
- CPE approaches that highlight divergence over convergence, however, are predicated on the very notion that variation in skill formation across countries is driven by the lack of higher education expansion in a sub-set of countries which

runs counter to the first empirical observation highlighted at the beginning of this section.

Piecing together these stylised facts leads us to the empirical puzzle, and chief research question, that this thesis aims to address, namely: *Why do national patterns of skill formation in higher education exist, despite the convergent trend of skill formation ‘moving up’ to higher education? What explains the different national trajectories of skill formation in higher education?*

More broadly, this empirical puzzle also lends itself as a case study to address a theoretical puzzle that the higher education literature has only recently started to tackle (cf. Schulze-Cleven 2015, 2016, Schulze-Cleven and Olson 2017), namely: *how can we theoretically account for divergent patterns within a convergent trend?* Indeed, recent literature on institutional change in higher education has come to the somewhat ambivalent conclusion that supranational convergent trends and country-specific patterns of institutional change coexist (Regini 2011b, Dobbins and Knill 2014, Musselin 2011). The lack of an explicit theorisation as to why we observe distinct national trajectories within supra-national convergent trends has led scholars to start theorising the emergence of ‘varieties of academic capitalism’ as opposed to a convergence towards ‘academic capitalism’ (Schulze-Cleven and Olson 2017). The theoretical challenge is therefore to devise a framework through which we can *theorise and explain* both convergent trends (i.e. higher education becoming the main locus of skill formation across advanced capitalist countries, *which the CPE literature cannot fully explain*) and country-specific patterns (i.e. distinct patterns of skill formation in higher education and distinct trajectories of change in national higher education systems, *which structuralist and ideational approaches cannot fully explain*).

This thesis seeks to provide an answer to these questions. In tackling these empirical and theoretical puzzles, the thesis puts forward an argument inspired by the emergence over the last 20 years of knowledge-based growth regimes across advanced

capitalist countries in which the role of higher education featured prominently in government policy on one hand (cf. Hall 2015, Hope and Soskice 2016) and by recent theoretical advancements on institutional change on the other hand (cf. Mahoney and Thelen 2009, Streeck and Thelen 2005). More specifically, I argue that the convergent trends of closer alignment between higher education and the labour market is the outcome of governments considering the skills produced by higher education systems as crucial to succeed in a knowledge economy. Up to this point, an ideational or structuralist approach could be equally plausible. However, as will be discussed extensively in chapter 2, I further specify this statement in two important ways. Firstly, knowledge economies are not the same across countries, to the extent that some are more heavily geared towards (advanced or high-tech) manufacturing while others are geared towards (dynamic or high-end) services: I suggest that this difference has implications for skill formation in higher education, in particular in terms of the type of high skills that employers demand and the extent to which governments need to intervene directly in shaping the supply of such skills. Secondly, I argue that universities across countries have different incentive structures towards ‘opening up’ to the demands of ‘external stakeholders’. This is identified as a crucial mediating factor in the patterns of institutional change that we observe across countries, namely determining whether institutional change is marginal (i.e. affecting specific segments of the higher education system) or encompassing (i.e. affecting the higher education system at large). Thus, while it has been discussed in section 1.2 that political cleavages along party lines are unlikely to play a major role, it is suggested that a major line of political conflict when it comes to high skill formation is between the higher education sector on one hand and governments and the business community on the other.

By introducing these two dimensions (type of knowledge economy and incentive structure of universities to open up to external stakeholders’ demands), it is argued that

we can provide theoretical predictions as to why we detect significant differences within this common pattern, while accommodating the convergent trends across countries in terms of shifting skill formation onto the higher education sector. My argument, therefore, advances our understanding of skill formation in knowledge-based economies as well as theories of institutional change in higher education. It also adds to the broader literature on the comparative political economy of advanced capitalist countries by offering an analysis of a policy field – higher education – that despite its growing importance has been somewhat overshadowed in this literature by the nearly exclusive focus on vocational training as far as skill formation is concerned.

1.4 Plan of the thesis

The thesis proceeds as follows. Chapter 2 outlines the proposed theoretical framework employed to understand the variation in national patterns of high skill formation. Chapter 3 provides details of the methodology and the research design, focusing in particular on how data has been collected and how case studies have been selected. Chapters 4, 5, and 6 constitute the bulk of the empirical work, testing the theoretical framework outlined in chapter 2 through case studies of institutional change in the higher education systems of the UK, Germany and South Korea. Chapter 7 brings together the conclusions, contribution and limitations, wider implications and potential avenues of future research.

2 Towards an alternative theoretical framework: varieties of high skill formation

This chapter puts forward the case for explaining the dynamics of skill formation in higher education through an approach that combines (i) the emergent literature on growth models and growth regimes (cf. Hall 2015, Hope and Soskice 2016, Baccaro and Pontusson 2016), and in particular the stream focusing on *growth strategies*, understood as sets of public and social policies underpinning given growth models and regimes (Hassel and Palier 2017); and (ii) the comparative political economy literature on (gradual) *institutional change* (cf. Mahoney and Thelen 2009, Streeck and Thelen 2005, Hall and Thelen 2009). The goal of this chapter is therefore to provide a theoretical framework that allows us to make sense – theoretically and, subsequently, empirically – of the relationship between higher education systems and knowledge-based labour markets (Ansell and Gingrich 2013). Indeed, while it is clear that symbiotic relationships between the two exist, the previous section highlighted how it has been thus far problematic to theorise such relationships, leading to empirical observations either disproving or only partly confirming existing theories. The chief theoretical challenge that this chapter engages with is therefore to elaborate a framework through which we may be able to theorise why national patterns of high skill formation persist in the context of a common cross-national trend, shifting skill formation on to the higher education sector.

More specifically the chapter develops as follows. It begins with a detailed illustration of the two main analytical dimensions proposed and the core theoretical propositions that stem from these dimensions (sections 2.1 and 2.2). In particular, evidence of significant variation across knowledge-economies is presented. It is argued that different knowledge economy profiles have distinct implications for the type of skills that the labour market needs and that, therefore, will be sought by employers and cultivated by governments (the first dimension). Subsequently, I will discuss the

institutional context of university agency, i.e. the incentive set that universities have (or do not have) to satisfy the demands of governments and business (the second dimension). For both theoretical dimensions, a preliminary empirical test is also offered by making use of descriptive statistics and bivariate analysis. The objective of these preliminary tests is to demonstrate that the patterns implied theoretically are also empirically plausible, before moving on to the country case studies in the second part of the thesis. Furthermore, building on the two theoretical dimensions, the chapter suggests a bi-dimensional categorisation of countries, and it develops hypotheses in terms of what patterns of institutional change we might expect according to where countries fall in the proposed categorisation (section 2.3). Section 2.4 provides some preliminary considerations on the universe of cases captured by the proposed bi-dimensional categorisation and, finally, in section 2.5 I present and contrast a set of observable implications and underlying mechanisms of change suggested by the proposed theoretical framework and by the main existing theories introduced in section 1.2.

2.1 The demand for high skills: varieties of knowledge economies and the theoretical implications for high skill formation⁵

The first dimension specifies the broad trend that is already outlined in figure 1.2 with reference to two most different countries, Germany and the UK. Figure 1.2 showed that both countries featured parallel and very similar developments in terms of (i) significant expansion of employment in knowledge-based activities (encompassing both the manufacturing and service sectors) and (ii) above average expansion of highly skilled – i.e. tertiary educated – workers within the general trend of expansion of employment in

⁵ I am grateful to David Hope for making available to me the dataset on GVA used in this section. He should not be implicated in how the data has been elaborated upon and/or presented.

knowledge-based sectors. This section focuses on the ‘nature’ of knowledge-based economies across countries. It suggests that national (knowledge-based) economic profiles differ markedly, although the academic literature and – even more – policy-makers have often treated the ‘knowledge economy’ as a rather uniform concept glossing over sectoral differences. According to the OECD glossary, a knowledge-based economy indicates “trends in advanced economies towards greater dependence on knowledge, information and high skill levels, and the increasing need for ready access to all of these by the business and public sectors” (OECD 2005). Yet, disaggregating the data, ‘varieties’ of knowledge economies emerge, each displaying a very different relative weight of specific economic sectors. Taking the observed variety of knowledge economies as its starting point, this section puts forward the argument that different types of knowledge economies have implications for the *type of high skills* that will be sought by employers and cultivated by governments.

The literature on the transition to a post-industrial society usually organises economic activities into four major sectoral groups: manufacturing; dynamic services; non-dynamic services; and welfare services (Wren 2013, Ansell and Gingrich 2013), each containing a distinct set of economic activities, as summarised in table 2.1.

Table 2.1. Industry composition of major sectors

Sector	NACE industries
Manufacturing	D: Total manufacturing
	64: Post and telecommunications
Dynamic services	J: Financial intermediation
	71t74: Renting of m&eq and other business activities
	G: Wholesale and retail trade
	H: Hotels and restaurants
Non-dynamic services	60t63: Transport and storage
	70: Real estate activities
	O: Other community, social and personal services
	L: Public admin and defence; compulsory social security
Welfare services	M: Education
	N: Health and social work

Source: own elaboration

In this section, we focus on the first two, which are more closely aligned with a knowledge-based economy as articulated by the OECD definition reported earlier in this section. Indeed, non-dynamic services and welfare services are certainly important features of the transition to a post-industrial society but they are not (directly) part of its knowledge-based component. The former have been expanding enormously in particular in LMEs, supporting high-levels of employment, although often in precarious and poorly paid positions – that is, they kept unemployment low at the cost of relatively high levels of inequality (Iversen and Wren 1998). Conversely, the latter have supported employment and relatively more egalitarian outcomes in Nordic European countries (Martin and Thelen 2007). Yet, neither are key components of the emergent knowledge economy, which is rather associated with dynamic services and (particularly high and medium-high technology) manufacturing – two sectors where a highly-skilled workforce is required to cope with technological advancements and/or the increasing importance of

inter-personal skills. As this section is primarily concerned with identifying the configuration of national *knowledge* economies, it therefore focuses on the relative weight of manufacturing vis-à-vis the dynamic service sectors, leaving out non-dynamic and welfare services. Table 2.2 ranks a sample of OECD countries according to the percentage contribution to Gross Value Added (GVA) of, respectively, manufacturing and dynamic services.

Table 2.2. Major sectors as a % of GVA in 2011 (countries ranked in descending order)

Country	Manufacturing	Country	Dynamic services
South Korea	31.1%	UK	28.1%
Ireland	26.8%	US	25.5%
Germany	22.4%	Ireland	23.8%
Finland	18.6%	Netherlands	22.8%
Japan	18.6%	Belgium	22.6%
Austria	18.5%	France	21.4%
Canada	16.7%	Australia	20.9%
Sweden	16.7%	Germany	19.5%
Italy	16.6%	Sweden	18.5%
Belgium	14.5%	Denmark	17.6%
Netherlands	14.1%	Italy	16.9%
US	12.3%	Austria	16.4%
UK	11.7%	South Korea	15.7%
Denmark	11.5%	Japan	15.4%
France	10.1%	Canada	15.2%
Australia	8.5%	Finland	14.5%
<i>Average</i>	<i>16.8%</i>	<i>Average</i>	<i>19.7%</i>
<i>St Dev</i>	<i>5.8%</i>	<i>St Dev</i>	<i>3.9%</i>

Source: World Input–Output Database (WIOD) Socio-Economic Accounts July 2014

Note: bold indicates above average countries/values

The data presented in table 2.2 prompts several observations. First, there is significant variation across countries in the internal composition of their respective knowledge economies; secondly, variation appears to be particularly stark in the weight of manufacturing, which ranges from over 30% in South Korea to 8.5% in Australia; conversely, differences are more modest when it comes to dynamic services, as shown by

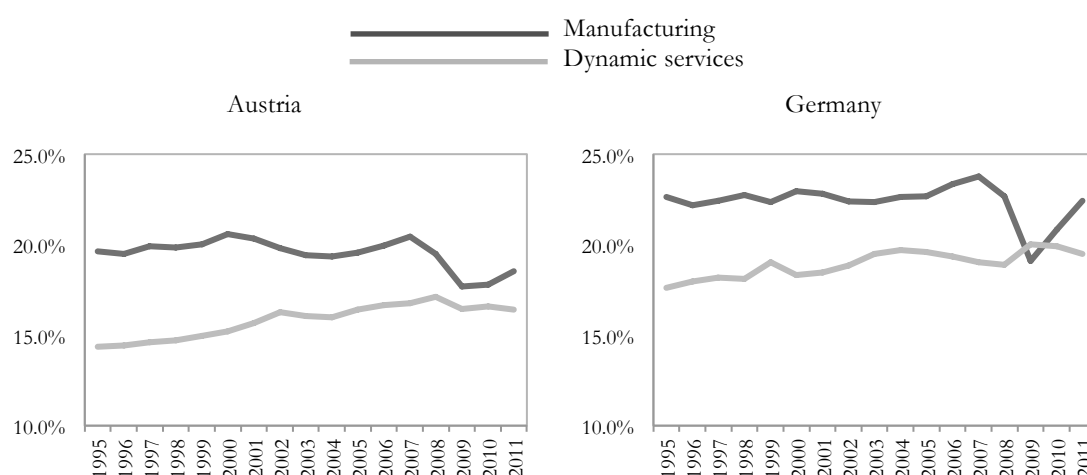
more limited standard deviation from the mean value; thirdly, countries do appear to cluster according to familiar categorisations in the CPE literature (Hope and Soskice 2016, Hall and Soskice 2001).

In particular, we notice three basic configurations. Apart from the Irish case, whose growth model has been picked out in the literature as rather *sui generis* and particularly reliant on attracting ‘business and skills’ in high-tech sectors from abroad (Regan and Brazys 2017), the Continental European and East Asian CMEs come firmly at the top of the manufacturing ranking, as we would expect from countries pursuing an export-led manufacturing-based growth model (Hassel and Palier 2017, Baccaro and Pontusson 2016). LMEs plus the Netherlands tend to have above average contributions of dynamic services to their national GVA, as expected in countries that pursued – actively and heavily – de-industrialisation. The Scandinavian countries take an intermediate position and display a rather mixed pattern of manufacturing and dynamic services (Hope and Soskice 2016, Hope 2016).

It is crucial to note here that different knowledge economy profiles have been actively sustained (or contested) and shaped by governments and other organised actors, notably employers and unions. Thus, these configurations are neither randomly assigned nor are they the exclusive outcome of path dependency – even in those cases where continuity in national economic profiles prevailed over change (Thelen forthcoming, Baccaro and Pontusson 2016, Hassel and Palier 2017). In particular, Kathleen Thelen shows that differences in the organisation of capital and labour and in their interactions with the state shaped different national trajectories to the knowledge economy (Thelen forthcoming). A pattern of continuity prevailed in Continental European and East Asian CMEs that have moved ‘up-market’ within their traditional core sector of strength (namely, manufacturing), and in LMEs, which have fostered a growth path centred on high-end services. On the other hand, a pattern of change best describes the Dutch

trajectory, where organised actors favoured a shift away from manufacturing towards high-end services (leading to an economic profile that closely resembles that of LMEs), and the Scandinavian countries that have branched out to areas, such as ICT, that were previously not at the core of their production strategies, without, however, completely turning their back on the manufacturing sector (Thelen forthcoming, Baccaro and Pontusson 2016, Hassel and Palier 2017). The different patterns of knowledge-based growth are captured by figure 2.1 that contrasts the development of GVA over time in manufacturing and in high-end services across a sample of OECD countries. Because the chief focus of this section is to identify variation in *knowledge* economies, figure 2.1 focuses on those countries that the literature has considered as pursuing a knowledge-based growth – i.e. it does not display a set of countries – the Southern European countries commonly referred to as Mixed Market Economies (MMEs) (Hancké, Rhodes, and Thatcher 2007) – that have been defined as pursuing a strategy of “competitive impoverishment” (Hassel and Palier 2017). Hence, in this set of countries, higher education (and high skill formation) is not expected to play a central role compared to countries that convincingly embraced a knowledge-based growth path (but see section 7.2 for some additional reflections on MMEs in the context of high skill formation).

Figure 2.1. GVA share by sector in selected countries

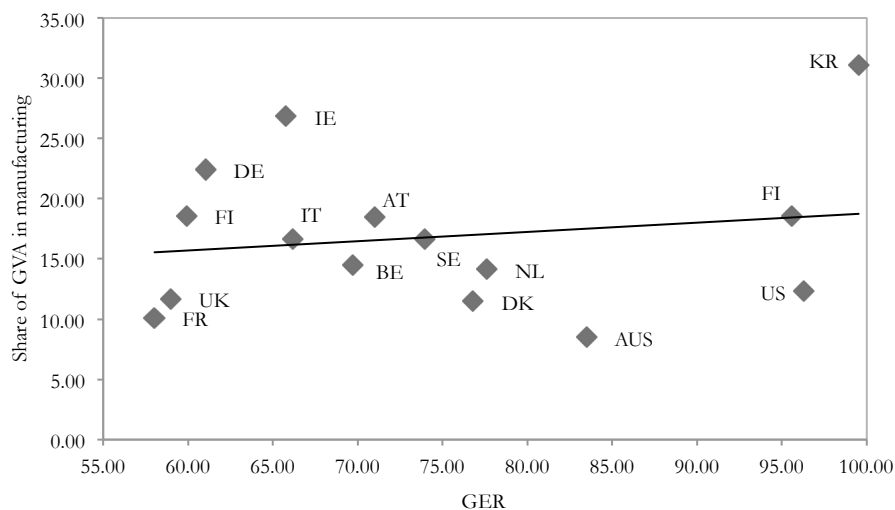




Source: author elaboration based on WIOD

Having established the existence of significant variation across national economic profiles, we can proceed to pose the following question: what are the implications for high skill formation? We should first start by reiterating – and challenging – one of the main tenets of the CPE literature with respect to ‘high skill formation’, namely: that countries pursuing export-led manufacturing-based growth will suppress the expansion of higher education to favour intermediate skill formation in the vocational training system (Hassel and Palier 2017, Anderson and Hassel 2013). This assumption proves problematic. Plotting the GER in tertiary education against the share of GVA coming from manufacturing, we do not see any particular relationship between the two measures, as suggested by a very low R-squared (0.0296) – and if anything, the slope is positive (see figure 2.2).

Figure 2.2. Relationship between GVA share of manufacturing and GER in tertiary education (2011)



Source: own elaboration based on UNESCO and WIOD

Yet, it is equally implausible to argue that the expansion of higher education is symptomatic of a secular convergence towards an LME model (van Santen 2014, see e.g. Lauder, Brown, and Ashton 2008 for this line of argument) in which the service sector

becomes the key component of the knowledge economy. Not only have we seen that manufacturing is an important (and relatively stable) source of growth in a number of countries, *but this growth path centred on manufacturing is also actively sustained by policy-makers and social partners (e.g. business organisations) in these countries* (Hassel and Palier 2017, Thelen forthcoming). As an example, we can think of Industry 4.0 in Germany, which has been defined as “a national strategic initiative from the German government through the Ministry of Education and Research (BMBF) and the Ministry for Economic Affairs and Energy (BMWi)” which “aims to drive digital manufacturing forward by increasing digitalisation and the interconnection of products, value chains and business models” (European Commission 2017). The wide political support granted to this project by powerful collective actors is one of its key features. Thelen notes in this respect that “what is as striking as the futuristic ambitions of this project is the cast of characters charged with implementing it, which reads like a who’s who of the oldest and most influential actors in German economic history”, including the “Trade Association for Mechanical Engineering (VDMA), the Federation of German Industry (BDI), the Manufacturers’ Association for the Electrical Industry (ZVEI), the German Association of the Automotive Industry (VDA), and of course the IG Metall” (Thelen forthcoming).

How, then, should the cross-national trend of expansion of higher education be understood in the context of persistently different knowledge economies? It is suggested in this respect that disentangling theoretically the *convergent* trend of higher education expansion in the context of *persistent differences* in national economic structures is crucial to explain the emergence of national patterns of skill formation in higher education. In particular, it is necessary to understand how different ‘families’ of academic disciplines are *complementary* to different economic sectors, and to what extent different economic sectors have more or less *specific* requirements in terms of high skills needed. In other words, the *type of high skills* cultivated by governments and sought by employers differs

according to the knowledge economy that actors actively sustain and that, therefore, countries rely upon.

To understand why there may be different types of ‘high skills’ requirements, it is necessary to go back to some of the basic concepts employed in the literature on skill formation. In particular, the CPE literature has often equated higher education with general skills. However, this claim needs some further specification (see Streeck 2012 for a broader discussion on the limits of a binary distinction between specific and general skills). Higher education provides skills that tend to be general *on the side of the individual who acquires such skills*. That is, with a few exceptions (think for instance of medicine), the skills conferred by most higher education degrees do *not* constrain individuals to one specific job or sector. Rather, they allow working across more than one job or sector: they have, in other words, a significant degree of portability.

But if we turn to the demand-side, i.e. the skills needed by knowledge-based sectors, the picture is quite different. A short example illustrates this point: let us assume a knowledge economy that is based on advanced manufacturing (e.g. industry 4.0) vis-à-vis a knowledge economy relying on high-end services (e.g. the financial sector). The high skill implications are rather different: while both types of knowledge economy will require high inter-personal and cognitive skills (e.g. problem solving or analytical skills, which potentially come with a university education regardless of the specific discipline), high-end manufacturing will have a greater need for a specific set of skills on top of general skills. Thus, knowledge economies based on high-end services will be less constrained by the type of skills that the higher education system supplies, as long as high ‘general’ skills are present. In more practical terms: while both STEM and social science graduates might successfully find employment in, say, the financial industry, it is much more likely that the manufacturing industry *needs exclusively* STEM graduates for a significant number of key positions. This line of reasoning helps explaining why a

shortage in STEM graduates is often part of the discourse, while there are no comparable concerns about, for instance, shortages in social scientists: STEM graduates are, on one hand, sought by employers in ‘non-STEM-related’ occupations, and, on the other, employers in ‘STEM-related’ occupations *necessarily need* STEM graduates (see e.g. BusinessEurope 2011, Cedefop 2016). To put this simply: *a knowledge economy based on high-tech manufacturing cannot thrive without highly skilled individuals trained in STEM subjects, i.e. they rely on a relatively specific set of high skills. Conversely, a knowledge economy based on dynamic services is faced with this constraint to a much lesser extent.* This is not say that STEM skills are considered irrelevant for knowledge economies based on high-end services. Indeed, it has been noted that STEM graduates are likely to be sought across all knowledge-based sectors, hence initiatives in support of STEM skills might appear across most countries. However, it is suggested that such initiatives will be more significant and prescriptive in those countries where the lack of STEM skills might directly endanger the skill base of strategic sectors, such as high-tech manufacturing.

To what extent does this line of reasoning hold empirically? Table 2.2 and figure 2.3 capture the idea of sectoral differences in the type of high skills required by making use of the data collected in ‘Flash Eurobarometer 304’ which asks employers recruiting higher education graduates across Europe a set of questions, including the following: *“From which educational fields do you mostly recruit higher education graduates?”*. Employers that responded to the survey could choose among the following fields:

- Engineering;
- Business and economic studies;
- Languages; Law;
- Teacher training and education;
- Medical Studies; Humanities;
- Art and design;
- Communication and Information Sciences;
- Other social and behavioural sciences;
- Other natural sciences;
- Other.

I compare the concentration in Western European countries for employers in the ‘industry’ sector and in ‘non-public services’. The categories ‘industry’ and ‘non-public services’ were already constructed in the Eurobarometer data and they come closest to the categories of ‘manufacturing’ and ‘dynamic services’ outlined in table 2.1. It should be noted in particular that the category ‘non-public services’ in the Eurobarometer survey *excludes* non-dynamic services (which are grouped under a separate category named ‘Trade, accommodation and food services’), making it therefore highly compatible with the dynamic service category introduced in table 2.1.

If the reasoning developed in this sub-section thus far is correct, we expect employers in the non-public services to be less concerned with the discipline of their graduates and to therefore have a higher dispersion in the answers provided. I show this by calculating an index of concentration⁶ for employers’ responses in industry and in the non-public services. The index takes value 1 if employers all recruited from one discipline and it takes value 0 if employers recruited equally from all disciplines.

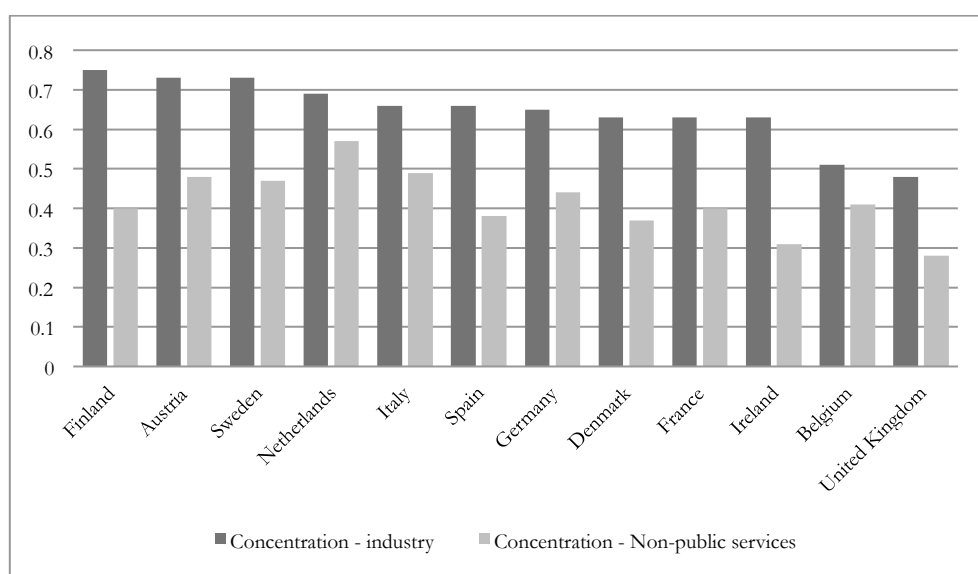
⁶ The index has been calculated using the formula of the GINI coefficient. Hence if employers responded that they recruited only from, say, law, the index would take value 1. If employers responded that they recruited equally from each of the disciplines listed, the index would take value 0.

Table 2.2. Employers' concentration of recruitment of higher education graduates in industry and non-public services

Country	Recruitment concentration index in industry	Recruitment concentration index in non-public services	Δ ⁷
Austria	0.73	0.48	0.25
Belgium	0.51	0.41	0.10
Denmark	0.63	0.37	0.26
Finland	0.75	0.40	0.35
France	0.63	0.40	0.23
Germany	0.65	0.44	0.21
Ireland	0.63	0.31	0.32
Italy	0.66	0.49	0.17
Netherlands	0.69	0.57	0.12
Sweden	0.73	0.47	0.36
Spain	0.66	0.38	0.28
United Kingdom	0.48	0.28	0.20
Average	0.65	0.42	0.23

Source: own calculations based on Gallup (2010)

Figure 2.3. Comparing employers' concentration of recruitment of higher education graduates in industry and non-public services



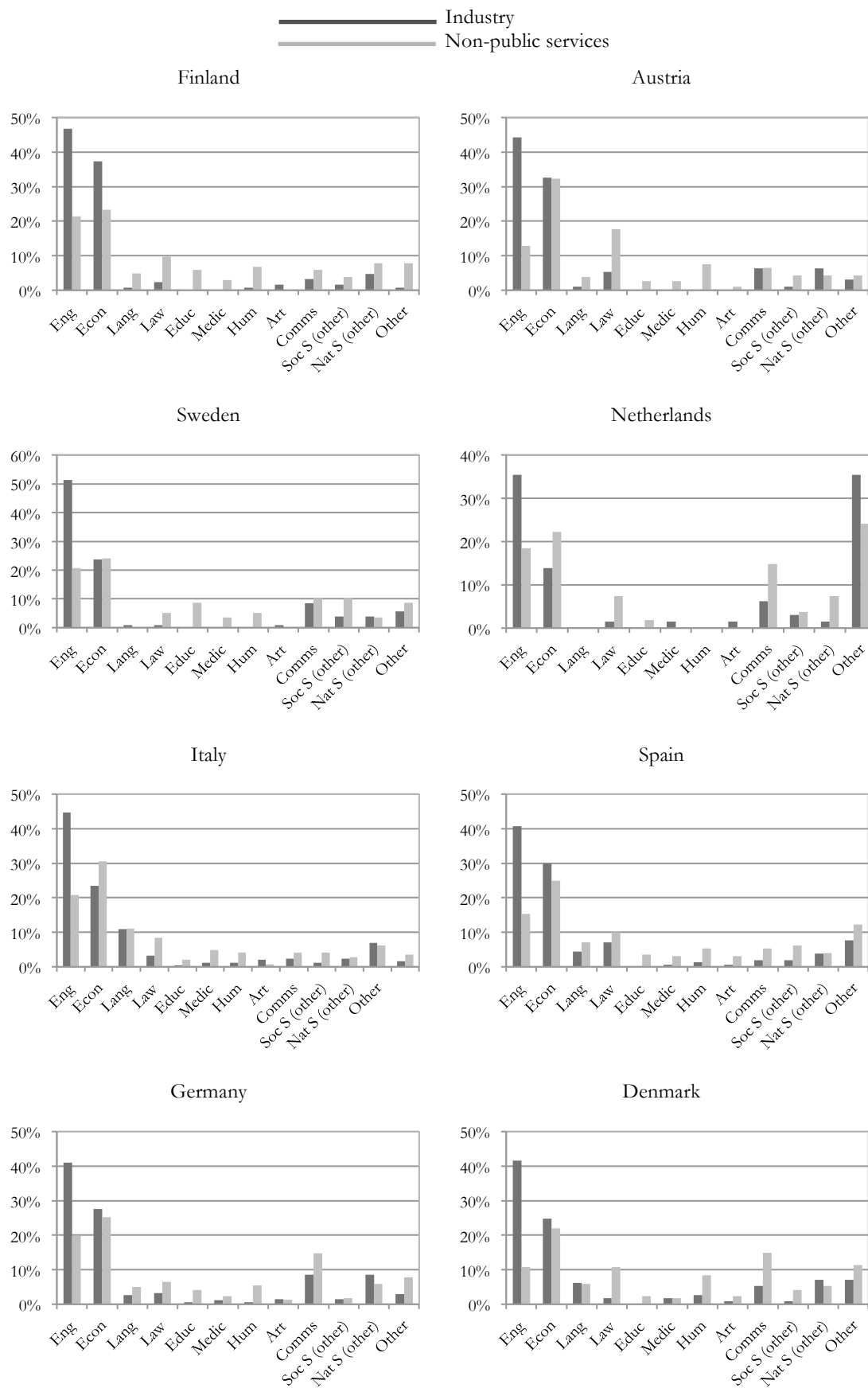
Source: own calculations based on Gallup (2010)

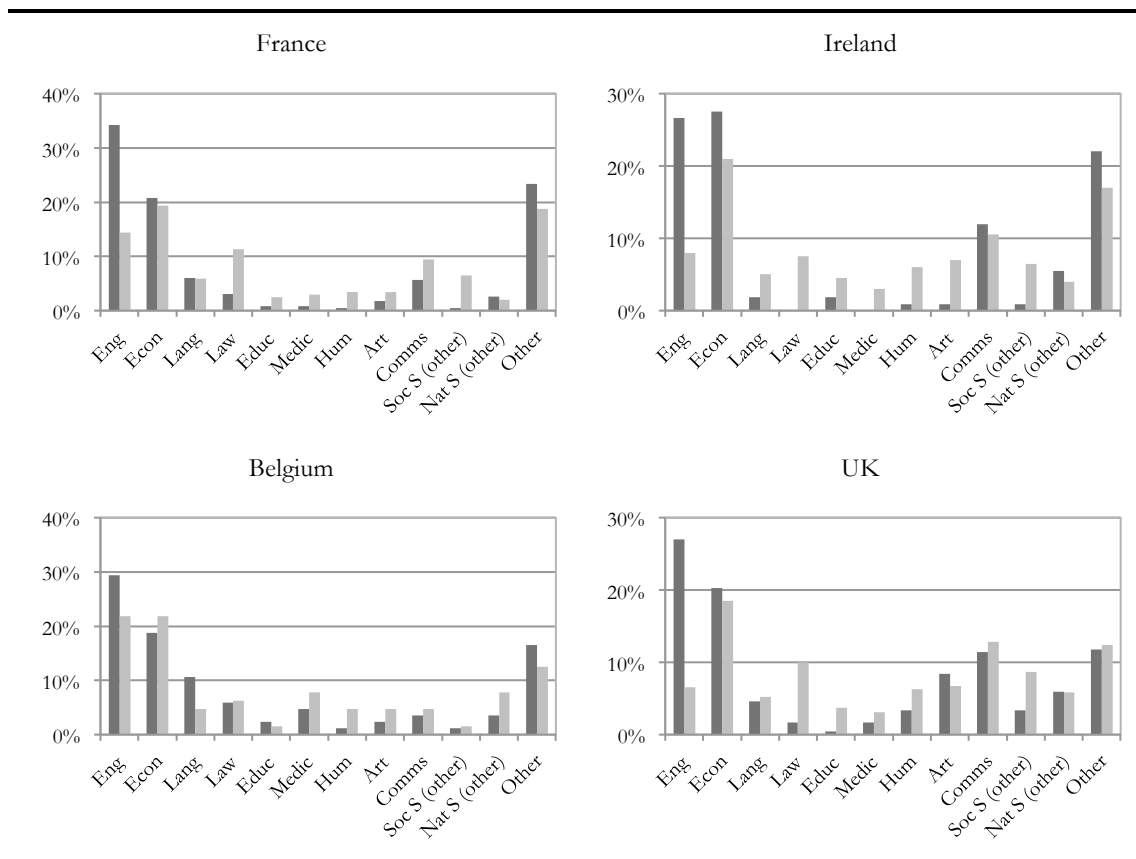
Table 2.2 and figure 2.3 confirm that – *in every country* – recruitment in the service sectors is less constrained by the discipline background of candidates, making it a sector with rather *general* high skill requirements, while employers in industry seem to have more *specific* requirements in terms of background, given that their recruitment patterns are

⁷ Calculated as [Recruitment concentration index in industry] minus [Recruitment concentration index in non-public services]

more concentrated. However, this piece of information does not tell us whether the higher concentration in recruitment of employers in industry is mostly around STEM disciplines, as hypothesised. To this end, figure 2.4 shows the distribution of responses that employers provided across countries. It shows that indeed employers in industry display much stricter preferences for recruitment around STEM, with a particularly skewed distribution of responses towards the ‘engineering’ category, as opposed to the less constrained recruitment pattern of employers in services. As illustrated in figure 2.4, the hypothesised pattern, notwithstanding some cross-country variation, holds across all Western European countries.

Figure 2.4. Recruitment by discipline and economic sector in Western Europe





Source: own calculations based on Gallup (2010)

The implication of this argument in terms of higher education policy is the following: *governments in those countries where strategic economic sectors rely on a specific set of skills (hence, countries relying strategically on advanced manufacturing) are more likely to step in to directly shape the supply of skills (i.e. by prioritising some disciplines over others), compared to countries where key economic sectors are relatively indifferent to the type of skills that the higher education system provides (hence, countries relying on dynamic services).* Indeed, even though higher education is a policy area where information asymmetries are less pervasive than most other social policies (Barr 2004), evidence shows that labour market signals are only one among several factors that lead to the choice of discipline (Briggs 2006, Reay et al. 2001), and that STEM disciplines are often those avoided by students (see e.g. Haynes 2008, Osborne, Simon, and Collins 2003 for a review of the reasons). Hence, even in the presence of strong labour market signals, shortages in STEM are likely to occur in the absence of specific actions and policies to promote the supply of these skills. Such specific actions and policies might be

driven directly by business, for instance by entering into cooperation with universities to negotiate the provision of degree programmes that respond to their needs. However, given that higher education is a policy area where the scope for ‘social partnership’ has traditionally been low, it is conceivable that in the majority of cases, business’ preferences on higher education policy will be enacted through government policy, as the scope for governments to directly influence higher education policy is certainly larger compared to that of business.⁸

To conclude this section: it has been argued that understanding how higher education systems align with knowledge economies requires considering how different types of knowledge economies are likely to require different types of high skills. The demand side has indeed been mostly side lined in the higher education literature seeking to explain the alignment between higher education and the labour market. Conversely, the CPE literature submits that the very expansion of higher education will be hampered in those countries where export-led manufacturing-based growth is dominant. This section showed that the CPE assumption is problematic: higher education has indeed expanded in countries that still today rely strategically on advanced manufacturing. But it has also been demonstrated that key actors’ preferences (such as governments and businesses) regarding the high skills needed to foster a particular knowledge economy might differ, an issue which structuralist and ideational literatures are by and large silent about. The insights drawn from this discussion on the different high skills needs that might be prompted by different knowledge economies will be picked up again in section 2.3 to formulate hypotheses on the trajectories of high skill formation that we should expect across different countries.

⁸ Although forms of governance of the higher education sector resembling ‘social partnership’ are traditionally found in some Scandinavian countries (Clark 1983, Olsen 2007, see section 2.2).

2.2 The supply of high skills: university agency in context and the theoretical implications for institutional change

While the previous section focused on the demand side, namely the type of skills that actors embedded in different knowledge economies might require and seek, I will now turn to the supply-side, that is the higher education systems that are expected to provide the high level skills demanded by knowledge-based labour markets. Chapter 1 highlighted the centrality of higher education as the main supplier of those high skills that are increasingly considered crucial to succeed in knowledge-based economies. It has also highlighted how the demands of policy-makers and business on universities have grown exponentially. As suggested by Regini, the development of knowledge-based economies has led to a situation in which “universities and companies can [...] no longer ignore each other as they have done in the past, but are now forced to work together and cooperate” (Regini 2011b, 81). It has also triggered an interest by external actors in “the ‘use’ of HE products [...] to an extent previously unknown” (Regini 2011b, 203).

In this section I discuss how higher education systems might *respond* to the demands of governments and employers in terms of closer alignment between higher education systems and labour markets. The starting point builds on recent work by Slaughter and Barrett. They argue that “universities are not simply acted upon by outside forces. Segments of the university, including some faculty, administrators, and students, embrace market activity [...], while other segments are resistant or neglected” (Slaughter and Barrett 2016, 1, see also Schulze-Cleven and Olson 2017). In particular, aligning higher education and labour markets is a ‘political’ process, which entails eroding part of the ‘academic freedom’ retained by universities as to *what* should be taught and *how*, in terms for instance of including ‘employability’ skills in the curricula, seeking advice from business on course contents or prioritising some subjects over others.

Under what circumstances should we expect universities to embrace (or even drive) the quest for a closer alignment with the labour market? Under what circumstances should we expect universities to defend their exclusive prerogatives of pursuing teaching and research ‘in separation’ from the demands of external stakeholders? What kind of cross-country variation should we expect to occur in this respect? These questions have not been systematically addressed by the literature thus far. Rather, universities have been mostly depicted as having a passive role and being subject to the demands of external stakeholders, without giving much consideration to the stance that they might take themselves when confronted with such demands and to the institutional context that might influence the preferences of actors *within* the higher education sector (but see Schulze-Cleven and Olson 2017 for a notable exception).

Borrowing Korpi’s categories of employers’ engagement with public policy-making and transferring it to the higher education sector, we might ask: (when) should we expect universities to act as ‘protagonists’, ‘consenters’ or ‘antagonists’ (cf. Korpi 2006)? In other words, once policy-makers implement reforms or promote policies that aim at increasing the alignment between the skills produced by the higher education sector and the needs of the labour market, when do we expect universities to second or to oppose these changes?

The early literature on higher education provides significant insights to hypothesise a theoretically-informed answer. Higher education is a multi-layered policy arena and the university in itself is a multi-faceted institution that, for instance, comprises a variety of stakeholders whose interests might not necessarily be aligned at all times: from faculty, to administrators as well as students – in addition to the external stakeholders that have been highlighted thus far, such as governments and employers (see e.g. Ginsberg 2011 for an analysis pointing to the decline of power of faculty members vis-a-vis administration).

Formulating any theoretical expectation as to how national higher education systems might react to the demands of external stakeholders, therefore, entails by definition a level of abstraction from the institutional complexity of universities and the host of micro processes that take place in each university on a daily basis. Yet, the literature on comparative higher education provides a starting point to simplify such complexity while simultaneously advancing a theoretically-grounded argument. In particular, I draw on Burton Clark's seminal work "Academic organization in cross-national perspective" (Clark 1983) to identify the institutional features of higher education systems that might help us theorise under what conditions universities will be more or less open to meet the demands of 'external stakeholders'.

Indeed, already in the early 1980s, Clark asked the question of which university system might be more amenable to changing environmental conditions and new external demands. After reviewing the organisational features and power dynamics across a variety of national higher education systems, Clark conceptualises university systems as being caught in a triangular tension between forms of 'coordination' – i.e. organising principles – relying on markets, states or academic oligarchies, providing an analytical framework that has profoundly shaped comparative higher education research for over three decades (Ferlie, Musselin, and Andresani 2008, Enders 2004, Neave and Van Vught 1994, Neave 2000, Teichler 1996a, 2003, 2005, Marginson and Rhoades 2002, Becher and Kogan 1992, Kogan and Hanney 2000, Bleiklie and Kogan 2007). Different forms of coordination became institutionalised in different parts of the world. Market-coordination, characterised by universities' behaviour akin to that of private firms and aimed at seizing 'market shares' in the higher education market, was identified as particularly prominent in the Anglo-Saxon countries (Marginson and Considine 2000). State coordination was found primarily in Scandinavian countries. This form of coordination is characterised by concertation between the government and the university

sector in a way that resembles social partnership in economic and social policy (Olsen 2007). Finally, university systems dominated by academic oligarchies were found chiefly in Continental Europe (Gieysztor 1992, Pechar 2012). Here, the state plays a crucial role in financing higher education but faculties enjoy extremely high de facto and/or formal power in academic matters (e.g. German professors' freedom of teaching and research is enshrined in constitutional law) (Clark 1983, Van de Graaff 1978).

Clark's argument posits that systems that are relatively more reliant on market coordination are those most amenable to change. At the other end of the spectrum, systems dominated by academic faculties are hypothesised to be the least ready to accommodate 'changes in environment', while state-coordinated systems take a somewhat intermediary position (Clark 1983, 202). To understand what is meant by market coordination and why it is plausible to expect these systems to be relatively more open to change than the others, it is worth going into some detail on Clark's work. First, with respect to the concept of markets in higher education, Clark points out that mechanisms of market coordination expand whenever there is "an increase in the capacity of students to choose among sectors, institutions, or disciplines" leading to an increase in "consumer sovereignty" (Clark 1983, 164, see also Jongbloed 2003).

Opportunities for choice are hypothesised to be particularly prominent in those higher education systems that "permit institutions to compete for students, engaging in claims of 'product differentiation' as a way of attracting consumers and thereby building a dependable base of support in a hived-off segment of the market" (Clark 1983, 162). The crucial feature for Clark in identifying a market-coordinated higher education system is the presence of tuition fees, as he submits that "when we hear the word *tuition* we are in the presence of a consumer market" (Clark 1983, 162), which in turn sets the incentives for higher education institutions to be malleable and change according to consumer demand (Clark 1983, 203).

Clark therefore concludes that “the market form appears [...to be...] the form most likely to keep a system open to change and adaptable to new environmental demands” (Clark 1983, 204). The point put forward by Clark can be understood in terms of what incentive-set universities are faced with, depending on whether they operate in a more or less ‘market-like’ environment. The crucial point is the extent to which universities compete against each other for private and public funds as well as position in rankings and prestige – all features that are usually bundled together in a market-coordinated higher education system. According to Clark’s line of reasoning, we expect universities to be more malleable to external demands when they operate in a highly competitive environment, because they perceive interaction with external stakeholders as a way to differentiate their educational offer, hence differentiate themselves from the competition. How does this general line of reasoning help us shed light on the dynamics of alignment between higher education systems and labour markets? There are at least two plausible mechanisms by which universities in high-competition settings might be expected to align their educational offer with labour market demands. Firstly, students might be (implicitly or explicitly) the transmission belt of employers’ preferences. Indeed, student surveys show that acquiring skills for their future professional life is a key motivation behind the pursuit of a university degree. A recent survey among university students in Europe reveals that the provision of “knowledge and skills [...] needed to be employable” (Gallup 2009, 5) is the top purpose assigned to higher education by respondents. Thus, particularly in a context where attracting students is critical to institutional survival, it is plausible to expect that universities – aware of students’ demands – strive to provide these skills and engage in a ‘product differentiation’ exercise along the lines hypothesised by Clark. This can take the form of closer alignment of their educational offer with labour market demands. Secondly, such strategic behaviour of universities might also take place in the absence of explicit student demand. In the

highly-competitive US higher education market, for example, community colleges in the 1970s transformed from liberal arts institutions into higher education institutions with strong ties with the local labour market. Such re-orientation of community colleges has been ascribed to managerial decisions that saw strong ties with the labour market as a strategic choice for these institutions to increase their viability in a highly-competitive higher education market (Brint and Karabel 1991). Clearly, concerns around institutional survival cannot be assumed to be exclusive to high-competition settings. However, it is plausible to assume that such concerns are stronger in these settings and that responsiveness to employers' and government's demand – whether channelled through student preferences or not – might be perceived as more urgent in these settings.

The issue of competition raised by the early literature on higher education is particularly suitable for an empirical test, because we find significant variation across countries in the degree to which universities compete. By exploiting variation across countries in the degree of competition among universities, we can therefore provide a preliminary empirical test of the central theoretical claim developed in this section, namely: *universities operating in highly-competitive institutional contexts will be relatively more open to the demands of external stakeholders compared to universities operating in low-competition settings.*

Despite all university systems having moved towards more market-based mechanisms across a variety of dimensions over the last two decades in particular (Dobbins and Knill 2014, Regini 2011b), we can still discern significantly different degrees of competition across universities in different university systems. Table 2.4 captures this variety through a composite index of competition, which takes into account three factors. The first one is the share of private funding in higher education, which speaks to Clark's argument that 'when we hear the word *tuition* we are in the presence of a consumer market' (Clark 1983, 162). This indicator is still certainly useful – and in fact it correlates with the following ones. However, compared to when Clark was writing, we

see in today's higher education a much stronger role of quasi-markets (Le Grand and Bartlett 1993) in allocating public funds (see e.g. Jongbloed 2003) and therefore competition might exist not only for fee-paying students but also for public funds, which might follow students.

Hence, to provide a more nuanced understanding of the extent to which a higher education system 'promotes competition' among universities, I also add two further dimensions drawn from the 'Flash Eurobarometer 260: Students and higher education reform'. In particular, I include in the index two further indicators that give a more complete understanding of the level of competition beyond the private/public funding dimension. The two additional elements are provided by the share of students that in each country agree with the two following statements: (i) "students choose where to study on the basis of the quality/reputation of the institution and its study programmes"; and (ii) "performance rankings of universities and programmes would help students to choose where to study".

The first statement captures the extent to which universities should care about their reputation in order to attract students. If perceived reputation/quality of universities is not an important factor informing students' choice, for instance because all universities are perceived as being of equal standing, then the competition – be it for public or private funds – would be significantly weakened. The second statement captures the extent to which reputation is a 'fixed' feature of universities. In other words, if universities know that moving up the rankings is important to uphold their reputation, this would increase competition. Conversely, if reputation, albeit important, was considered as unrelated to rankings, because for instance entirely judged on the basis of the history of a university, then, again, competition would be weakened because it would not make a huge difference moving up or down rankings, if these did not inform student choice. These three dimensions are averaged out to create an index of competition which

shows high inter-item correlation and reliability coefficient, suggesting that all three indicators are ‘pulling’ in the same direction. The Eurobarometer data is only available for European countries, hence a number of non-European countries only feature the private funding indicator, rather than the full ‘competition’ indicator. The data on competition among universities is reported in table 2.3.

Table 2.3. A composite index of competition among universities

Country	Private funding	Hierarchy	Rankings	Index of competition
Finland	4.1	17.8	6.0	9.3
Denmark	5.5	44.8	14.0	21.4
Belgium	9.9	39.6	43.0	30.8
Sweden	10.5	18.1	12.0	13.5
Austria	13.1	23.0	24.0	20.0
Germany	15.3	24.4	28.0	22.6
France	19.2	39.4	34.0	30.9
Ireland	19.5	44.7	34.0	32.7
Spain	22.5	19.0	35.0	25.5
Netherlands	29.2	34.0	16.0	26.4
Portugal	31.4	38.6	42.0	37.3
Italy	33.5	28.8	25.0	29.1
Australia	54.4	n/a	n/a	n/a
USA	65.2	n/a	n/a	n/a
Japan	65.5	n/a	n/a	n/a
United Kingdom	69.8	56.1	50.0	58.6
South Korea	73.0	n/a	n/a	n/a

Source: own calculations based on OECD (2017) and Gallup (2009)

Note: average inter-item correlation: 0.5902; scale reliability coefficient: 0.8120; private funding refers to

2011

Looking at the table, we note that countries group differently under this dimension compared to the knowledge economy-related indicators presented in section 2.2. In particular, at the high-end of the ‘competition scale’, we see LMEs and East Asian CMEs, while at the low end of the competition scale, Continental and Nordic CMEs group together. Thus, following the line of reasoning developed in this sub-section, we

should expect higher education systems at the high end of the competition scale to be ‘more open’ to external stakeholders compared to the ‘less competitive’ systems.

Finding a proxy to capture the openness of higher education systems is a significant challenge. I rely again on survey data, namely the ‘Flash Eurobarometer 198: Perceptions of Higher Education Reforms’, which asks university management and faculty members across European countries various questions on their preferences towards possible directions of reforms of their university systems. To gather an understanding of the ‘openness’ of the system to the demands of external stakeholders, I use two questions from the Flash Eurobarometer 198 in which respondents were asked to rate their ‘confidence’ in the involvement of a variety of actors on the reform of the university system.

In particular, they were asked to rate their confidence in the involvement of higher education reform of their own faculty and of professional associations. While confidence in faculty is a fairly close proxy for the confidence in stakeholders ‘internal’ to the system, the question on professional associations does not provide the same precision. However, given that the survey does not ask explicitly for ‘employer’s associations’, it is plausible to assume that these are considered as part of professional associations by respondents, and more broadly, it is plausible to assume that professional associations conform to the notion of a stakeholder ‘external’ to the higher education system and belonging to the private sector.

The share of respondents who stated that they have ‘full confidence’ is reported in table 2.4, along with a ratio of the share of respondents that stated that they have full confidence in faculty divided by the share who stated the same with respect to professional associations.

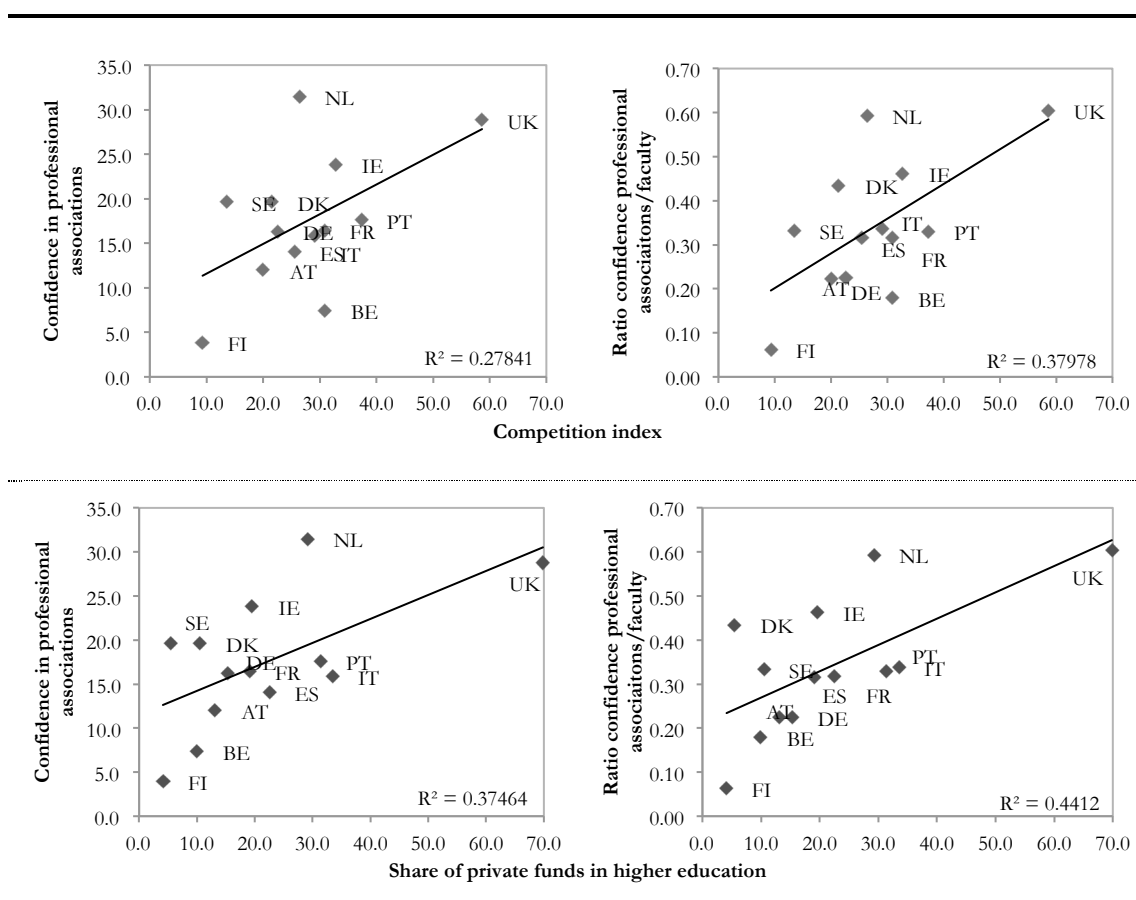
Table 2.4. A proxy of higher education systems' openness to 'external stakeholders'

Country	Confidence in faculty	Confidence in professional associations	Ratio faculty/professional associations
United Kingdom	47.6	28.8	0.61
Netherlands	53.1	31.5	0.59
Ireland	51.5	23.8	0.46
Denmark	45.1	19.6	0.43
Italy	47.2	15.9	0.34
Sweden	58.8	19.6	0.33
Portugal	53.3	17.6	0.33
Spain	44.2	14.0	0.32
France	52.0	16.4	0.32
Austria	53.5	12.0	0.22
Germany	72.6	16.3	0.22
Belgium	41.4	7.4	0.18
Finland	61.8	3.9	0.06

Source: own calculations based on Gallup (2007)

Taking the confidence in professional associations as a proxy for 'openness', given that these are 'external stakeholders', compared to the confidence in faculty that can be thought of as 'internal stakeholders', we should expect respondents in systems characterised by higher competition to be relatively more open towards external stakeholders. I test this relationship through simple scatter plots reported in figure 2.5. The top line plots the 'competition index' presented in table 2.3 against the proxies for openness developed in table 2.4, while in the bottom line we replace the 'competition index' with the 'simpler' measure of private funding in higher education.

Figure 2.5. A preliminary test of the relationship between ‘competition’ in the higher education sector and ‘openness’ to external stakeholders



Source: own calculations based on OECD (2017) and Gallup (2009)

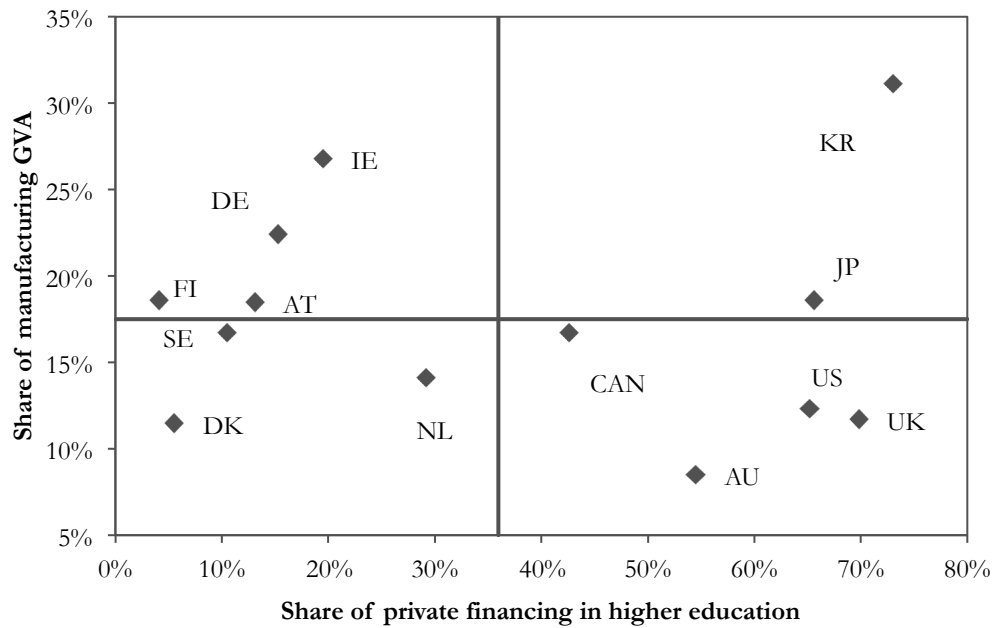
R-squared values range from 0.28 to 0.44, and they do not therefore provide a conclusive answer, possibly also due to the small sample of countries and to the fact that measurements developed are only proxies for what should be captured. However, the relationship goes in the hypothesised direction across the four scatter-plots (and when using different variables), suggesting that the theoretically-implied positive relationship between ‘competition’ in the higher education sector and its ‘openness’ towards external stakeholders is plausible. Thus, going back to the starting point of this section, we should expect universities in high competition settings to come close to the ‘protagonist’ or ‘consenter’ ideal type, when it comes to responding to (or driving) policy initiatives to open the higher education sector to external demands. On the other hand, a relatively

limited competition might incentivise universities' 'defence' of the status quo, hence bringing them closer to the 'antagonist' type, when it comes to opening up to the demands of governments and/or employers. Piecing together the insights from this section and the previous one, I will suggest next that it is possible to hypothesise different trajectories of skill formation in higher education across countries, and the associated patterns of institutional change in national higher education systems.

2.3 Piecing demand and supply together: varieties of high skill formation and hypotheses of institutional change

The two preceding sub-sections have set out the case for thinking of high skill formation and associated patterns of institutional change in higher education systems as a bi-dimensional space where 'types of knowledge economy' and 'competition among universities' are hypothesised to provide leverage in the theorisation of national trajectories of skill formation in higher education. The two sub-sections have also showed how countries cluster around the two dimensions differently. In particular, Continental European and East Asian CMEs share important features when it comes to the 'knowledge economy' dimension, namely high reliance on manufacturing vis-à-vis dynamic services; when we look at the 'competition' dimension, however, LMEs and East Asian CMEs cluster together to form a group of countries characterised by high competition among universities. Along this dimension, Continental European and Nordic CMEs cluster together in a group of countries with relatively low competition. Thus, we can graphically place countries in this bi-dimensional space according to Figure 2.6. Figure 2.6 shows the bi-dimensional grouping of countries by using GVA share of manufacturing to capture variation in the type of knowledge economy and share of private funding in higher education as a proxy for inter-university competition.

Figure 2.6. A bi-dimensional categorisation according to ‘type’ of knowledge economy and ‘competition’ in the higher education sector



Source: own calculations based on OECD (2017) and WIOD

As a general observation, we note that the four quadrants return a familiar pattern to CPE scholars as countries tend to cluster as we would theoretically expect, even as we consider a policy area – higher education – that has received comparatively limited scrutiny in the CPE literature: LMEs come close together in the bottom-right quadrant; East-Asian CMEs group in the top-right quadrant; Continental and Nordic European CMEs group on the left quadrants, differing by the weight of manufacturing in their economies that was already noted in section 2.2.

How do the two analytical dimensions proposed translate into hypotheses and observable implications? Starting from the knowledge economy dimension, we expect to find main differences between the top and bottom quadrants. In particular, following the line of reasoning illustrated (and preliminarily tested) in section 2.2, we can put forward two hypotheses as to how the ‘type’ of knowledge economy might affect the type of high skills that governments cultivate and employers seek, namely:

- H1. Governments are more active in directly shaping the supply of high skills in those knowledge economies that rely on a specific set of high skills, namely STEM skills in knowledge economies with relatively high reliance on manufacturing (i.e. countries in the top quadrants).
- H2. Governments across all four quadrants stimulate the provision of general skills across the higher education system, because cognitive/social skills are expected to be crucial in the knowledge economy, regardless of the ‘type’ of knowledge economy.

Turning to the competition dimension, we can hypothesise how the degree of openness of universities towards external stakeholders might affect the patterns of institutional change in the higher education sector. In particular, I link the arguments developed in section 2.3 with recent advancements in the comparative political economy literature on gradual institutional change (Mahoney and Thelen 2009, Streeck and Thelen 2005). We have pointed out that universities in ‘low competition’ settings are more likely to act as ‘antagonists’ to any reforms or policy initiatives that seek to open up the higher education system to the demands of external stakeholders. Thus, low competition settings approximate what Mahoney and Thelen (2009, 19) identify as a political context characterised by strong veto possibilities. Here it is important to note that I take a broad definition of veto possibilities, in which universities might be the *de facto* veto players, but they are not expected to have a *formal* veto right over policy-making as in the classic veto player theorem (cf. Tsebelis 2002). In such a context, it is expected that institutional change unfolds marginally, e.g. by side-stepping veto-players, rather than in an encompassing fashion, i.e. overhauling existing institutional arrangements. More specifically, marginal institutional change is expected to take the form of ‘layering’ and ‘drift’. Conversely, where the political context features weak veto possibilities (in this case: there is high competition between universities), institutional change is expected to

be encompassing, and take the form of ‘conversion’ or ‘displacement’. These four mechanisms of gradual institutional change are described in greater detail in table 2.5.

Table 2.5. Types of gradual institutional change

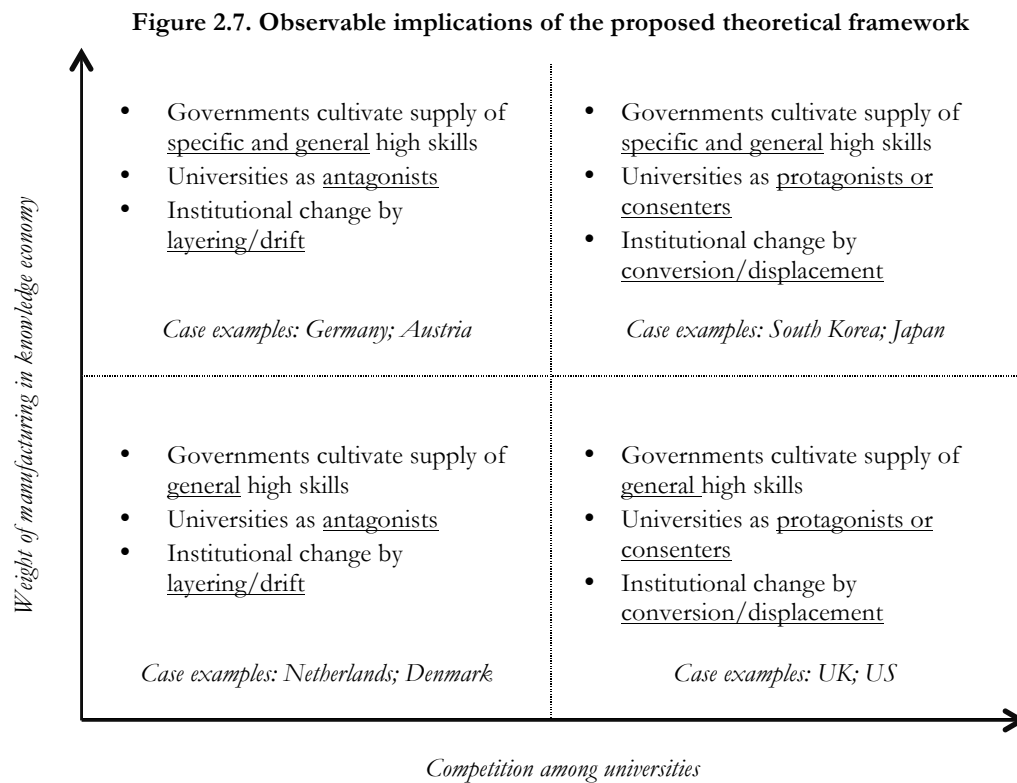
	Layering	Drift	Conversion	Displacement
<i>Definition</i>	New elements attached to existing institutions gradually change their status and structure	Neglect of institutional maintenance in spite of external change resulting in slippage in institutional practice on the ground	Redeployment of old institutions to new purposes; new purposes attached to old structures	Slowly rising salience of subordinate relative to dominant institutions
<i>Political context</i>	Strong veto-players	Strong veto-players	Weak veto-players	Weak veto-players
<i>Mechanism</i>	Differential growth	Deliberate neglect	Redirection, reinterpretation	Defection
<i>Example of process</i>	Faster growth of new institutions created on the edge of old ones	Change in institutional outcomes effected by (strategically) neglecting adaption to changing circumstances	Changing contextual conditions and coalitions open up space for redeployment	Active cultivation of a new ‘logic’ of action inside an existing institutional setting

Source: Mahoney and Thelen (2009) and Streeck and Thelen (2005), with own modifications

Thus, bearing in mind the preferences that universities might have in the process of aligning higher education with labour market demands, and considering how these preferences might affect patterns of institutional change, we can put forward the following additional four hypotheses:

- H3. Where competition among universities is high, the role of universities conforms to the ideal types of ‘protagonists’ or ‘consenters’ and institutional change is encompassing (i.e. it proceeds through conversion and/or displacement).
- H4. Where competition among universities is low, the role of universities conforms to the ideal types of ‘antagonists’ and institutional change is marginal (i.e. it proceeds through layering and/or drift).

Finally, combining the four hypotheses advanced so far, we can list the observable implications of the proposed theoretical framework in each of the quadrants. The observable implications of the theory are presented in figure 2.7.



Source: own elaboration

As described graphically in figure 2.7 and illustrated at length through sections 2.1, 2.2. and 2.3, the proposed theory offers a set of outcomes (e.g. the ‘type’ of high skills that will be cultivated by governments and sought by employers; the ‘type’ of institutional change that is expected to take place), a theorisation of actors’ preferences, the underlying reasons for a given preference formation process (e.g. the role of universities as informed by the institutional context of ‘university agency’), as well as the mechanisms through which these preferences are expected to play out in the policy process. In other words, it tries to comply with what Peter Hall defines as “good theories”, i.e. those characterised by “a set of causal processes associated with the operation of particular

variables” such as “predictions about the events that can be expected to occur, the sequence of those events, and the public and private positions actors are likely to take, as well as many other features of the relevant causal chain” (Hall 2003, 393).

2.4 Zooming into the four quadrants: the ‘centre of gravity’ of higher education systems and the implications for continuity and change

Before concluding the chapter with a comparison of the proposed theoretical framework with the existing theories illustrated in section 1.2, it is worth zooming into the four quadrants to provide some preliminary considerations on the cases that each quadrant contains. In particular, we ask whether the mechanisms of change hypothesised in sections 2.2 and 2.3, once taken out of the (mostly) theoretical discussions developed thus far, are equally expected to manifest across all quadrants. In particular, to the extent that this thesis is concerned with patterns of institutional *change*, we need to ask whether change is indeed what we should reasonably expect across all quadrants. Let us recall the dependent variable of this research as illustrated in section 1.1. We defined ‘skill formation in higher education’ as “*the institutional set-up of a higher education system and its connection to the labour market, in particular those segments of the labour market that are reliant on high skills*”. We also outlined that higher education systems have traditionally enjoyed a significant degree of freedom from ‘external stakeholders’ but also that pressure has been mounting since the mid-1990s to align higher education provision and labour market demands, as high skills have become increasingly crucial for economic success in the knowledge economy. But has this pressure for *change* been the same across countries? In other words, to what extent can higher education systems have an institutional set-up that makes them well connected with the labour market at the outset?

Theoretically we can argue that *pressure of change is greater the more distant a higher education system is at the outset with labour market demands*. In other words, if the ‘centre of

gravity’⁹ of a higher education system is close to labour market demands, the pressure for change in the context of continuous expansion of higher education is limited. A particularly significant proxy to assess whether the centre of gravity of a higher education system is in line with labour market demands or, conversely, removed from it is the proportion of students that are enrolled in ‘professional’ or ‘vocational’ higher education (such as those enrolled in universities of applied sciences and similar institutions) vis-à-vis those enrolled in universities. If a sizeable share of students is enrolled in professionally oriented higher education institutions, we suggest that the centre of gravity of a higher education sector is in its vocational sub-set. To the contrary, if traditional research-oriented institutions are home to the majority of students, the system’s centre of gravity is located in its research-oriented sub-set. If the centre of gravity of a higher education system is to be found in its vocational sub-set, we should expect that those higher education systems are ‘aligned by default’ with labour market needs and therefore governments – and employers – would work towards preserving the status quo and prioritising continuity over change when confronted with the pressing need to align higher education provision with labour market needs. Table 2.6 shows that differences in this respect were particularly striking in the second half of the 1990s, i.e. as the issue of high skill formation for the knowledge economy became particularly salient.

Table 2.6. Identifying the centre of gravity of higher education systems in the second half of the 1990s

Country	Share of students in universities	Share of students in professionally-oriented higher education institutions
Denmark	30%	70%
Netherlands	37%	63%
South Korea	73%	27%
Germany	76%	24%
UK	100%	--

Source: Huisman and Kaiser (2001, 19) and KEDI (2015, 32)

⁹ I am grateful to Kathleen Thelen for her advice to look for the ‘centre of gravity’, although she should not be implicated for what has been identified as such.

Note: bold indicates the ‘centre of gravity’ of the system in each country. Data refers to 1996 for Denmark, Netherlands, Germany and the UK and to 2000 for Korea

Table 2.6 highlights remarkable cross-country differences. Starting from the bottom line, the UK has a unitary higher education system. As such, all students are formally enrolled in the same ‘type’ of institution, and universities differ from each other mainly by virtue of their individual reputation. Despite some legacy effects, given that the UK used to be a binary system with explicitly vocationally-oriented higher education institutions, namely the Polytechnics, until 1992 (Pratt 2008, 1992), the major line of differentiation is expected to be a vertical one (as briefly mentioned in section 1.2 and as will become more apparent in chapter 4, when the UK case will be discussed in detail). But if we look at the other four countries in the table, we note that all display a proportion of students enrolled in traditional universities and a proportion of students enrolled in a different set of higher education institutions, namely professionally-oriented higher education institutions, such as German *Fachhochschulen*, Dutch *hogescholen*, or Korean Junior Colleges (it should be noted, however, that the latter do not provide full degrees, only offering sub-degree programmes, so differing from the German and Dutch cases where full degrees are offered by *Fachhochschulen* and *hogescholen* too). In other words, these countries have a *binary* higher education system, in which different groups of institutions serve different objectives. However, the relative weight of the two sub-sectors of the higher education system varies greatly: a vast majority of students is enrolled in traditional universities in Korea and Germany, while the reverse holds true for the Netherlands and Denmark, i.e. the two countries belonging to the bottom-left quadrant of the proposed bi-dimensional space in figure 2.6.

Because of specific historical developments in these two countries, higher education systems were therefore already heavily geared towards labour market demands in the mid-1990s through a remarkably high share of students enrolled in professionally-

oriented higher education institutions. Given that the centre of gravity of the higher education system is close to the labour market in these two countries, do we observe limited pressure for change in their respective higher education systems? We can answer this question with reference to the Dutch case. In particular, looking at a series of reforms undertaken from the second-half of the 1990s we indeed find that the skewed distribution of students towards the vocational sub-set of the higher education system steered the reform process relatively more towards stability than change. When the Dutch government embarked upon a large-scale reform process of the national university system under the auspices of the Bologna process, the issue of labour market relevance of higher education – which was part and parcel of the Bologna process (recall section 1.2 in this respect) – gained political salience (Witte 2006). Yet, the ensuing reform process was characterised by remarkably little change, and by a constellation of key actors' preferences that closely resembled a political-economic equilibrium.

In a detailed reconstruction of the Dutch reform process, Witte finds that: “hogescholen [i.e. professionally oriented higher education institutions] made up an important part of the Dutch HE system. Massification in the Netherlands was by and large accommodated by the hogeschool sector [...]. Accordingly, *the pressure to 'professionalise' university degrees was quite low*” (Witte 2006, 209 emphasis added, see also Huisman and Kaiser 2001). As expected from the theoretical framework presented in the preceding section, (traditional) universities objected to any potential transformation of their own degrees towards closer labour-market orientation (i.e. they performed the hypothesised antagonist role) (Witte 2006, 377, Lorenz 2006). Critically, policy-makers sided with (research) universities – instead of putting pressure on them – because of the historically-inherited skewed distribution of students in favour of professional higher education institutions, which made it unnecessary to push traditional universities towards a professionalisation of their degrees.

Furthermore, the Dutch hogeschool sector was traditionally seen as extremely responsive to societal needs, thus making it a particularly suitable target for government policy when adjustments in the higher education sector were required, as opposed to the relatively more rigid (research) university sector (Teichler 1989, Maassen, Moen, and Stensaker 2011). Early assessments of the hogescholen sector went as far as suggesting that “almost everything seems to be open for reform” (Teichler 1989, 200). And such openness to reform has accompanied Dutch universities of applied sciences for the following three decades. For example, the association of the hogescholen (i-HBO) has been actively involved in policy initiatives bringing together government and industry and aimed at adjusting the provision of higher education to the needs of the Dutch knowledge economy. Most recently, the i-HBO coordinated a policy initiative to improve the provision of higher level ICT skills, including the development across universities of applied sciences of ICT degrees with the explicit aim “to strengthen the position and image of ICT in the Netherlands, for both future students and industry” (European Commission 2014). More broadly, the important role of the hogescholen in meeting the needs of the Dutch labour market is well noted by domestic and international observers. A key strength of this sub-set of the Dutch higher education system is found in its ability to connect creatively theory and practice in their educational approach (Boezeroy 2003) and the OECD regards the hogescholen as the key component of a “highly developed model of a binary system”, whose core strengths lie in the “multifaceted connections to working life – in their pedagogy and instructional staff; through employer participation in their supervisory boards; and in advisory relationships between employers and hogescholen that extend from the development of programmes to their quality assurance” (OECD 2008, 219).

Given the availability of a large and vibrant sub-set of the higher education sector intimately linked to labour market needs, the minister in charge of higher education

policy was strongly in favour of keeping a distinction between professional and academic (higher) education, which was considered “an important form of differentiation that matches the prior education of students as well as labour market needs” (Witte 2006, 221, see also Ballarino 2011). The same view was held by employers who were systematically involved at the national level on the reform of Dutch higher education in the late 1990s (Ballarino 2011, Perotti 2011). In particular, business representatives “strongly opposed [any deviation from the binary system] as they highly valued the provision of ‘different types of graduates’” (Witte 2006, 221), with work-ready graduates from universities of applied sciences being particularly appreciated by internationally-oriented Dutch SMEs in high-tech sectors (Perotti 2011). This constellation of actors’ preferences was crystallised in the Dutch Education Council, the permanent advisory body set up to supervise and advise on the reform, which “strongly supported the maintenance of a binary system” (Witte 2006, 221).

Thus, a large professionally-oriented higher education system created the conditions for a political-economic equilibrium (Witte, Van der Wende, and Huisman 2008, Witte 2006), in which “state actors had fewer incentives to change the inherited task distribution between universities and hogescholen” (Witte 2006, 371). The importance of the historically-inherited distribution of students between the academic and professional sub-sets of the higher education system will become even clearer when the German case study will be presented (chapter 5): in Germany the size of ‘traditional’ academic and ‘professionally-oriented’ higher education in the mid-1990s was almost perfectly the reverse of that of the Netherlands (see table 2.6) and therefore the system was perceived by government and employers as overall irresponsible to labour market needs. In the German context, government and employers put pressure on traditional research universities to make a greater contribution towards professional higher education (Toens 2009), therefore tilting political-economic coalitions in favour of

change rather than continuity. In the Dutch case, instead, the strong professional orientation of higher education inherited by the government in the late 1990s contributed to cementing an alliance between business, policy-makers and (traditional) universities which supported ‘continuity’ in higher education policy as long as the relationship between the labour market and the higher education system was concerned.

Furthermore, the qualitative evidence just presented with reference to the Dutch case is consistent with how both Denmark and the Netherlands locate in figure 2.6. Indeed, in all four scatter plots both countries featured higher ‘openness’ towards external stakeholders than we would have expected given their level of ‘competition’ among universities. In light of the evidence just provided on the Dutch case, a possible interpretation could be precisely that the higher education sector is relatively more open to external stakeholders on the basis that they do not feel significant pressure for change from them. On the basis of the evidence presented in this section, we therefore modify the theoretical expectations developed in section 2.3 to make explicit that *the pressures for change introduced in chapter 1 and hypothesised to unfold as illustrated in this chapter do not apply to countries in the bottom-left quadrant. In the latter, a scenario of continuity – rather than change – is expected to prevail.*

2.5 Setting-up a ‘three cornered fight’: how would I know if I am wrong?

This chapter sketched out a theoretical framework to understand the alignment of higher education systems and knowledge-based labour markets in contemporary advanced capitalist countries. By way of conclusion to the chapter, I provide a summary of the existing theories presented in section 1.2 and the alternative theory developed in chapter 2, which I label ‘varieties of high skill formation’. As illustrated by Peter Hall, “[p]rogress in social science is ultimately a matter of drawing fine judgments based on a three-cornered comparison among a theory, its principal rivals, and sets of observations” (Hall

2003, 392). Accordingly, this section summarises the observable implications and underlying mechanisms of institutional change that the three theories presented in chapter 1 (structuralist; ideational; and CPE/VoC) posit and compares them with implications and mechanisms of change hypothesised by the alternative theory developed in this chapter (named ‘varieties of high skill formation’).

Two main differences between the proposed alternative theory and the three existing theories stand out. Firstly, both ideational and structuralist explanations predict a convergence of higher education systems through ‘conversion’ (in the ideational approach) or ‘layering’ (in the structuralist approach). The proposed theory, instead, predicts that we will see ‘conversion’ or ‘layering’ depending on the incentive set that different higher education systems pose on individual universities in the form of strong or weak competition; more specifically we expect institutional change to proceed via layering where competition is weak and via conversion where competition is strong.

Secondly, CPE/VoC approaches predict divergence on the basis of weak expansion of higher education in CMEs, which are expected to rely instead on vocational training, which is complementary to CME-like production regimes, while higher education expansion is expected to *complement* LME-like production regimes. The proposed theory – consistently with CPE/VoC approaches – appreciates the importance of the education-labour market nexus in leading to different institutional arrangements in the realm of education and skills, but it puts forward a case for different arrangements *within* the higher education sector rather than *between* higher education and vocational training, depending on the *high* skills needs of different knowledge economies. More specifically, it is expected that high skill formation will be centred around STEM skills in those countries where the knowledge economy relies strongly on the advanced manufacturing sector while higher education expansion is expected to be less constrained

in terms of disciplines in those countries pursuing knowledge-based growth reliant on high-end services.

By laying out alternative theories and identifying *both* observable implications / outcomes and underlying causal processes, I follow Hall's conceptualisation of "systematic process analysis" (Hall 2003, 391), which is based on the principle of examining "the processes unfolding in the cases at hand as well as the outcomes in those cases" (Hall 2003, 393). The methodological focus on both processes and outcomes reflects advancements in the ontologies underpinning the social sciences, which increasingly recognise "political outcomes as the result of causal processes in which distant events, sequencing and complex interaction effects play important roles" (Hall 2003, 398). Such complexity – it is suggested – is more fully appreciated when combining observations "not only about the values of the principal causal variables, but also about the processes linking these variables to the outcomes" (Hall 2003, 394). Once theories are illustrated in both outcomes and processes, alternative predictions can be confronted with "observations drawn from data about the world" and can be "shown to be false by available data" (Hall 2003, 394), preparing the ground for a 'three-cornered comparison' between rival theories and empirical observations. Table 2.7 provides a summary of the rival theories.

Table 2.7. Summary of alternative theories

Theory	Observable implications	Underlying mechanism
<i>Proposed theory</i>		
<i>Varieties of high skill formation</i>	All universities systems adjust to the knowledge economy, but providing different skillsets depending on type of knowledge economy Institutional change encompassing/marginal depending on incentive-set faced by universities	Governments and employers demand universities to provide high skills according to the needs of national knowledge economy and institutional change is mediated by higher education sector
<i>Existing theories</i>		
<i>Structuralist</i>	Horizontal differentiation of higher education systems Vocationally-oriented higher education located in separate tier/institutions Convergence via layering/differential growth	Expansion of universities enrolments prompts governments to create an additional vocationally-oriented tier
<i>Ideational</i>	Transformation of higher education systems subsumed to market needs Universities serving the needs of labour markets Convergence via conversion/displacement	Governments/international organisations reform higher education sector according to 'marketising' principles
<i>Institutionalist/VoC</i>	Higher education expanding in LMEs Higher education suppressed in CMEs, which continue to rely on vocational training instead Divergence via continued reliance on higher education in LMEs and on vocational training in CMEs	Governments respond to employer preferences, which support expansion of higher education in LMEs but not in CMEs

Source: own elaboration

From the next chapter onwards, the discussion moves on to the empirical observations: chapter 3 will show how the empirical material underpinning the observations needed to 'judge' between theories has been collected, before moving on to the presentation of such empirical material by means of country case studies in chapters 4, 5 and 6. As part of the conclusions (chapter 7), the empirical findings will be summarised and discussed in light of the alternative theories.

3 Methodology

This chapter provides details on key methodological issues, namely: the criteria used to select case studies (section 3.1); the tools that have been employed to collect the data (section 3.2); the limitations of the data collection strategy (section 3.3); and how the material collected will be presented across the three empirical chapters (section 3.4).

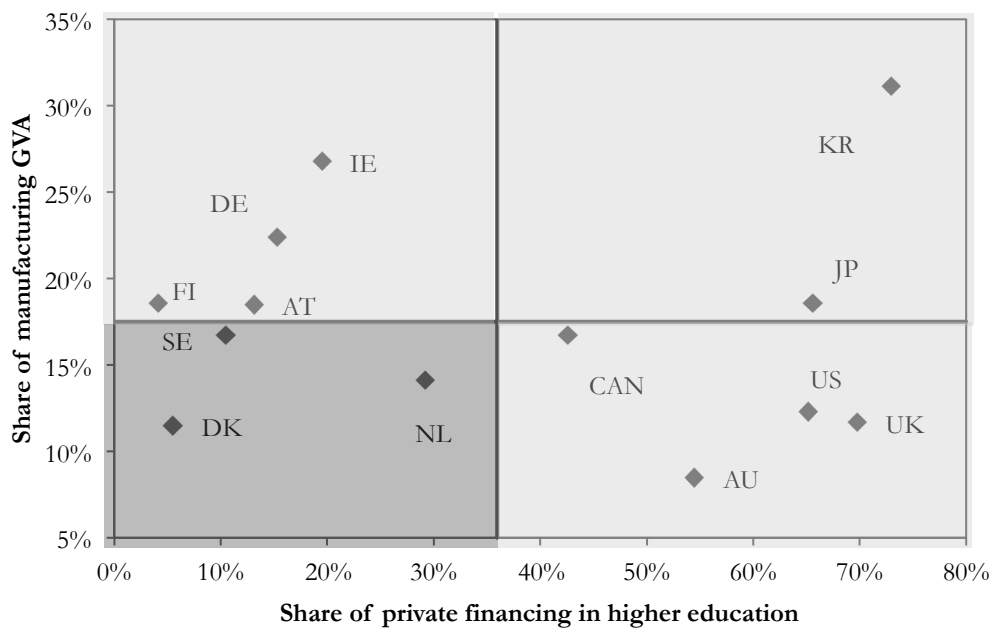
3.1 Case selection

As has been discussed in the preceding chapters, this thesis seeks to make sense theoretically and empirically of the distinct national patterns of high skill formation within the convergent trend of skill formation in higher education. Chapter 2 introduced a theoretical framework that, as I have argued, can explain the phenomenon of interest. In particular, the theoretical framework builds on two crucial variables: the type of knowledge economy that is dominant in a given country (as proxied by the share of national GVA that the manufacturing sector contributes to) and the degree of competition within the higher education sector (as proxied by the share of private spending in higher education). Given the theoretical framework is captured by a two-by-two matrix, I have selected case studies that maximise variation along the two dimensions that have been theoretically identified as relevant; that is, I have opted for a ‘diverse’ cases design, which has “stronger claims to representativeness than any other small-N sample” (Seawright and Gerring 2008, 301).

However, a caveat to a ‘pure’ diverse cases design applies: the thesis is primarily interested in the study of institutional *change*. It has been illustrated in section 2.4 that continuity is theoretically expected to prevail over change in the countries located in the bottom-left quadrant of the bi-dimensional space (i.e. marked in darker shade in figure 3.1). Through the brief case study of the Netherlands presented in section 2.4, it has also been demonstrated that – empirically – continuity indeed prevailed over change. Thus,

the selection covers a set of diverse cases drawn from the ‘universe of cases’ in which we theoretically expect institutional change to take place (i.e. drawn from the three quadrants in lighter shade in figure 3.1).

Figure 3.1. Universe of cases



Source: own calculations based on OECD (2017) and WIOD

The case selection therefore comprises three case studies, which make for a jointly exhaustive and mutually exclusive combination of cases *for the three quadrants of theoretical interest*. The selection of cases within each of the three quadrants of interest is performed according to a logic of “typological theorising” (Gerring 2008, 253), i.e. it is driven by the assumption that “different combinations of variables [...] have effects on an outcome that vary across types” (Gerring 2008, 253). This is precisely the theoretical expectation that was put forward in chapter 2, and that was made explicit in particular in section 2.3. Because the quadrants contain groups of cases that are internally homogenous with respect to the variables of interest, the choice of cases should target ‘typical’ cases within each quadrant (Gerring 2008). Thus, the choice is relatively unproblematic *unless* a

quadrant contains cases characterised by “suspected diversity” (Gerring 2008, 254), which only occurs with respect to the top-left quadrant, where Ireland (usually referred to in the literature as a LME) groups together with Western European CMEs. Furthermore, in the same quadrant, there are both Continental European and Scandinavian CMEs, that have been identified in the literature as different when it comes to their education and training systems and broader welfare states (Busemeyer 2009a, Busemeyer and Iversen 2014, Esping-Andersen 1990). Thus, selecting a case study from the top-left quadrant requires more elaboration (see point 2 below) compared to the selection of cases in the bottom-right and top-right quadrants (see points 1 and 3 below, respectively). Following this line of reasoning, and paying particular attention to both ‘typological theorising’ and ‘suspected diversity’, the case selection is performed as follows:

- 1- **UK:** it represents a knowledge economy based on dynamic services with a higher education sector characterised by high competition among universities. The UK falls within the bottom right quadrant together with the other LMEs and it has often been picked out in the CPE literature, and in particular in the comparative analysis of education and skills policies, as a typical LME case (Busemeyer and Vossiek 2016, Busemeyer 2015, Thelen 2004). More specifically, given that higher education policy varies across the UK, the empirical focus is on England. In this quadrant, a logic of typological theorising can be applied without particular problems: the UK, US, Australia and Canada have all been examined at length as cases of ‘academic capitalism’ in which competition among universities has increased and has been actively promoted by governments (Slaughter and Leslie 1997). Furthermore, these countries – with a particular focus on the UK and the US – have been identified in the literature as pursuing growth strategies in which

high-end services play a prominent role (Hassel and Palier 2017, Ansell and Gingrich 2013).

- 2- **Germany:** it represents a knowledge economy based on advanced manufacturing with a higher education sector characterised by limited competition among universities. Germany falls in the quadrant of Western European CMEs and, as for the UK, it has been invariably picked out in the CPE literature as the typical CME (Thelen 2004, Busemeyer 2009a, Busemeyer and Vossiek 2016, Busemeyer 2015). It should be noted that while the German school system is highly decentralised and each *Länder* has a high degree of autonomy in policy-making, the higher education sector is characterised by comparatively larger federal authority, which makes Germany suitable for a *country* case study when it comes to this policy area (Busemeyer 2015, 92). The selection of Germany in the top-left quadrant deserves more elaboration, however, given that this quadrant features next to Germany and Austria (i.e. Continental European CMEs), also an LME (Ireland) and – although not in a clear-cut position – two Scandinavian CMEs (Sweden and Finland). The Irish case can be ruled out in a relatively unproblematic way: given that the Irish growth model has been picked out in the literature as rather *sui generis* (Brazys and Regan 2017, Regan and Brazys 2017 see also section 2.1.), it does not provide significant leverage for broader theorising. In picking Germany over Austria or either of the Scandinavian CMEs, I select a *critical* case (Eckstein 1975), in which institutional change in the direction of better alignment between higher education provision and labour market needs is least expected, i.e. I stack the cards against myself (Hancké 2009, 68). Indeed, out of the countries in this quadrant, the German higher education system is the one featuring historically strongest self-governance of academic faculties, making it a least likely case of a higher

education system opening up to labour market needs (Clark 1983, Toens 2009, Pechar 2012). Furthermore, Germany's growth strategy is firmly centred on advanced manufacturing compared to the relatively more mixed-growth strategies found in the Nordic countries and entailing both high-end services and advanced manufacturing (Thelen forthcoming, Hassel and Palier 2017). As far as countries relying on advanced manufacturing are concerned, the literature stresses continued reliance on post-secondary vocational training systems (Anderson and Hassel 2013, Ansell and Gingrich 2013), thus providing an additional (higher) barrier to change compared to the other countries in the quadrant. By picking a critical case in the face of 'suspected diversity' within this quadrant, I select the case that provides me with greater theoretical leverage.

- 3- **South Korea:** it represents a knowledge economy based on advanced manufacturing with a higher education sector characterised by high competition among universities. South Korea is picked from the top-right quadrant, where – together with Japan - the East-Asian CMEs are located. Although Japan has been researched at length to explore this group of countries, scholarly interest in South Korea has been prominent over the last decade to illustrate patterns of institutional change of East Asian CMEs (Fleckenstein and Lee 2017, 2014), making it a suitable choice for a typical case within this quadrant. Indeed, the Korean and Japanese higher education systems are comparable in their key features, such as the high share of private financing and significant competition between public and private universities (Kariya 2011, Kim and Lee 2006), while both growth strategies have been identified in the literature as based on advanced manufacturing (Hassel and Palier 2017). Thus, in this quadrant as in the case of the UK, I can resort to a logic of 'typological theorising' without encountering particular problems.

Furthermore, taken as pairs, the three cases also allow exploiting of most similar and most different designs (Yin 2003, Seawright and Gerring 2008) along the two key variables that have been identified, thus strengthening confidence in the generalisability of the findings, as illustrated in table 3.1.

Table 3.1. How case studies pair up in most similar/most different designs

Country comparison	Dimension	
	Type of knowledge economy	Competition in higher education
UK-South Korea	Most different	Most similar
Germany-South Korea	Most similar	Most different

Source: own elaboration

3.2 Data collection

The empirical material has been collected using three main sources of information: (i) analysis of relevant policy publications and descriptive statistics; (ii) interviews with relevant policy stakeholders at the national level; and (iii) interviews at university level. The remainder of this section reviews each data source. Firstly, documents issued by relevant stakeholders as well as descriptive statistics from these publications have been analysed. These include policy publications by university associations, employer associations and policy-makers, special Eurobarometer reports focusing on higher education as well as newspaper articles. The analysis of these documents and related descriptive statistics – part of which has already appeared in chapter 2 – served three main purposes: (i) it was used to test the empirical plausibility of the theoretical framework (in particular, cross-national descriptive statistics served this purpose); (ii) it was used to map the policy landscape in the three countries that were analysed in depth (in particular, policy documents served this purpose); and (iii) both descriptive statistics and policy documents were used to triangulate (Hancké 2009, 92) the data collected at university-level (see later in this section) and test whether they were representative of broader national trends.

Secondly, ‘national-level’ interviews were conducted with senior representatives of university associations, employer associations and policy-makers (e.g. present or past civil servants). The role of national-level interviews was twofold: (i) they initially helped to test the accuracy of the policy mapping conducted through documents, namely by checking with interviewees whether relevant initiatives had not been identified through document analysis; and (ii), similarly to the document analysis discussed in the previous paragraph, they were subsequently used to triangulate the findings from the interviews at the university level and test the extent to which information collected at university level was representative of the higher education sector more broadly. This included in some instances follow-ups via telephone or email with national level interviewees.

Thirdly, interviews within universities were carried out to shed light on the specific patterns and strategies of skill formation within universities. Given that an important part of the theory builds on the assumption that universities’ behaviour depends on the institutional context within which they operate, university-level interviews were crucial to ensure that the meso-foundations of the theory were either confirmed or disproved. Individual universities were selected according to two main criteria: (i) location and (ii) type of institution. As far as location is concerned, universities have been selected in the capital cities of the three countries, where the economy tends to be relatively more reliant on dynamic services, and in regions that are more heavily geared towards the manufacturing sector (these regions are not named because, given that there are fewer universities compared to the number of universities in capital cities, doing so might compromise the anonymity of interviewees). Systematic regional data on GVA across the three countries of interest is slightly problematic to collect. To my knowledge, the most complete dataset of GVA by sector at regional level is the OECD regional dataset, which however lacks data for dynamic services for Germany. Nonetheless, combining the OECD regional data with national German statistics, it is

observed that the economy of the capital cities' regions in all three countries has a systematically higher share of GVA in the dynamic services and systematically lower in manufacturing. The aggregation of sectors is such to make it as compatible as possible with the WIOD data used in section 2.2, but some slight variations between the two datasets exist due to the different aggregation of economic sectors. Nonetheless, the two datasets are by and large consistent in the information that they provide.

Table 3.2. Differences in sectoral GVA between capital cities' region and country average (2011)

Country/region	Share of manufacturing on total GVA	Share of dynamic services on total GVA
UK	10%	25%
London region	3%	46%
Germany	23%	19.5%
Berlin region	11%	31%
South Korea	31%	17%
Seoul region	21%	25%

Source: own elaboration based on OECD Regional Demography database, except for the share of GVA of dynamics services in the Berlin region, which is based on IHK Berlin (2015, 8) and it refers to 2014, and the share of dynamic services in Germany, which is based on WIOD

Examining the behaviour of universities embedded in regions with different employment configurations is instructive to pick up and control for potential differences due to local economic structures. In other words, I take into account the warning that 'regional' varieties of capitalism are potentially relevant alongside national varieties of capitalism (Crouch et al. 2004, Crouch et al. 2001, Crouch, Schröder, and Voelzkow 2009).

Furthermore, universities were selected to ensure representation of different types of institutions. In the UK, the main line of differentiation is between so-called 'post-1992' and 'pre-1992' universities. Post-1992 institutions are former polytechnics, which have had traditionally close links with the labour market. Although the end of the binary system in 1992 abolished the formal boundary between universities and polytechnics, and the main line of differentiation is today to be found in the reputation

and prestige of individual universities, it is still appropriate to control for the possible differences that may exist due to specific historically-rooted ‘institutional traditions’. In Germany, the main line of differentiation is between research universities and *Fachhochschulen*, with the latter being roughly similar to the British polytechnics prior to 1992. In South Korea, the main line of differentiation is between public and private institutions, hence both types of institutions have been investigated. Higher education institutions across the three countries have been selected only among those institutions that provide full degrees at undergraduate and graduate level (hence Korean junior colleges, which offer professionally-oriented sub-degree qualifications have not been included in the analysis). To control for potential variation across disciplines, interviewees (at least two per university) were drawn from the senior management of the university (i.e. pro-vice chancellor for teaching and learning and/or other senior academics who have (had) managerial positions within the university so as to have an overview of educational activities across the institution) and from engineering departments. Selecting two interviewees per university allowed a degree of data triangulation within institutions. The rationale for selecting engineering was driven by the importance assigned to STEM across countries. STEM subjects have been a central theme in recent higher education policy (Freeman, Marginson, and Tytler 2014), hence engineering, as a chief component of STEM provision, represents a core area of concern as far as skill formation for the knowledge economy is concerned.

In total, 56 interviews have been conducted and a full (anonymous) list of interview partners is provided in appendix 1. Tables 3.2 and 3.3 provide a breakdown of, respectively, the interviews carried out and the universities analysed according to key characteristics.

Table 3.3. Summary data of interviews

Country	Total	National	University
UK	20	7	13
Germany	20	8	12
South Korea	16	5	11
Total	56	19	37

Source: own elaboration

Table 3.4. Summary data of universities

Country	Universities	Capital city	Elsewhere	Research university	Non-research university
UK	6	3	3	3	3
Germany	6	2	4	3	3
South Korea	5	3	2	2 (private)	3 (public)
Total	17	7	9	8	9

Source: own elaboration

All interviews were conducted by the author in English, with two exceptions: one interview was conducted in German by a colleague of the author (with the author present during the interview); the person conducting the interview was briefed in detail prior to the interview and she provided a full English transcription upon completion; one interview was conducted in Korean with simultaneous translation. All semi-structured interviews followed a template that was slightly adjusted to accommodate each country's specificity (see appendix 2 for a sample interview topic guide). Interviewees have been identified through universities, associations and governments websites and/or through snow-balling via prior interviewees. When approached, each interviewee was provided with an information sheet outlining the purpose of the interview, the right of the interviewee to withdraw at any time from the research, as well as the anonymity conditions and the potential outputs of the research (the information sheet that was sent to interviewees is included in appendix 3). When interviews are referenced in the text, they have been coded to include whether the interview was conducted in the UK, Germany or South Korea (marked as UK, DE and KR respectively) and whether the

interviewee is a ‘national-level’ stakeholder or a representative of a university (marked as N and U respectively). Thus, for example, reference to an interview conducted in a British university would appear as ‘interview UK_U3’ while that of a representative of a German university association would appear as ‘interview DE_N3’.

3.3 Limitations of the data collection strategy

The data collection strategy just presented holds some limitations that should be recognised and discussed at the outset. Two in particular stand out. Firstly, this thesis is *not* a study of curricular changes within individual universities and/or degree programmes. While occasional references to such changes are made, the data collection was geared towards capturing the direction and mechanisms of change in higher education policy at national level, since the core concern of this dissertation is to document and explain the emergence of national patterns of high skill formation. Thus, for the most part, interviewees were asked to identify, comment and explain overarching patterns of change at the national level (in the case of ‘national’ interviews) and at the institutional level (in the case of ‘university’ interviewees) with a twofold focus: (i) the nature of the relationship between governments, business and the higher education sector; and (ii) the responses of higher education institutions to the demands posed on them by governments and business (see appendix 2 for details on the interview topic guide).

Secondly, the focus on engineering comes with both disadvantages and advantages. The clear disadvantage is that the picture emerging from university-level interviews in engineering departments might create a bias in the findings, as other departments might have different relationships with business and governments or might be under a different degree of pressure. To avoid this bias, interviews at department level were triangulated with interviews at a ‘higher’ level within the same universities (e.g.

deans of studies and equivalent, as outlined in the preceding section). Yet it is still fair to say that actors' preferences and behaviour *outside* engineering departments could not be gauged as systematically. On the other hand, as alluded to in section 3.2, this disadvantage is in my view offset by the advantage that STEM subjects are at the heart of 'high skill formation' across countries to the point that contemporary higher education policy has been described as 'the age of STEM' (Freeman, Marginson, and Tytler 2014).

3.4 Presentation of the empirical material

As section 3.2 illustrated, the *collection* of the empirical material for the study has been carried out in the same way across the three country case studies, using a mix of national-level sources (i.e. national descriptive statistics; policy documents; and national-level interviews) and university-level sources (i.e. university interviews). However, the *presentation* of the empirical material differs slightly across chapters. In particular, there is relatively more reliance on 'university-level' evidence in the British chapter compared to the German and Korean chapters where, in turn, there is slightly more national-level evidence. In practical terms, this means that – while all chapters contain both national- and university-level evidence – the British case study focuses more on individual universities, while the German and Korean cases focus relatively more on government policies. The reason for such partial asymmetry between chapters is entirely empirical. Indeed, once the material has been collected, it was found that individual universities drove dynamics of institutional change in Britain to a greater extent compared to Germany and Korea where, on the contrary, government policy was found to be a greater (direct) lever of institutional change. Moreover, the different importance between universities and governments as 'key' agents is also entirely consistent with the theoretical expectations, and in particular with the argumentation developed in sections 2.1 and 2.3 that governments are more likely to intervene in knowledge economies that rely

strategically on advanced manufacturing. Notwithstanding the different weight of national- and university- level evidence across chapters, all case studies are organised according to the same structure, namely:

- Each case starts with an *introductory section* identifying a country-specific empirical puzzle upon which the research question answered by each case study is based;
- The introduction is followed by a *background section* outlining the policy landscape at the national level;
- Once the relevant policy background has been set out, each chapter provides a detailed *analysis of the dynamics of institutional change* taking place in the higher education sector, as far as high skill formation is concerned;
- In the final sections, I set out country-specific *conclusions*.

The empirical investigation focuses primarily on the period from the mid-1990s onwards, i.e. when (most) advanced political economies started pursuing patterns of knowledge-based growth (Hall 2015, 19).

4 Britain: competing universities as ‘general skills coordinators’

4.1 Introduction

This chapter analyses the changes that took place in British higher education over the last two decades,¹⁰ with the aim to explain the mechanisms that led to a substantive ‘opening up’ of universities towards meeting the skills needs of the labour market. In particular, by way of approaching the British case, the chapter seeks to explain the following empirical observation. In the late 1980s, the Thatcher government launched a programme, Enterprise in Higher Education (EHE), which has been defined as the “largest direct government intervention ever into the higher education curriculum” (McNair 1995, 3). Although the programme was limited in its financial resources, it illustrates a significant concern of policy-makers at the time that higher education was not ‘close enough’ to the world of work (Whiteley 1995, Burniston, Rodger, and Brass 1999).

In particular, the government argued that universities were not taking an active role in ensuring that their educational provision was sufficiently attuned to labour market needs and therefore set up a programme that would provide funding to universities on a competitive basis to increase the alignment of their provision with the needs of the labour market. The results of the EHE, however, were not particularly satisfactory. The evaluation showed that the effects of the initiative did not trigger a significant step change, given that curricular reforms only took place in those institutions that received funds through the initiative – as opposed to the government’s expectation that a change in mentality would travel from funded institutions to non-funded ones – and that it only affected a limited number of polytechnics that, during the years of implementation of the measure, had become in the meantime universities (Burniston, Rodger, and Brass 1999).

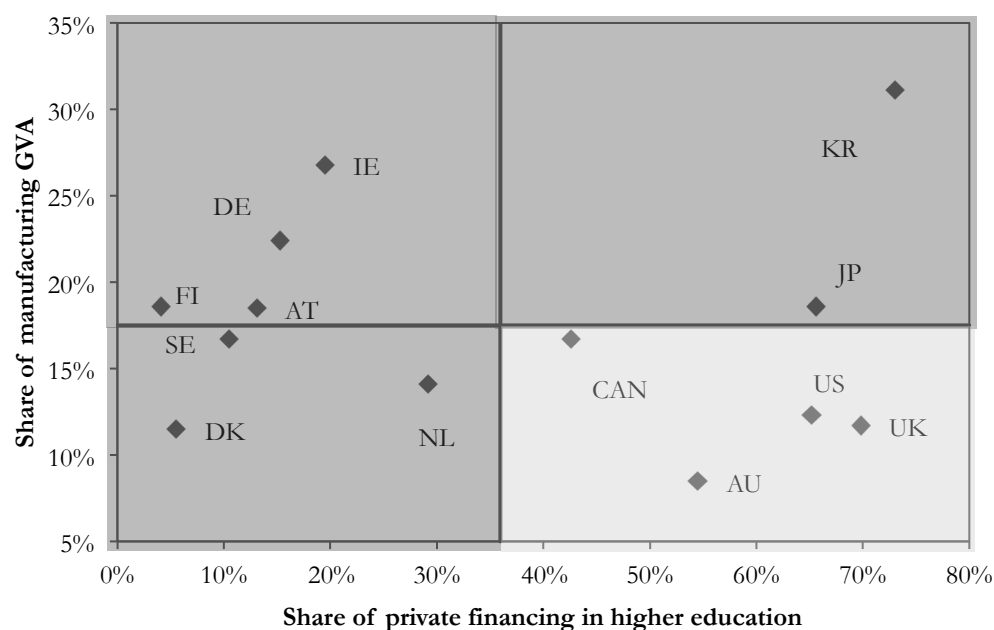
¹⁰ More specifically, as higher education is a devolved policy area, the empirical material has been collected with reference to England and interviews were carried out in English higher education institutions and with policy-makers and stakeholders operating in the English context.

Yet, fast forward by approximately 20 years and British universities have come to the forefront of the so-called ‘employability agenda’, broadly understood as the commitment of universities to provide degree courses that are relevant to the labour market and to equip students with a set of professional skills beyond the discipline-specific knowledge of the degrees. Influential international organisations, such as the OECD, cite British universities as an example for other countries of how the higher education sector could enhance the employability of their graduates (OECD 2015, 64); the UK comes at the top end of a large-scale survey financed by the European Commission on the extent of university-business cooperation in curriculum development (Davey et al. 2011); and more broadly researchers have discussed how issues around employability, labour market relevance of degrees and engagement with employers have become crucial for British universities – both research-intensive pre-1992 universities and post-1992 universities, i.e. the former polytechnics (Mason, Williams, and Cranmer 2009, Cranmer 2006). However, while existing research has shed significant light on the normative implications of skill formation in British universities as well as on its impact on individual level transitions to the labour market (Boden and Nedeva 2010, Bourner, Greener, and Rospigliosi 2011, Brown, Hesketh, and Williams 2004, Brown, Hesketh, and Williams 2003, Cranmer 2006, Jackson 2012, Morley 2001, Prokou 2008, Sharma 2013a), the question of *why* universities engage in these activities still remains unanswered and empirically under-specified, thus the specific research question that I seek to answer with respect to the British case is the following: why are British universities, accused of neglecting the relationship with employers and the labour market in the late 1980s/early 1990s, today at the forefront of efforts to establish links between higher education and the world of work? The question becomes more interesting if coupled with an additional piece of information, namely: the recent initiatives that were *specifically designed* by the government to align higher education provision with employers’ needs (namely,

Foundation Degrees and more recently Higher Apprenticeships) have been assessed as not particularly successful (cf. Greenwood et al. 2008, 36, Russell Group 2015, 3). Why, then, do we observe such a marked shift in the direction of ‘skill formation’ in universities?

Based on the theory developed in chapter 2, the UK locates in the bottom-right quadrant of the bi-dimensional categorisation as part of a universe of cases broadly corresponding to the countries referred to in the CPE literature as LMEs, characterised by high competition among universities and the limited weight of the manufacturing sector in their knowledge economies, which are in turn heavily geared towards dynamic services, as illustrated in figure 4.1.

Figure 4.1. Locating the UK in the bi-dimensional categorisation



Source: own calculations based on OECD (2017) and WIOD

The discussion developed in chapter 2 led to the following hypotheses regarding the observable implications for this set of cases:

- Governments cultivate the supply of general high skills
- Universities act as protagonists or consenters
- Institutional change proceeds by conversion or displacement

The empirical material broadly corroborates these hypotheses. The evidence collected in this chapter allows us to identify a strong link between competition in the higher education sector, which manifests itself in the growing concern on the side of universities to perform well in rankings and attract fee-paying students, and skill formation in higher education, which manifests itself in the growing engagement of universities with the employability and skills agenda. In this framework, universities – as hypothesised – have used skill formation as a way to stand out in a highly competitive higher education market and, thereby, to attract fee-paying students. The pattern of institutional change that can be discerned is also, as hypothesised, one of *conversion*. In particular universities have redeployed their degrees to adapt them to a changed socio-economic context, namely one in which it became imperative for them to make an explicit effort to equip graduates with the skillset required by employers as a way to enhance their institutional reputation and boost the prospects of future student recruitment. Thus, the behaviour of universities fits squarely with the mechanisms hypothesised in chapter 2, and it also conforms to the ‘protagonist’ type.

A review of government policy, on the other hand, suggests a slight reconsideration of the theoretical framework, to the extent that – as will be elaborated further in the chapter – while the government has certainly highlighted the growing importance of general skills in the context of a knowledge economy based on services (Dearing 1997a), it has also promoted policies that go in the direction of ‘specific skills’. For example, Foundation Degrees and, in particular, Higher Apprenticeships have been introduced by the government with the aim of ‘rebalancing’ the UK economy towards

the high-end manufacturing sector (Steedman 2012, 2). As part of this strategy, Higher Apprenticeships aim to create high level STEM skills that should respond to the needs of particular companies and economic sectors, and foreseeing heavy involvement of employers in their design and delivery – thereby suggesting that governments have not exclusively aimed at cultivating high general skills. However, employers have largely refrained from engaging in these programmes, owing to the dominant type of knowledge economy, which relies strongly on general rather than specific skills. This suggests that even when governments promote policies to deviate from the dominant growth regimes, their implementation will be hampered by limited demand ‘on the ground’. Thus, even in the presence of explicit government efforts, the implementation of policies that are not aligned with the dominant knowledge-based regime is bound to be rather problematic. The evidence that this chapter puts forward is therefore overall supportive of the hypotheses developed in chapter 2, while also specifying them further.

This chapter proceeds according to the following structure: first it outlines the (higher education) policy context of the last 20 years (section 4.2); then, evidence at the university-level and at the national policy-making level concerning the patterns of change in universities is introduced and assessed against the theoretical expectations set out in chapter 3 (section 4.3); section 4.5 discusses the limited success of policy initiatives aimed at creating specific skills; finally, section 4.6 provides some conclusive thoughts on the British case study, with reference to the theoretical expectations and empirical evidence collected.

4.2 Context: increasing emphasis on skills in an increasingly marketised higher education sector

Prior to the 1990s the British education and training system found itself in a rather peculiar position: compared to Continental European CMEs, its vocational training

system was considered highly dysfunctional as it failed to provide the labour market with high quality skills, and employers were reluctant to engage in training. Yet, unlike other LMEs, such as the US, that compensated the chronic weaknesses of the vocational training system through large higher education systems, the UK featured rather low enrolments in higher education too (Soskice 1993). After vocational training policy represented a terrain of political conflict between trade unions and the 'Thatcher governments in the 1980s, which ultimately led to its breakdown, attempts to revive the system in the 1990s did not bring about significant improvements: employers' disengagement with the vocational system has not been reversed (Keep 2014, Keep and Mayhew 2010, Keep, Mayhew, and Payne 2006, Gleeson and Keep 2004) and parity of esteem with general education was not achieved (Hansen and Vignoles 2005). As improving vocational training proved problematic, the mid-1990s saw an increasing focus on the higher education sector to ensure an adequate supply of skill to labour market, in connection with the increasing importance assigned to knowledge-based economic growth (Wilson 2012, 18).

Indeed, a major piece of policy review carried out in the 1990s on higher education policy – the Dearing report – makes the link explicit even in its title: 'Higher Education in the Learning Society', thus emphasising how high-level skills were deemed fundamental in a changing socio-economic landscape. Indeed, the Dearing enquiry, initiated (with bipartisan support) in 1996 under a Conservative government and released in 1997 under New Labour, set the scene for radical changes in the higher education landscape (cf. Shattock 2012, 155-168). Of particular relevance is the strong focus of the report on enhancing skill formation in higher education. Indeed, one of the starting points of the Dearing report was that "historic boundaries between vocational and academic education [are] breaking down, with increasingly active partnerships between higher education institutions and the worlds of industry, commerce and public service"

(Dearing 1997b, 2). Throughout the report, Dearing tightly links higher education to the changing labour market and while rejecting “a purely instrumental approach to higher education” (Dearing 1997a, 49), it stresses the key role of higher education for economic competitiveness, a section worth citing at some length:

[...] higher education has become central to the economic wellbeing of nations and individuals. The qualities of minds that it develops will be the qualities that society increasingly needs to function effectively. Knowledge is advancing so rapidly that a modern competitive economy depends on its ability to generate that knowledge, engage with it and use it to effect. Above all the country must enable people, in large numbers and throughout life, to equip themselves for a world of work which is characterised by change. Our examination of the future of higher education must therefore cover the changing context in which it will be operating. (Dearing 1997a, 49)

Furthermore, Dearing notes that “high quality, relevant higher education provision will be a key factor in attracting and anchoring the operation of global corporations because of the research capability of its institutions and the skills and knowledge it can develop in the local workforce” (Dearing 1997a, 55). But what are the skills that higher education institutions should equip the workforce with? The report points to de-industrialisation as a major trend in the British labour market, leading to a substantial expansion of employment in the service sector (Dearing 1997a, 56). Reflecting on the skills needs of an economy based on services, and as hypothesised in chapter 2, the Dearing report places strong emphasis on general skills arguing that higher education is expected “to give students the opportunities and skills to work *across disciplines* and to *develop generic or transferable skills* which are valuable to many contexts” (Dearing 1997a, 59 emphasis added). One of the key nine principles laid out in the Summary Report make the general skills argument even more explicit by arguing that “learning should be increasingly

responsive to employment needs and include the development of *general skills*, widely valued in employment” (Dearing 1997b, 5 emphasis added).

Interestingly, if we analyse the extent to which degree programmes have been ‘converted’ to meet the aims set out by Dearing, we note a striking correspondence between what government policy demanded and how universities restructured and redesigned their programmes. A quote from Universities UK (the association representing all British universities) illustrates the commitment of the higher education sector to pursuing an agenda that appears to closely match the auspices of the Dearing report and, as argued by Universities UK, to even go beyond what Dearing asked:

higher education institutions have been creative in developing a range of opportunities for their students that go beyond the proposals in the Dearing Report. There have been three broad areas of development. First, they have developed a more sophisticated understanding of the complexity of the modern workplace and of the needs of employers and of graduates in a variety of different work settings [...]. Institutions have developed a new appreciation of the diversity of attributes that contribute to employability [...]. This process has been aided by increased employer–higher education dialogue, co-operation in curricular developments, [and] the articulation of workforce needs beyond lists of key skills [...]. Second, there has been a wider debate on the nature of employability, informed by long-term studies of graduate employment and career paths [...]. Third, there is growing awareness of the diversity of activities within universities and of changes in approaches [...]. Increasingly, institutions are aware of the need to develop a long-term integrating strategy for employability that maximises links with employers, [and] embeds employability in the curriculum [...] (UUK 2002, 5-6)

Admittedly, it may be argued that university associations use these reports mostly for PR purposes and that real changes may not necessarily follow from these statements. Yet, the description of the activities provided in the association's publication reflects closely the activities implemented by individual universities across the country. Table 4.1 illustrates the main 'skill formation measures' undertaken by six universities in which interviews were carried out for this thesis and shows how 'general skill' formation has been introduced, increased and made explicit across universities. The information presented in table 4.1 covers both research-intensive universities (marked as 'A') and former polytechnics (marked as 'B').

Table 4.1. A summary of the main initiatives undertaken in the six institutions analysed

University	Skill formation measure(s)	Nature of the measure	Year of introduction	Position in national ranking
A1	Employability modules available to all undergraduate students, focus on: business and professional skills; international awareness. Industrial advisory boards traditionally operate across the university	Employability modules not compulsory (but taken up voluntarily by ca. 60% students). Advisory boards with limited impact	2014 'Always' present	High
A2	Interdisciplinary project weeks introduced across the department and curricula aligned with the 'graduate attributes' identified at university level. Industrial boards operate across the department.	Interdisciplinary projects introduced as a way to formalise employability activities that were already taking place Industrial advisory boards incentivised to take a more active role, including shifting chair of the board from member of faculty to representative of industry	2012 2010	High
A3	Skill development modules across all undergraduate programmes, focus on: business skills and communication. Industrial advisory boards operate in the department	Skills development modules are a key part of the 'revisited' degrees. Advisory boards had an important role in the process of setting up the 'revisited' degrees	2014 ca. 2000	High
B1	Employability modules across all undergraduate programmes, focus on: enterprise and entrepreneurship, industry certified skills, international and social awareness. Industrial panel validate degrees across the university	Each year of the undergraduate degrees students must undertake at least one employability project All new degrees must show evidence of industrial engagement (as well as existing degrees that are updated)	2007 2005	Medium, previously low
B2	Three key 'graduate attributes' embedded in all undergraduate courses: digital literacy, enterprising, global outlook. Validation panel bringing together industrial partners set up across all departments	Compulsory, with guidelines set out to ensure that these are introduced in all degrees All new degrees must show evidence of industrial engagement (as well as existing degrees that are updated)	2012 ca. 2000	Low
B3	Introduction of employability module across all undergraduate degrees, focus on management and communication skills, but also interpersonal skills. Advisory boards formalised to seek employer views on new or updated curricula	Compulsory modules, first two years in particular Advisory boards meet every two months and have significant impact	2010 2008	Low

Source: own elaboration based on interviews, university websites and documents

Note: regarding rankings, the Guardian University League Table has been consulted to triangulate the information received by interviewees regarding the ranking of their respective universities. To preserve anonymity of institutions, the precise position in the rankings is not provided

Yet, neither the Dearing Report nor any concrete reform that followed provided explicit regulation to guide universities through such a process of conversion. Then, how did this shift happen? In chapter 2 we have hypothesised that highly marketised higher education (Shin and Toutkoushian 2011, Marginson 2007) systems provide the incentive set for universities to engage in skill formation out of competitive pressures to recruit students and gain standing in rankings. Indeed, the UK system is an excellent case to test whether the hypothesised link between marketisation of higher education and skill formation in universities holds up.

Such process of marketisation started most prominently in 1997 when the Dearing report recommended a change in funding of the higher education system away from full reliance on general taxation towards a degree of cost-sharing between students/families and the tax-payer (see Shattock 2012, 155-169 for a full overview of these developments). In particular, an up-front fee of £1,000 per year was introduced, accounting to roughly 25% of the cost of a degree, which was to be shouldered by students and their families (Shattock 2012, 155, Dearing 1997b). This approach was radically changed by the 2004 Higher Education Act, which introduced from 2006 variable fees of up to £3,000 to be financed via a government-organised loan system and re-paid by graduates on an income-contingent basis.

In 2010, the Browne Report set the scene for a further radical move towards marketisation, by increasing the cap on the fee that universities are allowed to charge to £9,000 and, importantly, gradually lifting the cap on the number of students that universities can accept to the point that from the academic year 2015/2016 universities have been allowed to accept as many students as they want (Shaw 2014, The Economist

2017).¹¹ Accordingly, the reliance on universities on private sources grew exponentially: in 2000 over 30% of expenditure on tertiary education was drawn from private sources, and the figure reached 70% in 2009 (OECD 2012c). Student fees are particularly relevant in this respect as they constitute the bulk of private expenditure, and the main overall source of income for universities – standing at an average of around 45% of total universities’ funding in the academic year 2014/2015 (UUK 2016) .

Contextually, the high degree of autonomy that universities enjoy vis-à-vis the government in terms of setting curricula, expanding or down-sizing departments or subjects, and the increasingly important and powerful role of university management vis-à-vis faculty created the conditions for what has been labelled as a ‘real market’ of higher education (Shattock 2012, 155) characterised by highly autonomous institutions, run in a managerial fashion and competing for fee-paying students. This market-like mechanism was further oiled by the proliferation and extensive use of university rankings. Rankings are provided by private organisations, such as ‘The Complete University Guide’; ‘Times Higher Education Rankings’; or the *Guardian*’s ‘University League Table’ as well as by the government, such as ‘The Destinations of Leavers from Higher Education (DLHE)’, which compares employment outcomes of graduates from different institutions and disciplines. These have become part and parcel of higher education policy since the late 1990s in particular across Anglo-Saxon countries and allow students to compare between institutions and universities to rate their performance ‘against the competition’ (Altbach 2012, Hazelkorn 2015, Shin and Toutkoushian 2011, Marginson 2007) . The two features just outlined – fees and rankings – sharpened the vertical differentiation of the British higher education system, increasing the pressure on universities to stand out by virtue of their individual ‘reputation’ (Anderson 2016). Compounding heightened competition

¹¹ Although it should be noted that regulations on student numbers persist for specific disciplines, such as medicine (Hoareau McGrath et al. 2014).

driven by student fees, public funds have also been increasingly allocated to British universities on a competitive basis. This has been primarily true for research funding since the mid-1990s, when the Research Assessment Exercise (RAE) and the subsequent Research Excellence Framework (REF) were set-up to allocate public research funds to higher education institutions by means of competition in terms of research outputs, which was seen by policy-makers as the most effective tool to drive up quality of research in higher education (Shattock 2012, Palfreyman and Tapper 2009). This trend has further expanded at the time of writing of this thesis, as the Teaching Excellence Framework (TEF) has been introduced to replicate some of the RAE and REF dynamics in the allocation of public funds towards teaching (see OFS 2018 for an overview). Importantly, one of the key metrics of the emergent TEF is students' labour market outcomes, which is therefore likely to provide additional incentives for universities to focus on those skills that might maximise students' success in the transition to the labour market. However, neither the RAE/REF nor the TEF are of primary relevance for this thesis. The former focus on research (rather than teaching and skills) and therefore fall outside the main area of interest of this thesis, while the latter was just rolled out at the time of writing, hence the empirical material did not cover any of the developments that might be associated with the TEF. However, it is nevertheless important to mention these initiatives to provide more complete evidence of the highly competitive higher education market within which British universities find themselves operating. The next section tests whether skill formation in higher education developed as a by-product of the increasing competition within the higher education system.

4.3 Institutional change through competition: evidence at the university and national levels

We can test the hypothesised link between skill formation and competition in the higher education sector by relying first on interview data collected at the university level across six universities, and then by triangulating these findings with data drawn from comparative cross-national surveys and interviews with stakeholders representing organisations operating at the national level, as well as policy publications issued by these organisations.

Institutional change in selected universities

The picture emerging from table 4.2 makes clear that British universities have had an increasing concern in tightening their curricula around the ‘employability agenda’ and skill formation. The first substantive element that we find is that of the limited pro-active role of employers, which are rather found at the ‘receiving end’ of universities’ efforts to attune their provision to labour market needs. When asked about the ‘direction’ of the relationship between the university and labour market actors, responses from interviewees were nearly unanimous across the spectrum: it is the university that proactively organises skill formation by stepping up the provision of employability skills and engaging with employers, as illustrated by the following quotes, which speak to the ‘protagonist’ role that universities play, and cover interviewees in *both* pre- and post- 1992 institutions:

We know which ones are the top companies that employ [our graduates] so we felt that it would be helpful to work with them and they felt it would be helpful to work with us to define what are the skills and attributes that they should have. And it was the university’s initiative to start this relationship. (interview UK_U13)

In balanced terms, it is much more us going to employers. We do get employers occasionally that ask us to develop a particular course for them, but it is probably 80% us and 20% them. (interview UK_U11).

It was predominantly university-driven. Some of it was employer driven where we had an existing relationship but I cannot think of an example when a company out of the blue came to us with a new angle. So we either went out to actively seek it or we had an existing relationship with a company. (interview UK_U5)

In particular, several universities mentioned how they encourage members of staff to take a proactive stance in the relationship with industry, for instance by having “people in professional body boards” as well as “encourag[ing] people to take non-executive directorships” (interview UK_U9) and by having “members of academic staff in every area who make it their business to go out and talk to local employers and professional bodies and sector skill councils” (interview UK_U11). Thus, the ‘employability’ agenda does not seem to affect universities via pressures from employers but rather through the metrics that are used to assess universities’ success:

It [the employability agenda] is not predominantly driven by employers. We are all very conscious of how we are assessed. The Destination of Leavers of Higher Education [DLHE] survey gives you a sense of how many students are employed and more importantly how many are employed in graduate level jobs. And that’s an annual key performance indicator that we report to our board of governors, we analyse internally, and we worry about how we refer against our world of competitors. (interview UK_U11)

The data collected points in the direction of a joint – and inter-related – effect of two main elements as drivers of the skills agenda within universities. Firstly, the need to

catch-up or keep-up in university rankings in order to ensure a stable pipeline of future student recruitment emerged as a key factor: as employability comes into rankings and league tables, universities strived to form those skills that they perceived that employers valued highly (e.g. employability skills) and to ensure the relevance of their degrees to labour market needs (e.g. by organising and strengthening industrial advisory boards). Senior personnel highlighted that the changed framework conditions within which universities operate were key in pushing universities towards more skill provision as the widespread availability and practice of ranking forced them to show a firm commitment towards ensuring graduates' preparation for the world of work. Thus, the employability agenda was used by and large by universities as a way to keep up or catch up in rankings and as such ensure that reputation is upheld or improved and in turn keep attracting students. Indeed, students' expectations is the second crucial element, given that universities feel that students seek returns on their investments in the form of a graduate job and they therefore expect universities to make an explicit link between their educational offer and labour market needs. These two factors are reviewed in closer detail by drawing on interview data.

As far as rankings are concerned, the pressures are felt in rather similar terms by pre-1992 and post-1992 institutions. A representative of university A3 argued that “the university is very sensitive to student feedback, department audits, league tables. These factor in employability. It is more visible whether we are delivering or not” (interview UK_U6). A colleague from the same institution argued further that even universities that sit at the top of rankings feel the pressure from the competition because “a lot is shifting [in the] landscape of scrutiny. There are all these measures that start allowing comparisons on all of these areas” (interview UK_U5). A representative of university A1 that is at the very top of most national and international rankings explained their engagement with the employability agenda in the following terms: “we attract the best

students from around the world [...] We know that we have to enhance the reputation in terms of recruiting the best students around the world. We want to make sure we are keeping up and preferably ahead” since “rankings 20 years ago didn’t really exist, [and now] there is much more benchmarking [...] so we need to maintain our position of excellence in the rankings” (interview UK_U2).

The link between the ability to provide students with the right skillset and the perceived performance of the university itself was made even more explicit in universities that have struggled with their performance indicators. Thus, university B3 decided to step up the provision of employability skills when “the university recognised that it was not doing as well as other institutions in terms of employment prospects. And that was made clear by the DLHE data. Our data were not as good as other universities” (interview UK_U13).

A similar strategic reasoning had been undertaken at university B1. Here, it was explained that the management of the university in the early 2000s neglected the importance of league tables but that a change of management in 2004 brought about a connection between skill formation and performance in rankings: “it was early days of the league table movement, there was a denial that league tables were going to be important by the previous regime, and so a denial of some of the issues that were there. And therefore like any organisation that stood at the bottom of its own league table, there was something wrong” (interview UK_U9). Yet, when the new management came in, they decided to seek more employer involvement in course design and more practical inter-disciplinary skills in course content because “whether you like it or not, the students getting graduate-level jobs is one very important outcome from the DLHE survey and therefore important in the league tables” (interview UK_U9). Therefore, the university “[...] looked at relevant competitive organisations at that time, we looked at how we

needed to be different and to improve in all sorts of directions but we also used league tables as well to drive behaviour” (interview UK_ U9)

Jointly with the pressures stemming from operating in a highly scrutinised and comparable sector, student expectations also proved to be a crucial driver. Again, the process observed across the spectrum of the universities analysed was rather similar, insofar as universities tightly linked issues of student recruitment with the employability agenda. However, some universities, mostly the former polytechnics, felt a pressure in terms of recruiting *enough* students, whereas research-intensive universities felt pressures in terms of recruiting students of the highest quality. University B3 made clear why student recruitment and skill formation are tightly linked:

The driver [for skill formation] is our client-base, by which I mean the students. They want more than they did in the past to get a job at the conclusion of their studies. To get that job they need a certain set of skills, which include the transferable skills. We’ve had to change the way we do things to enable them to have this skillset [...] students come to university now for different reasons than they did 20 or 25 years ago. They come to get a job. If we don’t provide that, that means that not enough students apply and if we don’t have enough students, then we don’t have our funding. That means we go bust. It’s just finance. We are a service provider. (interview UK_U12)

Hence, “the university would like to give graduates a set of skills that are useful to employers immediately. In order to give our graduates an edge that would make them more interesting for employers. And we would be able to improve our key performance indicator in terms of employability” (interview UK_ U12). Indeed, the evidence that students go into higher education to improve their job prospects is strong given that it is indicated as the most important reason to go to university by nearly 80% of the

respondents to a study run by the National Union of Students (NUS) and the CBI (CBI and NUS 2011, 7). Survey data also shows that employment considerations are key concerns for students when deciding to pursue a university degree without significant differences across universities of varying ‘prestige’ (i.e. across Russell Group¹² and non-Russell Group universities) and between students of different socio-economic backgrounds (Ainley and Weyers 2008), suggesting that all universities are subject to similar pressures.

Furthermore, student expectations towards landing a graduate-level job were perceived to be heightened by the increase in fees, hence at university B2, equipping students with employability skills was a response to “getting students out into graduate level jobs” because “the students themselves want to make sure they have the best possible chance when they graduate” (interview UK_U11) especially given that “they are now investing a considerable amount of their future borrowing in their courses and [they are looking to get] a return on the investment” (interview UK_U11). Along the same lines, a senior representative at university B3 argued that equipping students with the right skillset for the world of work is “a moral obligation on the part of the university particularly in light of the fees. When the £9,000 fee came in, I think that if a student spends £27,000 for a degree, there is an obligation on the side of the university to ensure that the student is as fit as possible for the world of work” (interview UK_U13).

While the pressure from student expectation was softer in more prestigious research-intensive universities, the concern with (quality) student recruitment was a key element in the curricular changes, as noted by a senior academic in the department: “although we were attracting very good students, we wanted to be the place that people looked at first. We felt there was room to do something different in terms of careers and

¹² It indicates a group of 17 research-intensive universities that are usually considered as the top higher education institutions in Britain.

employability” (university UK_U5). An increased focus on employability was therefore the response provided by the department at university A3 to the perceived fall in reputation:

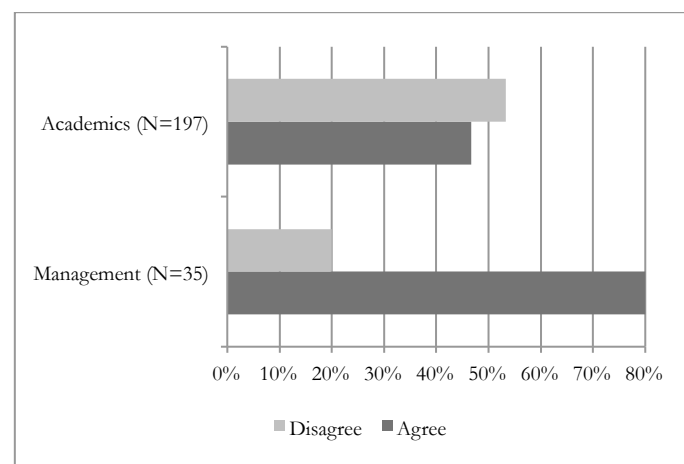
How would we grow the brand? Probably one of the things in [the university management’s] mind is that [university A3] scores very well on individual measures for individual faculties but we tended to come a lot lower in reputation, so it was something of brand identity (interview UK_ U11).

In those universities where changes were most marked, as in universities A3, B1, B2, and B3, interviewees assigned a crucial role in the process to the senior management of the university or of the department. At university B3, it was made clear that “as with all major shifts, it tends to come from [a new] Vice Chancellor, who noticed that the university was not doing as well as other universities and the driver really was that we were not doing the best for our students” (interview UK_ U13). A particularly strong argument on the side of the management to bring about change was to tie curricula change with “organisational survival”, hence – as explained by a senior academic and current pro-Vice Chancellor for Student Experience in university B1 – the new management could convince a part of the faculty that was not ready to undertake substantive changes to curricula because:

let’s say the economic position of the university was at risk, that was demonstrated, then an argument was made that this [enhancing the provision of employability skills and tightening links with the economy] was a way to differentiate and stand out at that time, and then [the new university management] delivered that, and showed that that was true and that also improved the economic prosperity of the university. Then the argument was much easier to win. (interview UK_U9)

Triangulating this interview finding with survey data on the attitude towards employers of higher education professionals in the UK, it emerges rather unequivocally that university management is strongly in favour of such a direction, as proxied by figure 4.2, which shows the extent to which respondents with different roles within the university would favour university programmes that adapt more with labour market needs.

Figure 4.2. Response to the statement ‘Study programmes need to adapt more to labour market needs’ by respondent’s role at university



Source: own elaboration based on Gallup (2007)

The preferences of university managers are particularly relevant in the UK context and in the broader LMEs context. These higher education systems saw a sharp increase in the power of university management vis-à-vis faculties over the last three decades and managerial personnel in higher education emerged as a separate professional group from academic faculties (Ginsberg 2011, Deem, Hillyard, and Reed 2007, Deem 1998). This stands in sharp contrast with the Continental European experience where university managers are appointed from academic faculties, they do not display radically different preferences from them, and the balance of power between management and academic faculties has not radically tilted in favour of the former (Schimank and Lange 2009, this point will be picked up again in the German case). Thus, given the high power resources

at their disposal, it is plausible that in the British context managers' preferences translate into organisational change as illustrated by the interview data.

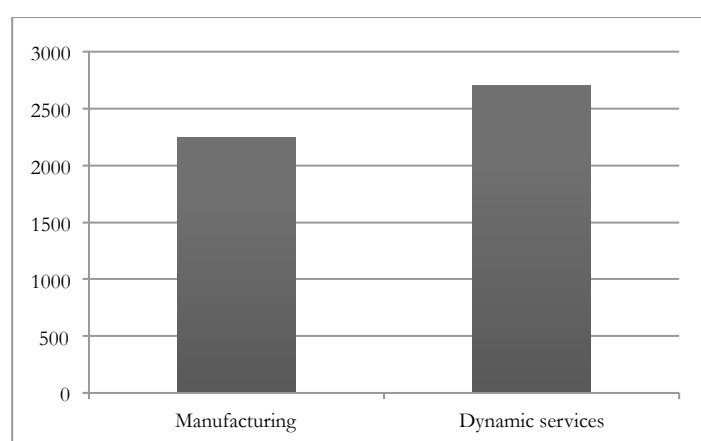
A final element of evidence concerns the type of skills that universities promoted. Even where interviewees argued that a specific skill formation measure was inspired by a 'search for organisational diversity', the direction of travel was very similar across institutions and very much in line with the hypothesised emphasis on general skills: management and business skills, IT literacy and international awareness featured prominently across all universities (see table 4.2 for details). Indeed, having established that student recruitment, student expectations and position in rankings – which are in turn shaped by employment rates of graduates – are key interrelated drivers for universities to engage in skill formation, universities have a rather narrow road towards the provision of employability skills. In particular, a curious coalition of students and employers emerged and was shaped by the common interest in 'employability' skills – which are demanded by employers and, as a consequence, by students who seek a financial return on their investment in higher education. Indeed, the National Union of Students (NUS) and the Confederation of British Industry came together to pose a set of demands to the university sector regarding skill formation and set out explicitly the key skills that universities should enhance in their graduates, which resonate closely with the skills that universities have been promoting (as presented in table 4.2), namely: "self-management, team working, business and customer awareness, problem solving, communication, application of numeracy, and application of information technology" (CBI and NUS 2011, 13-14).

Furthermore, the structural composition of the labour market, heavily geared towards the service sector, heightened – as hypothesised in the theoretical framework – the need for general skills, decreasing the importance of the specific discipline of graduates. Particularly enlightening in this respect was the reflection of one of the

interviewees who described how in STEM subjects, the university had undertaken a process to make the degrees less narrowly focused on technical issues and more focused on broad general skills, because “people often think that engineering graduates would go into engineering jobs, but that is almost a minority, they are going to many other sectors such as consultancy, finance. We have a broad range of people that employ our graduates” (interview UK_U5).

National-level data confirms the interview finding. Indeed, the data on labour market destination by economic sector of engineering graduates shows that these are more likely to end up working in dynamic services than in manufacturing. To the extent that STEM graduates are hired across the economy and to the extent that universities seek to equip graduates with the skills needed to succeed in the labour market, it is understandable that we also observed a trend towards general skill provision in STEM subjects. In other words, the demand side of the economy – as represented by employers – in its interaction with universities led to an emphasis on general skills in the development of university curricula.

Figure 4.3. Full-time first degree leavers in engineering entering employment in the UK in selected sectors (absolute number; 2011/12 to 2014/15)



Source: own elaboration based on HESA (2016)

Note: HESA data is categorised differently compared to the data presented in chapter 2. In this graph, manufacturing is the sum of the following categories in the HESA data: Manufacturing Electricity, gas, steam and air conditioning supply; while dynamic services is the sum of the following categories:

Thus, competitive pressures from the higher education market by and large led universities to *convert* their curricula towards increasing the provision of skills demanded by the labour market. Across institutions we have noted that the main measures introduced are considerably similar – even in those universities where interviewees have explicitly stated that skill formation measures were introduced to ‘differentiate’ their own institution from the competition. Thus, the main line of differentiation that has emerged is not so much around what individual institutions offer, but rather how central the skills agenda is to the institution. Here, we can identify institutions that did not feel an immediate pressure in terms of student recruitment (universities A1 and A2) and that only introduced limited changes to ensure that they would not fall behind in terms of reputation. On the other hand, radical changes were observed in institution A3, where there was a clear concern about the quality of student recruitment, and institutions B1, B2, B3 where there was a clear concern of ‘organisational survival’ determined by their low position in the ranking and the fear that this would translate into insufficient recruitment given the heightened competition in the higher education market.

National-level evidence and data triangulation

Moving on from university-level evidence to national-level evidence, we start by noting that the increase in fees – arguably, the main indicator of increasing marketisation of the sector (cf. Clark 1983, 162) – has had an impact on both students and universities according to stakeholders working for policy organisations in the higher education sector. As argued by a representative of a UK university association:

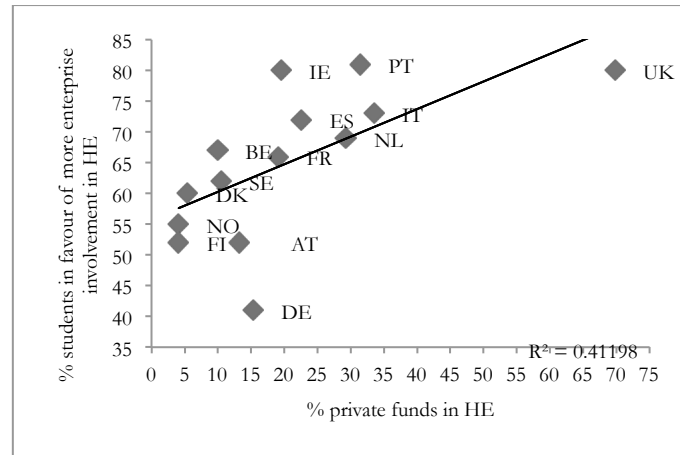
in the past some of the levers [...] resembled ‘bribery’ – paying universities to do certain things [such as the EHE] – [...] now in the context of austerity, the scope for the government to throw money at universities is very limited and it is much more a dynamic of, well, the students are paying this money, you universities should be doing it anyways. (interview UK_N1)

Along the same lines, a representative of a think-tank promoting dialogue between universities and businesses and former representative of one of the largest UK student unions argued that:

the main driver behind this change [the employability agenda in universities] can be thought of as the growing number of students who, in the context of increasing cost and risk of the investment in higher education, are more concerned with employability and labour market outcomes. (interview UK_N6)

The interviews with representatives from associations, that have a view on the entire sector, are therefore in line with the evidence collected at the university level. Cross-national datasets provide further confirmation that universities in Britain are under strong pressure from students to equip them with skills needed in the labour market – as perceived by interviewees. Figure 4.4 shows that university students in Britain are among those in Europe who more strongly favour the presence from private enterprises in higher education management, curricula design and funding (as a proxy for attitudes towards employability and labour market relevance of degrees). Furthermore, plotting the extent to which students would welcome more involvement of companies in higher education against the extent of private funds in higher education, which is largely driven by student fees, we find a positive relationship between the two measures ($R\text{-squared} = 0.41$), as assumed by interviewees at both university- and national- level.

Figure 4.4. Relationship between student preferences for firms' involvement in university education and share of private financing



Source: own elaboration based on OECD (2017) and Gallup (2009)

Note: the figure plots the share of private funds in tertiary education systems against the percentage of students who 'agree' or 'strongly agree' with the statement: 'enterprises should be more involved in higher education management, curricula design and funding'

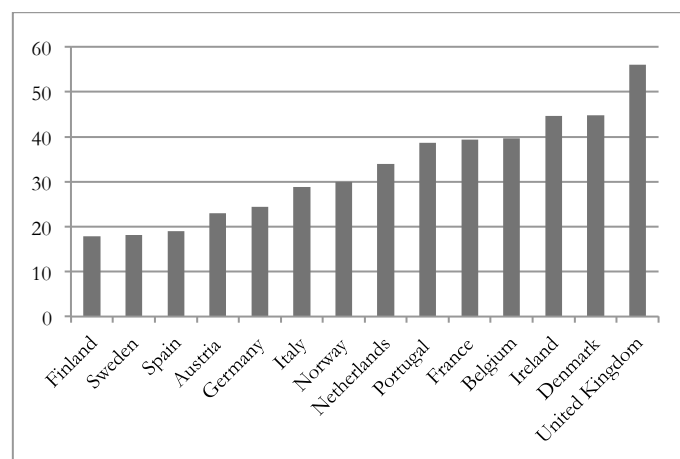
A clear interpretation of this figure is provided by one of the interviewees at national level who argued that:

fuelled by the fact that students are paying handsomely for their higher education, [...] there is a high level of interest in ensuring that the qualifications which are being studied at university are relevant to, and therefore incorporate content from, industry and business. (interview UK_N6).

Furthermore, next to the increased 'cost' of a university education, the array of tools by which students can make an informed choice has increased since the late 1990s as highlighted by several interviewees at university-level. The DLHE survey stood out as a particularly important component in the ranking domain as it maps graduate employment outcomes six months after graduation and it is used by major national league tables to produce an employability indicator for universities.

Indeed, the extent to which students choose universities on the basis of their reputation is in the UK the highest among Western European countries as figure 4.5 illustrates. Yet, reputation also appears to be under constant scrutiny, as interviewees across *all* the institutions discussed. Indeed, British students are not only more likely than their European peers to take ‘reputation’ into account, but they are also more likely to rely on rankings as a way to inform their choice of university, as indicated in figure 4.6.

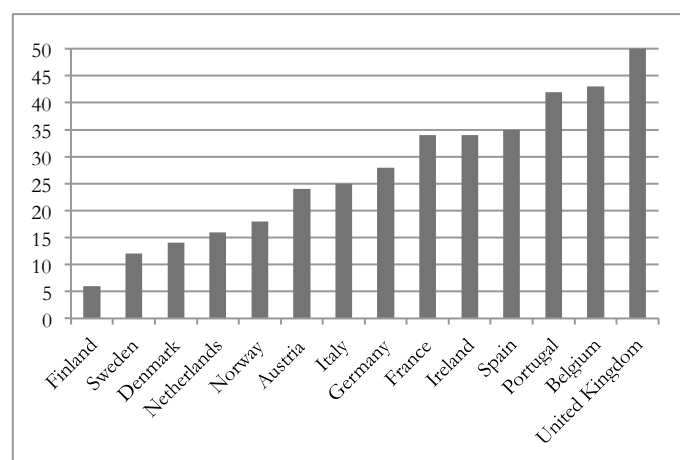
Figure 4.5. The importance of university reputation for students’ choice



Source: own elaboration based on Gallup (2009)

Note: the figure shows the percentage of students who ‘strongly agree’ with the statement: ‘students choose where to study on the basis of the quality/reputation of the institution and its study programmes’

Figure 4.6. The importance of university rankings for students’ choice

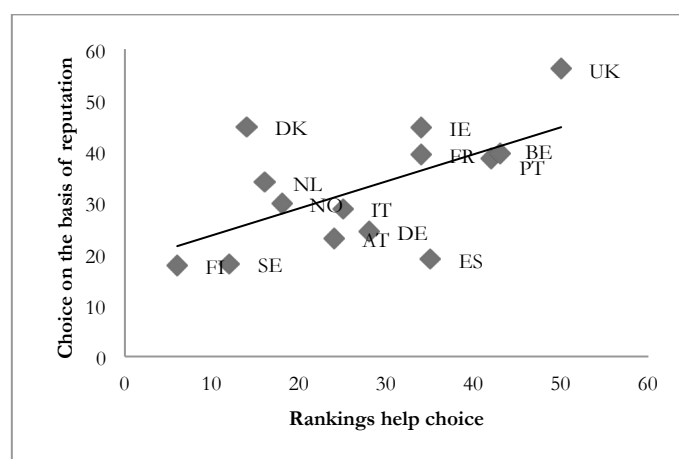


Source: own elaboration based on Gallup (2009)

Note: the figure shows the percentage of students who ‘strongly agree’ with the statement: ‘performance rankings of universities and programmes would help students to choose where to study’

Finally, ‘importance of reputation’ and ‘reliance on rankings’ correlate ($R^2 = 0.35$), confirming that rankings come into the equation when students consider the reputation of the university, which also gives a plausible explanation as to why universities that are commonly considered as ‘more prestigious’ could not be fully insulated from the employability agenda, but were rather pushed to engage with it, although admittedly in a less systematic and profound way than their counterparts who struggle in the rankings. Hence, despite ‘research-intensive’ universities being often considered in the literature as immune from competitive pressures due to their ‘high status’ (cf. Marginson 2006), the evidence collected suggests that these institutions are also very much aware of and influenced by competitive pressures, as highlighted from findings at the university-level.

Figure 4.7. Relationship between ranking and reputation



Source: own elaboration based on Gallup (2009)

Note: the figure plots the percentage of students who ‘strongly agree’ with the statement: ‘students choose where to study on the basis of the quality/reputation of the institution and its study programmes’ against the percentage of students who ‘strongly agree’ with the statement: ‘performance rankings of universities and programmes would help students to choose where to study’

4.4 The constrained development of specific skills in higher education: a bird's eye view on Foundation Degrees and Higher Apprenticeships

Yet, successive governments – next to a profound marketisation of the higher education sector (Shattock 2012) – also promoted policies that specifically incentivised skill formation in STEM areas. Both the New Labour and the Coalition governments sought to involve employers directly in the design and delivery of programmes with a strong component of work-based learning and aimed at forming high specific skills. Foundation Degrees and Higher Apprenticeships were assigned this task by the New Labour and the Coalition government respectively. Higher Apprenticeships in particular have been initiated with the aim of providing STEM skills to rebalance the UK economy towards manufacturing. Yet, as the remainder of this section discusses, neither initiatives have developed in such a way that suggests strong demand for specific skills on the side of employers (as hypothesised in a knowledge economy strongly reliant on dynamic services), while universities have engaged with these initiatives (confirming the responsiveness of the higher education sector towards external demands).

Foundation Degrees are sub-degree level qualifications “designed and delivered to equip people with the relevant knowledge and skills for business” (UKCES 2013, 15). They were introduced as a flagship policy by New Labour in 2000 upon recommendation of the Dearing Report to meet “intermediate skills needs across all sectors of the economy” (HEFCE 2000, 6) and satisfy employers’ demand “for higher technical and associate professional skills” (HEFCE 2000, 6). Thus, from the perspective of the government, Foundation Degrees were expected to fill a traditional gap of the British skill formation system, namely that of technical specific skills by tasking employers in cooperation with the HE sector to provide these skills (DfEE 2003, 36). In 2003, the Labour government created a quango, Foundation Degree Forward (FDF), which was funded by HEFCE, and it was assigned the objective of developing “innovative

approaches to the creation of [Foundation Degrees]” and to “stimulate, support and sustain employer partnerships with higher education in order to meet the demands of workforce development, business improvement and the knowledge economy” (FDF 2009). Foundation Degrees had a smooth start, with the Government achieving – in fact exceeding – the target of 100,000 Foundation Degrees learners by the academic year 2010/2011. Partly because of the very low initial base, Foundation Degrees have been in the first decade of the 21st century the fastest growing segment of higher education provision in England (Harvey 2009). However, the steady growth of Foundation Degrees does not tell us much about the impact of Foundation Degrees on the pattern of skill formation in British higher education. To what extent have Foundation Degrees actually met the need for higher level skills – to paraphrase the emphatic title of the 2003 government paper ‘Foundation degrees: Meeting the need for higher level skill’? While the evidence for their (initial) quantitative growth is unambiguous, the evidence on the qualitative developments of Foundation Degrees points to a mixed picture. Already in the early days of the Foundation Degrees, the extent to which employers would be keen to participate in the design and delivery of Foundation Degrees had been questioned. For instance, a witness to the House of Lords inquiry into the expansion of higher education stated that:

foundation degrees are developing rather well in the face of some of the scepticism which is apparent about them in some quarters. I think that the real issue is engaging employers with foundation degrees. They have an absolute right to be involved in the design of the curriculum for foundation degrees and we have found the engagement of employers really rather patchy. (House of Commons 2003, paragraph 91)

More structured evidence produced in 2008, i.e. after seven years Foundation Degrees had been introduced, found that employer engagement in Foundation Degrees – which was the crucial element of the policy initiative – was “very variable” and that some employers “had been actively engaged, but for the majority such engagement was passive, and for a minority, it had been minimal” (Greenwood et al. 2008, 53). The evaluation report goes on to find that it has been the higher education sector ‘going out’ and trying to engage with employers, rather than employers actively taking steps to engage with the higher education sector in skill formation (Greenwood et al. 2008, 33). Along the same lines, a review of the literature produced on Foundation Degrees from their establishment until 2009 concludes with respect to employer engagement that “lack of understanding of [Foundation Degrees] amongst employers is a major challenge for institutions attempting to develop partnerships with employers” and that “real and perceived time constraints are major inhibiting factors for employer involvement in the design and delivery of [Foundation Degree] programmes” (Harvey 2009, 36). Thus, the lack of employer engagement in Foundation Degrees, that has been defined as employers pushing back the task to universities (Colombo 2011, 107), confirms the direction of the relationship between universities and employers, which is strongly driven by the former while the latter play a far more passive role. Such a relationship – actively pursued by universities and rather passively consented by employers – is amplified by the importance of general over specific skills, which provides a strong incentive for employers to take a step back given that general skills do not require strong employer involvement, while universities face the opposite set of incentives, namely to satisfy the needs of the labour market. Supporting this line of reasoning, a survey by the University Alliance, an association representing former polytechnics, found that “the burden of funding employer engagement activities largely fell on the university” (University Alliance 2015,

11) leaving the university-employer partnership substantially imbalanced towards universities (Colombo 2011, Reeve and Gallacher 2005).

The policy emphasis around Foundation Degrees vanished with the Coalition government taking office in 2010 and switching the focus onto Higher Apprenticeships, which can be thought of as a more focused version of Foundation Degrees, requiring deeper employer involvement. In other words, Higher Apprenticeships set the framework for fully-fledged apprenticeships located in the HE sector, where the learner has the double role of student and employee. Higher Apprenticeships are expected to provide qualifications at level 4 (i.e. that of a Foundation Degree) or higher (i.e. at undergraduate honours level and above) and they have been specifically developed with a view to involving employers in high level STEM skills to be deployed as a recalibration of the UK economy towards high-end manufacturing (Steedman 2012, University Alliance 2015). The development of Higher Apprenticeships is difficult to assess as of yet, since they have been introduced only recently. However, to date, Higher Apprenticeships have been faced with one of the key issues that affected Foundation Degrees as well, namely the extent to which employers are willing to take the lead in providing high specific skills in conjunction with higher education institutions. The lack of employer engagement outlined with respect to Foundation Degrees had not prevented the ‘quantitative’ development of Foundation Degrees because employer engagement was a clear policy objective openly sought by the government, but not a necessary condition for Foundation Degrees to be implemented. However, in the case of Higher Apprenticeships, employer engagement is crucial because of the double status of the learner (i.e. student and apprentice/employee) and therefore, without direct demand and commitment from employers, Higher Apprenticeships cannot start.

According to government data, the demand for Higher Apprenticeships does not seem to be particularly strong. Figures from the academic year 2014/2015 show that

19,800 Higher Apprenticeships have started. This represents 4% of all apprenticeship starts, which is a significant increase from the previous year, when Higher Apprenticeships represented 2% of all apprenticeship starts. Yet, a closer inspection shows how Higher Apprenticeships do not seem to be used by employers as an initial form of training, but they rather appear as a form of up-skilling/continuous training of their current workforce, given that over 14,000 of the Higher Apprenticeships starts are for people aged 25+ (DfE, SFA, and ESFA 2017). In addition, as predicted given the structural composition of the British economy, the evidence from individual employers and their associations shows that the appetite for Higher Apprenticeships is limited to a small fraction of British businesses. Traditionally, small businesses have not had extensive engagement with the skills system and their quest for high skills has translated into routes to access graduate skills easily and cheaply. Thus, instead of engaging extensively with the higher education institutions in design and delivery of degree programmes, as would be required in the framework of a Higher Apprenticeship, small businesses have mostly campaigned for the government to ring-fence the public investment into a scheme called the ‘Talent Pool’. This provided government-sponsored internships for recent graduates and was almost exclusively used by small businesses (House of Commons 2011, 60 - 61, FSB 2011). Similarly, employers (large and small) in the low-end services have voiced their satisfaction with lower-level apprenticeships (e.g. level 2), i.e. *restrictive* apprenticeships that provide support to basic literacy and numeracy skills and are mostly focused on the work-related component as opposed to the educational part (Fuller and Unwin 2003), and therefore do not need to engage with the HE sector in higher education skill formation. Support for Higher Apprenticeships was therefore mostly confined within a few large employers located in high-tech industries that expressed their support for vocational programmes co-designed and co-delivered by employers and higher education institutions (House of Commons 2012), that nonetheless

has been mostly used so far to up-skill existing workforce rather than to train and employ secondary school leavers. Again, comparing employers' and universities' reactions is quite striking: while employers have been rather ambivalent and only a minority expressed their willingness to engage in these programmes, the higher education sector has responded positively across the board. It is significant to note that even Russell Group universities, i.e. research-intensive universities, stated their availability to engage in the development of Higher Apprenticeships, while noting how they perceived weak employer demand as a key limitation that Higher Apprenticeships are faced with (Russell Group 2015, 3).

This positioning of actors towards Foundation Degrees and Higher Apprenticeships provides a stark comparison with the German case, highlighting how demand for high skills and universities' incentives to satisfy governments and employers demands played out in the two countries in exactly the opposite way, as the theoretical framework hypothesised. In the British case, universities (including research-intensive universities) have expressed their willingness to engage with employers in the provision of STEM skills, which, however, did not develop to a significant extent due to the demand for these skills being limited to a minority of British employers (Cruickshank 2016). In the German case, as the next chapter will illustrate in detail, the business sector demanded more engagement with the higher education sector, but these demands have been met with a lukewarm reaction – if not open opposition – from (research) universities, paving the way to a strategy of layering whereby both employers and governments had to look 'beyond' research universities to meet their high skills needs and found a suitable partner in universities of applied sciences, triggering a process of layering and differential growth.

4.5 Conclusion: back to theory and final remarks

While there is widespread agreement that higher education systems across countries are subject to increasing pressures from employers and policy-makers to become more instrumental to labour market needs, the processes by which this alignment occurs remain underspecified. This chapter provided a case study to understand this process by focusing on the UK, which exemplifies a broader set of cases which share two key features: (i) a knowledge economy where services are predominant compared to manufacturing and (ii) a higher education sector in which competition among universities (for students, funds, reputation) is a defining feature. The UK represents therefore a broader set of cases that share these characteristics, which are commonly referred to in the literature as LMEs.

The findings from this chapter broadly support the theoretical framework developed in chapter 3 by suggesting that the alignment between labour market needs and educational provision in universities is strongly mediated by the competitive environment within which higher education institutions have been operating in the UK since, in particular, the late 1990s. As far as ‘organisational survival’ rests upon the recruitment of fee-paying students and performance in league tables, universities emerged as ‘protagonists’ in the development of the skills agenda driven by a strategic choice to formulate an appealing educational offer to current and future students. As such, employability skills have been introduced in most universities and made explicit in curriculum design and development, and the advisory role of industrial partners has often been strengthened. The changes applied by universities to their degrees – therefore – conform to the notion of conversion as illustrated in table 2.5, namely the redeployment of existing institutions to new purposes, identified in the increasing importance of equipping graduates with a set of skills sought by employers, with changing contextual

conditions (namely: an increasing competition in the higher education sector) providing the underpinnings for such restructuring.

Moreover, the chapter also highlights how the demand side of the economy ‘constrains’ higher education policy. The dominant knowledge-based regime – based on high-end services – meant that interaction between universities and employers in high-end services led to a prioritisation of ‘general skills’ even in those subject and disciplines (such as STEM) where sector-specific technical knowledge used to be explicit. The constraints posed by the demand side of the economy emerged even more clearly in the case of Foundation Degrees and Higher Apprenticeships whose development was – at best – patchy due to weak demand of high specific and technical skills on the side of employers.

More broadly, this chapter points to the role of universities and their institutional contexts as a key variable to understand the formation of high skills in post-industrial societies. In particular, the analysis of universities’ engagement in skill formation in the British context uncovers a curious collective-action dynamics taking place in liberal higher education systems that goes in the opposite direction compared to the well-known ‘free-riding’ problem of firms as far as skill formation is concerned in the liberal labour market. While in a liberal labour market, firms *refrain from* training because of the risks of poaching associated with it (Finegold and Soskice 1988, Soskice 1993), in a liberal higher education market, universities *engage in* training as a way to boost their student recruitment prospects. In a way, we can characterise universities in a liberal higher education system as ‘general’ skills coordinators – triggered by the pressures of a highly competitive higher education market.

5 Germany: failed conversion and the layering of high skills

5.1 Introduction

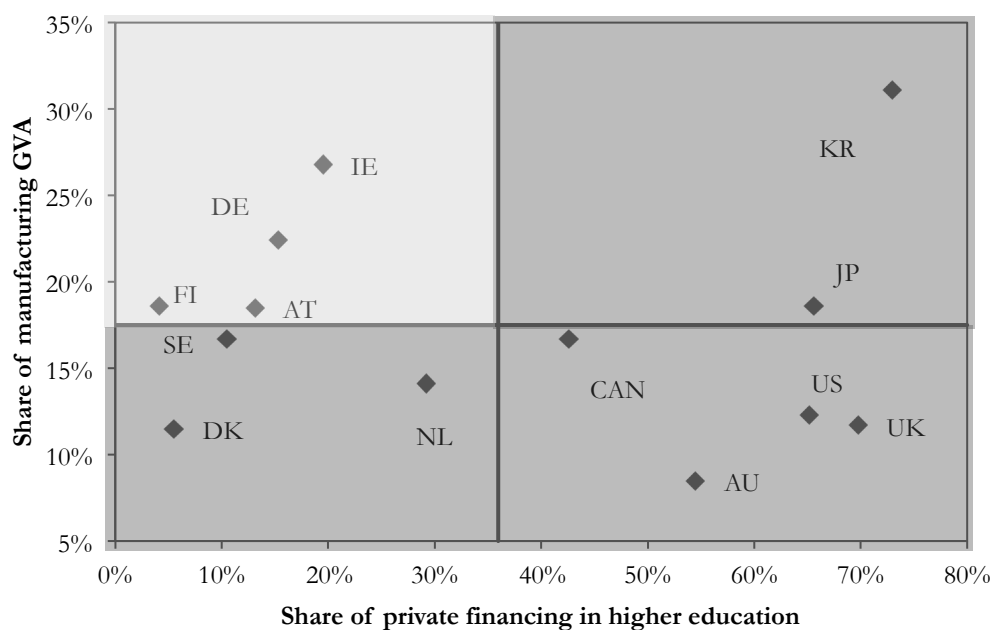
This chapter analyses the processes of institutional change that took place in the German higher education system over the last two decades with respect to its relationship with the labour market. The empirical observation that this chapter starts from – and seeks to explain – is the substantive alignment of higher education with labour market needs, which has primarily occurred via three routes: firstly, the government financed an increased supply of study places in those subjects that are high in demand from employers (by and large the STEM subjects); secondly, enrolments have increased in those institutions that have traditionally been closer to labour market needs, namely *Fachhochschulen* (or universities of applied sciences) vis-à-vis traditional research universities; thirdly, we also observe an expansion of dual study programmes, i.e. university degrees that combine theory (at a university or, more commonly, at a university of applied science) and practice (with substantive elements of work experience in a firm, which also finances the programme). Why did this alignment between higher education and the labour market take place?

At the outset, these developments are puzzling from the perspective of a higher education system that has been traditionally considered by comparative standards as ‘distant’ from labour market concerns and skill formation even in those disciplines, such as engineering, that tend to be more oriented towards practice (cf. Kivinen and Nurmi 2003). Indeed, the skills needed in the labour market have been traditionally provided by the VET system, and to a rather limited extent by universities of applied sciences. The latter have been historically overshadowed by traditional research universities, which have been for a long time the dominant actor in the higher education system – both in terms of political power and in terms of share of students enrolled (Witte 2006, Witte, Van der Wende, and Huisman 2008, Toens 2009). The strict distinction between VET

and higher education, which has been referred to as “educational schism” (Baethge 2006), also contributed to keeping the university system relatively limited in size (Powell and Solga 2011) and strongly guarded by an academic oligarchy who took a certain pride in keeping higher education apart from labour market needs (Pechar 2012, Clark 1983). How can we then explain this shift?

Based on the two main dimensions identified in chapter 3, Germany locates in the top-left quadrant of the bi-dimensional categorisation as part of a universe of cases broadly corresponding to the Continental European CMEs (see figure 5.1).

Figure 5.1. Locating Germany in the bi-dimensional categorisation



Source: own calculations based on OECD (2017) and WIOD

Through the theoretical framework, we hypothesised the following observable implications for this set of cases:

- Governments cultivate the supply of specific and general high skills

- Universities act as antagonists
- Institutional change proceeds by layering/drift

The empirical data presented in the chapter lends support to the hypothesised trajectories and mechanisms of institutional change. In particular, I identify two main phases of institutional change, introduced as ‘de-differentiation’ (which took the form of ‘attempted’ *conversion*) and ‘re-differentiation’ (which proceeded by *layering* and *differential growth*). In analysing the processes of change, it is highlighted how the critical juncture of the Bologna process offered a unique window of opportunity to ‘open up’ to the demands of external stakeholders (governments, employers) a system traditionally dominated by the academic oligarchy (Witte 2006, van Santen 2014, Pechar 2012). Most prominently, ideational explanations – as introduced in the first chapter – have singled out ‘Bologna’ as an example of neoliberal convergence of European higher education systems driven by the political agency of the European institutions (notably, the European Commission).

However, the exogenous shock of Bologna does not provide us with sufficient analytical leverage to make sense of the overall move of the university system towards the labour market. Rather, it is argued that to account for the change, we need to focus on the “subterranean political process” (Hacker 2005, 243) and its implications for gradual, yet transformative, reconfigurations of existing institutional arrangements (cf. Mahoney and Thelen 2009, Streeck and Thelen 2005). A preview of the argument put forward by the chapter runs as follows: the ‘de-differentiating’ process triggered by Bologna aimed at establishing a bachelor degree across traditional universities and universities of applied sciences with equal footing on the labour market and characterised by a balance between discipline-specific skills and employability/professional skills. This change was strongly supported by policy-makers and employers, and it foresaw the

bachelor degree as the main entry point into the labour market (cf. van Santen 2014, Ertl 2013, BMBF 2007, BDA 2004, 2009, 2003). Yet, this de-differentiating process fell short of its initial objectives, to the extent that (research) universities successfully resisted government's and employers' 'call to employability' and defended their distinct organisational field and status within the higher education sector – characterised by the pre-eminence of research and knowledge over teaching and skills and by a degree of distance from the demands of external stakeholders. The veto-playing role on the side of universities is therefore in line with the hypothesised 'antagonist' role, preventing institutional change from being encompassing. This can be thought of as an attempt of *conversion*, i.e. the process of redeploying existing institutions to new purposes (Streeck and Thelen 2005, 31) that we have seen occurring in the British case, that reached its results only to a limited extent.

Rather, other forms of institutional change following the attempted conversion led to a new settlement in skill formation in higher education. Institutional change has mostly proceeded by *layering*, i.e. the process of attaching new elements to existing institutions (Streeck and Thelen 2005, 31), through the introduction of the Higher Education Pact, a government policy established in 2007, which spurred a process of 'differential growth' (Streeck and Thelen 2005, 31) of those institutions and skills profiles that were deemed high in demand in the labour market, i.e. universities of applied sciences and STEM subjects respectively. Employers also played a part in the process of layering by stepping up the provision of dual study programmes. In both the establishment of the Higher Education Pact and the growth of dual study programmes, universities of applied sciences emerged as the ideal partners for policy-makers and employers in a process that led to a *re*-differentiation of the higher education landscape in the country. The expansion of teaching has been primarily located in universities of applied sciences, while research funding concentrated in (selected) research universities

through the Excellence Initiative, a research-focused government policy that has been running roughly in parallel to the Higher Education Pact. The process of layering focused on STEM provides two key insights that speak directly to the theoretical framework put forward in chapter 2. Firstly, it highlights the importance of high specific skills in manufacturing-heavy knowledge economies; secondly, it also shows how institutional change is likely to proceed at the margins if the policy context is populated by veto-players.

The chapter is organised as follows: the next section discusses the policy context, focusing on the pressures that had been mounting on the higher education system, which intensified in particular in the 1990s (section 5.2); the following sections illustrate the two phases of institutional change, i.e. the de-differentiating and re-differentiating phases (sections 5.3 and 5.4 respectively); section 5.5 concludes the chapter by bringing together its main insights.

5.2 Context: mounting pressures on the higher education system

The German education system at large has been traditionally characterised by a schism between vocational training and higher education (Baethge 2006), as radically different normative assumptions and organisational logics underpinned the two sectors. The “normative reference for the curricula” was that of “economic demand for qualifications” in the vocational training sector as opposed to that of “representative systematic knowledge in academic disciplines” in higher education (Baethge and Wolter 2015, 100). These normative assumptions translated into distinct organisational logics: social partnership underpins vocational training, while academic self-governance dominates the higher education sector (Baethge and Wolter 2015, Graf 2013).

Such a strong divide should be treated with some caution, as for instance exemplified by the establishment of universities of applied science in 1969 which do not

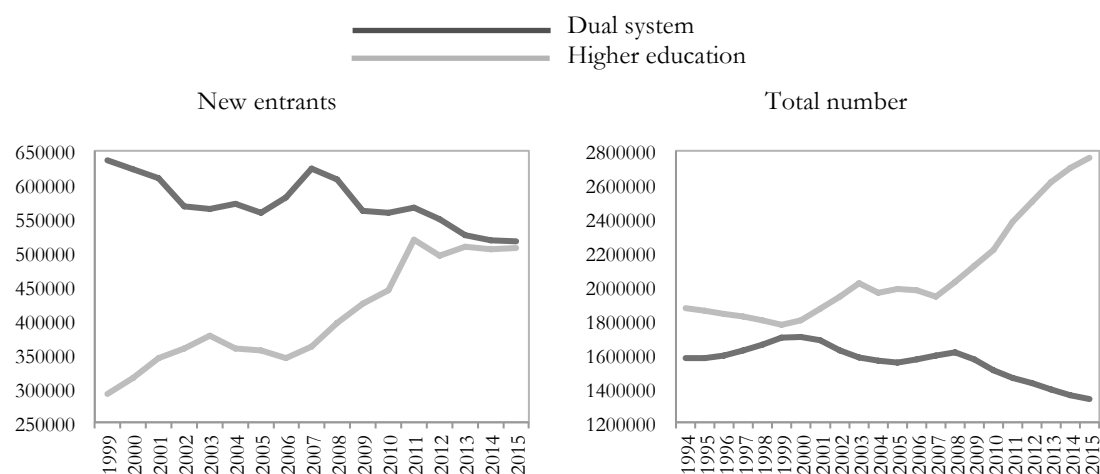
fit neatly in either category. Yet, the notion of ‘educational schism’ has the merit of capturing the broad picture that had characterised the German system until the early 1990s, not least because the higher education sector has been traditionally limited in size, and the universities of applied sciences had traditionally constituted a minority within an already ‘small’ sector. In other words, research universities have firmly represented the ‘centre of gravity’ of an ‘elite’ higher education system (Ansell 2012, 2008), as illustrated already in section 2.5.

Vocational training delivered primarily through the dual apprenticeship system was on the other hand traditionally at the centre of the German skill formation providing the vast majority of skilled labour to the labour market. The role of intermediary organisations (notably Chambers of Commerce, Trade Unions) is the key feature of this model ensuring that curricula are broad enough to deliver predominantly industry- (as opposed to firm-) specific skills (Culpepper 2001, 2003): encompassing employer organisations ensure firms against the risk of poaching (Soskice 1994), industrial relations institutions work as “beneficial constraints” pushing German firms towards a high skill equilibrium characterised by “diversified quality production” (Streeck 1997a, 1991); and an authoritative certification process ensures the industry-wide applicability and recognition of the vocational qualifications (Busemeyer 2009a). Contrary to the repeated failures of training policy in Britain outlined in section 4.2, the German vocational system has traditionally had high social recognition and it has been an attractive option upon completion of secondary school *also* for high achieving pupils, while successfully integrating low achievers in the labour market (Iversen 2005). Its success and complex underpinning of institutional arrangements led to the dual system being regarded as an equilibrium where key actors (firms, unions as well as individual learners) had no incentive to change (Soskice 1994). Indeed, Powell and Solga (2011) argue that it is precisely the high societal esteem around the German vocational training system which

has traditionally limited the expansion of higher education. To give an example of the quantitative relationship between the two sectors, in 1985 the number of new entrants in the VET system was approximately three times higher than the number of entrants in the HE system – roughly, 600,000 and 200,000 students respectively (Baethge and Wolter 2015, 99). Thus, until the late 1980s skill formation was firmly located at the secondary level.

Yet, this traditional configuration of the relationship between vocational training and higher education muted profoundly in recent years. From the 1990s in particular, the number of new entrants into the apprenticeship system has been decreasing, while the numbers of new entrants in higher education have been constantly and steeply on the rise. Baethge and Wolter (2015, 98) argue that “[t]he preliminary end of this development was reached in 2011/2012 when there was an equal number of entrants in both sectors”. To capture this trend, it is instructive to contrast the ‘size’ of the higher education system with that of the apprenticeship system in terms of total number of students and new entrants (see figure 5.2).

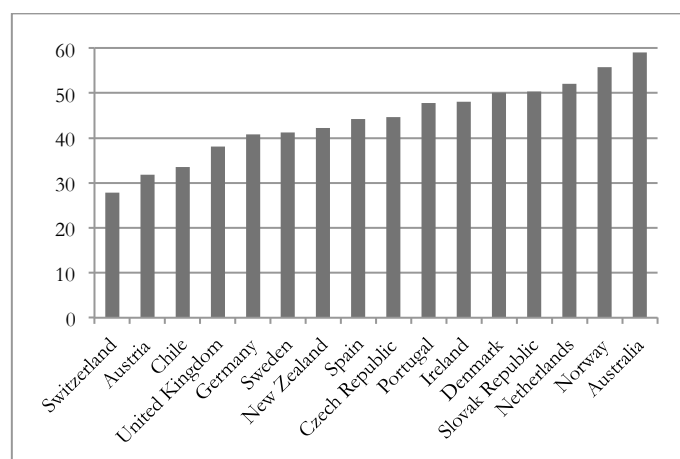
Figure 5.2. New entrants and total number of students in the dual system and in higher education in Germany



Source: own calculations based on Statistisches Bundesamt

Indeed in recent years, by some measures, entry rates to university in Germany have been higher than in the UK, which is traditionally associated with a mass university system (see e.g. Ansell 2010), as shown in figure 5.3.

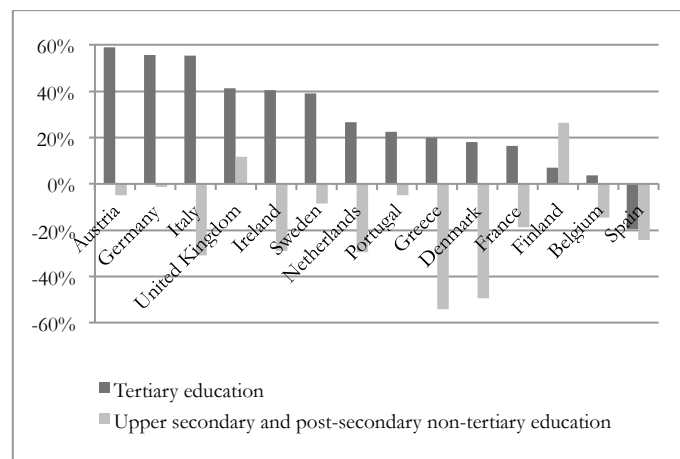
Figure 5.3. Entry rates into higher education of students under the typical age of entry, adjusted from international students in 2012 (ISCED 5A)



Source: OECD (2014)

Hence, in Germany as in most affluent countries, universities are today the primary locus of skill formation for young people before they enter the labour market (Warhurst 2008). This trend is captured in figure 5.4, which shows the percentage change of young employees between 2000 and 2013 by highest educational attainment.

Figure 5.4. Percentage change in the number of 25-29 year-old employees between 2000 and 2013 by highest educational attainment



Source: own calculations based on Eurostat

The stark expansion of higher education vis-à-vis vocational training has been ascribed to two simultaneous trends: (i) increasing ‘credentialism’ on the side of young people and their families and (ii) the changing composition of the labour market, which relies increasingly on higher-level skills (Baethge and Wolter 2015, Graf 2017, Fleckenstein, Saunders, and Seeleib-Kaiser 2011, Oesch 2013, Oesch and Rodríguez Menés 2010). Baethge and Wolter show in particular that the long-term trends in Germany’s secondary education system fuelled the expansion of enrolments at the tertiary level:

There has been a dramatic change in the educational decisions determining the allocation of pupils across the different school types within the secondary school system. In the early 1950s the share of pupils transferring from the primary to the lower secondary school [...]

amounted to more than 75% nationwide; this proportion decreased continuously to less than 12 % in 2012 [...] the participation rate in the grammar school track (at grade 5 or 7) leading to the entitlement necessary to access higher education has expanded in the same period from 15 % to more than 40 %. (Baethge and Wolter 2015, 103)

This trend in secondary schooling had an asymmetric effect on the distribution of students between vocational training and higher education as it triggered a massive expansion of potential demand for higher education while shrinking potential demand for the dual system (Baethge and Wolter 2015, 104). Secular macro-sociological trends played a prime part in this development as “the allocation processes between alternative school types seems to be the increasing level of educational awareness, aspirations and ambitions in wider parts of the population” (Baethge and Wolter 2015, 104).

On the demand side, the changing composition of the labour market provided a further set of functional underpinnings: the occupational distribution saw a stable decline, in Germany as in most advanced capitalist countries, of intermediate occupations (typically in need of intermediate skills delivered by the vocational system) to the advantage of professional and managerial occupations (typically in need of a higher education) (Oesch 2013, Oesch and Rodríguez Menés 2010); furthermore, Germany experienced a significant expansion of knowledge-intensive sectors, across both high-end manufacturing and services (Thelen forthcoming, Durazzi 2017, recall also figure 1.2).

The introduction to a recent publication by the German Rectors’ Conference (HRK) sums up eloquently the quantitative and qualitative changes occurring within the German education system and highlights the central role retained by the higher education sector in the process:

Over the past few years, the educational debate has been enriched with several new key terms. Whilst previously conducting research in the interests of technical progress and educating the future social elite were among the noblest responsibilities of universities, today further aims are coming into focus that are of increasing significance: Universities are now expected to make a growing contribution to social integration and to prepare young people for conditions of life and work that are becoming ever more complex, international, and nuanced. A glance at the statistics quickly reveals the extent of the changes that this entails: Within just a few decades, the number of students has more than doubled; today, half of the secondary school graduates will go on to university. (HRK 2013, 3)

In this context, pressures mounted on the higher education sector to engage with external stakeholders (see, e.g., Regini 2011b), which included also delivering relevant skills demanded by the labour market. This implied a shift away from the traditional focus on teaching and research in separation from labour market concerns but rather embarking upon a path of ‘hybridisation’ which could increasingly accommodate skill formation within the higher education sector (Graf 2013, Powell and Solga 2010). Looking back at the main socio-economic changes that had taken place through the 1990s and reflecting on future developments, the *Wissenschaftsrat*, an advisory board that brings together scientists, public figures (by and large business people) and policy-makers to advise the federal government on higher education and science policy, argued that the need to align higher education and labour market needs mainly stems from “[t]he anticipated increased demand for personnel with higher educational qualifications” (Wissenschaftsrat 2000, 7). They go on to argue that this demand is translated into an increasing interest towards profiles “with academically sound, practice-oriented training” (Wissenschaftsrat 2000, 7). To satisfy this need, it is argued that teaching in higher

education institutions “must be far more connected to actual practice” (Wissenschaftsrat 2000, 6).

However, German universities have been largely perceived as not sufficiently interacting with society, because of many actors in the higher education field “still holding on tight to traditional stereotypes of reasoning and practice” (Wissenschaftsrat 2000, 15). The attempt to step-up practice-oriented teaching in higher education institutions goes back to the 1980s, when several reform proposals were made to increase the share of students in Universities of Applied Sciences (cf. Toens 2009), and it has been strongly advocated “time and again” by the Wissenschaftsrat through the 1990s (Wissenschaftsrat 2000, 22). However, these attempts largely failed for a variety of reasons (Witte 2006, 154), and most prominently because of research universities opposed to a significant expansion of Universities of Applied Sciences (Toens 2009, 81, interviews DE1, DE2, DE3, DE7), which would have required financial support through “a shift of resources in favour of the *Fachhochschulen*” (Wissenschaftsrat 2000, 7). Thus, in the 1990s, universities came increasingly under the spot-light “as politicians began to expect regular universities to take a larger share of responsibility for practice-oriented higher education” (Toens 2009, 81), while employers lamented the irresponsiveness of the higher education sector to labour market needs and argued for greater involvement in higher education matters. As argued by van Santen (2014) in a detailed study on the transformation of German higher education:

While in the past, German employers have predominantly depended on the vocational training system to provide their workers with the necessary skills and have mainly cooperated with universities in research and development, higher education has become increasingly important for the education and training of the general workforce. This is also one reason why German employers have played an important role in the

reform of the German higher education system, and why the Bologna declaration and recent German higher education reforms put a strong focus on employability issues. (van Santen 2014, 64)

Yet, it is theoretically and empirically debatable whether we should expect the notion of greater business involvement in the reforms of higher education to be uncontested. Indeed, the seminal work by Burton Clark on “Academic Organization in Cross-National Perspective” illustrates how the German system comes close to the idea of a system dominated by the “academic oligarchy”, where “guildlike authority has predominated within the universities, with much personal authority at the operating level and with groups of professors exercising string collegial rule over the higher levels of faculty and university” (Clark 1983, 125). An important implication of this “mode of authority” (Clark 1983, 107-134) is that:

in comparison with the British and especially the American mode, the Continental mode has exhibited weak autonomous authority at the levels of the university and its constituent faculties. The professors have not wanted a separate administrative class and have simply elected deans and rectors as amateur administrators on short appointments and easy recalls. (Clark 1983, 126)

This mode of authority is therefore expected to be resistant to change, in particular when a demand for such change comes from external stakeholders (Pechar 2012). On the other hand, however, recent contributions by historians of higher education looked back at the roots of the German universities, considered the present challenges (many of which have been outlined in this section), and conclude that the traditional research universities would be somewhat forced to give way to the mounting pressures of external stakeholders by “significantly weakening” their research infrastructure, and “emphasizing

the teaching functions” over their research mission (Ash 1997, 205). It is therefore ultimately an empirical question whether change has occurred, and to what extent the balance of power between external and internal stakeholders has shifted, leading to significant changes.

5.3 De-differentiation and (attempts of) conversion: competing ‘organisational fields’ in the higher education sector (2003-2007)

The Bologna process has been widely regarded as a critical juncture in German higher education policy. As a European process whose “main goal is to increase staff and students’ mobility and to facilitate employability [of graduates]” (EHEA n.d.), it represented an opportunity to reform the higher education sector and align it to the needs of a knowledge economy (Fallon 2012, Pritchard 2011, Schulze-Cleven 2015, van Santen 2014, Welsh 2010, Winkel 2010). Interviewees from the higher education sector, business community and policy-making shared the view that “[Germany] never had such big structural reform of the higher education system. Bologna changed a lot in the higher education system and it changed the relevance of higher education” (interview DE_N3) and it also “attracted a degree of interest and attention towards study methods that was absolutely unknown in the past” (interview DE_N1).

Governments and employers in particular, who had become by the 1990s long standing critics of the university system, seized the opportunity offered by Bologna to ‘modernise’ the higher education sector (BMBF 1999, BDA 2003). The issue of the labour market relevance of higher education featured prominently in the early years of Bologna as a crucial component of the transition from the old system with a 4 to 5-year degree (the *Diplom*), to the new ‘tiered’ structure composed by a 3-year bachelor degree followed by a 1 to 2-year master degree. In this context, employers and governments expected the bachelor degree to become the main point of entry to the labour market. In

the run up to the start of Bologna, “employer demands for reforms of curricula of degree structures had become more pronounced” (Witte 2006, 164) culminating in an extensive memorandum released by the peak employer association BDA in 2003 on the expectations of the business community on the reform. The memorandum contained several key points revealing employers’ preferences. In particular, the BDA argued that:

The bachelor should be established in Germany as the first standard degree in German universities conferring eligibility for employment. The business community will work to give bachelor graduates an attractive start on the labour market. [...] An essential precondition for a bachelor degree giving a realistic chance of entry into the labour market is a university education in the relevant bachelor course geared to consistent transmission of basic and core skills that confer employability. (BDA 2003, 1)

Furthermore, employers made clear that “a change in the study structure is not enough on its own to meet the employability demands on first and higher degrees. The study content of bachelor and master courses also needs to be redesigned” since a “re-labelling of old courses is not acceptable and will permanently damage acceptance of the new degrees” (BDA 2003, 1-2). The BDA argued therefore in favour of a “work-oriented bachelor degree” (BDA 2003, 3) that could combine discipline-specific knowledge with the acquisition of broader professional skills that businesses deemed crucial in a fast-changing economic environment. Business’ ideas of bachelor degrees had been outlined as follows:

A bachelor who has specialised in engineering should have mastered the principles of mathematics and physics, technical principles, basic information technology skills (information technology, informatics, microcomputer technology, computer organisation, software technology)

as well as a basic knowledge of a technical application area and a methodology for solving engineering problems. This profile should be supplemented by elements of management accounting and a knowledge of quality, environmental and energy management (BDA 2003, 3-4)

The conception of higher education put forward by the BDA is consistent with that of the BDI, the employer association representing the large German industry that linked a reformed higher education to contemporary changes in production processes. Indeed, a 1998 paper by the BDI had already called for a shift towards a “productive information society” where “not only the organisation of work, but also its content will change. More and more employees will work on the generation, collection, processing, distribution, and commercialisation of information. The pure production of goods will take a back-seat and highly qualified labor will dominate over low-skilled labor” (BDI 1998, 18-19 cited in van Santen 2014, 136-137). Put more simply by an engineering company cited in Arthur (2006, 247):

[...] in the railways, the focus is no longer just on one wheel, or even one type of engine, we are now looking for people who understand a train and all vehicles connected with the railway industry. Graduates should have a basic understanding of technology but also of the economy as a whole. So they need to be less narrowly specialised and have a broader view on a range of technology related matters. In that sense we need specialists who are also generalists.

The turn towards employability of university education was shared by policy-makers as well, and in particular by the Centre-Left government that was in office when the Bologna process was embraced in Germany in the late 1990s. While not providing a similar level of details to that of businesses, the two key government actors in German higher education, namely the Federal Ministry of Education and Research (BMBF) and

the Standing Conference of the Ministers of Culture (KMK) that brings together the education ministries of the *Länder*, shared substantive elements with businesses as long as a closer connection between university education and labour market is concerned. A 1999 policy paper issued by the BMBF argued that competitiveness and quality of life will be in the future increasingly dependent on individual knowledge, skills and creativity. As such universities have a key role to play insofar as they are asked to train a highly skilled workforce while being the backbone of national research output. However, it is also argued that the contribution of universities towards smoothing the transition to a knowledge-based economy is hampered by, among other things, lengthy study periods, high drop-out rates and – most relevant from the perspective of skill formation – lack of practical orientation of the programmes (BMBF 1999, 1 - 2).

Opening up the higher education system to external stakeholders by tightening cooperation between universities and employers is identified a crucial element towards the ‘modernisation’ of the higher education system (BMBF 1999, 13). Along the same lines, the KMK promulgated in 2003 a decision titled “10 theses on the bachelor and master structure” that makes clear how the bachelor degree is to be considered a ‘professional qualification’ that allows entry to the labour market and as such must incorporate scientific competences and professional skills (KMK 2003). Accordingly, the Standing Rectors Conference (HRK), i.e. the organisation representing the university sector, indicates that “[b]achelor programmes are oriented towards subject-specific standards, but also general skills relevant to the labour market” (HRK n.d.).

In the early 2000s, therefore, the transition to a bachelor/master structure in which the bachelor degree would constitute a full qualification for entrance to the labour market appeared to work in an analogue way to the concept of “coalition magnet” developed in the ideational literature (Béland and Cox 2016), i.e. a ‘polysemic’ policy option that spoke to the preferences of various actors and therefore facilitated the

establishment of a policy coalition. The government saw the opportunity to restructure the degrees as a way to modernise the higher education sector: the government not only saw this as an opportunity to increase the professional orientation of higher education, but it also represented a way to tackle the long standing issue of excessively lengthy study programmes, thus also allowing for a significant saving in public financial resources (King 2010, 5) – a key strategic issue at times of education expansion (cf. Ansell 2010). The attractiveness of this re-structuring was even more pronounced for businesses that had the opportunity to increase their voice in higher education policy-making, a policy area in which they had been traditionally weak (Toens 2009, Baethge 2006, Baethge and Wolter 2015, van Santen 2014). A detailed reconstruction by Witte (2006) of the policy processes taking place in the early 2000s concludes that German businesses should “generally be seen as proponents [of the reform]” (Witte 2006, 473).

Indeed, after the 2003 memorandum, the BDA started in 2004 a major campaign named ‘Bachelor welcome!’¹³, supported by several large firms including BMW, Deutsche Bahn and Deutsche Telekom. Since 2004, the BDA has been releasing statements every two years that reiterated business support for the transition to the bachelor/master system and pointed out business’ demands to improve such transition (see, e.g., BDA 2004, 2008, BDA, Stifterverband, and BDI 2010, BDA 2006a). Finally, a third actor also joined the coalition, although less explicitly than employers and policy-makers, namely universities of applied sciences. Indeed, the ‘vocational drift’ prompted by the Bologna process, with its “emphasis on graduates’ employability and labour market relevance” also “strengthened the position of professionally oriented institutions” such as, indeed, the universities of applied sciences (Reichert 2010, 14-15). Clearly, universities of applied sciences stood to gain from this transition for two main reasons. Firstly, they increased

¹³ Since 2012, the campaign has been renamed ‘Bologna@Germany’.

their prestige given the *formal* equivalence of bachelor and master degrees *regardless* of the institution that awards them. Indeed, the formal boundaries between the traditional university sector and the universities of applied sciences has been blurring as a consequence of Bologna (Witte, Van der Wende, and Huisman 2008).

Secondly, the cost of adjustment to the new degrees was lower for universities of applied sciences, which have been since their establishment “characterised by a practice-oriented bias in teaching and research, a usually integrated semester of practical training’ (Lohmar and Eckhardt 2015, 149) and have traditionally been offering shorter degrees. As such, universities of applied sciences were already offering a type of education rather close to the ideas of policy-makers and employers in form (i.e. shorter degrees) and substance (i.e. significant practical orientation). These factors contributed to “*Fachhochschulen* finding themselves in a more favourable position” (Ertl 2015, 3). Interviews with key stakeholders confirmed this constellation of actors. A KMK representative, when asked about the main actors behind the emergence of this agenda in Germany, left little room for doubt: “Politicians, business leaders, universities of applied sciences” (interview DE_N7).

The constellation depicted above, however, clearly misses one crucial actor: research universities, which, it should be recalled, accommodated over two thirds of the total student population in higher education in the early 2000s. As expected from the early literature on higher education discussed in section 2.2 (Clark 1983, Van de Graaff 1978), universities firmly opposed what was perceived as a downgrading of the old degrees to short-term training, and a blurring of profiles between traditional universities and universities of applied sciences, i.e., again, a downgrading of traditional university education. In other words, the reforms initiated in the context of the Bologna process were perceived by the academic community as “utilitarian approaches [to university education] that threaten the cultural profile and identity of the Germanic tradition”

(Pechar 2012, 616). The conflict was particularly stark in the engineering discipline since engineering is the main area of overlap between universities and universities of applied sciences, i.e. both types of institutions offer degrees in this subject. Hence the blurring of boundaries between the two ‘organisational fields’ promised to be the strongest in this discipline, which was additionally under the spotlight because of the key role that was assigned to STEM subjects for a highly skilled workforce in the knowledge economy (see e.g. BDA 2006a).

Indeed, at the same time when employers and policy-makers were setting the scene for the transition to a bachelor/master system, and for the establishment of the bachelor degree as the main professional qualification towards labour market entry, academic faculties had a very different view. For instance, commenting on the KMK’s “10 theses” published in 2003, the *Fakultätentag* for Mechanical and Process Engineering (FTMV), i.e. the association of deans of universities for this discipline, strongly criticised the idea of a bachelor degree as a fully qualifying, main point of entry to the labour market and the implied blurring of boundaries between universities and universities of applied sciences. More specifically, their disagreement with current policy was articulated along three lines, which would characterise the position of research universities for the following decade. Firstly, they argued that for academic quality to be upheld, it needed to be clear that the master degree was going to be the equivalent of the old *Diplom*. Secondly, they argued that two different profiles should have been clearly identified for degrees pursued at universities and degrees pursued at universities of applied sciences. Thirdly, they argued that at bachelor level only a limited preparation for the world of work could be achieved because a three-year degree should only focus on the theoretical foundations of the discipline, while job-related skills could not be achieved. If companies were to hire bachelor graduates, they were expected to stand ready to provide significant on-the-job training (FTMV 2004). The stance of universities was therefore in clear

tension with that of policy-makers and employers. As argued by a senior academic in an engineering department of a research university: “My university, as well as all other universities, considered the master the level at which you leave the university and the bachelor more like an emergency exit, but not the standard degree at which to leave the university” (interview DE_U12).

In the public debate, research universities, and their engineering faculties in particular, were nonetheless perceived as the ‘academic oligarchy’ fighting to preserve their status (see also Pechar 2012). Employers kept demanding a fast conversion of degrees to the new structure, and after their initial support to a work-oriented bachelor degree in 2004 (BDA 2004), in 2006 they urged the university sector to implement a “faster and more consistent transition in all study courses to the new structure, in which bachelor degrees are expected to provide a professional qualification” (BDA 2006a) signalling some growing discontent in the business community. Furthermore, leading figures of the BDA’s working group on higher education made several public statements in the early years of the implementation of the new degree structure where they complained rather openly about the lack of cooperation that business had found on the side of universities. Thomas Sattelberger, chair of the BDA’s working group on higher education, argued that “technical universities [i.e. research universities with a specific focus on STEM subjects] discuss way too long what they could lose – this is totally unnecessary”, while “*Fachhochschulen* [...] are thinking about what they could win” and that “most of all, the leading technical universities want to save the prestigious *Diplom* of Engineering” (Gillman 2006). A senior policy officer from the BDA illustrated how the conversion of degrees at universities had been problematic:

When you ask employers themselves, you ask if they are happy with the discipline content, they say we are more than content. But if you ask

about generic skills, like taking decisions, presenting, leading a small team, being responsible for a small budget, having rhetoric skills, communication. If you ask about key competences, they say that universities should do more, they are not content with the graduates. They say there is not enough training at universities. There are differences between *Fachhochschulen* and universities – *Fachhochschulen* students do internships, longer than six months, and they get training of generic skills in the enterprise. We argued for universities to introduce these as well. (interview DE_N3)

Another BDA representative reinforced the point by suggesting that the lack of alignment between universities and employers' preferences "has lots to do with the history of our universities and their mentality" which meant that "there always has been a separation between universities and the world outside" (interview DE_N4). Policy-makers' assessment was very close to that of employers'. In a document reviewing the interim process of restructuring of degrees, the Federal Ministry illustrated the problems encountered as follows:

For higher education institutions – large universities more than universities of applied sciences – the challenge of 'employability' means to conciliate – sometime short-term interests – of the labour market and the impartment of academic, science-based knowledge and skills that will be useful for students and alumni all of their work-life. The teaching staff of universities sometimes still has reservation to align generic employability skills and in-depth knowledge of the subject. The paradigm shift that the increased integration of generic employability skills means has not yet been fully accepted by university staff i.e. there is still concern that academic studies might not be sufficiently science-based anymore. (BMBF 2007, 1-2)

Even the HRK, i.e. an organisation representing universities' rectors, generally perceived as the reformist part of the higher education sector (see Toens 2009), provided a very similar assessment as employers', therefore placing academic faculties in research universities under the spotlight as far as the difficulties in the transition to the new degrees are concerned:

The bachelor degree is something that is not yet working in an optimal way in Germany. [...] It still takes some time for professors, students and employers to adjust and to consider the bachelor as a full grown academic degree. It varies from subject to subject, for instance a bachelor in engineering in *Fachhochschulen* find it rather easy to find a job but bachelor graduates from engineering from universities find it very difficult and the universities professors say "you're not a real engineer if you leave university with a bachelor degree". [...] We still encourage universities to reflect on how they construct a polyvalent bachelor degree. It should be polyvalent in the sense that it should allow you to go into the labour market or to continue your studies in the same area or to switch area. (interview DE_N1)

To be sure, universities did not shy away from these 'accusations', but rather reinforced their position, which was informed by their collective identity as research universities, whose functions and purposes in relation to the labour market – and to society more broadly – have to be kept separate from other organisational fields, namely that of universities' of applied sciences. Thus, universities have strived to uphold their collective differentiation, as made clear by several stakeholders holding senior positions in research universities:

We have research universities, which are called universities, then we have these universities of applied sciences, *Fachhochschulen*, which are closer to

the needs of the labour market, and then we have these universities of cooperative education and they are really doing these dual programmes where students spend half of their time in a company and half of their time at these institutions. Everything is fine, everything serves a specific need of the industry as a whole but not every type of institution is appropriate to do everything else. (interview DE_ U8)

Clearly, the reference point for the restructuring – or, rather, lack thereof – of curricula for (research) universities has been their peer organisations, as opposed to any external stakeholder:

We are trying to be comparable, and also adaptable, to the other [research] universities. Well, because I also think it is good for the students to know that if I studied in [university A] I have a similar or same profile as I would in [university B]. I mean, at least on the national level there are standards set by the faculty association, Fakultätentag, and this is why we participate in it, in order to simply not fall out of our role. [...] For most students it is important to know that they are not worse nor better than if I had studied in [university B] or [university C]. (interview DE_U7)

Thus, as highlighted by the interview excerpt just reported, the position of research universities is reinforced and institutionalised by organisations, such as the faculty associations, which provide a forum for coordination among universities along discipline lines, as brought up even more clearly by a university vice-dean who illustrated how:

in each subject [...] you have a meeting of all deans and representatives of all schools or faculties in [say] electrical engineering, and they talk to each other exactly about those things [how to develop curricula] and so you may have universities who are outstanding in some areas but due to these

discussions it is rather disciplines that follow some joint track. (interview DE_U8)

The concern with horizontal collective differentiation of research universities was also formalised by sector associations. The TU9, the association of technical universities, argued for instance that the designation ‘TU’ should be added to the degrees awarded by technical universities to differentiate their degrees from those of universities of applied sciences (TU9 2014). Along the same lines, the Deutscher Hochschul Verband (DHV), the association of university professors, argued forcefully that the horizontal differentiation between universities and universities of applied sciences and, more broadly, vocational training should not be blurred (DHV 2015), despite political attempts to do so (cf. Witte, Van der Wende, and Huisman 2008, interviews DE_U11, DE_U12). In this context, therefore, the conversion of degrees towards professional skills and employability only occurred to a limited extent in universities:

We still at least in engineering did not change [the curriculum] in that way the politicians wanted us to go, that the science part had to move up to the master’s degree and we should focus on skills and employability in the bachelor and leave everything, the math and the more difficult parts, to the masters because they thought this is something only needed by people who later do real science. And we did not do this. We stick to the old structure that the fundamentals of the discipline, which is math in many cases, should be taught right from the beginning. (interview DE_U8)

Upholding the difference between universities and universities of applied sciences appeared as a major reason for universities to keep policy-makers’ and employers’ demands at bay. Commenting on the differences between the two types of institution, a professor with overall responsibility for teaching and learning in a university argued that:

the type of education is also different. We are providing our students with knowledge that lasts long. So companies that are recruiting graduates from a research university should know that they have to invest, I don't know, another half a year, in order to teach them on specific tools they need to know. I remember that once the head of Microsoft Germany complained that our graduates are not able or are not familiar with the software development tools of Microsoft itself. And I said to him, that is not our task and obligation [...] if you, Microsoft, want them to be familiar, then you have to familiarise them. That's not our task. (interview DE_ U8)

The focus on theory – as opposed to practice – was also made clear at another research university:

What you see [in our university] and all other universities as well, is that the changes to the bachelor/master structure required much bigger changes at universities than at universities of applied sciences, because they already before had something like a 6 semester lecture period while the Diplom was 8 or 10 semesters. [...] If you have to achieve a level of employability in just 6 semesters you have to cut in those areas [mathematics, physics, etc.]. And all I can see is that all universities in Germany have been very careful in cutting these basics and if there was a clear conflict in cutting basics and achieving extremely high levels of employability, what I can see is that universities usually chose that they stuck with the more elaborate basic studies and accepted that perhaps some more job-related topics were probably less in the study programmes than it would be required for full employability. (interview DE_U12)

Compared to the UK case, where we have seen a firm commitment towards 'employability' on the side of universities – driven by (powerful) university managers in the context of a highly competitive higher education market, German universities were

able to resist to a much greater extent the demands of government and business. Indeed, managerial control and high competition among universities – which as we have seen were crucial factors in shaping universities’ behaviour in Britain – are much less prominent in Germany. Firstly, despite attempts to reduce the power of academic faculties in favour of university management, it has been shown that very limited change was in fact achieved at the level of university governance – not least because managerial positions are often occupied by faculty members who share the same preferences (Schimank and Lange 2009, 65) – while in the British context, university managers have gradually become a ‘distinct’ profession (Whitchurch 2008) responding to a different set of incentives and displaying different preferences compared to academic faculties (as we have noted in chapter 4 and as captured by figure 4.2). The German case, despite the (neoliberal) push stemming from the Bologna process (recall section 1.2), shows remarkably limited change in the degree of power and self-governance retained by academic faculties. This speaks to a key limitation of the ideational literature, namely the lack of explicit attention to the role of actors within universities mediating between the spread of neoliberal ideas and their translation into actual organisational or institutional change. While it is true that under the auspices of Bologna policy-makers tried to curtail academic faculties’ power by introducing management boards in universities with representatives of external stakeholders (including local government and businesses) (Regini 2011b), evaluations found “little evidence” that these new structures “have uprooted collegial, professor-dominated university governance structures” (Dobbins and Knill 2017, 75, see also Hüther 2009). Indeed, in a systematic cross-country analysis of the changing patterns of power and authority across European higher education systems, Dobbins and Knill maintain that the German system – despite some tendency towards empowering university management – is still today a system in which the ‘academic community’ represents the ‘dominant decision-maker’ and where a collegial ‘management

approach' still prevails over bureaucratic or entrepreneurial management styles (Dobbins and Knill 2017, 78).

Secondly, the competitive pressures experienced by British universities, e.g. in terms of student recruitment, are not present (at least to the same extent) in Germany. Indeed, even where performance-based budget allocations have been expanded, which has been in itself uneven across Lander, these were the result of a compromise by which performance is measured through a wide-array of criteria including student recruitment, but also a number of other criteria, such as gender balance, average time to graduation or graduation rates (Burgard and Grave 2013, 8). The availability of a large number of criteria upon which budget is allocated provides German universities with more room for manoeuvre compared to their British counterparts. In the latter, if student recruitment drops, a university's finances are directly at risk, while in the former, if student numbers drop, universities can focus on improving other indicators and keep their finances, by and large, stable.¹⁴

Faced with the lower competitive pressures compared to their British counterparts, German universities made therefore clear that employability is not a concern that firms should offload on to universities, in particular as far as bachelor graduates are concerned. Indeed, the TU9 argued that their bachelor degrees are not a professional qualification and that their "value on the labour market will depend on the preparedness of the enterprises to provide the necessary continued training" (TU9 2014). Despite pressures from politics and businesses, universities have therefore resisted to a significant extent the rise of the employability agenda. Thus, until circa 2007, we observe a transition towards 'more employability' pushed by politicians, business associations, and supported by universities of applied sciences.

¹⁴ I am thankful to Ulrich Schreiterer for pointing this out to me.

Yet, universities – where the vast majority of students are enrolled – opposed the move away from discipline specific preparation towards more general employability skills. The concerns voiced by the BDA and other industry representatives that the transition to the two-tiered system has to an extent represented a case where “old wine is [...] filled into new bottles” (BDA et al. 2009) have now characterised higher education policy for over 15 years. Indeed, as of 2015, the Association of the Chambers of Commerce argued that “the promotion of employability represents an important target of the Bologna reforms. At many universities there is still a need for improvement with respect to the practical orientation of the contents of study programmes required for this, as well as the teaching of employment market-related skills” (DIHK 2015, 34). Hence, the conversion of degrees at bachelor level towards full qualification for labour market entry with a focus on broad professional skills was very limited, largely because of universities who felt that it is not their task to prepare students for the labour market, especially upon completion of a bachelor degree.

5.4 Re-differentiation through layering and the coordination of skill formation in higher education (2007 to present)

The early 2000s have therefore been characterised by a strong commitment to reform of the higher education sector. Bologna was used by key stakeholders – government, employers and partly universities of applied sciences – to further their interests on a higher education system that had been perceived as irresponsible to labour market needs for a long time. Yet, the template promoted through Bologna, implicitly pushing research universities to design their curricula in a way that resembled those of universities of applied sciences while removing formal differences of qualifications awarded by the two types of universities, fell short of its objectives. As the previous section illustrated, faculties in research universities significantly resisted government’s and employers’ call to

employability and hampered the conversion of degrees along the lines promoted by policy-makers. It is in this context of ‘truncated’ reform that, however, the German higher education system came under growing pressures. In 2007 it became clear for the government that the number of entrants into higher education was growing beyond previous projections, increasing the pressure on universities. This trend was expected to further exacerbate by 2011 when a change in legislation in four *Länder*¹⁵ shortened compulsory schooling by one year thus leading to a double cohort of students enrolling into university. The trend of rising enrolments has been remarkable: even after adjusting for the effect of the double graduation cohort, the share of the relevant age cohort entering higher education rose from 36% to over 50% in just a five-year period, between 2007 and 2011 (Hüther and Krücken 2014, 104).

This development worried business: while through the apprenticeship system businesses could ensure the skills needed by directly shaping the supply (i.e. employers would offer apprenticeships in particular occupations according to their needs), such a massive and rapid expansion of higher education – if not located in the disciplines needed in the labour market – could have led to significant problems of skill mismatch and shortages given that business cannot directly influence the allocation of students to degrees and disciplines. Accordingly, businesses began to formulate ever more detailed demands towards the higher education sector. The 2008 release by the BDA not only made statements regarding the necessity of strengthening the practical orientation of higher education, but it also advanced more detailed demands on the need to increase the supply of STEM graduates. Businesses feared greatly the skill shortage that expansion of higher education and unfavourable demographic conditions might have led to. This was particularly alarming in the STEM subjects – which are considered by the BDA as the

¹⁵ Bavaria and Lower Saxony implemented this change in 2011, Baden-Wuttenberg and Berlin in 2012.

backbone of German economic success in knowledge-intensive sectors (BDA 2008). In actual fact, the campaign of large industry had moved from demanding a general modernisation of the higher education sector through more employability and work-oriented education in 2004 to a much more defined demand in 2008 for practice-oriented STEM graduates that could support the expansion of knowledge-intensive services, and high-tech manufacturing in particular, that rely to a much greater extent on highly skilled workers compared to traditional manufacturing.

Accordingly, starting from 2007, we observe a shift in focus of higher education policy. While until 2007 the Bologna process had been the key trigger of the reformist effort of policy-makers, new domestic issues contributed to national policies (and politics) becoming more prominent vis-à-vis the international processes that characterised the previous years. Increasing numbers of students put pressure on universities, which needed additional financial resources if they were to meet the increasing demand. In the meantime, unfavourable demographic conditions and the need for highly skilled STEM scientists made business' voice louder.

To solve a potentially double crisis – universities not being able to meet increased demand for higher education, and businesses not being able to meet their high skill needs – the Centre-Right government in office at the time showed a similar keen concern for the alignment of higher education provision and labour market needs as its Centre-Left predecessor, and it launched a new policy initiative in 2007: the Higher Education Pact. While this policy looks at first sight like a rather 'simple' increase of the public budget for university education in the face of unprecedented – and not fully predicted – expansion of students seeking to enrol at university, a closer look at the measure reveals the transformative potential that the Higher Education Pact has had on the university system. To understand the key features of the Pact, we should first recall a peculiarity of the German system: research universities have traditionally dominated the sector vis-à-vis

universities of applied sciences, politically (by being more influential) and, as a consequence, financially (by attracting more public resources).

The higher education system, in other words, has traditionally had its centre of gravity in the research universities (recall section 2.5 in this respect). Indeed, when universities of applied sciences were created in the late 1960s, they were expected to grow in such a way that the majority of students would be pursuing their studies in these institutions. However, while this trend was achieved in countries that set up analogous institutions around the same time (section 2.5 discussed one of the most notable examples, the Netherlands, where two thirds of students attend the equivalent of universities of applied sciences), this re-distribution of students (and financial resources) internal to the system was never achieved in Germany because of strong resistance of faculties in universities who vetoed the implied shift of resources towards universities of applied sciences (Toens 2009, Wissenschaftsrat 2000). The political role of universities in keeping at bay the expansion of universities of applied sciences was articulated further by stakeholders belonging to both the business and higher education sides, as illustrated by the two following quotes by a BDA and HRK representative respectively:

Of course you can argue that even more money should be located in universities of applied sciences but there are structures, peoples in traditional universities that need money and the only way would be to reduce the number of faculties, close disciplines and because of our federal structures we have big discussions in each state about closing small disciplines and how the government is managing universities. And politicians are probably in fear of such discussions. (interview DE_N3)

When it comes to taking decisions on the ground, universities proved too strong in the political setting of the land to take something away

from them, and universities are of course prestigious. It is nice to have Heidelberg as one of your higher education institutions rather than an anonymous university of applied science somewhere in the countryside. So there are all sorts of vested interests on the side of the universities and a certain local pride on the side of the politicians. (interview DE_N1)

The nature of the Pact represented the opportunity to sidestep the veto player role of universities and use these resources to address the main issues that higher education faced, and that Bologna did not solve, because the conversion of degrees only happened to a limited extent in universities, as illustrated in the previous section. The expansion of students above and beyond the previous forecast by the KMK allowed the government to pursue a policy specifically to create *additional* study places to meet increasing demand. Given that the Pact was in practice increasing the size of the higher education pie, the room for political manoeuvre by the government was larger than in the case of an internal redistribution to the system, which is by and large a zero sum game, and that, as such, had been veto-played in the past by universities. Thus, the government was able to create additional study places with two very clear objectives: universities of applied sciences and the STEM subjects had to be expanded the most through the new policy (BMBF 2014, 2009). Starting from the expansion of universities of applied sciences, the choice stems directly from the failure of the ‘conversion’ of bachelor degrees towards a fully-fledged professional qualification outlined in the previous section. As illustrated by a representative of the KMK, “universities of applied sciences were ‘born partners’ for the Higher Education Pact, because the implementation of the Bologna-Process turned out well at universities of applied sciences, universities had much more problems and less readiness; they were reluctant to install ‘just’ additional Bachelor-programmes” (interview DE_N7). On a similar note, a representative of the Hochschullehrerbund (hlb), the

association representing the interests of universities of applied sciences, argued that the Higher Education Pact was a reactive response to the societal demand of more university education:

If there is a need in society, and politicians say there are demographic developments, and we need more scientists, then once the need is identified, universities of applied sciences can move faster than research universities. Universities of applied sciences are more easily prepared to respond to societal demands, while traditional universities do not feel that they are there to respond to societal demands. (interview DE_N2)

Furthermore, the smoother implementation of the Bologna process in universities of applied sciences and the strong applied and practical orientation of these institutions was also recognised in terms of employer satisfaction with graduates from universities of applied sciences, hence the expansion of universities of applied sciences through the Pact also met the long-standing employers' demand for practical orientation of study programmes. Indeed, a study carried out by the VDI and based on a survey of companies employing engineering graduates found that:

the professional qualification and practical orientation of the bachelor graduates, especially university graduates, is often not considered sufficient by the graduates and students themselves as well as by the executives. [...] The integration of practical semesters and modules is stronger in universities of applied sciences than in universities. At the universities in particular bachelor graduates are often not sufficiently prepared for an industry career. (VDI 2016)

Commenting on the findings of the VDI study, the vice-president of the Verband Deutscher Maschinen- und Anlagenbau (VDMA), representing companies in the

mechanical engineering industry, argued that “*Fachhochschulen* show that more praxis in study programmes is possible” and that “only a heavily practice-oriented education optimally prepares students for an industry career” (VDI 2016). The firm support for universities of applied sciences expressed by engineering business groups like VDI and VDMA, operating primarily in high-end manufacturing, is particularly significant, as these are among the key actors at the core of the coalition sustaining the transition to a knowledge economy reliant on advanced manufacturing (Thelen forthcoming). To be sure, employers’ support for universities of applied sciences is not only a rhetorical exercise, but also reflected in the salaries of graduates. While university graduates have traditionally received a higher salary than their counterparts from universities of applied sciences (see e.g. Teichler 1996b, 129), the situation became more nuanced after Bologna, as illustrated by Ertl who shows that “the comparison between the two types of higher education institutions is reversed for Bachelor degrees”, with graduates from universities of applied sciences earning one year after graduation on average €32,700 per annum, compared to €27,100 of university graduates (Ertl 2013, 20).

Moreover, the expansion of universities of applied sciences was to an extent also a mechanism for ‘automatically’ expanding STEM graduates, given that STEM subjects – and engineering in particular – tend to make up for a larger share of the student cohort at universities of applied sciences than at research universities. In this respect, a representative of the KMK explained that “universities of applied sciences had – and still have – a reasonable share of MINT-subjects and also less dropouts, compared to universities” (interview DE_N7), although it should be noted that the Higher Education Pact was also used to increase the share of STEM students at research universities. Thus, looking at the subject distribution of the additional study places, we notice that STEM subjects have gained significantly, relative to other areas. The most recent report on the implementation of the Higher Education Pact shows the trend clearly: engineering

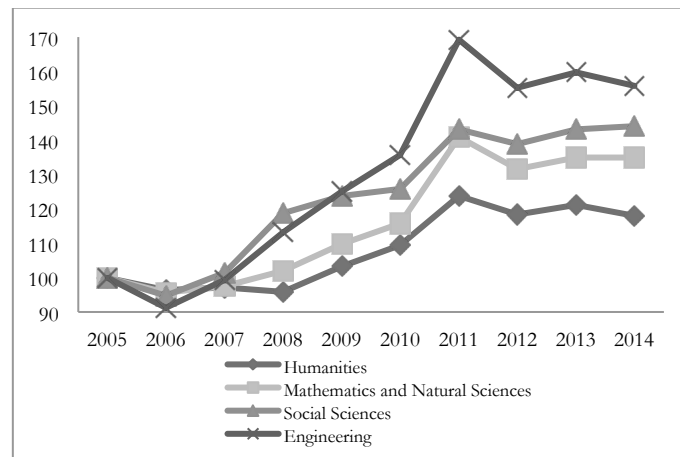
increased by almost 57% between 2005 and 2015, while social sciences expanded by 44% and humanities by only 18% (GWK 2016, 11). The expansion of engineering, and more broadly STEM, subjects was partly a response by policy-makers to increased lobbying of businesses who feared that shortages of high skills in these subjects would create problems to the expansion of high-tech manufacturing and knowledge intensive services. The Cologne Institute for Economic Research, a business-financed research centre, published several reports on the shortage of STEM workers, and the BDA released several statements following the 2008 campaign ‘Bachelor Welcome – Securing young STEM!’, when the BDA painted a rather gloomy picture, suggesting that the lack of STEM graduates constituted a “dramatic bottleneck” in a context where “STEM graduates are not only required in the classical manufacturing sectors such as the metal and electrical industry, but increasingly also in the service sector. New technological challenges also require new qualification profiles” (BDA 2008, 1). The same fear was reiterated in 2011, in conjunction with double cohorts of high school graduates coming up in several states. Thomas Sattelberger, chairman of the BDA/BDI/HRK working group University/Industry, urged the government to expand the STEM potential of the country: “Double graduation cohorts represent a huge reservoir of talent for the economy. Given the alarming shortage of skilled workers, it would be outrageous to shut the doors of higher education to so many young people. In the STEM fields of science, technology, engineering and mathematics alone, companies currently have demand for more than 150,000 professionals” (BDA, HRK, and BDI 2011, 1). Policy-makers used therefore the Higher Education Pact also to respond to the skill shortage highlighted by business. A KMK representative argued that the efforts of “all kinds of well organised stakeholders, under them big companies, local firms, associations [...]” did “shape the political opinion in a way” and that indeed the STEM area was chosen “because of the urgent need for engineers and the upcoming discussion on the shortage of skilled

‘MINT’-workers” (interview DE_N7). The federal government highlighted the same process, and argued that:

in order to ensure training of a highly-qualified work force, inside and outside higher education, and the maintenance of the economic competitiveness of the economy, the GWK has acknowledged the need to supplement the quantitative expansion of higher education by growth in qualitative expectations with respect to fields of major impact. Universities of applied sciences and the academic disciplines of science, technology, engineering and mathematics are perceived as being of such significant relevance. (interview DE_N6)

Accordingly, the official agreement signed by the federal government and the *Länder* makes clear the ‘human resource development’- aim of the Higher Education Pact by setting out at the very beginning of the document that the Pact is a way for the Federal government and the *Länder* to meet the demand in the labour market for skilled labour (GWK 2007, 1). Thus, government documents on the implementation of the Higher Education Pact issued by the GWK and the BMBF specify that labour market demands were to be met through the expansion of *Fachhochschulen* and study places in the STEM areas (GWK 2016, 3, BMBF 2014, 3, 2009, 2) and “accordingly, they were mentioned as qualitative targets in the agreements between the Federal and *Länder* government on the higher education pact” (interview DE_N6). As captured in figure 5.5, the expansion of STEM subjects was indeed successful: businesses, after voicing their worries in the mid-2000s and early 2010s, argued in 2015 that “years of public campaigns for more engineers and technical skills have paid off” and that given the increase in new entrants in engineering degrees between 2008 and 2013, “the lack of skilled labour is no longer a threat” (Gillmann 2015).

Figure 5.5. New students in higher education by (selected) disciplines (2005 = 100)



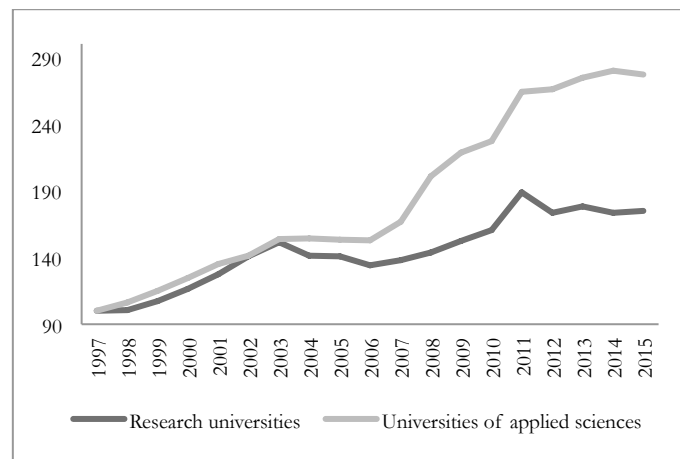
Source: GWK (2016, 11)

Thus, compared to the conversion attempted through Bologna, which only occurred to a limited extent, institutional change advanced a much greater deal through a layering process via the Higher Education Pact. Indeed, ‘layering’ is a form of institutional change expected to be successful in a political context populated by veto players (the research universities in this case) and that aims at spurring a process of “differential growth” (Streeck and Thelen 2005, 31) of a previously relatively ‘marginal’ institutional arrangement vis-à-vis the dominant part of the system, i.e. universities of applied sciences vis-à-vis research universities in this case. As discussed by a leading German think-tank in higher education policy, the Centrum für Hochschulentwicklung (CHE), the Pact has indeed had a differential impact upon the higher education system:

The types of higher education institution benefit from the sharp increase in students to a different extent. Universities of applied sciences are among the winners in the expansion of the number of places available. The proportion of first-year students at universities of applied sciences increased from 32 per cent (2005) to 40 per cent (2013). (CHE 2015)

Figure 5.6 compares the relative figures in the number of entrants and universities and universities of applied science and shows the process of differential growth induced by the Higher Education Pact clearly starting from 2007. If we have noted at the beginning of the chapter that traditional universities constituted the centre of gravity of the German higher education system, the Higher Education Pact started to shift the centre of gravity towards universities of applied sciences.

Figure 5.6. Relative intake of first year students at universities and universities of applied sciences (1997 = 100)



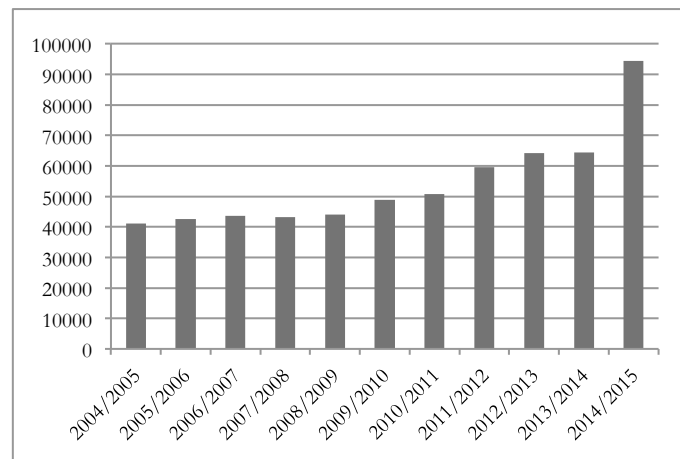
Source: own calculations based on Statistisches Bundesamt

The ‘differential growth’ of the universities of applied sciences sector was primarily but not exclusively triggered by the Higher Education Pact. Business also contributed directly to this process by offering since the 2000s an ever-increasing number of places in dual study programmes – by and large housed at universities of applied sciences. The emergence of dual study programmes has been a defining feature of the HE landscape over the last decade in particular (Powell et al. 2012, Powell and Solga 2010, Graf 2013, 2017). According to the Federal Institute for Vocational Education and Training (BIBB), dual study programmes can be defined as:

courses [that] combine a degree programme at a university or a university of cooperative education (Berufsakademie) with vocational training and/or relevant practical employment. This greater emphasis on practical relevance is the key difference between dual and standard degree courses. One special feature is the close integration of academic and vocational content in the curriculum. This is achieved through contractual ties between the cooperation partners, namely the company and the higher education provider. (Kupfer and Stertz 2011, 29)

In a rich historical-institutionalist account on the establishment and expansion of dual study programmes, Graf (2013) illustrates how these programmes have a long history, having been first established in 1972 in one *Länder*, Baden-Württemberg, upon the initiative of a number of large firms predominantly in the manufacturing sector (Graf 2013, 102). However, until very recently, the programmes remained a niche in the German higher education landscape. Indeed, it is not until the early 2000s that dual study programmes became available in every *Länder* and the number of students became significant, reaching around 95,000 enrolled students in 2014, after – as recently as 2004 – there were only 40,000 students enrolled in these programmes (BIBB 2014, 12). Over 90,000 students are now enrolled across the country in over 1,500 dual study programmes – again registering a steep increase from the just 500 programmes available in 2004 (BIBB 2014, 10, see also Figure 5.7). Furthermore, these figures are said to be conservative as “providers of dual study programs report student numbers on a voluntary basis” (BIBB 2011, 23 cited in Graf 2013, 98). The expedited growth of students in and offer of dual study programmes have prompted the observation that, growing out of a niche, these programmes are currently contributing to shaping institutional change in the German HE system (Graf 2014).

Figure 5.7. Number of students enrolled in dual study programmes



Source: Ausbildung Plus

The reasons for the expansion of dual study programmes overlap significantly with the reasons for the expansion of universities of applied sciences outlined earlier in the section. Firstly, dual study programmes have been praised by the business community for their ability to train work-ready graduates. The VDI study on engineering education concluded that dual study programmes are a “success model” and that “69 percent of the business managers consulted indicate that they have gained good to very good new recruits through the dual studies programmes” (VDI 2016). Similar conclusions were reached in an in-depth study of business experience with dual study programmes, which found that “the satisfaction with dual study graduates is very high, and businesses assume that qualities such as diligence, durability and teamwork are particularly pronounced in dual studies graduates” (Wolter et al. 2014, 30). Furthermore:

[a] clear advantage [...] was the immediate employability upon graduation. Businesses highly value the much shorter training period of dual study graduates in comparison to the graduates of regular degree programs, and also list this as one of the reasons they offer dual studies programs. Graduates would know immediately the structure of the business, culture of the business, as well as the daily routines and ways

within the business, and in the individual areas or departments, so that they would be immediately operational. (Wolter et al. 2014, 108)

In addition, businesses resorted to dual study programmes in the context of the feared skill shortage as they saw these programmes as a way to tie future STEM workers to their company early on their career (interviews DE_N2, DE_N4). As in the case of the Higher Education Pact, universities of applied sciences emerged as an ideal partner for the development of dual study programmes given that “traditional universities are still very reluctant [to participate in dual study programmes and] they say they cannot be oriented towards the short term needs of the labour market” (interview DE_N2). Hence, a relative increase of students in universities of applied sciences – financed primarily by the government and to a (much) lesser extent by employers – emerged as the policy option that aggregated the modernisation concerns of the government with the need of employers for labour-market ready STEM graduates, working as a second, and arguably more effective, ‘coalition magnet’. The consequence of this layering process has been to promote a degree of re-differentiation in German higher education, following the early years of Bologna that rather responded to a logic of (attempted) de-differentiation through conversion. Indeed, with the differential growth of universities of applied sciences, the teaching function of higher education has been increasingly located in these institutions, while universities were less involved in the Higher Education Pact, and in the development of dual study programmes. On the other hand, the Excellence Initiative, which was developed roughly in parallel with the Higher Education Pact and disbursed competitive funding for research activities, was exclusively targeting traditional research universities, despite universities of applied sciences demanding to be allowed to take part (hlb 2015). Thus, we notice in parallel with an increase of teaching and training activities

in universities of applied sciences, a relatively higher public support for research towards traditional universities, counteracting, in essence, the earlier de-differentiating trend.

5.5 Conclusion: back to theory and final remarks

This chapter assessed the extent to and modes by which higher education provision has aligned with labour market demands in Germany. The findings of this chapter can be broadly summarised as follows. Institutional change has proceeded both by conversion and layering. However, patterns of conversion, that essentially meant blurring boundaries between universities and universities of applied sciences and demanding that both types of institutions increased the provision of employability and practical skills in their curricula, fell short of policy-makers' and businesses' expectations. Research universities were in this respect the crucial actor to understand this development – or, rather, lack thereof. Indeed, research universities, and in particular their faculty members, resisted government's and employers' call to employability, and rather defended their distinct traditional status and function within the German higher education system – that is, to provide education and conduct research in separation from the demands of external stakeholders. They, in other words, performed the 'antagonist' role. In the absence of the competitive pressures noted in the British case (and that will be noted in the Korean case too), universities were able to 'defend' (substantially) the status quo, even in the presence of (formally) significant reforms.

The process of layering, on the other hand, was far more incisive, as we have hypothesised in chapter 2 with respect to a political context populated by strong veto-players (cf. Mahoney and Thelen 2009). In the German case, therefore, we see layering as the dominant form of institutional change, taking place in two ways. Firstly, and primarily, through the Higher Education Pact, the government increased the size of the higher education pie by allocating additional resources to fund the expansion of

additional study places. However, these resources have been channelled into universities of applied sciences vis-à-vis traditional universities, and into those disciplines that were high in demand on the labour market, namely STEM subjects. Secondly, businesses stepped up the provision of dual study programmes, which also contributed to meeting the need for highly skilled, work-ready graduates in the STEM subjects. The strong development of high technical skills in STEM subjects supported by specific policies stands in stark contrast with the British case. German employers strongly demanded STEM skills owing to the strategic part played by advanced manufacturing in the economy, while such demand – as we have seen in the previous chapter – was weak in a knowledge economy, such as the British one, dominated by high-end services.

The chapter also offers two broad insights for theories of institutional change of higher education systems and of skill formation systems more in general. Firstly, it highlights – as in the British case – the relevance of universities as political actors in understanding trajectories of continuity and change in higher education. Specifically, higher education institutions appear as a crucial (collective) actor whose role in preventing or facilitating change in higher education has been greatly underestimated by current approaches that seek to explain the trajectory of change of contemporary university systems. Secondly, next to the role of universities, government agency appears as a key factor shaping high skill formation. Thus, the chapter also highlights the need for re-thinking the political economy of skills at times of shifting balance between university education and VET: while analyses of the latter have mostly focused on the role of producer groups, the expansion of the former brings to the fore the crucial role retained by universities and governments.

6 South Korea: from the state to the market and back

6.1 Introduction

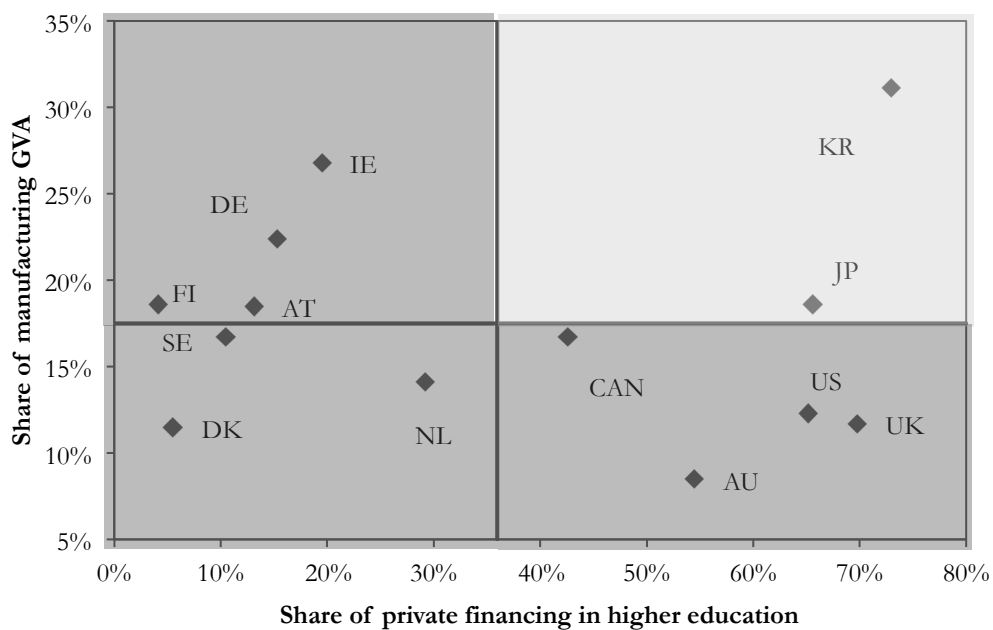
This chapter provides an analysis of institutional change in the South Korean higher education system. In particular, the chapter seeks to make sense of the following empirical observation: the emergence since (circa) 2010 of the vigorously active role of the government in stirring universities to align their educational offer with the labour market's demands, suggesting that the government took a coordinating role in the supply of high skills (MOSF 2015c, 2014, 2015b, MOE 2016, 2015a, b, Park 2016, The Chung-Ang Herald 2016, Yoon 2015a).

This observation is at odds with conventional wisdom developed in recent years regarding South Korean higher education (and the South Korean skill formation system and political economy more broadly): as South Korea embarked in the mid-1990s upon a clear trajectory of liberalisation which encompassed various policy areas, the higher education sector has been significantly deregulated and liberalised and the market was upheld by successive governments as the main mechanism in the allocation of skills (Woo 2002, Green 2015, Kim and Lee 2006, Kwon 2015, Park 2007, Park 2013b). This country-specific empirical puzzle underpins the research question through which I approach the Korean case study, namely: why did the government intervene so strongly with policies aimed at *coordinating* skill formation in higher education after they created the basis for a *liberal* skill formation system just over a decade before?

Based on the theory developed in chapter 2, I located Korea in the top-right quadrant of the bi-dimensional categorisation. Cases in this quadrant belong to the East-Asian coordinated capitalism and they are characterised by high competition among universities (similarly to the LMEs – of which we have analysed Britain in chapter 4) coupled with an economic structure significantly reliant on (advanced) manufacturing (similarly to Continental European CMEs – of which we have analysed Germany in

chapter 5). Given this set of similarities, the East-Asian cluster is expected to share some features of the process of institutional change with both Britain and Germany. Namely, the pattern of institutional change is expected to be similar to the British case – with universities willing to satisfy the demands of ‘external’ stakeholders, hence leading to encompassing – rather than marginal – institutional change. That is, we expect universities’ preferences to conform to the ‘protagonist’ or ‘consenter’ role, rather than to act as ‘antagonists’. At the same time, however, the economic structure geared towards manufacturing is expected to pose a constraint in the type of high skills sought by employers and cultivated by governments making STEM skills crucial for economic success, following a similar path as the one observed in the German case (see figure 6.1).

Figure 6.1. Locating South Korea in the bi-dimensional categorisation



Source: own calculations based on OECD (2017) and WIOD

Based on the theoretical framework developed in chapter 2, we therefore outline the following observable implications as far as South Korea is concerned:

- Governments cultivate the supply of specific and general high skills

- Universities act as protagonists or consenters
- Institutional change proceeds by conversion/displacement

The evidence mobilised in this chapter broadly supports the hypothesised trajectory of change and it does so through a twofold argument. First, it is argued that recent developments in Korean higher education are best interpreted as a case of *de-liberalising* reforms, which were prompted by a *disequilibrium* created by the previously liberalising reforms. I therefore note the government re-establishing and seizing for itself an active role in the coordination of skill formation, which closely resembles the approach of the developmental state that had been progressively abandoned since the 1980s. The crucial difference, however, from the early developmental state is to be found in the ‘partner’ chosen by the government to coordinate the supply of skills. While, until the 1980s, the government enabled skill formation through businesses providing extensive in-firm training, the reforms since the mid-2000s point to universities – not firms – as the main actors delivering the high skills needed in the labour market.

Institutional change proceeded by conversion and displacement – each facilitated by a specific public policy initiative, namely Leaders in Industry-University Cooperation (LINC) and Programme for Industry-Matched Education (PRIME) respectively. Both policies provided selective financial incentives to universities that attuned their educational offer to labour market needs. In the case of LINC, universities were asked to make their curricula more labour-market relevant by introducing practical skills and stepping up cooperation with businesses in the design and delivery of curricula; PRIME, instead, was bolder in its demands as it asked universities to adjust their annual intake of students to match the government’s skill forecasts and therefore ease the skill-matching process in the labour market. In essence, universities who were selected to take part in

PRIME were asked to downsize their humanities and social science departments and to increase enrolments in engineering.

Secondly, it is argued that the government was able to drive significant change in the higher education sector because of the sector's high 'malleability' due to intense competition across universities. Indeed, although the policies pursued by the government, and in particular PRIME, have been controversial and at times openly opposed from within the higher education sector (Yoon 2015a, Huh and Lim 2016), this chapter shows that the strong competition among universities – for students and government funds – in a highly marketised higher education system facilitated the implementation of the government's policy and enabled encompassing patterns of institutional change in the Korean higher education sector. Compared to the other case studies, and as hypothesised in the theoretical framework, government policy resembles – in its objectives – the German case (i.e. focusing on feeding discipline-specific high skills needed in high-tech manufacturing), while universities' behaviour – and associated patterns of institutional change in the higher education sector – resemble the British case study (i.e. universities 'consenting' to change, leading to encompassing rather than marginal institutional change).

The structure of the chapter is as follows: the next section outlines by means of contextual information the traditional features of the Korean skill formation system until the mid-1990s, noting in particular the role retained by the state, and how these features were fundamentally altered through a liberalisation process initiated most vigorously in the mid-1990s (section 6.2); section 6.3 presents the profound problems in terms of skills mismatch and shortages that came with a market-based allocation of skills; the analysis then moves on to recent policy initiatives arguing that we can discern a 'return to the state' as skills coordinator (section 6.4); finally, conclusive remarks in light of the theoretical framework are provided (section 6.5).

6.2 Context: from the state to the market

The system of skill formation in South Korea is traditionally considered akin to the Japanese one (Green 1999b, 64) and therefore part of the cluster of *segmentalist* skill regimes that is typically found in East Asia (Busemeyer and Vossiek 2016, see Busemeyer 2009a for an elaboration of key features of segmentalist regimes). This model of skill formation was premised on the idea that stable employment relations within a single company provided the incentives (and underwrite the risk) for investment in firm-specific skills, i.e. skills that are valuable primarily within a single firm (Estevez-Abe, Iversen, and Soskice 2001). In this respect, a key role in the provision of skills has been played by large firms in manufacturing sectors, the *Chaebol*, through extensive workplace training (Park 2013b). The relationship between employment protection and firm-specific skills is aptly described in Green (1999a) who discusses how “large national conglomerates [...] dominate the economy, with the major 10 in 1984 accounting for 67% of sales and the majority of employment” and “although not formally practising lifetime employment policies like Japan, they tend to retain their core staff and are therefore prepared to invest heavily in training” (Green 1999a, 270).

A secondary school system premised on the development of general skills, such as literacy and numeracy, has traditionally been the functional complement to a skill formation regime heavily geared towards firm-specific skills (Green et al. 1999, Green 1999b). In short, the traditional features of the skill formation system in Korea can be identified in “its highly egalitarian compulsory school systems and extensive in-company training in large enterprises” (Park 2013b, 293). In this framework, higher skills – i.e. those acquired through tertiary education – did not seem crucial to serving the purposes of the rapid industrialisation process, which the country was undergoing through the 1960s and 1970s. Rapid industrialisation called for a broad pool of intermediate-skilled technicians, rather than highly educated workers with strong interpersonal and cognitive

skills. Indeed, it is not until the 1980s and, most significantly, the mid-1990s that the government relaxed strict regulation on annual enrolments to university (Kim 2002). In other words, the government ensured high rates of participation in (vocational) in-firm training by ‘suppressing’ participation in higher education through tight regulation of universities’ enrolments. This approach resulted in an ‘artificially’ low rate of enrolments in higher education as the government kept at bay the ‘education fever’ of Korean families. The latter refers to a profoundly-rooted popular demand for increasingly higher levels of education that characterises Korean society at large. The origins of education fever are to be found in a set of mutually reinforcing factors that range from Confucian cultural heritage to Japanese colonial legacy, compounded by reforms implemented in the aftermath of World War II, that abolished tracking in primary education and weakened it at secondary level (Seth 2005). Keeping education fever under control through tight regulation was therefore a crucial element enabling a segmentalist skill formation regime.

Segmentalist regimes have often been interpreted in employer-centred terms, i.e. with (large) firms as pivotal actors in the system, while the state has been considered to underwrite businesses’ efforts through an institutional framework which grants high employment protection to core workers (cf. Busemeyer 2009a, Thelen and Busemeyer 2012). However, a closer look at the Korean system reveals the crucial role of the state in creating (or, rather, imposing) the conditions for workplace training leading to a firm-specific skilled workforce, and the relatively more passive role of firms. In particular, a crucial policy development that stirred the Korean skill formation systems towards significant involvement of industrial conglomerates in skill formation was the introduction of a training levy in 1974. The levy ‘forced’ firms with more than 500 workers – extended in 1976 to firms with 300 or more workers – to train (Park 2013b, 295 - 297). The introduction of a training levy signals that a genuine commitment to training on the side of firms was hardly ever there: the system was *mandatory* and it

worked precisely because of this feature (Park 2013b, 295, Jeong 1995, 239-240). At the same time, however, the levy also worked “as a lever to identify training needs for companies” (Green et al. 1999, 309) and ensured therefore that the industrialisation process was sustained by adequate skill levels (Jeong 1995).

In sum, the traditional model of skill formation in Korea – particularly prominent in the 1970s and the 1980s – saw heavy involvement from both the state and companies. However, unlike the collectivist skill regimes of Western Europe, there is limited evidence that (large) companies had a genuine commitment to training, which was rather enforced upon them by the state (Park 2013b). The latter had a crucial role not only through the establishment of the training levy, but also through the formulation of “a clear industrial policy” and “the projected requirements in terms of skills in the key industries” which “were informing the design and reforms of education and training systems” (Ashton et al. 2002, 11-12, see also Green et al. 1999). In other words, we can think of the Korean traditional system of skill formation as *coordinated* by the state and *delivered* by business. Conversely, universities were traditionally at the margins of the Korean skill formation system as governments privileged intermediate skills to higher skills and actively kept the higher education sector limited in size, putting a brake on the education fever of Korean families.

The state-organised – and company-delivered – system of skill formation started to weaken through the 1980s, until a departure from the model was actively promoted and fully enacted by the government in the following decade (Park 2013b, 298). Indeed, the 1990s witnessed a sweeping series of changes across policy areas, which affected the skill formation system, but went much beyond it. As “the conservative government of Kim Young-sam (1993–98) pursued a set of liberalization reforms” (Fleckenstein and Lee 2017, 217), the relationship between state and businesses changed significantly, affecting also the main features of the skill formation system outlined in the previous

section. Notable changes included a liberalisation of the labour market, of the equity markets, and of the education system in the form of progressively loosening state control over these policy areas. A significant deregulation of the labour market undermined “the institutional basis of large company training strategies” (Green 1999a, 275): the liberalisation of the equity market weakened the tight control that government had on business in the preceding decades (when the government was crucial for businesses to access credit), therefore diminishing the scope of government to reign in large firms (Ashton et al. 2002, 14, Fleckenstein and Lee 2017) while simultaneously “increasing shareholder power and demands for short-term profit [...]” hence “endangering the strategic approach that major companies [...] have taken towards R&D and human capital development” (Green 1999a, 275). Most likely, these features alone would have been enough to weaken significantly the existing model of skill formation. But the government also enacted specific reforms of the vocational training and higher education systems which underscored a marked move towards a model closely resembling that of LMEs (Park 2013b, 300, Ihm 1999, 319) characterised by (i) weak vocational training system, (ii) significant expansion of general skill formation in universities and (iii) the market as the chief mechanism of allocation of skills (cf. Estevez-Abe, Iversen, and Soskice 2001, Hall and Soskice 2001).

Key education-related reforms in the 1990s were undertaken under the auspices of the Presidential Commission on Education Reform (PCER). The PCER marked a departure from a state-led model as the government withdrew from the coordination of skill formation in favour of market mechanisms, which were established and actively promoted. The reforms enacted by the PCER have been variously defined by scholars as radically marketising, deregulating and liberalising (cf. Park 2013b, 2010, Kim and Lee 2006, Woo 2002). The guiding principle of the reforms, as expressed in the PCER’s documents, was inspired by an “explicitly [...] neoliberal approach, shifting the role of

the government from ‘controlling and regulating’ to ‘encouraging and supporting’” (PCER 1996, 83 cited in Park 2013b, 299). The move away from state coordination towards market coordination was deemed crucial to put in place an education and training system that was no longer serving the needs of rapid industrialisation but rather those of the emergent knowledge economy (Cheon 2014, Park et al. 2015). The weakening of the state-coordinated training system became clear when the application of the levy was gradually restricted through the 1980s and 1990s until it was ultimately abolished in 1999 through the Workers Vocational Training Promotion Act (Park 2013b). Throughout the 1980s alone, the share of firms involved in training declined spectacularly from 60.7% to 15.5% (Ra and Shim 2009, 46-47). The gradual abandonment of the levy and the resulting change in legislation have been interpreted as “leading from a mandatory vocational training system to a voluntary enterprise-led system” (Park 2013b, 300). In turn, vocational training became less of an instrument for initial skill formation within companies, but it was rather redeployed as a social policy buffer for the unemployed, whose financing was shouldered increasingly more by the state rather than companies (Ihm 1999, 319, Ra and Shim 2009).

But it is in the higher education realm that the liberalising efforts of the PCER emerged most clearly. Indeed, the establishment of the Commission has been seen as a “critical turning point” in Korean higher education policy as it laid out the foundations for one of the largest (in terms of participation) and most privatised (in terms of financing) higher education systems in the world (Green 2015, 4). As part of the neoliberal education reforms, the Kim Young-sam government “facilitated the rapid growth of higher education” (Park 2013b, 301) relying on market forces. In particular, policy-makers at the time believed that “as the economy became more diversified and changed more quickly”, the state should have taken a step back from the coordination of the supply of skills in favour market forces (Kim 2002, 30-31). The new interpretation of

education policy that the government held in the 1990s – with emphasis placed on the supply-side as opposed to the previous demand-side focused approach – is further elaborated by Park et al. (2015, 9):

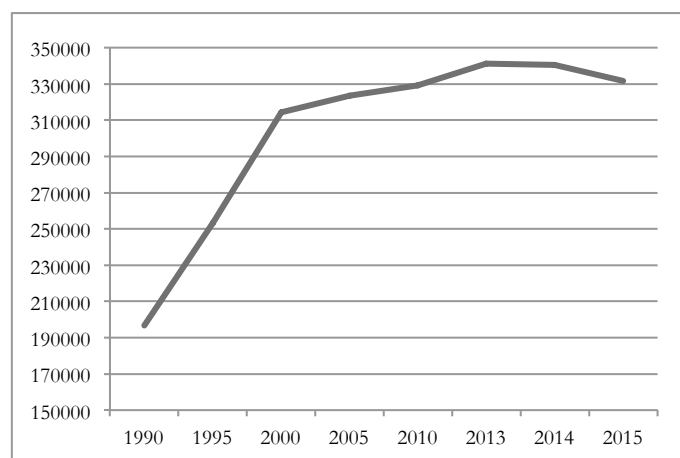
The Kim administration intended to transform the nature of the education system in Korea, moving from an education system of a developing country whose major focus was on creating human resources, to a system that includes quality improvement and diversification of education that leads the future of the country in the knowledge-based global economy.

In this context, the main thrust of the reform was to move from a “government-led” approach towards a model that placed the “emphasis on the role of market”: while the former was premised on “providing manpower in direct response to the national economic development plans”, the latter was “relying on the function of the market” (Park et al. 2015, 9). The withdrawal of the state from tight regulation of virtually all aspects of higher education in favour of a system based on market demand meant a striking change in policies:

The Plan [set out in the PCER] further reduced central control over the establishment of private [universities] and student quotas which led to an increase in the number of small and medium sized private institutions in regional areas, as well as new graduate schools and online universities. The previously used ‘permission’ policy was replaced by the ‘minimal conditions’ policy for the establishment of new institutions [...] These policies were remarkably successful in expanding the higher education sector [...] In 1990, there were 265 [higher education institutions] enrolling 1,691,681 students. By 2005, those figures had increased to 419 [higher education institutions] enrolling 3,548,728 students. (Green 2015, 4)

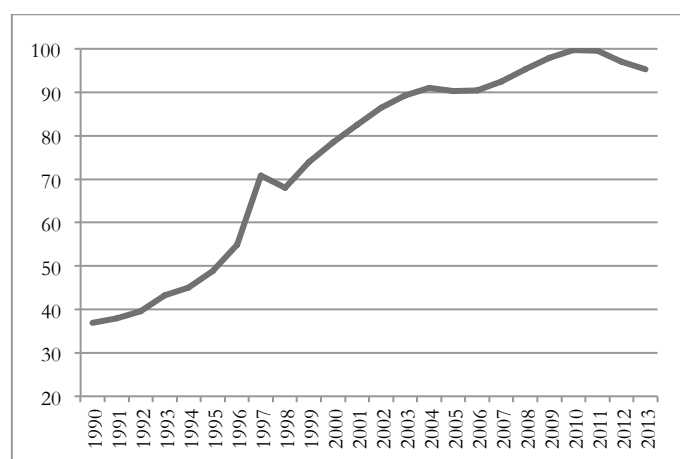
The lion's share of new institutions – and the steep increase in student numbers that came with them – was accommodated by private universities (Kim and Lee 2006, 581, Chae and Hong 2009), which were given extraordinary freedom not only in setting 'quantitative' targets (i.e. how many students to admit) but also in qualitative criteria. For example, private universities were allowed "to choose any screening criteria or procedures to select students" (Woo 2002, 13-14). The deregulation of the higher education sector unleashed the previously suppressed education fever of Korean families (Chae and Hong 2009, 342). Indeed, "Korea ranked first among the OECD member states on the proportion of private expenditure spent on educational institutions at all levels in 2004" (Chae and Hong 2009, 342), testifying to the high importance attached by Korean families to educational attainments (Kim, Lee, and Lee 2005, Lee 2005, Lee 2006). The growth in student numbers and participation rates had indeed been spectacular through the 1990s to the point that in "2010, 98% of 25-34 year-old Koreans attained an upper secondary education – the highest proportion among OECD countries" (OECD 2012b, 1). The steep rise in educational participation, which has only slowed down in recent years due to demographic decline (Yonezawa and Kim 2008), is captured by the two following figures, which show the trend in (absolute number of) new entrants and gross enrolment rates (GER) in tertiary education, respectively.

Figure 6.2. Absolute number of new entrants in 4-year universities in Korea (1990-2015)



Source: KEDI (2015, 38) and MOE (n.d.)

Figure 6.3. Gross enrolment rate in tertiary education in Korea (1990-2013)



Source: UNESCO (2017)

The trajectory of expansion of Korean higher education conformed to the ‘partially private – mass enrolment’ model depicted in Ben Ansell’s seminal work on the political economy of higher education financing and participation (Ansell 2010). Indeed, in the Korean case, ‘*partially* private’ might be perceived as an understatement, as the private share of higher education funding stood at an OECD second-highest of 73% in 2011 (OECD 2014, 241). The massive expansion of higher education through private sources has been seen as inevitable at a time when the parallel expansion of the secondary education system attracted most of the public budget for education, leading universities

to “having to rely on private sources” (Kim and Lee 2006, 581, see also Chae and Hong 2009). Yet, the expansion of higher education through (primarily) private institutions seeking student fees is not the only dimension that led scholars to describe South Korean higher education as heavily marketised: private universities are not the only institutions placed at the centre of market mechanisms and student tuition fees are not the only source of competition for universities. Indeed, the level of tuition fees differs between private and public universities, with the former charging an average of just above USD 8,000 per year, while the latter charges an average of just above USD 5,000 per year (OECD 2011, 2016). Yet, in both cases, the revenues from fees can only cover up to approximately 70% of a university’s budget (interview KR_N1), leaving a minor – but substantial – part of university funding reliant on government subsidies. The latter, however, are *also* allocated through *market-based mechanisms* to an extent that can be hardly found anywhere else across OECD countries, making Korea an outlier in this respect. Indeed the allocation of *public* funds through competitive mechanisms and ‘evaluation based’ processes reached in 2008 a share of 90% of the entire public higher education budget (Shin 2012, 63).

Reliance on markets – both in terms of attracting student fees and government funding – reveals a higher education sector where universities heavily compete against each other. Such competition is sharpened further by the strong vertical differentiation of the system, where institutional reputation is considered as a key factor for students choosing one higher education institution over the other, hence leading to heightened competition among universities to attract students. Indeed, the Korean system of higher education is described as carrying “incredible pressure on high school students to secure places at the nation’s best – or most highly regarded – universities, as institutional reputation and alumni networks are strong predictors of future job prospects” (Park 2013a). Thus, similarly to what we observed in the British case, students’ reliance on

rankings to inform their choice translates into pressure on universities to climb up rankings and become therefore a more appealing option to prospective students. The OECD notes in this respect that the vast majority of universities offer degrees across all subjects, leading to a very tenuous *functional* differentiation (that is, horizontal differentiation) among institutions but rather highlighting universities' position in rankings as "by far the main distinguishing factor" between them (that is, vertical differentiation) (OECD 2009, 140). The multi-faceted competition, which has been even increasing in recent years due to a shrinking cohort of new entrants to university and therefore a smaller pool of prospective fee-paying students (cf. Yonezawa and Kim 2008), was sharply captured by one of the interviewees, the Dean of the Engineering Faculty at a public university, underscoring how fierce competition has not spared public universities:

We [universities] compete: for government funding, for ranking, for incoming students...the number of incoming students is going to decrease dramatically in the future so recruiting students is one of the big issues and we cannot avoid competition. (interview KR_U10)

The expectation of an exacerbated competition for students is also noted by scholarly analyses that illustrate how:

as the number of high school graduates starts to decline and as the enrolment rate of higher education is already very high, the demand for higher education is expected to decline in the near future. This certainly will create financial pressure on some universities, as many Korean institutions rely on tuition revenue as the major income source. (Kim and Lee 2006, 564-565)

6.3 The problematic market-based allocation of skills: business dissatisfaction between mismatches and shortages

The reforms undertaken in the mid-1990s have therefore led to a higher education system with two key features: firstly, higher education enjoyed huge popularity among secondary school-leavers and their families, becoming – in essence – a *mass system* in just a few years; secondly, the combination of high reliance on student fees, competitive allocation of government funding and highly vertical differentiation among institutions led to a *system characterised by intense competition* among universities. Yet, these two features, while heralded in the early 1990s as key ingredients for a successful transition into the knowledge economy did not deliver the results that the government had expected (Cheon 2014, 224). As the remainder of this section will discuss in greater detail, problems of skills mismatch became evident in the late 1990s and early 2000s, and business at the ‘receiving end’ of the skills formation process in the higher education system became increasingly dissatisfied with Korean universities.

Broadly speaking, employers noted two types of misalignment between university provision and labour market needs. The first one has to do with the lack of work-readiness of graduates, without specific reference to their degrees. The second one refers to the specific shortage of STEM graduates that are vital for an economy tightly reliant on exports from high-tech manufacturing. Evidence abounds on both accounts and cuts across large industrial conglomerates and small and medium sized enterprises. Samsung, the largest *Chaebol*, reported in the early 2000s that “annually invested in re-education of newly recruited non-experienced employees KRW80 billion (approximately equivalent to £40 million)” (Donga, 2003 cited in Park 2007, 420) which has led to a situation whereby large companies prefer poaching experienced workers rather than training new recruits as suggested by the observation that while “the total employed workers reduced by 4.4% between 1997 and 2003, the share of employed young people by large companies (over

300 employees) declined by 9.6% in the same period of time” (Park 2007, 420). The picture is even more problematic for SMEs, as suggested by a CEO who illustrated how “we [SMEs] do not have enough time to re-educate and train university graduates for two years. Therefore, in general, personnel recruitment is centred on experienced workers” (Park 2007, 421).

The expensive process associated with lengthy re-training emerges starkly also by looking at more structured evidence produced by employers’ organisations. The results of a survey conducted by the Federation of Korean Industries (KFI) released in 2004 found that “it takes on average 23 months of general management work and 30 months of technical work for non-experienced workers to be skilled and knowledgeable to the extent that a company requires” (Park 2007, 421, see also Witt 2012, 11). A survey released in 2006 by the Korea Employers Federation (KEF) came to roughly similar results insofar as findings showed “that it takes 20.3 months on average until they are placed in ‘real work’ after training” (Park 2007, 421), and concluded that “61.8% [of the companies taking part in the survey] were not satisfied with their [i.e. graduates’] performance which shows that scores on personal qualities of employees do not correspond to their actual job-related skills” (KEF 2006). This issue is also picked up by the OECD that highlights in its country note on Korean higher education how “there are substantial complaints, particularly from employers, that the skills of graduates do not match the skills required in the labour force” (OECD 2009, 36).

In addition to a mismatch between the skills that employers demand and those produced by the university system, it became clear in the first decade after the turn of the century that Korea was facing a more specific problem of skill shortages in a strategic area of the economy, namely high skills in manufacturing. An analysis by Woo argues that:

Technicians and engineers are also in serious shortage in Korea's backbone industries such as electronics, automobiles, and machinery. Such groups of professional manufacturing workers cannot be produced in a short period of time. Nurturing them takes a systematic and intensive investment like regular schooling at the technical high school or university level. In view of Korea's stage of industrialization now, it is likely that the present situation of shortage of technicians and engineers would persist or worsen, which implies the danger of serious undermining of Korea's long term competitiveness base. (Woo 2002, 19)

Along the same lines, Yonezawa and Kim (2008) argue that: "in spite of the rising number of unemployed among higher education graduates, however, Korea suffers from a shortage of quality manpower in production and other engineering fields. The number of students applying for science and technology subjects at universities has declined from 43% in 1997 to 27% in 2001 [...]" (Yonezawa and Kim 2008, 206). Again, employer surveys return a rather unequivocal picture as summed up by the employers' association: "companies in general lack professionals and technicians irrespective of industry, which demonstrates failure of the university education system to meet industrial demands and tendencies of high school graduates to avoid science and engineering majors" (KEF 2005). A report by the OECD painted a similar picture regarding the distribution of higher education enrolments:

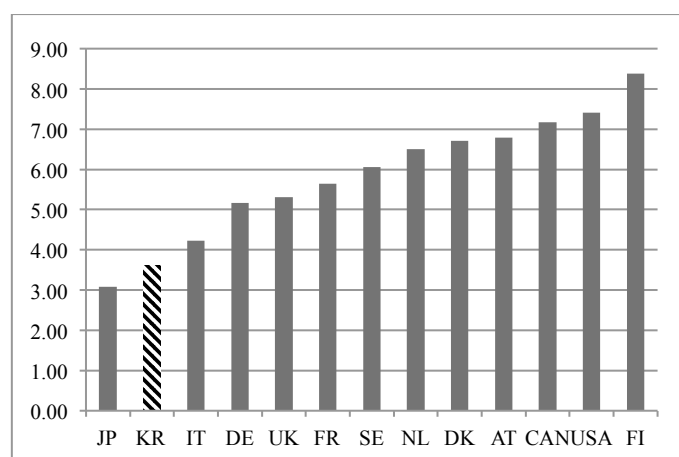
The most recent data from the Ministry of Education (up to 2006) suggests that the situation in science and engineering degrees is rapidly worsening [...] There has also been a slight decline in the number of enrolments in natural sciences. The social sciences and humanities are increasingly popular, particularly in the universities, with the number of social science enrolments surpassing the number of engineers for the first time in 2005. (OECD 2009, 154)

The swift expansion of higher education thus led to a paradoxical situation whereby policy-makers had to simultaneously face a general *over-supply* of graduates (and corresponding relatively high levels of unemployment among the tertiary educated) and a *shortage* of highly-skilled workers in crucial sectors of the economy such as the high-tech sectors of the Korean knowledge economy (KEDI 2006).

Scholars have identified the deregulation of the higher education sector and the parallel shift to a market-based allocation of skills as the main causes for the developments of skills mismatches and skill shortage. Even observers who had expressed strong support for the deregulation of higher education in the early 2000s came to conclusion that “deregulation by itself may not be sufficient enough to ensure intimate interplay between higher education sector and business sector” and that “the policies on higher education were pursued in a kind of ‘supply-oriented manner’ without enough attention given to their linkages with other policies regarding labor market, R&D, and industrial development” (Woo 2002, 41). As a result, Kim (2013) illustrates that “the rapid expansion of higher education has increased concerns about the quality of university graduates and the value of higher education being expressed by different stakeholders, especially business leaders and students and parents” (Kim 2013, 240).

The significant dissatisfaction of employers towards the skills produced in the higher education system is captured by the World Competitiveness Survey, which asks businesses from across the globe various questions on the state of the economy in their country and on the policies needed – from their point of view – to facilitate economic competitiveness. One of the questions asks businesses to evaluate whether university education meets their needs, and Korea has consistently scored at the low end compared to other OECD countries in the late 1990s/early 2000s, as reported in figure 6.4.

Figure 6.4. Employers' response to the statement 'University education meets the needs of a competitive economy' on a 0-10 scale (average of responses 1999-2004)



Source: own calculations based on IMD World Competitiveness Online

The comparative data from the World Competitiveness Survey is noteworthy because it features prominently in government documents and it is mentioned as a source of concern that public policies should address if Korea was to stay competitive in the knowledge economy (cf. MOEST 2009b, MOEHRD 2005). A 2009 publication released by the Ministry of Education, Science and Technology (MOEST), for instance, argues that it is imperative for the Korean higher education sector “to better meet the challenges of today’s globalized knowledge-based era and the practical needs of students, parents and industries” (MOEST 2009b, 1) and as evidence of the unsatisfactory results it is reported that “in a 2008 IMD report, Korea ranked 53rd out of 55 countries surveyed in terms of university education meeting the needs of a competitive economy” (MOEST 2009b, 4). Indeed, as will become clear in the next section, the government vigorously implemented policies to align higher education offer to labour market needs, with particular emphasis from 2010.

6.4 Conversion, displacement and (re-) coordination of skill formation in higher education

As illustrated in the previous sections, the Korean skill formation system underwent, most prominently in the second half of the 1990s, a fast and profound transformation from a segmentalist skill formation system, characterised primarily by large employers delivering firm-specific skills through in-company training to a model closely resembling a liberal skill formation regime, characterised by weak vocational training, strong expansion of higher education and reliance on the market for high skill formation and allocation. Yet, it has also been noted how a liberal framework of skill formation contributed to a *disequilibrium* which manifested itself primarily in the form of skill mismatches and skill shortages, and more broadly dissatisfaction on the side of firms (and government) for the disconnect between higher education and the labour market.

In this context, the government started to intervene strongly to shape the supply of skills produced by the higher education sector. Against the mechanisms of gradual institutional change identified in the literature and summarised in table 2.5, the processes that took place in Korea are best characterised, initially, as *conversion* and, subsequently, as *displacement* (cf. Mahoney and Thelen 2009, Streeck and Thelen 2005). Through conversion, the government prompted a redeployment of universities' education to match more closely business' demands. The process of displacement, instead, signalled a more fundamental shift in the principle underlying skill formation and in the relationship between the state, universities and employers. Indeed, the governments cultivated a "new logic of action" (Mahoney and Thelen 2009) within the higher education sector, which led to the gradual demise of a pure market-based allocation of high-skills in favour of a government-coordinated mechanism of skills allocation. Based on skills forecasts, the government demanded that universities prioritise those subjects (namely, STEM) that were deemed to be high in demand in the labour market and, conversely, downsize intake

in those subjects for which such forecasts suggested weak labour market demand (namely, humanities and social sciences).

Thus, after deregulation and liberalisation were at the core of the reforms undertaken by the PCER since the mid-1990s under a Centre-Right government (Rowley and Yoo 2013), the Centre-Left government started putting a brake on these processes since 2004, when a process of re-regulation gradually started to emerge (Green 2015). The Centre-Left government launched two initial policies that aimed at making higher education provision more responsive to labour market demands: the initiative New University of Regional Innovation (NURI) provided funds for better cooperation between universities outside of the Seoul metropolitan area with local companies; next to NURI, the programme Nurturing Excellent engineers in Information Technology (NEXT) supported the improvement of engineering education with a view to heightening its labour market relevance (Rowley and Yoo 2013, 76). Yet, when Centre-Right governments were back in power between 2008 and 2017, they did not reverse the re-regulation trend started under the Centre-Left, but they rather reinforced it. In 2012, the government assessed the policy initiatives put in place by the Centre-Left to align higher education provision and labour market needs and considered them overall successful, although it was also noted that they “partly overlapped and were unsystematic” (Rowley and Yoo 2013, 76). In particular, the government noted that until 2012 the alignment of higher education and labour market relied on a rather fragmented policy landscape as illustrated by the Minister of Education, Science and Technology:

Activities regarding industry-university (I-U) cooperation have been considered as secondary and peripheral programs conducted only within university sites. There are government-subsidized initiatives currently being operated for I-U cooperation, but they are applicable to only a limited number of departments at selected universities and inadequate

for colleges to establish sustainable I-U partnership systems for themselves. The LINC Initiative was planned to overcome this shortcoming. The goal is to reform college education systems, promote the growth of local industries, and link graduation and employment through I-U collaboration. In addition, existing I-U cooperation initiatives will be integrated into the LINC Initiative and expanded to create greater synergies. The LINC initiative will facilitate key programs such as hands-on experiments, on-site training, internships [...] which can nurture the right talents required by industry [...] (Lee 2013, 466)

Hence, LINC stands out as the government's response developed to provide a single policy framework in support of the 'conversion' of university programmes towards more labour market relevance. The process of displacement, instead, occurred within the framework of the so-called Programme for Industry-Matched Education (PRIME), which was established in 2015 and implemented since 2017. As demographic developments made younger cohorts of entrants into higher education smaller and smaller, the government was not only concerned with increasing graduates' job-readiness (as addressed through LINC) but it also put in place a swift response to avert the skill shortages in crucial fields of the Korean knowledge economy. Under the heading of "Reorganizing college courses to meet social demands", the 2016 Education Plan introduced PRIME as a policy aimed at increasing "student enrolment [...] for courses that have high demand (e.g. engineering)" (MOE 2016, 14). Critically, it appears clear that when the government document refers to "high demand", the reference is to "*employers'* high demand". Indeed, section 6.4 illustrated the twin trend of increasing demand for highly-skilled engineers and other highly-skilled technicians by Korean firms, while secondary school-leavers appeared as rather avoiding these subjects. The remainder of this section illustrates these two policies and provides an analysis of the associated patterns of institutional change.

Leaders in Industry-University Cooperation

LINC has been identified as a “representative government-funded project to promote cooperation between industry and academia” (Park et al. 2015, 2). The policy provided funding to over 50 universities “to match the educational and research activities [...] to the demands of industry” (Park et al. 2015, 19).

The annual funding that the government provided to support the universities’ activities has varied year-on-year within the range of (approximately) 180 and 260 billion Won, corresponding to (approximately) £125 and £180 million (Park et al. 2015, MOSF 2016a). Notably, the project enjoyed wide popularity among universities: out of over 160 Korean universities, more than 90 applied for the project and 51 were selected in 2012 as LINC universities¹⁶ (MOSF 2016a). To be selected for LINC, universities were subject to a two-staged selection process. In the first step, the government assessed “the basic competence of the university and their potential for exercising industry-university cooperation” (Hanyang University 2014, 2), while in the second phase universities submitted “detailed business plans” including “their specific goal and means of attaining the objectives” (Hanyang University 2014, 2). The policy design of LINC speaks directly to the problems of skills mismatch highlighted in the previous section and the complaints raised by employers regarding work-readiness of graduates. These themes emerge clearly from government documents highlighting the strategic direction of higher education policy just before the launch – and throughout the time of implementation – of LINC. The Education Plan of 2010 argued that “for undergraduate students, the ministry will provide an industry-tailored curriculum and employment linkage programs at selected exemplary universities for industry-academy collaboration” (MOEST 2009a, 30). In 2011, the MOEST argued that “more hands-on experience and internships will be made

¹⁶ The number of universities changed slightly year-on-year but always stayed between 50 and 60.

available through closer university-government-industry cooperation and by deploying industry workers to the campus” (MOEST 2011, 12-13). These aims were finally turned into practice in 2012 when the 51 LINC universities were designated as “leaders in industry-university cooperation” and received financial support from the government to enact their curricular reforms (MOSF 2012, 7). LINC was therefore seen by the government as a crucial response to the critical problem identified by the Ministry as that of students being “not equipped to meet the job market demand because they are not taught practical skills at school but only theory-based skills” (MOE 2013, 1).

Indeed, the inclusion of practical skills in curricula features prominently among the activities that universities promoted through LINC: internships have been made compulsory parts of the curricula; capstone design projects, i.e. cooperative projects between groups of students and business partners, have also been made part and parcel of the educational experience; and dialogue with business to tailor curricula to their needs has been stepped up (Hanyang University 2014, KMU 2011, Hanbat National University 2016). These activities have been most prominent in STEM-related departments, but they were also expanded across departments to cover other areas, such as the social sciences (interviews KR_N1, KR_N5, KR_U1, KR_U2, KR_U8, KR_U9). The tailoring of the university’s education towards business has also been publicly presented by participating universities as a key strength of their curricular offer. This approach can be observed across Korean universities: public and private institutions alike, and those with both high and low standing in rankings have used LINC as an example of ‘greater value’ of their educational offer as the following examples illustrate. A publication by the Hanbat National University – a *public* university outside of the Seoul metropolitan region and with *average* prestige and status (around the 60th place across various rankings) – illustrates how through LINC the university has been able to: “trigger university education to cope with demands of the rapidly changing industries” as well as “reduce

the gap between educational and demands of the industries” and “resolve mismatch of employment, strengthening the work experience and skills of students” (Hanbat National University 2016, 18). Along the same lines, Hanyang University, a *private* university in the Seoul metropolitan area enjoying *high* reputation and consistently included among the top 10 universities in the country (see table 1 below for an overview of the top 20 Korean universities), argues that the university will “adjust their education into a more industry university cooperation favorable atmosphere by improving and specialising curriculums into more practical and experience based classes where students can actually benefit” and goes on to suggest that through LINC the university

also plans to meet the demands of regional industries by cultivating skilled manpower and alleviating the unemployment of young people at the same time. The program’s emphasis is to foster students equipped with high-tech knowledge and skills through cooperative means between university and industry. (Hanyang University 2014, 1)

A similar approach was described in an interview by the Director of LINC at Kookmin University – also a *private* university in Seoul but not as high in ranking as Hanyang (around 25th place across rankings) – who illustrated how through LINC “we [Kookmin University] plan to develop practical workforce with convergence and integration capability that meets industry’s demand and global workforce with creativity and leadership” (KMU 2011, 2).

Programme for Industry-Matched Education

Yet, while LINC addressed the issue of skill mismatch by asking universities to tailor their curricula to include the practical skills that industry demands, it did not tackle the parallel problem described in the previous section of skill shortages in STEM disciplines,

and in engineering in particular. If anything, the issue of skill shortage, exacerbated by a shrinking cohort of university entrants, became an even more pressing item on the government's agenda in 2014. Indeed, in that year, the Ministry of Employment and Labour published a report titled "Prospects of Manpower Conditions Classified by Majors from 2014 to 2024" that triggered the initiation – next to LINC – of PRIME (cf. Park 2016, The Chung-Ang Herald 2016). The Ministry of Labour's report provided two key pieces of information that would inform government policy. Firstly, the report pointed out that "ten years from now, the number of graduates who major in Engineering will be in short supply by about 260,000 people. On the other hand, the number of graduates who major in Liberal Arts, Social Sciences and Arts will be in excessive supply by about 530,000 people" (The Chung-Ang Herald 2016, Park 2016). Secondly, the report highlighted that, next to the skill shortages, the employment outlook of STEM graduates is significantly better than social sciences and humanities. Indeed, current statistics report an employment rate around 15% higher for engineering graduates compared to graduates in humanities and social sciences (75% compared to 58% and 61.5% respectively) (KEDI 2015, 41).

These two findings from the Ministry of Labour and Employment triggered the policy discussions that would have led to the initiation of PRIME – a competitive allocation of funding that forces universities, if selected for the project, to downsize their humanities and social science departments and increase enrolments in STEM subjects, and in particular in engineering (Park 2016). In the run-up to the initiation of PRIME, both the Ministry of Education (MOE) and the Ministry of Strategy and Finance (MOSF) which granted the budget line to the MOE, introduced the notion of "restructuring university programmes" (MOSF 2015b) and "restructuring of universities to increase competitiveness of higher education" (MOE 2015a, 6) as part of a broader strategy to combat youth unemployment (MOSF 2015b) and to stimulate the economic

competitiveness of the country along with reforms of the public sector and the financial sector (MOSF 2015c). The MOE announced therefore that PRIME would be enacted in its Education plan 2015, where it was mentioned that departments “will be consolidated to better meet the demands of industries, and those colleges that actively implement consolidation will receive further support” (MOE 2015a, 3). The successive plan, in 2016, under the emphatic heading of “Reorganizing college courses to meet social demands” provides details regarding the plan, most importantly that “student enrolment will be increased for courses that have high demand (e.g. engineering)” and that the “PRIME project will receive 200 billion Korean Won of financial support” (MOE 2016, 14). The Minister for Education, commenting on PRIME, argued that “the country needs to accurately calibrate the needs of the society and provide plans on meeting such needs” and that these needs translate, as far as education policy is concerned, to finding a way “to reduce the gap between what industry needs and what the universities provide” (Yoon 2015b). The underlying principles of PRIME are therefore in line with those of LINC, but PRIME takes a significantly more prescriptive approach: 11% of new entrants to ‘PRIME institutions’ are expected to be adjusted according to governments’ skills forecasts (MOSF 2016b), leading according to government’s estimates to 20,000 enrolments to be re-organised in the first four years of prime (MOE 2015b, 15). As such, PRIME “aims to fulfil the industrial needs such as the demand for science, IT and engineering, which has been increasing” (Lee and Byeon 2016, 2).

Institutional change through government policy

The two policies just outlined – and PRIME in particular – show a marked change of direction in skill formation compared to the mid-1990s. Indeed, when the government found itself facing stark problems of skills mismatch and skill shortages, the Ministry of Education first nudged universities through LINC to establish better connections with

the labour market, and then took a much more active role in the coordination of skills formation through PRIME. After the strong emphasis on liberalisation and deregulation that we noted in the 1990s, the guiding principle in skill formation adopted through PRIME resembles much more closely the idea underlying the state-coordinated regime outlined at the beginning of the chapter. Indeed, the MOSF argued in 2015 that “in order to promote the education sector reform, *the government will release the mid-term human resources demand outlook in October and have universities adjust the number of students*” (MOSF 2015c, 1 emphasis added). More precisely, the MOSF has pointed out that PRIME will be used to “restructure university programs to meet industrial demand and prepare for the future” and that this process will be enacted through the release of “5 and 10 year labor force supply and demand outlooks by university major, in order for universities to refer to the outlooks when restructuring their programs” (MOSF 2015b). Thus, compared to the model of coordination outlined at the beginning of the chapter, there appears a resurgence of the government in matching skills supply and demand, though with a different partner: namely universities, instead of business. While LINC is therefore an example of conversion, i.e. universities – through incentives set by the government – redeploying their educational offer to new objectives, namely matching labour market needs, PRIME is best understood as a case of displacement occurring both at the national level of policy-making and at university-level. At the national-level we observe a marked movement away from the market as the chief mechanism of allocation of skills through a deregulated higher education sector in favour of a re-regulated sector where the government coordinates the supply of skills by demanding that universities adjust to skills’ forecasts. In other words, the market mechanism introduced in the mid-1990s has been gradually *displaced* in favour of a mechanism where state coordination becomes (or, rather, returns to being) more prominent. Indeed, one of the key mechanisms by which displacement occurs is through the “rediscovery and activation of dormant or latent

institutional resources” (Streeck and Thelen 2005, 31), such as state coordination of skill formation in this case. At the university-level, the process of displacement can be seen across the PRIME institutions which, quite literally, displaced enrolments, courses and in some cases departments to match student intake with the government’s skill forecasts, that are in turn driven by considerations around employment rates and labour market needs.

Looking at the distribution of universities selected for both LINC and PRIME, we note that *also* top institutions, as commonly perceived by one of the leading university rankings in Korea – the one produced by the JoongAng Daily – have been keen to engage with these programmes and restructure their curricula and yearly intakes accordingly. More precisely, table 6.1 shows which universities within the top 20 of the JoongAng Daily ranking took part in either policies. The presence of several leading universities – both private and public – in LINC and PRIME is strong evidence that institutional change has been encompassing (rather than marginal), as expected by the theoretical framework, i.e. institutional change affected universities across types (both public and private) and status (both more and less ‘prestigious’ institutions). This observation, as hypothesised, provides a strong parallel with the British case – and it contrasts starkly with the German one. It is particularly telling that within the top 10 of a highly selective higher education system, five universities have taken part in LINC and/or PRIME.

Table 6.1. Participating universities in LINC and PRIME among top universities

University ranking	
1.	<i>Seoul National University</i>
2.	Sungkyunkwan University +
3.	Hanyang University (Seoul campus)
4.	Yonsei University (Seoul campus)
5.	Korea University (Anam campus)
6.	Sogang University +
7.	Ewha Women University *
8.	Chung-Ang University +
9.	Hanyang University (ERICA campus) * +
10.	The University of Seoul
11.	Kyung Hee University
12.	<i>Pusan National University</i> +
13.	Inha University +
14.	Hankuk University of Foreign Studies
15.	<i>Kyungpook National University</i> * +
16.	<i>Chonbuk National University</i>
17.	<i>Chungnam National University</i> +
18.	Dongguk University (Seoul campus) +
19.	<i>Chonnam National University</i>

Source: Korea JoongAng Daily (2015)

Note: + = selected for LINC; * = selected for PRIME; names in italic denote public universities; all the others are private universities.

The availability of more specific data on universities' participation in LINC provides even stronger evidence in support of the encompassing nature of the process of institutional change. Tables 6.2 and 6.3 show in particular three features of LINC: firstly, if we compare the total number of higher education institutions in the country with the total number of institutions that applied for LINC, we note that the policy has been hugely popular; secondly, LINC has been even more popular across universities than junior colleges (i.e. vocationally-oriented institutions); among the former, over 57% of institutions applied, while among the latter the figure drops to just below 52%; thirdly, universities have been remarkably more successful at attracting LINC funds, with over 90% of LINC budget being assigned to universities.

Table 6.2. Funding and applicants for LINC

Year	Budget (£ ¹⁷)	Successful applicants	Total applicants	Total institutions
<i>All higher education institutions</i>				
2012	125,580,000	81	166	303
2013	186,990,000	80	--	--
2014	178,227,000	86	--	--
<i>Universities</i>				
2012	117,300,000	51	92	160
2013	169,740,000	51	--	--
2014	164,772,000	56	--	--
<i>Junior Colleges</i>				
2012	8,280,000	30	74	143
2013	17,250,000	29	--	--
2014	13,455,000	30	--	--

Source: own calculations based on MoE documents

Table 6.3. The engagement of universities with LINC

Year	LINC budget of universities/total LINC budget	Universities implementing LINC/higher education institutions implementing LINC
2012	93%	63%
2013	91%	64%
2014	92%	65%

Source: own calculations based on MoE documents

The data presented in tables 6.2 and 6.3 speaks strongly to the consenter role of universities, which engaged extensively with LINC. This observation contrasts with the German pattern of high skill formation where universities have been mostly reluctant (i.e. antagonists) when government and employers demanded their deeper engagement with skill formation policies, which have in turn been welcomed by vocationally-oriented universities of applied sciences. In Korea, the reverse holds true as vocationally-oriented

¹⁷ The figures are indicative as they have been converted into British pounds using the exchange rate of 23rd November 2017, but they nonetheless provide an indication of the size of the budget. In the local currency, the total budget for LINC for 2012, 2013 and 2014 has been respectively 182, 271 and 258 billion Won.

institutions were nowhere near as successful as (research) universities at attracting the public funds attached to the corresponding government policy.

Why did universities – even at the very top of the ranking – decide to second these policies? The question is particularly relevant for both policies but even more so for PRIME, given that its strongly prescribing nature stirred much controversy across Korean campuses, some of which saw strong protests from students, for instance at Ewha Women University and Inha University (Huh and Lim 2016). More broadly, the President of the Korea University Student Association (KUSA) took distance from PRIME and argued that universities “seem to be adjusting the students to fit to the companies” and that such a move would compromise “the essence of the humanities as the universities turn into employment factories” (Lee 2016, 3). To understand the keen engagement of universities with this policy, experts working on higher education pointed unequivocally to the strong competition within the Korean higher education market. A former civil servant in the MOE discussed this issue in the following terms:

Why did universities follow PRIME? Money! I am hungry, I need to survive. [...] Tuition can only cover 70% of total spending [at a maximum], for the rest you need to get money from government, or donations. [...] After tuition the second source of revenue is government funding, and that is why universities look into government funding.
(interview KR_N1)

Similarly, a representative from a think-tank working on education policy explained that “tuition is not enough...the government intentionally fixes the level of tuition so that universities, given tuition level, cannot run. So they kind of beg for extra money from outside. The government is using financial resource [to stir universities]” (interview

KR_N3). These views echoed those from within the higher education sector. An interviewee from a public university explained that:

about 20 years ago we didn't have these programmes...they just gave general funding to each...however they didn't increase the money at all...then they decided whom to give the money to...specific money (e.g. LINC, PRIME) may not be that much but this can change some things...it is not stable...at least in our university sometimes this is only 5%, but when it was highest, about three years ago, it was more than 20% of the total university budget including student fees...now we've lost in a few programmes and it's gone down again because we lost to the competition....so this is significant...They [the government] enjoy controlling the university, given that it is their money! (interview KR_U10)

This explanation – if anything – was reinforced by a representative of a private university who argued that: “private universities are responding to that [government policy] because of competition” (interview KR_U2). More broadly, interviewees across the board highlighted the competitive pressures that universities are subject to in the Korean higher education system and how such pressures make universities likely to respond positively to governments' demands, if these are backed by financial rewards (interviews KR_N1, KR_N5, KR_U1, KR_U2, KR_U10, KR_U11). These interview findings are supported by scholarly assessments of the Korean higher education system pointing out that the reforms undertaken in the 1990s created a legacy in the higher education system which made it “highly amenable to market-based reform policies” (Kim and Lee 2006, 581). Thus, in a context of high competition for public and private funds, universities have little choice but to follow the demands set out by external stakeholders, if these are conducive – directly or indirectly – to achieving gains in the multi-faceted competition for funds, students and – more broadly – prestige.

Indeed, the views of these stakeholders regarding the high responsiveness of universities to external demands in a context of high competition for funds is clear when we consider the value of PRIME to individual institutions:

The chosen nine universities in the big type will get 15 billion Won each. In 2015, 11 out of 20 universities reduced their budget and those 20 universities' budget averages were about 26.4 billion Won. In this situation, the support funds from the PRIME Project amount to more than half of the budgets of most of the universities. In the case of Sookmyung Women's University, their budget was about 17 billion Won last year. They get more than two thirds of their a year [sic] budget by being elected as one of the PRIME Project universities. Huh Seongsil, the member of "University for Everyone," an organization of university students, said, "Schools have no choice but to embrace the project guidelines because they are in need of greater funding". (Lee and Byeon 2016, 19-20, see also Park 2016 on the finance-related motives of universities joining PRIME)

Competition for funds is certainly a crucial driver of universities' behaviour. Next to it however, stakeholders explained how reputational gains also arise from greater government funding. Again, this analysis was shared by stakeholders in the higher education system who explained how universities use government funds as a way of self-promoting their educational offer, so being more appealing to prospective students and therefore having a conjoint effect of attracting increasing private revenues thanks – and in addition – to public subsidies (interviews KR_U1, KR_N3). As an interviewee put it: "it is also good PR material for universities if they get funding from these projects. Some universities had a hard time recruiting their students and for universities like that getting the government funding is a very significant PR issue" (interview KR_N3, also interviews KR_2, KR_N4). The strategic reasoning (and behaviour) that was observed across

Korean universities is therefore highly compatible with the incentives set imposed on universities by a highly competitive higher education sector and illustrated also by the British case in section 4.2. Conversely, it stands in stark contrast with the empirical observations collected in Germany, where competition among universities did not appear to be a significant lever of change. However, the Korean and German cases displayed close similarities with respect to the objectives of government policy: responding to the skill shortages and mismatches endangering their respective advanced manufacturing sectors, the Korean and German governments intervened in the supply of high skills by promoting STEM skills and engineering in particular through public policies such as PRIME and the Higher Education Pact.

6.5 Conclusion: back to theory and final remarks

This chapter provided an analysis of high skill formation in Korea by tracking recent reforms in the higher education sector. These reforms have been interpreted as a case of de-liberalisation prompted by the government after a disequilibrium in the form of skill mismatch and skill shortage emerged from the liberalising reforms undertaken in the mid-1990s. Indeed, as the government actively promoted a liberalisation of the higher education system and a market-based allocation of high skills, a set of skills that were crucial for the advanced-manufacturing base of the emergent Korean knowledge economy – namely: STEM skills – was undersupplied. This concern led governments from the mid-2000s onwards to change the approach to high skill formation. The same market mechanisms heralded in the 1990s as a key ingredient for the knowledge economy were increasingly marginalised by the government in favour of government-coordinated mechanisms for the supply of high skills. This process of re-regulation of high skill formation reached its peak with the implementation of PRIME, through which universities had to adjust the distribution by discipline of incoming students according to

the government's forecast of skills needed in the labour market. The chapter also showed that the high level of competition among universities within the Korean higher education system made them particularly malleable in responding to government policy and institutional change has therefore been comprehensive, taking the form of conversion and displacement.

The process of government-led adjustment resembled in its underlying logic the traditional Korean model of skill formation as described in section 6.2, with the major difference that government forecasts did not determine in-firm skill formation as in the traditional model in the 1970s but rather shaped the supply of high skills provided by the higher education sector. In this sense, and in line with the German chapter, the argument developed through the Korean case also provides broader insights to understand how skill formation systems in CMEs are changing at times of higher education expansion and the increased importance of high skills to success in the knowledge economy. In particular, it is highlighted how the defection of businesses from the institutional arrangement typical of the industrialisation period and the strong preference for a university education on the side of secondary school-leavers and their families do not lead automatically to a convergence towards a liberal model of skill formation. Rather, we have noted in both the German and the Korean cases how the state can take a crucial role in (re-) coordinating high skill formation in the knowledge economy. However, government policy is also significantly mediated by the incentives that universities themselves have in adjusting to the demands of external stakeholders. Along this dimension, the Korean case has proved to be one of 'encompassing' change that resembles more closely the British case, rather than the German example of change 'at the margin'. Competition (or lack thereof) among universities has been identified as a crucial mechanism that allowed the detection of encompassing (or marginal) patterns of institutional change. More broadly, the Korean chapter highlighted the non-linear

trajectory of liberalisation processes. In the Korean case, encompassing liberalisation took place across policy areas in the mid-1990s followed, a decade later, by instances of re-regulation undertaken by the government to manage disequilibria created by the previous liberalising efforts.

7 Conclusions

This final chapter brings together and summarises the findings of the research (section 7.1); discusses its contributions and limitations and outlines implications for future research (section 7.2); finally I argue, as has been discussed at the very beginning of this thesis, that aligning higher education provision and labour market needs has become a crucial concern for policy-makers, and the policy implications of the research are presented (section 7.3).

7.1 Summary of findings against alternative theories

Empirically, the thesis built on a set of diverse cases (section 3.1 illustrated the rationale for case selection) through which three existing theories (outlined in chapter 1) and one alternative theory (illustrated in chapter 2) were tested to understand the alignment between higher education systems and knowledge-based labour markets and the associated patterns of institutional change (see also section 2.5 for a preliminary comparison of the observable implications derived from each theory). In this section, we first summarise the findings from each case study and we then discuss these findings in the light of the rival theories.

Britain

The first case study focused on Britain, which represents a broader set of cases with highly marketised higher education systems and a knowledge economy heavily geared towards high-end services (e.g. finance; consultancy). This case falls within the broader universe of LMEs. In Britain we have observed two main macro-developments. Firstly, the increasing marketisation of higher education (initiated under a centre-left government and heightened by a centre-right government) set in motion a number of pressures on universities to align their offer from labour market needs. Such pressures came primarily

from two mechanisms typical of highly marketised higher education systems: rankings and student fees. Universities increasingly looked into skill formation measures as a way to perform well in rankings – which are partly driven by the employment outcomes of graduates – and thereby be more attractive to prospective (fee-paying) students. But students themselves also put pressure on universities to improve their curricula with respect to skill formation measures. Interviewees across universities reported this demand from students, which was interpreted by universities' senior staff as students' concern to ensure a return on an increasingly costly investment. It is emblematic that the NUS, the largest student organisation, formally put pressure on universities in this respect through joint policy work with the largest employers' association (CBI and NUS 2011).

Aware of the competitive pressures and of students' demands, universities sought to engage with businesses to increase the provision of the skills needed in the labour market. Unsurprisingly, given the nature of a labour market heavily geared towards high-end services, the demands of the business community were centred on general skills (problem solving; IT literacy; team-work). The effect of the demand side of the economy on making general skills more widely and explicitly taught at universities is clear when considering the development in a discipline like engineering. Interviewees illustrated how engineering no longer has the traditional tight link with employment in the engineering profession. As engineering graduates increasingly find employment in high-end services, universities engaged more with employers in these sectors, which led to an increase of general skills in the curriculum vis-à-vis discipline-specific technical skills.

The relationship between demand side of the economy and high skill formation leads us to the second macro-development observed in Britain, namely the rather unsuccessful implementation of policies aimed at creating specific technical skills, particularly in the STEM subjects, that both centre-left and centre-right governments

promoted through Foundation Degrees and Higher Apprenticeships respectively. The weak demand for technical skills, however, led to weak engagement of employers with these policy initiatives (FDF 2009, Russell Group 2015), which ultimately remained at the margin of the British system of high skill formation. The predominance of high-end services in the British knowledge economies was therefore central to understanding the inclusion of general skills in university curricula in Britain, while policy initiatives aimed at specific technical skill development were far less successful.

Where did universities stand in this process? Despite some differences between faculty and management as to whether and to what extent universities should meet business needs when setting out their educational offer (recall figure 4.2), universities were key actors in implementing the ‘skills agenda’ even beyond government’s and employers’ demands. Interviewees and descriptive statistics provide strong evidence that links the increasing competition in the higher education sector with the strategic decision of universities to increase the labour market relevance of their educational offer as a way to remain attractive – or to increase their attractiveness – towards prospective students and to gain reputation in rankings. These initiatives were mostly led by university management, who seized increasing power within universities vis-à-vis faculty and were therefore in the position to push the skills agenda forward.

Germany

As we move from Britain to Germany, key variables take opposite values. Germany represents a case of a knowledge economy strategically reliant on advanced manufacturing and with a higher education sector characterised by limited competition between universities. Countries sharing these two features belong to the Continental (and, partly, Nordic) European cluster. How did the alignment of higher education and knowledge-based labour markets proceed in Germany? The empirical material allowed

me to discern two phases. The first one started in the late 1990s with the Bologna process, while the second one started in 2007 with the Higher Education Pact. In the first phase, policy-makers and businesses seized the opportunity offered by Bologna to increase their voice in the university system. Indeed, by the late 1990s, the German higher education system was perceived as hard to reform, inward looking and irresponsible to the demands of those stakeholders external to the system. In particular, research universities were accused of neglecting labour market needs when setting out their educational offer. Universities of applied sciences, on the other hand, were perceived as more responsive and dynamic but any attempt to expand them was vetoed by politically powerful research universities (Toens 2009).

Given the previous failed attempts to expand universities of applied sciences, policy-makers and businesses used the opportunity provided by Bologna – which emphasised skills and employability in university curricula – to make traditional universities more responsive to labour market needs. This effort took place in the context of overhauling degree structures and conforming them to the tiered structure promoted at European level under the auspices of the Bologna process. Yet, it met the firm opposition of universities – and, most prominently, of their faculties – that opposed what they perceived as a ‘downgrading’ of university education to mere training. Furthermore, they feared that research universities’ degrees would become increasingly similar to those offered by universities of applied science, implying a loss of status of traditional universities vis-à-vis universities of applied sciences. Because of this opposition, curricular reforms in the context of Bologna did not lead to substantial changes, leaving policy-makers and businesses rather dissatisfied (BMBF 2007, BDA 2003, 2006b, Gillmann 2006).

Yet, while the ‘conversion’ of universities’ degrees towards more labour market relevance was hampered by the opposition ‘on the ground’ of academic faculties, more

students than ever enrolled in German universities. Net entry rates to university went up from 36% to 51% in only five years between 2007 and 2011 (Hüther and Krücken 2014). Policy-makers and businesses alike feared that the massive expansion in the context of an irresponsible higher education sector would endanger the skill-base of the export-oriented German economy, in particular with respect to the perceived vital need of STEM graduates equipped with practical skills (BDA 2008). The Higher Education Pact, implemented from 2007, offered the opportunity to side-step universities' opposition to expand universities of applied sciences. The increase of students above and beyond previous forecasts allowed the government to pursue a policy specifically designed to create *additional* study places to meet increasing demand. Given that through the Pact the government increased the size of the higher education pie, the room for political manoeuvre was larger compared to previous attempts aimed at redistributing financial resources within the system, which is by and large a zero-sum game, and that, as such, had been veto-played by universities. Through the Pact, the government created additional study places specifically targeting the expansion of universities of applied sciences and STEM subjects (BMBF 2014, 2009) and therefore meeting the skills needs of a knowledge economy that is highly reliant on advanced manufacturing.

Businesses not only lobbied strongly in favour of the policies implemented through the Pact, but they also gave a direct contribution to the expansion of STEM skills in universities of applied sciences through the financing of an increasing number of dual study programmes. These are work-based learning programmes in which students share their time between a university (usually a university of applied sciences) and a company, towards the completion of an undergraduate degree (often in STEM subjects), while also strengthening their professional skills through on-the-job training. Employers establish these programmes through direct collaboration with universities of applied

sciences and select candidates for dual study programmes while also partially financing them through a stipend that students receive for the duration of the programme.

Stark differences between the German and British case stand out: the most obvious is the opposite behaviour of universities and employers across the two cases. While universities were a ‘driving force’ of the skills agenda in high-competition Britain, their stance was one of open opposition in low-competition Germany. Employers – on the other hand – were more passive in the British context while they played a more active role in the German case, in particular through consistent lobbying for more STEM skills and by offering degrees in STEM subjects themselves by cooperating with universities of applied science, which testifies to the crucial importance of STEM skills for knowledge economies that rely strategically on advanced manufacturing.

South Korea

We complete the summary of findings moving on to the Korean case, which is methodologically crucial to assess the generalisability of findings given that it shares similarities and differences across the two key variables of interest with the cases of Britain and Germany. More specifically, the higher education sector in many ways resembles the high competition setting that we have found in Britain, while the structure of the Korean knowledge economy offers a parallel with Germany’s above-average reliance on advanced manufacturing. The combination of high-competition in the higher education sector and high reliance on advanced manufacturing speaks to a set of East Asian advanced capitalist countries, most notably Japan. What kind of pattern did we find in Korea? Compared to the rather linear development that we have found in Britain, the Korean case displays significant variation over time, similarly to the German case. The first phase started in the mid-1990s when the PCER mandated a clear shift from state control of higher education in favour of a deregulated system heavily reliant on

market-mechanisms for the supply of high skills (Park 2013b). In just a few years, a higher education system whose size was traditionally tightly controlled and regulated by the government became essentially universal with gross enrolment rates nearing 100%.

Private universities flourished and private funding quickly came to make up the lion's share of total higher education funding with universities particularly dependent upon student tuition fees for their survival. Market mechanisms were further oiled by the introduction of competitive allocation of public funds for 90% of the total public budget of universities. The strong liberalisation of the higher education sector was heralded by governments in the mid-1990s as a crucial ingredient for a successful transition of Korea to the knowledge economy as governments believed that markets provided the most effective mechanism of skills allocation. Yet, problems of skill shortage and mismatch had already arisen by the early 2000s. In particular, according to several accounts (including those of employers and government but also of researchers) university education was not preparing students for the world of work leading to lengthy in-firm re-training programmes (KEF 2005, 2006). Furthermore, the distribution of students across disciplines showed that STEM disciplines tended to be avoided by students, making governments and employers fear a shortage of workers possessing those skills that were perceived as vital for the Korean knowledge economy based on advance manufacturing.

Responding to skills shortages and mismatches, governments promoted two policies, LINC and PRIME, that aimed to align higher education provision with labour market needs (MOEST 2009b, MOSF 2014, 2015a). Through LINC, the government supported curricular changes that emphasised practical skills and cooperation with businesses in the design and delivery of curricula. PRIME was bolder in its demands as it asked universities to adjust their annual intake of students to match the government's skill forecasts and therefore ease the skill-matching process in the labour market. In essence, universities that were selected to take part in PRIME were asked to downsize

their humanities and social science departments and to increase enrolments in STEM – engineering in particular. Thus, comparing the Korean case with the previous ones, we note a striking parallel with the German Higher Education Pact. Both PRIME in Korea and the Higher Education Pact in Germany responded to a perceived threat of skill shortages in the STEM subjects that would endanger a crucial component of the national knowledge economy – that is, the advanced manufacturing sector.

But how did Korean universities behave compared to the other cases? When the government initiated LINC and PRIME, the response from the university sector was enthusiastic since a large share of universities (including several at the top of the rankings) applied for these initiatives. Interviewees illustrated how such reaction has to be ascribed to the competitive pressures of the higher education sector that made universities significantly malleable towards the demand of external stakeholders, and made them engage with government policy to secure (public) funding, but also to gain prestige by participating in these projects and therefore enhancing their capacity to be attractive to prospective fee-paying students. Compared to the German case, where universities pushed back on governments' and employers' demands leading to institutional change being located in a specific sub-set of the higher education sector (i.e. universities of applied sciences), the Korean case displays a more encompassing pattern of institutional change. This reflects – as in the British case – the accommodating position that universities are incentivised to take towards the demands of external stakeholders when competitive pressures are high.

How do alternative theories fare against the empirical evidence?

In this section I will discuss the findings in the light of the existing theories sketched out in chapter 1 and the alternative theory developed in chapter 2. Starting from the existing theories, we observe that structuralist explanations have limited explanatory power.

Indeed, the chief observable implication of this theory is the establishment of a vocational sub-set of institutions catering for labour market needs. The main mechanism underlying this development is expected to be the growing functional pressures placed on the higher education system by the continuous expansion of university enrolments. Framing this expectation in the institutional change jargon, higher education systems are expected to change through the *layering* of a sub-set of institutions next to the existing ones. Contrasting this theory with the empirical evidence presented in chapters 4 to 6 and summarised earlier in this section, we note that the only case study that is consistent in its outcome with a structuralist explanation is the German one. As far as the British and Korean cases are concerned, we do not observe significant layering processes. Quite the contrary, we have seen that institutions across the entire higher education sector have engaged with skill formation initiatives. Even in the case of Germany, a structuralist explanation – although consistent in terms of outcomes – needs to be qualified. In particular, structuralist explanations gloss over issues around power and agency of actors, reducing institutional change to a set of functional pressures setting in motion a pattern of change in an essentially apolitical context.

The case study illustrated how the layering of STEM skills, which took place most prominently from 2007 onwards through a government-led process of differential growth of universities of applied sciences and a business-led process of expansion of dual study programmes, was partly driven by the accumulation of “negative feedbacks” (Jacobs and Weaver 2015) from the previous decade, when research universities blocked on the ground the implementation of curricular reforms. Thus, structuralist explanations have difficulties accounting for patterns of high skill formation across advanced capitalist countries, not only because its predicted outcomes are only partly confirmed by the empirical data, but also because – even where outcomes are consistent – the underlying

process appears to be more complex and more ‘political’ than structuralist explanations assume.

Turning to ideational explanations, we find a somewhat better match between theory and empirics. In particular, the British case is in its outcomes consistent with the idea of a neoliberal transformation of higher education whereby governments provide an incentive set for universities to open up to business and to satisfy their demands. The Korean case too in its first phase fits squarely with an ideational explanation as governments created the conditions for a heavily-marketised higher education system which was believed to provide the most efficient allocation of high skills. Yet, this explanation has some difficulties in accounting for some of the trends across time and space that were highlighted by the case studies. Two issues stand out in particular. Firstly, ideational explanations ignore the mediating role that actors within the higher education sector might have in pushing back on governments’ agendas. In particular, we have seen how a historically-inherited low competition setting in the German case, coupled with a system without an obvious (implicit or explicit) hierarchy among universities, allowed universities to jointly oppose neoliberal reforms, such as the ‘employability’ agenda promoted by government and employers in the late 1990s. On the other hand, a historically-inherited highly competitive environment and vertical differentiation among universities in Britain and Korea undermined the scope for collective action among universities, making them malleable towards governments’ and employers’ demands as they sought to gain reputation and resources vis-à-vis their ‘competitors’.

Secondly, the Korean case shows that the demand side of the economy is a critical element to consider when theorising trajectories of high skill formation. The ideational literature remains silent on this issue, but the Korean case shows how governments might have to partially reverse previous neoliberal/liberalising reforms and rather promote reforms that aim at the re-regulation of the higher education sector. The

potential skill mismatches and skill shortages that a pure market-based allocation of high skills might produce emerged as crucial elements informing government policy and corresponding patterns of reform and institutional change. Thus, the ideational literature – while capturing a trend that is undoubtedly occurring, namely: governments increasingly framing higher education as ‘economic policy’ – cannot explain variation across countries in the degree to which these reforms occur (e.g. Germany vis-à-vis the UK and Korea) nor cases of policy reversals (such as in Korea).

Turning to the CPE/VoC literature, we reiterate at the outset the empirical observation that was already spelled out in chapter 1, namely that the expansion of higher education over the last two decades is *not* an LME-exclusive development. Rather, higher education expansion has been occurring across countries and it has proceeded equally fast – if not faster – in CMEs. The case of Korea, where university enrolment rates became essentially universal, and Germany, where they spiralled above and beyond government forecasts from 2007 onwards, illustrate the point. Hence, from a theoretical point of view, the original VoC distinction, which has been also employed in more recent research (Hassel and Palier 2017, Anderson and Hassel 2013), between CMEs relying on vocation training and LMEs relying on higher education, holds increasingly less explanatory power for understanding different models of skill formation. Empirically, we have noted that by and large the British case conforms to a standard VoC scenario: as we would have expected in an LME, the chief arena of skill formation is a large higher education system delivering general skills through market mechanisms. Yet, it should also be noted that the key actors driving this development seem to be universities, and not employers – as we would have predicted from a pure VoC perspective. But to the extent that CMEs are expected to rely on vocational training and suppress the development of higher education, a standard VoC/CPE explanation does not offer a convincing account of the pattern observed in Germany and Korea.

Building on one of VoC's key insights – i.e. the complementarity between skill formation systems and production regimes – but placing higher education at the centre of skill formation systems *also* in CMEs as they transition into knowledge-based growth, we move on to assess how the proposed theory ('varieties of high skill formation') fared against the empirical evidence presented in this thesis. Compared to the other theories, we observe closer correspondence of empirical evidence and theoretical expectations. In the UK case, we found a pattern of general skill formation, as expected in a knowledge economy that is predominantly reliant on high-end services. Universities have been found to second the pattern of increasing alignment between higher education provision and labour market needs, primarily driven by the competitive pressures of the higher education market.

Moving to the German case, we found a pattern of alignment between higher education provision and labour market needs that is opposite to the British case. In Germany, we found governments and employers orchestrating the expansion of higher education to supply a well-defined set of high skills, namely STEM skills that were perceived as vital in a knowledge economy that relies strategically on advanced manufacturing. Further differences with the British case appear when considering the role of universities: largely insulated from competitive pressures by comparative standards, traditional universities did not second governments' and employers' demands of closer alignment between labour market needs and higher education provision and conformed to the hypothesised 'antagonist' role as they 'pushed' the skills agenda onto universities of applied sciences. In Germany, institutional change proceeded mostly by layering and differential growth, which governments and employers triggered through the Higher Education Pact and the establishment of Dual Study Programmes.

The Korean case reveals yet another pattern: as hypothesised, universities' behaviour was similar to that of their British counterparts as they seconded government

initiatives, which they perceived as a strategy to gain funds (directly and indirectly) in a fiercely competitive market. But – similarly to the German case – the policies promoted by the government were specifically set towards increasing the supply of STEM skills, which in the Korean context were considered pivotal given the strong reliance of the country on advanced manufacturing.

Thus, the proposed theory of ‘varieties of high skill formation’ seems to have more explanatory power than the existing theories. By highlighting the institutional context of universities’ agency, the proposed theory was able to predict in which countries universities would second or oppose government and business demands highlighting how variation in university behaviour would have led to marginal (as in Germany) or encompassing (as in Britain and Korea) institutional change. On the other hand, by hypothesising a complementarity between the type of knowledge economy (whether reliant on high-end services or manufacturing) and the type of high skills needed (whether ‘just’ high skills or high STEM skills), the proposed theory was able to predict the different degree of involvement of governments and businesses in directly shaping the supply of high skills. Such involvement was stronger and more prescriptive in those countries – Germany and Korea – that necessarily need STEM skills for their knowledge economies to thrive. It was – on the other hand – less prescriptive in the British case, as strategic sectors of the knowledge economy tend to be indifferent to the ‘type’ of high skills, as long as general skills are present.

With its twin focus on the supply and demand side of the higher education/labour market alignment, the proposed theory provides therefore a useful heuristic to understand the trajectories of high skill formation in knowledge economies and the associated patterns of institutional change in higher education systems. Tables 7.1 and 7.2 provide a summary of the explanatory power of different theories by comparing first in some detail the observable implications of the proposed theory with

the empirical evidence presented in chapters 4 to 6 (table 7.1), and then by showing in which case studies the implications derived from each theory have been confirmed or disproved by the empirical material (table 7.2).

Table 7.1. Comparing empirical evidence and observable implications of the proposed theory

Context	Predicted observable implications	Empirical evidence
<ul style="list-style-type: none"> • High competition among universities • Knowledge economy based on high-end services • Case example: <i>Britain</i> 	<ul style="list-style-type: none"> • Governments cultivate supply of general high skills • Universities as protagonists or consenters • Institutional change by conversion/displacement 	<ul style="list-style-type: none"> • Predominance of general skills • Universities act as protagonists • Institutional change primarily by conversion
<ul style="list-style-type: none"> • Low competition among universities • Knowledge economy based on advanced manufacturing • Case example: <i>Germany</i> 	<ul style="list-style-type: none"> • Governments cultivate supply of specific and general high skills • Universities as antagonists • Institutional change by layering/drift 	<ul style="list-style-type: none"> • Targeted focus on STEM skills • Universities act as antagonists • Institutional change primarily by layering
<ul style="list-style-type: none"> • High competition among universities • Knowledge economy based on advanced manufacturing • Case example: <i>Korea</i> 	<ul style="list-style-type: none"> • Governments cultivate supply of specific and general high skills • Universities as protagonists or consenters • Institutional change by conversion/displacement 	<ul style="list-style-type: none"> • Targeted focus on STEM skills • Universities act as consenters • Institutional change by conversion and displacement

Source: own elaboration

Table 7.2. Alternative theories and empirical evidence

			Empirics support theory?		
Theory	Observable implications	Underlying mechanism	UK	DE	KR
<i>Existing theories</i>					
<i>Structuralist</i>	Horizontal differentiation of higher education systems Vocationally-oriented higher education located in separate tier/institutions Convergence via layering/differential growth	Expansion of university enrolments prompts governments to create an additional vocationally-oriented tier	X	✓	X
<i>Ideational</i>	Transformation of higher education systems subsumed to market needs Universities serving the needs of labour markets Convergence via conversion/displacement	Governments/international organisations reform higher education sector according to ‘marketising’ principles	✓	X	(✓)
<i>CPE/VoC</i>	Higher education developing in LMEs Higher education suppressed in CMEs, which continue to rely on vocational training instead Divergence via continued reliance on higher education in LMEs and on vocational training in CMEs	Governments respond to employer preferences, who support expansion of higher education in LMEs but not in CMEs	✓	X	X
<i>Proposed theory</i>					
<i>Varieties of high skill formation</i>	All universities systems adjust to knowledge economy, but providing different skillsets depending on type of knowledge economy Institutional change encompassing/marginal depending on incentive-set faced by universities	Governments reform higher education according to skills needs of national knowledge economy and institutional change is mediated by higher education sector	✓	✓	✓

Source: own elaboration

7.2 Contributions, limitations and implications for future research

This section places the research in the context of broader academic debates outlining its contributions, main limitations and avenues of future research that the thesis might lead to. In terms of *contributions*, the research mostly engaged with the literature on institutional change in higher education and skill formation systems and with the broader comparative political economy literature focusing on the institutional arrangements underpinning advanced capitalist countries' production regimes and public policies.

Starting from the implications for the higher education literature, the empirical material collected points at the importance of universities' preferences and agency in mediating the outcomes of higher education reforms. We have theorised and subsequently observed through the case studies that universities' behaviour towards government policy was systematically different across countries and that differences in their preferences and agency was shaped by the incentive-set that they faced across different higher education systems. By focusing on this level of analysis and explicitly theorising why and when we might expect universities to take an accommodating stance towards reforms, oppose them or drive them, we might be able to make sense of the somewhat disappointing findings of much of the comparative literature on higher education that stresses how 'continuities and changes co-exist' (Musselin 2011, Regini 2011b) without being able to grasp the reasons for such 'uneven convergence'. Importantly, the literature on higher education has – somewhat surprisingly – devoted little attention to the role of universities as 'agents of change' in higher education policy. Indeed, universities have been generally depicted rather passively at the receiving end of reforms. The evidence presented in this thesis suggests taking universities as political agents systematically into account in future analysis of institutional change in higher education.

Moving on to the broader literature on skill formation, the German and Korean cases illuminated a pattern of skill formation in higher education that the comparative political economy literature has by and large overlooked as it focused – as far as CMEs are concerned – almost exclusively on vocational training. In identifying such patterns of high skill formation, a different set of dynamics to those assumed by the political economy literature emerged. Next to the agency of universities that was already pointed out, it should also be highlighted here how the move from vocational training to higher education as the primary locus of skill formation does not appear to be a 'simple'

convergence towards a liberal model of education and training as is implied in some analyses (cf. Lauder, Brown, and Ashton 2008). Rather, the pattern uncovered in both Germany and Korea points towards a case of non-market coordination where the government seized a key role in shaping the supply of high skills targeting specifically those high skills that were considered vital for the national knowledge economy.

The Higher Education Pact in Germany and PRIME in Korea emerge as a major case in point here, and they suggest that the rise of knowledge economies in CMEs, with its interrelated focus on skill formation in the university sector, calls for a political economy of skills that discovers *the state as a central coordination actor*, thus going beyond the binary distinction between the persistence of strategic non-market coordination among firms on one hand (Hall and Soskice 2001, Hall and Gingerich 2009) and an inevitable convergence towards market coordination on the other (Streeck 2009). More broadly, this finding suggests that forms of non-market coordination might persist in CMEs but that such persistence is not necessarily based on pre-existing institutional complementarities and lock-in effects. Rather, non-market coordination emerged through a process of creative adaptation of coordination to fundamentally new policy areas – such as higher education, which has been traditionally at the margins of CMEs’ policy mix – highlighting how CMEs can thrive with very liberal-like institutions that have been adapted to their needs. The findings suggest therefore that cross-country diversity can persist *through change* – not exclusively through continuity.

A final implication of the research refers to the notion of institutional complementarities. This notion has become central to the comparative political economy literature mostly thanks to the VoC scholarship, which put institutional complementarities at the core of its firm-centric view of the political economy. As already outlined in chapter 1, the basic idea of institutional complementarities refers to the presence of one institution increasing the returns of a second institution (Hall and

Soskice 2001). In the case studies discussed in this thesis, I documented the emergence of institutional complementarities between the high skills supplied by the university system on one hand (general vs. STEM) and the dominant knowledge-based regime on the other (high-end services vs. advanced manufacturing).

But how do institutional complementarities come about? Boyer (2005) argued that insufficient attention has been paid to the mechanisms that may lead to the emergence, reproduction and change of institutional complementarities. In particular, he warned that institutional complementarities may be an ex-post rationalisation of a number of developments that may not be necessarily responding to a strict rational-choice framework based around the firm, as proposed by the VoC literature (see also Jackson and Deeg 2012, Deeg 2007, Amable 2016). In this respect, the findings of this thesis suggest that institutional complementarities might be best understood as the outcome of a “powering and puzzling” process (Heclo 1974, 305). In terms of ‘powering’ we outlined how the institutional context shapes the (power) relationship between governments, employers and universities, showing for instance that universities in high-competition settings are likely to have their potential for collective action against government policy curtailed compared to universities in low-competition setting. In terms of ‘puzzling’, we noted several instances of governments promoting policies that – although corresponding to their first order preferences – were hardly successful and, as such, they were changed. The strongest case in point in this respect comes from the Korean example: a firm belief in market-based allocation of high skills soon revealed itself as highly inefficient for a knowledge economy relying on advanced manufacturing. Successive governments – of all political stripes – therefore addressed this issue by restricting market mechanisms and (re-) introducing forms of state coordination of the supply of high skills. Thus, the thesis supports the analytical value of the notion of institutional complementarities but it also suggests that the emergence of institutional

complementarities may be the outcome of a less linear and less rational process than assumed in the VoC approach. Rather, it suggests that the outcome is strongly mediated by actors' power and by their learning processes and corresponding updating of preferences.

Turning to the *limitations* of the present research, three stand out in particular. Firstly, the three actors that have been primarily taken into consideration in the research are universities, employers and governments. Chapter 2 set out the theoretical case as to why these three actors are particularly important. Yet, one issue that has not been addressed *systematically* is that of government *partisanship*. As we have noted throughout the chapters that skill formation in higher education involves in certain cases governments siding with employers – and against universities – to induce them to engage more in skill formation, should we expect governments of different stripes to behave differently in this respect? The role of partisanship has been convincingly shown to matter in terms of access to and funding of higher education (Ansell 2010, Busemeyer 2015, Garritzmann 2016) and we might therefore wonder whether similar logics extend to the issue of skill formation. In section 1.2, it has been argued that partisanship is not expected to matter in terms of high skill formation. Indeed, while it has been demonstrated that – by catering to different social groups – Left and Right have different preferences regarding access to and funding of higher education (Ansell 2010, 2008, Garritzmann 2016, Busemeyer 2009b), there does not seem to be an obvious reason as to why either the Left or the Right should not want higher education systems to be aligned with labour market needs, in an era when bipartisan consensus has emerged around skills as a crucial ingredient for success in the knowledge economy. Moreover, the case studies also control for variation in partisan composition of governments, and they show – admittedly in a cursory way – that variation in government composition did not lead to significant differences in policy choices. In the period taken into consideration in all three

countries there were Centre-Left and Centre-Right cabinets, and we did not find a clear pattern of different preferences between Left and Right on this issue. Notwithstanding that there are no strong theoretical or empirical reasons to assign a crucial role to partisanship, it is conceivable that Left and Right have distinct historical relationships and linkages with different (organised) groups within the higher education sector (e.g. student unions; academics unions) and future research could therefore explore these links systematically.

Secondly, migration is a potentially important issue that has not been addressed. Indeed, it could be argued that the national (higher) education system is only one of several routes that policy-makers might take to address skill needs or plug skill shortages. Others include for instance ‘importing’ those skills from abroad by attracting (highly) skilled workers who have been trained in a different country. This strategy has been found to be central to the development of the Irish growth model where the “internet-tech sector is built on the back of inward migration of high-skilled labour from other EU countries” (Regan and Brazys 2017, 2). Yet, it would appear that the Irish economic strategy, with its reliance on attracting foreign direct investments, is a rather unique growth model (Regan and Brazys 2017, Brazys and Regan 2017), thus the extent to which inward-migration of skilled workers might be considered a pillar of skill formation in other countries too remains limited and the cases analysed certainly suggest that high skill formation was primarily framed as (domestic) education policy. At any rate, reliance on inward migration and forming domestic skilled workers are not mutually exclusive policy options, thus future research might explore how these two routes are combined and interact across countries.

A third limitation concerns the generalisability of findings. How much can be inferred from three case studies? The research design – being theoretically informed – employed a two-fold strategy to ensure that findings could be generalisable. First, it

adopted a ‘diverse’ cases approach and secondly countries could be also paired up in most different/most similar designs along the two key analytical dimensions that were identified. These two strategies strengthen the general plausibility of the empirical findings (Seawright and Gerring 2008). In addition, the descriptive statistics presented in chapter 2 provide evidence that the implied relationships between variables hold across a larger sample of countries. Yet, looking at the universe of cases (see figure 3.1), we note that some countries (e.g. Sweden) take a rather hybrid position across quadrants, hence for these countries theoretical expectations might not be as clear-cut and some theoretical nuance – together with specific empirical scrutiny – might be needed. In addition, the Southern European countries (plus France) were excluded from the discussion since the chief focus of the research was the alignment between higher education systems and the *knowledge-based* labour market. Since Southern European countries (plus France) have been shown to have adopted a strategy of “competitive impoverishment” rather than having convincingly pursued policies to move up the global value chain (Hassel and Palier 2017), these countries were excluded from the theoretical discussion and they were not scrutinised empirically. While not a chief focus of the present research, it would nonetheless be an interesting empirical question to assess how the relationship between higher education and the labour market developed in those countries that have been struggling to fully embrace a knowledge-based growth path.

To conclude this sub-section, I will outline the *implications for future research*. The first avenue of research goes back to the important coordinating role of the state in shaping the supply of high skills, which it is suggested should be given full appreciation beyond the case of high skill formation. Indeed, the transition to the knowledge economy is altering the socio-economic make-up of advanced capitalist countries: policy areas and institutional arrangements that used to be crucial, e.g. the industrial relations arena or vocational training, have become relatively less important in the knowledge

economy (Iversen and Soskice 2015); conversely, policy areas that used to be marginal, e.g. higher education, have become central in the transition to a knowledge-based growth regime (Hall 2015). Critically, the ‘emergent’ sub-spheres of the political economy might be characterised by limited scope for employer-led coordination, for instance because employers might have been historically at the margins of a given policy area (as in the case of higher education). What types of coordination mechanisms should we then expect to emerge in these areas? The evidence provided by the German and Korean cases shows that where the scope for strategic coordination is low, ‘liberalisation’ does not automatically emerge as the default option. However, this dynamic is difficult to grasp if the only available analytical tool is the distinction between persistence of strategic non-market coordination among firms on one hand (Hall and Soskice 2001, Hall and Gingerich 2009) and inevitable convergence towards market coordination on the other (Streeck 2009, Baccaro and Howell 2017) – or a ‘mixed’ picture in which strongholds of “traditional coordination” co-exist with “liberalised” areas (Jackson and Sorge 2012, Palier and Thelen 2010). The pattern of state coordination illuminated by the case of high skill formation offers a way out of the ‘traditional’ dichotomy that the comparative political economy literature has often presented us with. Importantly, this is not the only area where we notice this development. The introduction of the minimum wage in Germany offers some similarities insofar as the state emerged as the crucial actor in that area too (Mabbett 2016). Thus, avenues for future research open up with respect to a systematic theorisation of the institutional, political and socio-economic conditions that might lead to the emergence of state coordination in the transition to the knowledge economy. While the literature has argued in the past for a ‘re-discovery’ of the state in the analysis of advanced capitalist countries (Schmidt 2008b), it is still unclear under which socio-economic and socio-political conditions state coordination is expected to emerge, in particular in those countries where state agency has been traditionally placed in the

background, overshadowed instead by a focus on strategic coordination among social partners (Streeck 1997b).

A second stream of future research concerns a broader analysis of the institutional complementarities that have emerged across countries in the transition to the knowledge economy (Thelen forthcoming, Hassel and Palier 2017). This thesis has only focused on one particular set of complementarities, namely those between high skill formation and knowledge-based growth regimes. But how do other public policies sustain countries' attempts to move up the global value chain? In particular, next to skill formation, we might hypothesise an important role for industrial policy, innovation policy, R&D, as well as social policies. With respect to the latter, it would be particularly intriguing to assess the changing relationship between skills and (un-) employment protection (Iversen and Soskice 2001, Estevez-Abe, Iversen, and Soskice 2001). Indeed, as discussed in section 2.1, in the transition from vocational training to higher education, an ever-increasing share of the population is being equipped with general skills, which might lead to an erosion of public support for generous (un-) employment protection. On the other hand, we have also seen how a set of skills (such as STEM skills) are increasingly important for employers, in particular in those countries relying on advanced manufacturing. This might mean that employers in these sectors have a growing concern in securing and retaining highly-skilled STEM workers, which might determine in parallel to a decline of universal public welfare, a further expansion of company-based welfare leading to increasing segmentation of welfare provision *within* countries *across* industry/skill lines (Wiß 2015). The politics and political economy dynamics behind the establishment of complementarities across institutional spheres in the transition to the knowledge economy appears as a research agenda worth pursuing in the future.

7.3 Implications for policy-making

This thesis started off by noting the increasing salience among policy-makers of the alignment between higher education and knowledge-based labour markets. How might this research inform policy-makers' choices in this respect? By means of a conclusion I will outline two main policy implications that stand out from the theoretical discussion and the empirical evidence across case studies. Firstly, the higher education literature has noted that the horizontal differentiation of higher education systems that took place in several countries in the 1960s and 1970s gave way to an increasing vertical differentiation (Goglio and Regini 2017). In other words, governments have been incentivising processes of diversification within the higher education system that are no longer based on a functional differentiation among (groups of) universities (e.g. those teaching-oriented vis-à-vis those that are research-oriented); rather they promoted vertical higher education systems whereby (individual) universities are expected to find a way to stand out vis-à-vis the 'competition'. European processes (such as the Bologna Process) also contributed to blurring the functional boundaries within the tertiary education sector (Witte, Van der Wende, and Huisman 2008). Yet, this research shows the persistent merits of a functional differentiation of the higher education sector. The German case in particular showed that universities of applied sciences have – if anything – increased their appeal to employers through their close connections with the labour market. Importantly, such connections are actively supported by faculty and management in these institutions because they see cooperation with employers and skill formation as central to their mission. Thus, instead of demanding a labour market conversion of the higher education sector 'across the board' with the inter-related tensions that it would create in 'research-oriented' institutions, governments might consider a re-discovery of functional differentiation of tertiary education as an effective – and politically feasible – strategy to align higher education and knowledge-based labour markets.

Secondly, the research shows that supply-side-only policies are unlikely to be sufficient for a successful transition into the knowledge economy. Indeed, the research showed that a broad upskilling trend – which governments often promote by setting targets for the share of each age cohort that should enrol in university – runs into severe problems if it does not match the demand side of the economy. Furthermore, the research confirmed that labour market signals are not enough to channel students into those disciplines that are high in demand on the labour market calling for *explicit* policies aiming to match supply and demand. The Korean example was striking in this respect: de-regulation and expansion of higher education was by and large associated with skill mismatches and shortages that the government had to rectify by introducing re-regulating measures. In Britain, we saw the reverse occurring with Foundation Degrees and Higher Apprenticeships, where both policy initiatives were hampered by weak employers' demand. These findings resonate well with recent research conducted on the UK in comparative perspective, which shows precisely that supply-side policy has proven insufficient and that the demand-side of the labour market should be (back) at the top of policy-makers' agenda, including “identifying and targeting inclusive growth sectors” and “fostering demand-led skills development” (Pike et al. 2017, 5, see also Mazzucato 2016, Mazzucato 2015b, a).

Appendix 1. List of interviews

United Kingdom

Interview code	Affiliation	Date
UK_N1	University Association	08.12.2016
UK_N2	University Association	17.12.2015
UK_N3	Employer Association	22.04.2015
UK_N4	Employer Association	17.04.2015
UK_N5	Employer Association	31.03.2015
UK_N6	Think-tank	03.12.2015
UK_N7	Government	17.12.2015
UK_U1	University (pre-1992)	13.05.2016
UK_U2	University (pre-1992)	21.03.2016
UK_U3	University (pre-1992)	22.07.2016
UK_U4	University (pre-1992)	22.07.2016
UK_U5	University (pre-1992)	07.03.2016
UK_U6	University (pre-1992)	15.03.2016
UK_U7	University (pre-1992)	16.03.2016
UK_U8	University (post-1992)	22.03.2016
UK_U9	University (post-1992)	13.05.2016
UK_U10	University (post-1992)	26.04.2016
UK_U11	University (post-1992)	26.04.2016
UK_U12	University (post-1992)	26.02.2016
UK_U13	University (post-1992)	26.02.2016

Germany

Interview code	Affiliation	Date
DE_N1	University Association	05.04.2016
DE_N2	University Association	11.08.2016
DE_N3	Employer Association	05.04.2016
DE_N4	Employer Association	17.06.2016
DE_N5	Employer Association	27.10.2016
DE_N6	Government	10.05.2016
DE_N7	Government	26.05.2016
DE_N8	Think-tank	22.04.2016
DE_U1	University of Applied Sciences	27.04.2016
DE_U2	University of Applied Sciences	27.04.2016
DE_U3	University of Applied Sciences	04.05.2016
DE_U4	University of Applied Sciences	02.05.2016
DE_U5	University of Applied Sciences	31.05.2016
DE_U6	University of Applied Sciences	19.04.2016

DE_U7	University	15.04.2016
DE_U8	University	22.04.2016
DE_U9	University	30.05.2016
DE_U10	University	19.05.2016
DE_U11	University	19.05.2016
DE_U12	University	08.06.2016

South Korea

Interview code	Affiliation	Date
KR_N1	Government	09.09.2016
KR_N2	University Association	21.09.2016
KR_N3	Think-tank	20.09.2016
KR_N4	Think-tank	20.09.2016
KR_N5	University; Advisor to government	20.09.2016
KR_U1	University (private)	20.09.2016
KR_U2	University (private)	20.09.2016
KR_U4	University (public)	07.09.2016
KR_U5	University (public)	07.09.2016
KR_U6	University (public)	13.09.2016
KR_U7	University (public)	13.09.2016
KR_U8	University (private)	13.09.2016
KR_U9	University (private)	13.09.2016
KR_U10	University (public)	08.09.2016
KR_U11	University (public)	08.09.2016

Appendix 2. Interview topic guide template

Interviews in higher education institutions

Setting the context of the institution

1. Could you say a few words on your role within the institution as well as previous role in this or other (HE) institutions since, roughly, the early 1990s?
2. Over the last 20 years, what would you identify as the major changes or developments that took place within your institution [or department], in particular with respect to teaching / education?
 - a. Why did these changes take place?
3. Which stakeholders?
4. Has this always been the case or can you identify and recent change? And why?

Main elements of skills agenda within institution

5. [Introduce skills agenda and clarify what exactly I am talking about] How are professional / vocational skills taught in your institution?
6. What do you identify as the main driver for the rise of the skills agenda?
7. Why does your institution engage in the skills agenda?
8. What policy developments [at national or local level] have provided specific incentive for your institution to engage in skill formation?

Organisational and institutional elements of skills agenda

9. Could you describe the debate within your institution regarding the employability agenda and the provision of more vocational skills?
10. Which stakeholders influenced the decision-making process and in what ways?
11. Can you identify any turning points in the management of the university?
12. How does the cooperation with employers in professional / vocational skills occur?
13. Do you mostly cooperate with large or small employers in professional / vocational skills formation? Why?
14. Do you cooperate with employers in particular economic sectors only?
15. Which financial arrangements underpin your cooperation?
16. If you were to make changes to the skills agenda, how would that impact your student recruitment?
17. If you were to operate under a different funding regime, how would you change your activities around skills?
18. Has fluctuating students' number been a concern for your university and, if so, how has this been dealt with?

Interviews with representatives of governments and associations

Policy context

1. What have been the main initiatives since the 1990s to align higher education and the labour market?
2. Which ones do you think were most successful and why?
3. How have these initiatives changed the HE offer in your country?
4. Why have these initiative developed?

Actors

5. Who was the main driver behind these initiatives? In particular, what was the role of governments, employers and universities?
6. Within the HE sector, who supported these initiatives and who opposed them?
7. Have different universities supported/opposed the initiative in different ways?
8. Within the employers' camp, who is interested in engaging with HEIs in terms of skill formation? E.g. services sector vs manufacturing/small vs large employers?
9. To what extent do employers cooperate in this respect? E.g. by forming consortia of companies or by having intermediary bodies arranging this?
10. How successfully do employers engage with HEIs?
11. What do you think is the impact of skill formation in HE within the broader skill formation system (e.g. vocational training)?
12. What do you think should change on the employers' side in order to step up cooperation?
13. And what on the HE side?

Academia – labour market relationships

14. How would you define the relationship between academia and labour market? Conflictual / cooperative?
15. How has this changed over the years?
16. How do HE policy (e.g. funding) and broader socio-economic trends (e.g. expansion of HE, knowledge economy) influence academia – labour market relationships?
17. Where would you locate the power in the HE system of your country? E.g. state / government, university management, professors?
18. How does this distribution of power facilitate or hinders cooperation between HE sector and labour market actors?
19. Do you think that HE – labour market relationship is generally well received within academia? By whom in particular?

Outcome and outlook compared with other countries

20. Are you generally satisfied with the way HEIs and industry cooperate in your country in terms of skill formation?
21. Are shortcomings due to employers, HEIs or government policies?
22. Do you think that this works better in other countries, and why?

Appendix 3. Interviewees information and consent sheet



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Knowledge economies and the political economy of skill formation in higher education

Information for those considering taking part

Why is this project being done?

Niccolo Durazzi, at the Department of Social Policy at LSE, is carrying out a research on patterns of adjustments of skill formation systems to the needs of the knowledge economy across countries. As part of the study, he aims to gain greater understanding of how universities are adjusting to (perceived) labour market needs. In particular, the study will look at how universities are dealing with three elements of the 'employability agenda': (i) provision of transferable skills, (ii) cooperation with employers in course design and (iii) cooperation with employers in course delivery.

Will I be asked to take part?

For the project, Niccolo hopes to carry out short interviews with senior members of universities who have knowledge of how curricula have changed (or have not) in response to labour market needs over the last 20 years.

If you are approached to take part in the study and agree to be interviewed, but later decide you no longer want to take part, you can notify Niccolo and be withdrawn immediately from the study without giving any reasons.

What will happen to data and findings from the project?

Findings from the project will eventually be used to form a PhD thesis, and possibly a book. Some journal articles will also be written and published on what has been learned from the project. The contents of the interviews will be treated in confidence and when the research is written up, all references to individuals and institutions will be thoroughly anonymised.

During and after the project, all data and transcripts will be held securely by Niccolo in password-protected computer files *to which no other person will have access*. Niccolo will be happy to explain data confidentiality and anonymity arrangements further with you prior to formal consent for an interview being given. He will also be very happy to provide feedback to you and/ or your organisation on key findings from the research once these are produced.

For more information please do not hesitate to contact Niccolo Durazzi at the LSE Department of Social Policy, Houghton Street, London, WC2A 2AE. Email: n.durazzi@lse.ac.uk

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References

- Ainley, Patrick, and Mark Weyers. 2008. "The variety of student experience, investigating the complex dynamics of undergraduate learning in Russell and non-Russell universities in England." In *Structure and Agency in the Neoliberal University*, edited by Joyce E. Canaan and Wesley Shumar, 131-152. New York: Routledge.
- Alexiadou, Nafsika, and Sylvia van de Bunt-Kokhuis. 2013. "Policy Space and the Governance of Education: Transnational Influences on Institutions and Identities in the Netherlands and the UK." *Comparative Education* no. 49 (3):344-360.
- Altbach, Philip G. 2012. "The globalization of college and university rankings." *Change: The Magazine of Higher Learning* no. 44 (1):26-31.
- Amable, Bruno. 2016. "Institutional complementarities in the dynamic comparative analysis of capitalism." *Journal of Institutional Economics* no. 12 (1):79-103.
- Amaral, Alberto, Glen A Jones, and Berit Karseth. 2002. "Governing higher education: Comparing national perspectives." In *Governing higher education: National perspectives on institutional governance*, edited by Alberto Amaral, Glen A Jones and Berit Karseth, 279-298. Dordrecht: Springer.
- Amaral, Alberto, and Antonio Magalhaes. 2002. "The emergent role of external stakeholders in European higher education governance." In *Governing higher education: National perspectives on institutional governance*, edited by Alberto Amaral, Glen A Jones and Berit Karseth, 1-21. Dordrecht: Springer.
- Anderson, Karen M, and Anke Hassel. 2013. "Pathways of change in CMEs: training regimes in Germany and the Netherlands." In *The Political Economy of the Service Transition*, edited by Anne Wren, 171-194. Oxford: Oxford University Press.
- Anderson, Robert. 2016. University fees in historical perspective. In *History and Policy*.
- Ansell, Ben. 2008. "University Challenges: Explaining Institutional Change in Higher Education." *World Politics* no. 60 (2):189-230.
- Ansell, Ben. 2010. *From the Ballot to the Blackboard: The Redistributive Political Economy of Education*. Cambridge: Cambridge University Press.
- Ansell, Ben. 2012. "Humboldt humbled? The Germanic University System in Comparative Perspective." In *Social Policy in the Smaller European States*, edited by Gary B. Cohen, Ben Ansell, Robert Henry Cox and Jane Gingrich, 215-236. Oxford: Berghahn Books.
- Ansell, Ben, and Jane Gingrich. 2013. "A Tale of Two Trilemmas: Varieties of Higher Education and the Service Economy." In *The Political Economy of the Service Transition*, edited by Anne Wren, 195-224. Oxford: Oxford University Press.
- Arthur, Lore. 2006. "Higher education and the knowledge society: Issues, challenges and responses in Norway and Germany." *Research in Comparative and International Education* no. 1 (3):241-252.
- Ash, Mitchell G. 1997. *German universities past and future: Crisis or renewal?* New York: Berghahn Books.
- Ashton, David, Francis Green, Johnny Sung, and Donna James. 2002. "The evolution of education and training strategies in Singapore, Taiwan and S. Korea: A development model of skill formation." *Journal of Education and Work* no. 15 (1):5-30.
- Ashton, David Norman, and Francis Green. 1996. *Education, training and the global economy*. Cheltenham: Edward Elgar.
- Autor, David H, Frank Levy, and Richard J Murnane. 2003. "The Skill Content of Recent Technological Change: An Empirical Exploration." *The Quarterly Journal of Economics* no. 118 (4):1279-1333.

- Baccaro, Lucio, and Chiara Benassi. 2017. "Softening Institutions: The Liberalization of German Industrial Relations." In *European Industrial Relations: Trajectories of Neoliberal Transformation*, edited by Lucio Baccaro and Chris Howell. Cambridge: Cambridge University Press.
- Baccaro, Lucio, and Chris Howell. 2011. "A Common Neoliberal Trajectory The Transformation of Industrial Relations in Advanced Capitalism." *Politics & Society* no. 39 (4):521-563.
- Baccaro, Lucio, and Chris Howell. 2017. *Trajectories of Neoliberal Transformation*. Cambridge: Cambridge University Press.
- Baccaro, Lucio, and Jonas Pontusson. 2016. "Rethinking comparative political economy: the growth model perspective." *Politics & Society* no. 44 (2):175-207.
- Baethge, Martin. 2006. "Das deutsche Bildungs-Schisma: Welche Probleme ein vorindustrielles Bildungssystem in einer nachindustriellen Gesellschaft hat." *SOFI-Mitteilungen* (34):13-27.
- Baethge, Martin, and Andrä Wolter. 2015. "The German Skill Formation Model in Transition: From Dual System of VET to Higher Education?" *Journal for Labour Market Research* no. 48 (2):97-112.
- Ballarino, Gabriele. 2011. "Redesigning curricula: the involvement of economic actors." In *European universities and the challenge of the market: A comparative analysis*, edited by Marino Regini, 11-27. Edward Elgar Publishing.
- Barr, Nicholas. 2004. *The economics of the welfare state*. Oxford: Oxford University Press.
- BDA. 2003. Memorandum on the Tiered Study Structure (Bachelor/Master). Berlin: Bundesvereinigung der Deutschen Arbeitgeberverbände.
- BDA. 2004. Bachelor Welcome! Berlin: Bundesvereinigung der Deutschen Arbeitgeberverbände.
- BDA. 2006a. More Bachelors and Masters Welcome! Berlin.
- BDA. 2006b. More Bachelors and Masters Welcome! Berlin: Bundesvereinigung der Deutschen Arbeitgeberverbände.
- BDA. 2008. Bachelor Welcome - MINT-Nachwuchs sichern! Berlin: Bundesvereinigung der Deutschen Arbeitgeberverbände.
- BDA. 2009. Short country surveys – Employers point of view. In *BFUG Employability Working Group 2007-2009*. Berlin: Bundesvereinigung der Deutschen Arbeitgeberverbände.
- BDA, BDI, Stifterverband, and HRK. 2009. Achieving Reforms by Working Together - University and Industry Representatives take stock of 10 years of the Bologna Process. Berlin and Bonn: Bundesvereinigung der Deutschen Arbeitgeberverbände, Bundesverband der Deutschen Industrie e.V., Stifterverband für die Deutsche Wissenschaft, Hochschulrektorenkonferenz.
- BDA, HRK, and BDI. 2011. Take Two Cohorts of Students as an Opportunity and Increase Higher Education Pact. Berlin and Bonn: Bundesvereinigung der Deutschen Arbeitgeberverbände, Bundesverband der Deutschen Industrie e.V., Hochschulrektorenkonferenz.
- BDA, Stifterverband, and BDI. 2010. Bachelor Welcome 2010. Berlin.
- Becher, Tony, and Maurice Kogan. 1992. *Process and structure in higher education*. London: Heinemann.
- Béland, Daniel. 2007. "The social exclusion discourse: ideas and policy change." *Policy & Politics* no. 35 (1):123-139.
- Béland, Daniel. 2009. "Ideas, institutions, and policy change." *Journal of European public policy* no. 16 (5):701-718.
- Béland, Daniel, and Robert Henry Cox, eds. 2010. *Ideas and politics in social science research*. New York: Oxford University Press.

- Béland, Daniel, and Robert Henry Cox. 2016. "Ideas As Coalition Magnets: Coalition Building, Policy Entrepreneurs, and Power Relations." *Journal of European Public Policy* no. 23 (3):428-445.
- BIBB. 2014. *Duales Studium in Zahlen*. In *Trends und Analysen*. Bonn: Bundesinstitut für Berufsbildung.
- Blackmore, Jill. 2001. "Universities in crisis? Knowledge economies, emancipatory pedagogies, and the critical intellectual." *Educational theory* no. 51 (3):353-370.
- Bleiklie, Ivar. 1998. "Justifying the evaluative state: New public management ideals in higher education." *European Journal of Education* no. 33 (3):299-316.
- Bleiklie, Ivar, and Maurice Kogan. 2007. "Organization and governance of universities." *Higher Education Policy* no. 20 (4):477-493.
- Blyth, Mark. 2001. "The transformation of the Swedish model: economic ideas, distributional conflict, and institutional change." *World Politics* no. 54 (1):1-26.
- Blyth, Mark. 2002. *Great transformations: Economic ideas and institutional change in the twentieth century*. New York: Cambridge University Press.
- BMBF. 1999. *Mut zur Veränderung: Deutschland braucht moderne Hochschulen Vorschläge für eine Reform*. Berlin: Bundesministerium für Bildung und Forschung.
- BMBF. 2007. *Working Group employability - Answers for Germany*. Berlin: Bundesministerium für Bildung und Forschung.
- BMBF. 2009. *Verwaltungsvereinbarung zwischen Bund und Ländern gemäß Artikel 91b Abs. 1 Nr. 2 des Grundgesetzes über den Hochschulpakt 2020 (zweite Programmphase)*. Berlin: Bundesministeriums für Bildung und Forschung.
- BMBF. 2014. *Verwaltungsvereinbarung zwischen Bund und Ländern gemäß Artikel 91b Abs. 1 Nr. 2 des Grundgesetzes über den Hochschulpakt 2020*. Berlin: Bundesministeriums für Bildung und Forschung.
- Boden, Rebecca, and Maria Nedeava. 2010. "Employing discourse: universities and graduate 'employability'." *Journal of Education Policy* no. 25 (1):37-54.
- Boezerooy, Patra. 2003. *Higher Education in the Netherlands, Country Report*. Enschede: Centre for Higher Education Policy Studies (CHEPS), .
- Bonoli, Giuliano. 2012. "Active labour market policy and social investment: a changing relationship." In *Towards a social investment welfare state? Ideas, policies and challenges*, edited by Nathalie Morel, Bruno Palier and Joakim Palme, 181-204. Bristol: Policy Press.
- Bonoli, Guiliano. 2006. "New social risks and the politics of post-industrial social policies." In *The politics of post-industrial welfare states: adapting post-war social policies to new social risks*, edited by Klaus Armingeon and Giuliano Bonoli, 3-26. London and New York: Routledge.
- Bourner, Tom, Sue Greener, and Asher Rospigliosi. 2011. "Graduate employability and the propensity to learn in employment: a new vocationalism." *Higher Education Review* no. 43 (3):5-30.
- Boyer, Robert. 2005. "Coherence, diversity, and the evolution of capitalisms—the institutional complementarity hypothesis." *Evolutionary and Institutional Economics Review* no. 2 (1):43-80.
- Brazys, Samuel, and Aidan Regan. 2017. "The Politics of Capitalist Diversity in Europe: Explaining Ireland's Divergent Recovery from the Euro Crisis." *Perspectives on Politics* no. 15 (2):411-427.
- Briggs, Senga. 2006. "An exploratory study of the factors influencing undergraduate student choice: the case of higher education in Scotland." *Studies in Higher Education* no. 31 (6):705-722.

- Brint, Steven, and Jerome Karabel. 1991. "Institutional origins and transformations: The case of American community colleges." *The new institutionalism in organizational analysis* no. 337 (360):283-298.
- Brown, Phillip, Andy Green, and Hugh Lauder. 2001. *High Skills: Globalization, Competitiveness, and Skill Formation*. New York: Oxford University Press.
- Brown, Phillip, Anthony Hesketh, and Sara Williams. 2003. "Employability in a knowledge-driven economy." *Journal of education and work* no. 16 (2):107-126.
- Brown, Phillip, Anthony Hesketh, and Sara Williams. 2004. *The mismanagement of talent : employability and jobs in the knowledge economy*. New York: Oxford University Press.
- Burgard, Claudia, and Barbara S Grave. 2013. "Does it Pay Off to Incentivize Universities? Performance Funding in the German Higher Education System." *Ruhr Economic Papers*.
- Burniston, Stephen, John Rodger, and James Brass. 1999. *Enterprise in Higher Education - Changing the Mindset*. London: Department for Education and Employment.
- Bussemeyer, Marius R. 2009a. "Asset Specificity, Institutional Complementarities and the Variety of Skill Regimes in Coordinated Market Economies." *Socio-Economic Review* no. 7 (3):375-406.
- Bussemeyer, Marius R. 2009b. "Social democrats and the new partisan politics of public investment in education." *Journal of European Public Policy* no. 16 (1):107-126.
- Bussemeyer, Marius R. 2015. *Skills and Inequality: Partisan Politics and the Political Economy of Education Reforms in Western Welfare States*. Cambridge: Cambridge University Press.
- Bussemeyer, Marius R, and Torben Iversen. 2014. "The political economy of skills and inequality." *Socio-Economic Review* no. 12 (2):241-243.
- Bussemeyer, Marius R, and Christine Trampusch. 2012. "The Comparative Political Economy of Collective Skill Formation." In *The Political Economy of Collective Skill Formation*, edited by Marius R Bussemeyer and Christine Trampusch, 3-40. New York: Oxford University Press.
- Bussemeyer, Marius R, and Janis Vossiek. 2016. "Global Convergence or Path Dependency? Skill Formation Regimes in the Globalized Economy." In *The Handbook of Global Education Policy*, edited by Karen Mundy, Andy Green, Bob Lingard and Antoni Verger, 145-61. Chichester: Wiley-Blackwell.
- BusinessEurope. 2011. *Plugging the skills gap The clock is ticking*. Brussels: BusinessEurope.
- Campbell, John L. 2002. "Ideas, politics, and public policy." *Annual review of sociology* no. 28 (1):21-38.
- Capano, Giliberto, and Simona Piattoni. 2011. "From Bologna to Lisbon: The Political Uses of the Lisbon 'Script' in European Higher Education Policy." *Journal of European Public Policy* no. 18 (4):584-606.
- Carroll, William, and James Beaton. 2000. "Globalization, neo-liberalism, and the changing face of corporate hegemony in higher education." *Studies in Political Economy* no. 62 (1):71-98.
- CBI, and NUS. 2011. *Working towards your future Making the most of your time in higher education*. London: Confederation of British Industry and National Union of Students.
- Cedefop. 2016. *Skill shortages in Europe: Which occupations are in demand – and why*. Thessaloniki: European Centre for the Development of Vocational Training.
- Chae, Jae-Eun, and Hee Kyung Hong. 2009. "The expansion of higher education led by private universities in Korea." *Asia Pacific Journal of Education* no. 29 (3):341-355.
- Charles, David. 2003. "Universities and territorial development: reshaping the regional role of UK universities." *Local Economy* no. 18 (1):7-20.

- CHE. 2015. Higher Education Pact Eight Years on. Gütersloh: Centre for Higher Education.
- Cheon, Byung You. 2014. "Skills development strategies and the high road to development in the Republic of Korea." In *Transforming economies: Making industrial policy work for growth, jobs and development*, edited by José Manuel Salazar-Xirinachs, Irmgard Nübler and Richard Kozul-Wright, 213-238. Geneva: International Labour Office.
- Clark, Burton R. 1983. *The Higher Education System: Academic Organization in Cross-National Perspective*. Berkeley: University of California Press.
- Colombo, Sabrina. 2011. "UK: the university as economic actor." In *European universities and the challenge of the market: A comparative analysis*, edited by Marino Regini, 93-116. Cheltenham: Edward Elgar.
- Corbett, Anne. 2005. *Universities and the Europe of knowledge: Ideas, institutions and policy entrepreneurship in European Union Higher Education Policy, 1955–2005*. London: Palgrave Macmillan.
- Cranmer, Sue. 2006. "Enhancing graduate employability: best intentions and mixed outcomes." *Studies in Higher Education* no. 31 (2):169-184.
- Crouch, Colin, David Finegold, and Mari Sako. 1999. *Are Skills the Answer? The Political Economy of Skill Creation in Advanced Industrial Countries*. New York: Oxford University Press.
- Crouch, Colin, Patrick Le Galès, Carlo Trigilia, and Helmut Voelzkow, eds. 2004. *Changing governance of local economies: responses of European local production systems*. Oxford and New York: Oxford University Press.
- Crouch, Colin, Patrick Le Galès, Carlo Trigilia, and Helmut Voelzkow. 2001. *Local production systems in Europe: rise or demise?* New York: Oxford University Press.
- Crouch, Colin, Martin Schröder, and Helmut Voelzkow. 2009. "Regional and sectoral varieties of capitalism." *Economy and Society* no. 38 (4):654-678.
- Cruickshank, Justin. 2016. "Putting Business at the Heart of Higher Education: On Neoliberal Interventionism and Audit Culture in UK Universities." *Open Library of Humanities* no. 2 (1).
- Culpepper, Pepper D. 2001. "Employers, Public Policy, and the Politics of Decentralized Cooperation in Germany and France." In *Varieties of Capitalism*, edited by Peter A. Hall and David Soskice, 275-306. Oxford: Oxford University Press.
- Culpepper, Pepper D. 2003. *Creating cooperation: How states develop human capital in Europe*. Ithaca: Cornell University Press.
- Culpepper, Pepper D. 2007. "Small States and Skill Specificity Austria, Switzerland, and Interemployer Cleavages in Coordinated Capitalism." *Comparative Political Studies* no. 40 (6):611-637.
- Culpepper, Pepper D, and David Finegold, eds. 1999. *The German Skills Machine: Sustaining Comparative Advantage in a Global Economy*. New York: Berghahn Books.
- Culpepper, Pepper D, and Aidan Regan. 2014. "Why don't governments need trade unions anymore? The death of social pacts in Ireland and Italy." *Socio-Economic Review* no. 12 (4):723-745.
- Dale, Roger. 2005. "Globalisation, knowledge economy and comparative education." *Comparative education* no. 41 (2):117-150.
- Davey, T, T Baaken, V Galan-Muros, and A Meerman. 2011. *The State of University-Business Cooperation in United Kingdom*. Brussels, Belgium: European Commission, DG Education and Culture.
- De Weert, Egbert. 1999. "Contours of the emergent knowledge society: Theoretical debate and implications for higher education research." *Higher Education* no. 38 (1):49-69.

- De Weert, Egbert. 2011. "Perspectives on Higher Education and the labour market." *IHEM/ CHEPS Thematic report*.
- Dearing, Ron. 1997a. Higher Education in the Learning Society: The National Committee of Inquiry into Higher Education. London: NCIHE.
- Dearing, Ron. 1997b. Higher Education in the Learning Society: The National Committee of Inquiry into Higher Education: Summary Report. London: NCIHE.
- Deeg, Richard. 2007. "Complementarity and institutional change in capitalist systems." *Journal of European Public Policy* no. 14 (4):611-630.
- Deem, Rosemary. 1998. "'New managerialism' and higher education: The management of performances and cultures in universities in the United Kingdom." *International Studies in Sociology of Education* no. 8 (1):47-70.
- Deem, Rosemary. 2001. "Globalisation, New Managerialism, Academic Capitalism and Entrepreneurialism in Universities: is the local dimension still important?" *Comparative education* no. 37 (1):7-20.
- Deem, Rosemary, Sam Hillyard, and Mike Reed. 2007. *Knowledge, higher education, and the new managerialism: The changing management of UK universities*. New York: Oxford University Press.
- DfE, SFA, and ESFA. 2017. Apprenticeship Programme Starts by Sector Framework/Pathway & Apprenticeship Standard, Level and Age (2013/14 to 2014/15). London: Department for Education, Skills Funding Agency, and Education and Skills Funding Agency.
- DfEE. 2003. The future of higher education. London: Department for Education and Employment.
- DHV. 2015. Berufliche und akademische Bildung nicht gegeneinander ausspielen. Mainz: Deutscher Hochschul Verband.
- DIHK. 2015. Preventing burdens, Shaping the future. Berlin: DIHK – Association of German Chambers of Commerce and Industry.
- Dobbins, Michael. 2011. "Explaining different pathways in higher education policy in Romania and the Czech Republic." *Comparative Education* no. 47 (2):223-245.
- Dobbins, Michael, and Christoph Knill. 2014. *Higher education governance and policy change in Western Europe: International challenges to historical institutions*. Basingstoke: Palgrave.
- Dobbins, Michael, and Christoph Knill. 2017. "Higher education governance in France, Germany, and Italy: Change and variation in the impact of transnational soft governance." *Policy and Society* no. 36 (1):67-88.
- Doyle, Mike. 2003. "Discourses of employability and empowerment: foundation degrees and 'third way' discursive repertoires." *Discourse: studies in the cultural politics of education* no. 24 (3):275-288.
- Durazzi, Niccolo. 2017. The Political Economy of Skills Revisited: University Expansion, High Skills, and State Coordination in Germany. In *Rethinking German Political Economy: Lessons for Comparative Theorizing after the Social Democratic Century*. San Francisco.
- Eckstein, Harry. 1975. "Case Study and Theory in Political Science." In *Handbook of Political Science*, edited by Fred Greenstein and Nelson Polsby, 119-164. Reading: Addison-Welley.
- EHEA. 2016. *European Higher Education Area and Bologna Process* n.d. [visited 3 November 2016]. Available from <http://www.ehea.info/>.
- Enders, Jürgen. 2004. "Higher education, internationalisation, and the nation-state: Recent developments and challenges to governance theory." *Higher education* no. 47 (3):361-382.

- Ertl, Hubert. 2013. "The Impact of the Post-Bologna Reforms on German Higher Education and the Transition of Graduates into the Labour Market." *SKOPE Research Paper No. 116*.
- Ertl, Hubert. 2015. Bologna-style degrees in the labour market The impact of qualification and curriculum reform in German higher education. In *SRHE Annual Research Conference*. Celtic Manor, Newport in South Wales, United Kingdom.
- Esping-Andersen, Gosta. 1990. *The Three Worlds of Welfare Capitalism*. Princeton: Princeton University Press.
- Esping-Andersen, Gosta, Duncan Gallie, Anton Hemerijck, and John Myles. 2001. "A new welfare architecture for Europe." *Report submitted to the Belgian Presidency of the European Union*.
- Estevez-Abe, Margarita, Torben Iversen, and David Soskice. 2001. "Social Protection and the Formation of Skills: A Reinterpretation of the Welfare State." In *Varieties of Capitalism*, edited by Peter A. Hall and David Soskice, 145-183. Oxford: Oxford University Press.
- European Commission. 2014. The Netherlands: Country Report. In *E-skills in Europe*.
- European Commission. 2017. Digital Transformation Monitor Germany: Industrie 4.0. Brussels: DG Internal Market, Industry, Entrepreneurship and SMEs.
- Eurostat. 2013. Employment in technology and knowledge-intensive sectors at the national level, by level of education (1994-2008, NACE Rev. 1.1) [htec_emp_niscd]. Brussels: Eurostat, the statistical office of the European Union.
- Eurostat. 2016. High-tech industry and knowledge-intensive services (htec). Brussels: Eurostat, the statistical office of the European Union.
- Fallon, Daniel. 2012. "Europe Inches Forward on Higher Education Reform, Focus: Germany." *Social Research* no. 79 (3):713-741.
- FDF. 2018. *Foundation Degree Forward* 2009 [visited 15 June 2018]. Available from <http://www.open.ac.uk/opencetl/resources/pbpl-resources/foundation-degree-forward>.
- Ferlie, Ewan, Christine Musselin, and Gianluca Andresani. 2008. "The steering of higher education systems: A public management perspective." *Higher education* no. 56 (3):325.
- Finegold, David, and David Soskice. 1988. "The failure of training in Britain: analysis and prescription." *Oxford review of economic policy* no. 4 (3):21-53.
- Fleckenstein, Timo, and Soohyun Christine Lee. 2014. "The Politics of Postindustrial Social Policy Family Policy Reforms in Britain, Germany, South Korea, and Sweden." *Comparative Political Studies* no. 47 (4):601-630.
- Fleckenstein, Timo, and Soohyun Christine Lee. 2017. "The politics of labor market reform in coordinated welfare capitalism: comparing Sweden, Germany, and South Korea." *World Politics* no. 69 (1):144-183.
- Fleckenstein, Timo, Adam M Saunders, and Martin Seeleib-Kaiser. 2011. "The Dual Transformation of Social Protection and Human Capital Comparing Britain and Germany." *Comparative Political Studies* no. 44 (12):1622-1650.
- Fleckenstein, Timo, and Martin Seeleib-Kaiser. 2011. "Business, skills and the welfare state: the political economy of employment-oriented family policy in Britain and Germany." *Journal of European Social Policy* no. 21 (2):136-149.
- Freeman, Brigid, Simon Marginson, and Russell Tytler. 2014. *The age of STEM: educational policy and practice across the world in science, technology, engineering and mathematics*. New York: Routledge.

- FSB. 2011. FSB plea to save the Graduate Internship Scheme. London: Federation of Small Businesses.
- FTMV. 2004. 10 Thesen des Fakultätentags für Maschinenbau und Verfahrenstechnik zur Bachelor-Master-Struktur in Deutschland. Paderborn: Fakultätentag für Maschinenbau und Verfahrenstechnik.
- Fuller, Alison, and Lorna Unwin. 2003. "Learning as apprentices in the contemporary UK workplace: creating and managing expansive and restrictive participation." *Journal of Education and work* no. 16 (4):407-426.
- Gallup. 2007. Perceptions of Higher Education Reforms. In *Flash Eurobarometer*. Brussels: European Commission.
- Gallup. 2009. Students and Higher Education Reform. In *Flash Eurobarometer*. Brussels: European Commission.
- Gallup. 2010. Employers' Perception of Graduate Employability. In *Flash Eurobarometer*. Brussels: European Commission.
- Garritzmann, Julian L. 2015. "Attitudes towards student support: How positive feedback-effects prevent change in the Four Worlds of Student Finance." *Journal of European Social Policy* no. 25 (2):139-158.
- Garritzmann, Julian L. 2016. *The Political Economy of Higher Education Finance: The Politics of Tuition Fees and Subsidies in OECD Countries, 1945–2015*. Basingstoke: Palgrave Macmillan.
- Gerring, John. 2008. "Case selection for case-study analysis: Qualitative and quantitative techniques." In *The Oxford handbook of political methodology*, edited by Janet M Box-Steffensmeier, Henry E Brady and David Collier, 645-684. New York: Oxford University Press.
- Gieysztor, Aleksander. 1992. "Management and resources." In *A History of the University in Europe*, edited by Hilde de Ridder-Symoens, 108-143. New York: Cambridge University Press.
- Gillman, Barbara. 2006. "Wirtschaft mahnt Unis zur Eile." *Handelsblatt*, 31 May 2006.
- Gillmann, Barbara. 2006. "Wirtschaft mahnt Unis zur Eile." *Handelsblatt*, 31 May 2006.
- Gillmann, Barbara. 2015. "Großes Interesse an den Ingenieurfächern." *Handelsblatt*, 12 March 2015.
- Ginsberg, Benjamin. 2011. *The fall of the faculty*. New York: Oxford University Press.
- Gleeson, Denis, and Ewart Keep. 2004. "Voice without accountability: the changing relationship between employers, the State and education in England." *Oxford Review of Education* no. 30 (1):37-63.
- Goedegebuure, Leo CJ. 1992. "Grapes, grain and grey cats: binary dynamics in Dutch higher education." *European Journal of Education* no. 27 (1/2):57-68.
- Goglio, Valentina, and Marino Regini. 2017. "Processes and stages of differentiation in European higher education." *Higher Education Quarterly* no. 71 (4):320-337.
- Goldstein, Judith, and Robert Owen Keohane. 1993. *Ideas and foreign policy: beliefs, institutions, and political change*. Ithaca: Cornell University Press.
- Graf, Lukas. 2013. *The hybridization of vocational training and higher education in Austria, Germany, and Switzerland*. Opladen, Berlin and Toronto: Budrich UniPress.
- Graf, Lukas. 2014. Growing in a Niche Dual Study Programs Contribute to Change in Germany's Higher Education. Berlin: Wissenschaftszentrum Berlin für Sozialforschung.
- Graf, Lukas. 2017. "Combined Modes of Gradual Change: The Case of Academic Upgrading and Declining Collectivism in German Skill Formation." *Socio-Economic Review*. Advance online publication. DOI: 10.1093/ser/mww044.
- Green, Andy. 1999a. "East Asian skill formation systems and the challenge of globalisation." *Journal of Education and Work* no. 12 (3):253-279.

- Green, Andy. 1999b. "Education and globalization in Europe and East Asia: convergent and divergent trends." *Journal of education policy* no. 14 (1):55-71.
- Green, Andy, and Akiko Sakamoto. 2001. "Models of high skills in national competition strategies." In *High skills: Globalization, competitiveness, and skill formation*, edited by Philip Brown, Andy Green and Hugh Lauder, 56-160. New York: Oxford University Press.
- Green, Christopher. 2015. "Internationalization, Deregulation and the Expansion of Higher Education in Korea: An Historical Overview." *International Journal of Higher Education* no. 4 (3):1-13.
- Green, Francis, Donna James, David Ashton, and Johnny Sung. 1999. "Post-school education and training policy in developmental states: the cases of Taiwan and South Korea." *Journal of Education Policy* no. 14 (3):301-315.
- Greenwood, Maggie, Brenda Little, Eddie Burch, Carol Collins, Maki Kimura, and Karen Yarrow. 2008. Report to Foundation Degree Forward on the Impact of Foundation Degrees on Students and the Workplace. London: Centre for Higher Education Research and Information The Open University and Learning and Skills Netowrk.
- Grubb, W Norton. 1985. "The convergence of educational systems and the role of vocationalism." *Comparative education review* no. 29 (4):526-548.
- Grubb, W Norton, and Marvin Lazerson. 2006. "The globalization of rhetoric and practice: The education gospel and vocationalism." In *Education, globalization and social change*, edited by Hugh Lauder, Phillip Brown, Jo Anne Dillabough and Albert Henry Halsey, 295-307. New York: Oxford University Press.
- Guri-Rosenblit, Sarah, Helena Šebková, and Ulrich Teichler. 2007. "Massification and diversity of higher education systems: Interplay of complex dimensions." *Higher Education Policy* no. 20 (4):373-389.
- GWK. 2007. Verwaltungsvereinbarung zwischen Bund und Ländern über den Hochschulpakt 2020. Bonn: Gemeinsame Wissenschaftskonferenz.
- GWK. 2016. Hochschulpakt 2020 Bericht zur Umsetzung im Jahr 2014. Bonn: Gemeinsame Wissenschaftskonferenz.
- Hacker, Jacob S. 2005. "Policy drift: The hidden politics of US welfare state retrenchment." In *Beyond continuity: Institutional change in advanced political economies*, edited by Wolfgang Streeck and Kathleen Thelen, 40-82. Oxford: Oxford University Press.
- Hall, Peter A. 1989. *The political power of economic ideas: Keynesianism across nations*. Princeton: Princeton University Press.
- Hall, Peter A. 1993. "Policy paradigms, social learning, and the state: the case of economic policymaking in Britain." *Comparative politics* no. 26:275-296.
- Hall, Peter A. 2003. "Aligning ontology and methodology in comparative research." In *Comparative historical analysis in the social sciences*, edited by James Mahoney and Dietrich Rueschemeyer, 330-359. New York: Cambridge University Press.
- Hall, Peter A. 2015. How Growth Regimes Evolve in the Developed Democracies. In *22nd International Conference of Europeanists*. Paris.
- Hall, Peter A, and Daniel W Gingerich. 2009. "Varieties of Capitalism and Institutional Complementarities in The Political Economy: An Empirical Analysis." *British Journal of Political Science* no. 39 (03):449-482.
- Hall, Peter A, and David Soskice. 2001. "An Introduction to Varieties of Capitalism." In *Varieties of capitalism: The institutional foundations of comparative advantage*, edited by Peter A Hall and David Soskice, 1-68. Oxford and New York: Oxford University Press.

- Hall, Peter A, and Kathleen Thelen. 2009. "Institutional change in varieties of capitalism." *Socio-Economic Review* no. 7 (1):7-34.
- Halpin, David, and Barry Troyna. 1995. "The politics of education policy borrowing." *Comparative Education* no. 31 (3):303-310.
- Hanbat National University. 2016. Industry-university cooperation strategy. Daejeon: Hanbat National University.
- Hancké, Bob. 2009. *Intelligent research design: a guide for beginning researchers in the social sciences*. New York: Oxford University Press.
- Hancké, Bob, Martin Rhodes, and Mark Thatcher. 2007. *Beyond Varieties of Capitalism: Conflict, Contradictions, and Complementarities in the European Economy*. Oxford: Oxford University Press.
- Hansen, Kirstine, and Anna Vignoles. 2005. "The United Kingdom education system in a comparative context." In *What's the Good of Education*, edited by Stephen Machin and Anna Vignoles, 13-35. London: Centre for Economic Performance.
- Hanyang University. 2014. LINC, a Step towards Industry-University Cooperation.
- Harvey, Lee. 2009. Review of research literature focussed on Foundation degrees. London: Foundation Degree Forward.
- Hassel, Anke, and Bruno Palier. 2017. Growth and Welfare in Global Capitalism. In *RC19 Annual Conference*. Chapel Hill.
- Haynes, Lyn. 2008. Studying STEM: what are the barriers? Stevenage: The Institution of Engineering and Technology.
- Hazelkorn, Ellen. 2015. *Rankings and the Reshaping of Higher Education: the Battle for World Wide Excellence*. New York: Palgrave Macmillan.
- Heclo, Hugh. 1974. *Modern social politics in Britain and Sweden: From relief to income maintenance*. New Haven and London: Yale University Press.
- HEFCE. 2000. Foundation degree prospectus. London: Higher Education Funding Council for England.
- Hemerijck, Anton. 2015. "The quiet paradigm revolution of social investment." *Social Politics* no. 22 (2):242-256.
- Hemerijck, Anton, ed. 2017. *The uses of social investment*. Oxford: Oxford University Press.
- HESA. 2016. Destinations of Leavers from Higher Education in the United Kingdom for the academic year 2014/15. London: Office for National Statistics.
- Hibbs, Douglas A. 1977. "Political parties and macroeconomic policy." *American political science review* no. 71 (4):1467-1487.
- hlb. 2015. Hochschulelehrerbund hlb fordert die Beteiligung der Fachhochschulen/Hochschulen für angewandte Wissenschaften an der Exzellenzinitiative 2017 In *Hochschulelehrerbund*. Bonn.
- Hoareau McGrath, Cecile, Marie Louise Henham, Anne Corbett, Niccolo Durazzi, Michael Frearson, Barbara Janta, Bregtje W Kamphuis, Eriko Katashiro, Nina Brankovic, and Benoit Guerin. 2014. Higher education entrance qualifications and exams in Europe: a comparison. Brussels: European Parliament.
- Hope, David. 2016. *The political economy of growth models and macroeconomic imbalances in advanced democracies*, London School of Economics and Political Science, London.
- Hope, David, and David Soskice. 2016. "Growth Models, Varieties of Capitalism, and Macroeconomics." *Politics & Society* no. 44 (2):209-226.
- House of Commons. 2003. Education and Skills - Fifth Report. London: House of Commons.
- House of Commons. 2011. Government reform of Higher Education Volume I. London: House of Commons.
- House of Commons. 2012. Apprenticeships Volume III. London: House of Commons.

- House of Lords. 2012. Higher Education in Science, Technology, Engineering and Mathematics (STEM) subjects. edited by Select Committee on Science and Technology. London: House of Lords.
- HRK. 2013. Higher education institutions – active and involved Strong in research, involved in practice, active in society. Bonn: Hochschulrektorenkonferenz.
- HRK. 2015. *Implementing Bologna structures and principles in German universities* n.d. [visited 25 November 2015]. Available from <http://www.hrk.de/activities/bologna-process>.
- Huh, Ryun-jung, and Ye-ju Lim. 2016. Conflict over PRIME project occurs between students and authorities. Seoul: Ewha Womans University English Newspaper.
- Huisman, Jeroen, and Franciscus Kaiser. 2001. *Fixed and fuzzy boundaries in higher education. A comparative study of (binary) structures in nine countries*. Den Haag: Adviesraad voor het Wetenschaps.
- Humburg, Martin, and Rolf van der Velden. 2013. "A note on skill formation in higher education." In *The state of higher education 2013*, edited by Anna Glass, 87-91. Paris: OECD.
- Hüther, Otto. 2009. "Hochschulräte als Steuerungsakteure." *Beiträge zur Hochschulforschung* no. 31 (2):50-73.
- Hüther, Otto , and Georg Krücken. 2014. "The Rise and Fall of Student Fees in a Federal Higher Education System: the case of Germany." In *Students, markets and social justice: higher education fee and student support policies in Western Europe and beyond*, edited by Hubert Ertl and Claire Dupuy, 85-110. Oxford: Symposium Books.
- Ibsen, Christian Lyhne, and Kathleen Thelen. 2017. "Diverging Solidarity: Labor Strategies in the New Knowledge Economy." *World Politics* no. 69 (3):1-39.
- IHK Berlin. 2015. Berlin's Economy in Figures. Berlin: Industrie- und Handelskammer zu Berlin.
- Ihm, Chon Sun. 1999. "The dynamics of implementing VET reform and lifelong learning in Korea." *Journal of Education and Work* no. 12 (3):309-321.
- Iversen, Torben. 2005. *Capitalism, democracy, and welfare*. New York: Cambridge University Press.
- Iversen, Torben, and David Soskice. 2001. "An asset theory of social policy preferences." *American Political Science Review* no. 95 (4):875-894.
- Iversen, Torben, and David Soskice. 2015. "Democratic limits to redistribution: inclusionary versus exclusionary coalitions in the knowledge economy." *World Politics* no. 67 (2):185-225.
- Iversen, Torben, and Anne Wren. 1998. "Equality, employment, and budgetary restraint: the trilemma of the service economy." *World politics* no. 50 (4):507-546.
- Jackson, Denise. 2012. "Business undergraduates' perceptions of their capabilities in employability skills Implications for industry and higher education." *Industry and higher education* no. 26 (5):345-356.
- Jackson, Gregory, and Richard Deeg. 2012. "The long-term trajectories of institutional change in European capitalism." *Journal of European Public Policy* no. 19 (8):1109-1125.
- Jackson, Gregory, and Arndt Sorge. 2012. "The Trajectory of Institutional Change in Germany, 1979–2009." *Journal of European Public Policy* no. 19 (8):1146-1167.
- Jacobs, Alan M, and R Kent Weaver. 2015. "When Policies Undo Themselves: Self-Undermining Feedback as a Source of Policy Change." *Governance* no. 28 (4):441-457.
- Jakobi, Anja P, Kerstin Martens, and Klaus Dieter Wolf, eds. 2009. *Education in Political Science: Discovering a neglected field*. Oxon: Routledge.

- Jeong, Jooyeon. 1995. "The failure of recent state vocational training policies in Korea from a comparative perspective." *British Journal of Industrial Relations* no. 33 (2):237-252.
- Jong, Simcha. 2012. "Academia's Place in European Capitalist Systems and the Conservative Reform Movement." In *Economy and Society in Europe: A Relationship in Crisis*, edited by Luigi Burrioni, Martin Keune and Guglielmo Meardi, 81-99. Cheltenham: Edward Elgar.
- Jongbloed, Ben. 2003. "Marketisation in higher education, Clark's triangle and the essential ingredients of markets." *Higher education quarterly* no. 57 (2):110-135.
- Jongbloed, Ben, Jürgen Enders, and Carlo Salerno. 2008. "Higher education and its communities: Interconnections, interdependencies and a research agenda." *Higher education* no. 56 (3):303-324.
- Kariya, Takehiko. 2011. "Credential inflation and employment in 'universal' higher education: enrolment, expansion and (in) equity via privatisation in Japan." *Journal of Education and Work* no. 24 (1-2):69-94.
- Karsten, Sjoerd. 1999. "Neoliberal education reform in the Netherlands." *Comparative education* no. 35 (3):303-317.
- KEDI. 2006. OECD Thematic Review of Tertiary Education Country Background Report for Korea. Seoul: Korean Educational Development Institute.
- KEDI. 2015. Brief Statistics on Korean Education. Seoul: Korean Educational Development Institute.
- Keep, Ewart. 1999. "UK's VET Policy and the 'Third Way': following a high skills trajectory or running up a dead end street?" *Journal of education and work* no. 12 (3):323-346.
- Keep, Ewart. 2014. "The role of higher education within broader skills policies, a comparison of emerging Scottish and English approaches." *Higher Education Quarterly* no. 68 (3):249-266.
- Keep, Ewart, and Ken Mayhew. 1996. "Economic Demand for Higher Education—A Sound Foundation for Further Expansion?" *Higher Education Quarterly* no. 50 (2):89-109.
- Keep, Ewart, and Ken Mayhew. 2010. "Moving beyond skills as a social and economic panacea." *Work, Employment & Society* no. 24 (3):565-577.
- Keep, Ewart, Ken Mayhew, and Jonathan Payne. 2006. "From skills revolution to productivity miracle—not as easy as it sounds?" *Oxford review of economic policy* no. 22 (4):539-559.
- KEF. 2005. 2005 Survey on surplus and shortage of the workforce. Seoul: Korea Employers Federation.
- KEF. 2006. Survey on Recruitment of Entry-level University Graduates. Seoul: Korea Employers Federation.
- Kehm, Barbara M, and Ulrich Teichler. 1995. "Higher education and employment." *European journal of education* no. 30 (4):407-422.
- Kim, Gwang-Jo. 2002. Education policies and reform in South Korea. Paper read at UNESCO/BREDA-World Bank Regional Workshop, at Mauritius.
- Kim, Juhu, Jong-gak Lee, and Soo-kwang Lee. 2005. "Understanding of education fever in Korea." *KEDI Journal of Educational Policy* no. 2 (1):7-15.
- Kim, Sunwoong, and Ju-Ho Lee. 2006. "Changing facets of Korean higher education: Market competition and the role of the state." *Higher education* no. 52 (3):557-587.
- Kim, Terri. 2013. "The (Un)changing Relationship between the State and Higher Education in South Korea: some surprising continuities." In *Higher education and the state: Changing relationships in Europe and East Asia*, edited by Roger Goodman, Takehiko Kariya and John Taylor, 235-260. Oxford: Symposium Books.

- King, Conrad. 2010. Higher Education Policy Regimes: Policy Design for Germany and the United Kingdom, 1997-2004. In *8th ECSA-C Biennial Conference*. Victoria, BC.
- Kivinen, Osmo, and Jouni Nurmi. 2003. "Unifying higher education for different kinds of Europeans. Higher education and work: a comparison of ten countries." *Comparative Education* no. 39 (1):83-103.
- KMK. 2003. 10 Thesen zur Bachelor- und Masterstruktur in Deutschland. Berlin: Kultusministerkonferenz.
- KMU. 2011. [LINC] Selected as Outstanding University for Specialization Area Investment and Field-oriented Operation. Seoul: Kookmin University.
- Kogan, Maurice, and Stephen Hanney. 2000. *Reforming higher education*. London: Jessica Kingsley Publishers.
- Korea JoongAng Daily. 2015. SNU at No. 1 in university survey. 7 November 2015.
- Korpi, Walter. 2006. "Power resources and employer-centered approaches in explanations of welfare states and varieties of capitalism: Protagonists, consenters, and antagonists." *World Politics* no. 58 (02):167-206.
- Kottmann, Andrea, and Egbert De Weert. 2013. Higher Education and the Labour Market. The Hague: Dutch Ministry of Education, Culture and Science (OCW).
- Kupfer, Franziska, and Andrea Stertz. 2011. Dual courses of study - the supply and demand situation. In *BWP Special Edition 2011*. Bonn: Bundesinstitut für Berufsbildung.
- Kwon, Ki-Seok. 2015. "Evolution of Universities and Government Policy: the case of South Korea." *Asian Journal of Innovation and Policy* no. 4 (1):103-127.
- Kyvik, Svein. 2004. "Structural changes in higher education systems in Western Europe." *Higher education in Europe* no. 29 (3):393-409.
- Lauder, Hugh, Phillip Brown, and David Ashton. 2008. "Globalisation, Skill Formation and the Varieties of Capitalism Approach." *New Political Economy* no. 13 (1):19-35.
- Le Grand, Julian, and Will Bartlett. 1993. "Quasi-markets and social policy: the way forward?" In *Quasi-markets and social policy*, edited by Julian Le Grand and Will Bartlett, 202-220. London: Palgrave Macmillan.
- Lee, Chong Jae. 2005. "Korean education fever and private tutoring." *KEDI Journal of Educational Policy* no. 2 (1):99-107.
- Lee, Jae-won, and Hee-jin Byeon. 2016. The PRIME project is now of prime importance to universities. *The Argus*.
- Lee, Jeong-Kyu. 2006. "Educational Fever and South Korean Higher Education." *Revista Electronica de Investigacion Educativa (REDIE)* no. 8 (1):1-14.
- Lee, Ju-Ho, ed. 2013. *Positive Changes*. Seoul: Korea Economic Daily & Business Publications Inc.
- Lee, So-young. 2016. "Blinded by CORE " *The Granite Tower*.
- Leuze, Kathrin. 2010. *Smooth path or long and winding road? How institutions shape the transition from higher education to work*. Leverkusen-Opladen: Budrich UniPress.
- Leuze, Kathrin. 2011. "How structure signals status: institutional stratification and the transition from higher education to work in Germany and Britain." *Journal of Education and Work* no. 24 (5):449-475.
- Lohmar, Brigitte, and Thomas Eckhardt. 2015. The Education System in the Federal Republic of Germany 2013/2014. Bonn: Secretariat of the Standing Conference of the Ministers of Education and Cultural Affairs of the Lander in the Federal Republic of Germany.
- Lorenz, Chris FG. 2006. "Will the Universities Survive the European Integration? Higher Education Policies in the EU and in the Netherlands before and after the Bologna Declaration." *Sociologia Internationalis* no. 44 (1):123-153.

- Lynch, Kathleen. 2006. "Neo-liberalism and Marketisation: the implications for higher education." *European educational research journal* no. 5 (1):1-17.
- Maassen, Peter, Eli Moen, and Bjørn Stensaker. 2011. "Reforming higher education in the Netherlands and Norway: The role of the state and national modes of governance." *Policy Studies* no. 32 (5):479-495.
- Mabbett, Deborah. 2016. "The Minimum Wage in Germany: What Brought the State in?" *Journal of European Public Policy* no. 23 (8):1240-1258.
- MacGregor, Karen. 2013. "A higher education avalanche is coming, says new report." *University World News*, 16 March 2013.
- Mahoney, James, and Kathleen Thelen. 2009. *Explaining institutional change: ambiguity, agency, and power*. New York: Cambridge University Press.
- Marginson, Simon. 1997. "Steering from a distance: Power relations in Australian higher education." *Higher education* no. 34 (1):63-80.
- Marginson, Simon. 2006. "Dynamics of national and global competition in higher education." *Higher education* no. 52 (1):1-39.
- Marginson, Simon. 2007. "Global university rankings: Implications in general and for Australia." *Journal of Higher Education Policy and Management* no. 29 (2):131-142.
- Marginson, Simon. 2009. *The knowledge economy and higher education: Rankings and classifications, research metrics and learning outcomes measures as a system for regulating the value of knowledge*. Paris: OECD Publishing.
- Marginson, Simon, and Mark Considine. 2000. *The enterprise university: Power, governance and reinvention in Australia*. New York: Cambridge University Press.
- Marginson, Simon, and Gary Rhoades. 2002. "Beyond national states, markets, and systems of higher education: A glonacal agency heuristic." *Higher education* no. 43 (3):281-309.
- Marginson, Simon, and Marijk van der Wende. 2007. "Globalisation and higher education." *OECD Education Working Papers* no. No. 8, OECD Publishing.
- Martin, Cathie Jo, and Kathleen Thelen. 2007. "The state and coordinated capitalism: Contributions of the public sector to social solidarity in postindustrial societies." *World Politics* no. 60 (1):1-36.
- Mason, Geoff, Gareth Williams, and Sue Cranmer. 2009. "Employability skills initiatives in higher education: what effects do they have on graduate labour market outcomes?" *Education Economics* no. 17 (1):1-30.
- Mayer, Karl Ulrich, and Heike Solga. 2008. *Skill formation*. Cambridge and New York: Cambridge University Press.
- Mazzucato, Mariana. 2015a. "Building the entrepreneurial state: A new framework for envisioning and evaluating a mission-oriented public sector." *Working Paper, Levy Economics Institute* (No. 824).
- Mazzucato, Mariana. 2015b. *The entrepreneurial state: Debunking public vs. private sector myths*. London: Anthem Press.
- Mazzucato, Mariana. 2016. "From market fixing to market-creating: a new framework for innovation policy." *Industry and Innovation* no. 23 (2):140-156.
- McNair, Stephen. 1995. "Editorial." *Education+ Training* no. 37 (9):3.
- MOE. 2013. National Education Policy for 2013. edited by Ministry of Education. Seoul: Ministry of Education.
- MOE. 2015a. Happy Education for All Creative Talen Shapes the Future. edited by Ministry of Education. Seoul.
- MOE. 2015b. Stakeholders Engagement in Skills Development in Korea. edited by Ministry of Education. Seoul.
- MOE. 2016. Happy Education for All Creative Talent Shapes the Future. Seoul: Ministry of Education.

- MOE. 2017. *Higher Education*. Ministry of Education n.d. [visited 2 February 2017]. Available from <https://www.moe.go.kr/sub/info.do?m=050103&cs=english>.
- MOEHRD. 2005. Brain Korea 21. Seoul: Ministry of Education & Human Resources Development.
- MOEST. 2009a. Major Policies and Plans for 2010. Seoul: Ministry of Education, Science and Technology.
- MOEST. 2009b. Major Policies to Enhance the Competitive Strength of Korean Higher Education. Seoul: Ministry of Education, Science and Technology Development.
- MOEST. 2011. Major Policies and Plans for 2011. Seoul: Ministry of Education, Science and Technology.
- Moore, Phoebe V. 2010. *The international political economy of work and employability*. Basingstoke: Palgrave Macmillan.
- Morel, Nathalie, Bruno Palier, and Joakim Palme, eds. 2012. *Towards a social investment welfare state?* Bristol: Policy Press.
- Morley, Louise. 2001. "Producing new workers: quality, equality and employability in higher education." *Quality in Higher Education* no. 7 (2):131-138.
- MOSF. 2012. 2013 Budget Proposal. Seoul: Ministry of Strategy and Finance.
- MOSF. 2014. From school to work: measures to increase young adult employment. Seoul: Ministry of Strategy and Finance.
- MOSF. 2015a. Government Announces Comprehensive Measures For Youth Employment. Seoul: Ministry of Strategy and Finance.
- MOSF. 2015b. Government announces comprehensive measures for youth unemployment. Seoul: Ministry of Strategy and Finance.
- MOSF. 2015c. Government to continue to work on major reforms. Seoul: Ministry of Strategy and Finance.
- MOSF. 2016a. Personal correspondence on LINC with civil servant at the Ministry of Strategy and Finance, 19 December 2016.
- MOSF. 2016b. Personal correspondence on PRIME with civil servant at the Ministry of Strategy and Finance, 16 December 2016.
- Müller, Walter, and Marita Jacob. 2008. "Qualifications and the returns to training across the life course." In *Skill Formation*, edited by Karl Ulrich Mayer and Heike Solga, 126-172. New York: Cambridge University Press.
- Musselin, Christine. 2011. "Convergences and divergences in steering higher education systems." In *Handbook on globalization and higher education*, edited by Roger King, Simon Marginson and Rajani Naidoo, 454-468. Cheltenham: Edward Elgar.
- Neave, Guy. 1995. "On living in interesting times: higher education in Western Europe 1985-1995." *European Journal of Education* no. 30 (4):377-393.
- Neave, Guy. 2000. "The Universities' Responsibilities to Society: International Perspectives. ." *Issues in Higher Education Series*.
- Neave, Guy, and Gary Rhoades. 1987. "The academic estate in Western Europe." In *The academic profession*, edited by Burton R Clark, 211-270. Berkeley: University of California Press.
- Neave, Guy, and Frans A Van Vught. 1994. "Government and Higher Education Relationships across Three Continents: The Winds of Change." *Issues in Higher Education*.
- Nikolai, Rita. 2012. "Towards social investment? Patterns of public policy in the OECD world." In *Towards a social investment welfare state*, edited by Nathalie Morel, Bruno Palier and Joakim Palme, 91-115. Bristol: Policy Press.
- OECD. 1987. Universities under scrutiny. Paris: Organisation for Economic Co-operation and Development.

- OECD. 2004. *Innovation in the knowledge economy : implications for education and learning*. Paris: Organisation for Economic Co-operation and Development.
- OECD. 2005. *The Measurement of Scientific and Technological Activities: Guidelines for Collecting and Interpreting Innovation Data*. Paris: Organisation for Economic Co-operation and Development.
- OECD. 2008. *Tertiary Education for the Knowledge Society*. Paris: Organisation for Economic Co-operation and Development.
- OECD. 2009. *OECD Reviews of Innovation Policy: Korea 2009*. Paris: Organisation for Economic Co-operation and Development.
- OECD. 2011. Indicator B5: How Much Do Tertiary Students Pay and What Public Subsidies Do They Receive?, in *Education at a Glance 2011*. In *OECD Indicators*. Paris: Organisation for Economic Co-operation and Development.
- OECD. 2012a. *Better Skills, Better Jobs, Better Lives: A Strategic Approach to Skills Policies*. Paris: Organisation for Economic Co-operation and Development.
- OECD. 2012b. Country Note KOREA In *Education at a Glance: OECD Indicators 2012*. Paris: Organisation for Economic Cooperation and Development.
- OECD. 2012c. Is increasing private expenditure, especially in tertiary education, associated with less public funding and less equitable access? Paris: Organisation for Economic Cooperation and Development.
- OECD. 2014. *Education at a Glance: OECD Indicators*.
- OECD. 2015. *Youth, Skills and Employability*. Paris: Organisation for Economic Co-operation and Development.
- OECD. 2016. How much do tertiary students pay and what public support do they receive? In *EDUCATION INDICATORS IN FOCUS*. Paris: OECD Publishing.
- OECD. 2017. *Social Expenditure: Aggregated data*.
- Oesch, Daniel. 2013. *Occupational change in Europe: how technology and education transform the job structure*. Oxford: Oxford University Press.
- Oesch, Daniel, and Jorge Rodríguez Menés. 2010. "Upgrading or polarization? Occupational change in Britain, Germany, Spain and Switzerland, 1990–2008." *Socio-Economic Review* no. 9 (3):503-531.
- OFS. 2018. *The Teaching Excellence Framework: A short guide to the 2018 onwards*. Bristol: Office for Students.
- Olsen, Johan P. 2007. "The institutional dynamics of the European university." In *University dynamics and European integration*, edited by Peter A Maassen and Johan P Olsen, 25-54. Dordrecht: Springer.
- Olssen, Mark, and Michael A Peters. 2005. "Neoliberalism, higher education and the knowledge economy: from the free market to knowledge capitalism." *Journal of Education Policy* no. 20 (3):313-345.
- Osborne, Jonathan, Shirley Simon, and Sue Collins. 2003. "Attitudes towards science: A review of the literature and its implications." *International journal of science education* no. 25 (9):1049-1079.
- Palfreyman, David, and Ted Tapper. 2009. *Structuring Mass Higher Education: The Role of Elite Institutions*. Abingdon: Routledge.
- Palier, Bruno, and Kathleen Thelen. 2010. "Institutionalizing Dualism: Complementarities and Change in France and Germany." *Politics & Society* no. 38 (1):119-148.
- Park, Hannah. 2013a. *Education in South Korea*. New York: World Education Services.
- Park, Hannah. 2016. *PRIME: Massive Government Subsidy Seeks to Reshape Higher Education in Korea*. New York: World Education Services.

- Park, Heejin, Jeung Yun Choi, Jong Hyeok Yun, and Jae-Eun Chae. 2015. *Skills for Work: The Development and Expansion of the Higher Education Sector in the Republic of Korea*. Washington DC: Inter-American Development Bank.
- Park, Insub. 2007. "The labour market, skill formation and training in the 'post-developmental' state: the example of South Korea." *Journal of Education and Work* no. 20 (5):417-435.
- Park, Sang-Young. 2010. "Crafting and dismantling the egalitarian social contract: The changing state-society relations in globalizing Korea." *The Pacific Review* no. 23 (5):579-601.
- Park, Sang-Young. 2013b. "The political and institutional basis of Korea's skill formation system." *Journal of Education and Work* no. 26 (3):291-308.
- Parsons, Craig. 2007. *How to map arguments in political science*. New York: Oxford University Press.
- Pechar, Hans. 2012. "The Decline of an Academic Oligarchy. The Bologna Process and 'Humboldt's Last Warriors'." In *European Higher Education at the Crossroads*, edited by Adrian Curaj, Peter Scott, Lazar Vlasceanu and Lesley Wilson, 613-630. Dordrecht: Springer.
- Perotti, Loris. 2011. "The Netherlands: a difficult marketization." In *European universities and the challenge of the market: A comparative analysis*, edited by Marino Regini, 117-131. Cheltenham: Edward Elgar Publishing.
- Peters, Michael A. 2003. "Classical Political Economy and the Role of Universities in the New Knowledge Economy." *Globalisation, Societies and Education* no. 1 (2):153-168.
- Pierson, Paul. 1993. "When effect becomes cause: Policy feedback and political change." *World Politics* no. 45 (4):595-628.
- Pierson, Paul. 1995. *Dismantling the welfare state?: Reagan, Thatcher and the politics of retrenchment*. New York: Cambridge University Press.
- Pike, Andy, Neil Lee, Danny MacKinnon, Louise Kempton, and Yohan Iddawela. 2017. *Job creation for inclusive growth in cities*. York: Joseph Rowntree Foundation.
- Powell, Justin JW, Lukas Graf, Nadine Bernhard, Laurence Coutrot, and Annick Kieffer. 2012. "The shifting relationship between vocational and higher education in France and Germany: towards convergence?" *European Journal of Education* no. 47 (3):405-423.
- Powell, Justin JW, and Heike Solga. 2010. "Analyzing the nexus of higher education and vocational training in Europe: a comparative-institutional framework." *Studies in Higher Education* no. 35 (6):705-721.
- Powell, Justin JW, and Heike Solga. 2011. "Why are Higher Education Participation Rates in Germany so Low? Institutional Barriers to Higher Education Expansion." *Journal of Education and Work* no. 24 (1-2):49-68.
- Pratt, John. 1992. "Unification of higher education in the United Kingdom." *European Journal of Education* no. 27 (1/2):29-44.
- Pratt, John, ed. 2004. *The 'Accreditation' Model: Policy transfer in higher education in Austria and Britain*. Oxford: Symposium Books.
- Pratt, John. 2008. UK: End of the British binary system. *University World News*.
- Pritchard, Rosalind. 2011. *Neoliberal Developments in Higher Education: The United Kingdom and Germany*. Oxford: Peter Lang.
- Prokou, Eleni. 2008. "The emphasis on employability and the changing role of the university in Europe." *Higher Education in Europe* no. 33 (4):387-394.
- Ra, Young-Sun, and Kyung Woo Shim. 2009. *The Korean case study: Past experience and new trends in training policies*. Washington DC: The World Bank.
- Radice, Hugo. 2013. "How we got here: UK higher education under neoliberalism." *ACME: An International Journal for Critical Geographies* no. 12 (2):407-418.

- Reay, Diane, Jacqueline Davies, Miriam David, and Stephen J Ball. 2001. "Choices of degree or degrees of choice? Class, 'race' and the higher education choice process." *Sociology* no. 35 (4):855-874.
- Reeve, Fiona, and Jim Gallacher. 2005. "Employer–university 'partnerships': a key problem for work-based learning programmes?" *Journal of Education and Work* no. 18 (2):219-233.
- Regan, Aidan, and Samuel Brazys. 2017. "Celtic Phoenix or Leprechaun Economics? The Politics of an FDI-led Growth Model in Europe." *New Political Economy* no. 23 (2):223-238.
- Regini, Marino. 2011a. "Conclusions: where are European universities going?" In *European universities and the challenge of the market: A comparative analysis*, edited by Marino Regini, 198-212. Cheltenham: Edward Elgar Publishing.
- Regini, Marino, ed. 2011b. *European universities and the challenge of the market: A comparative analysis*. Cheltenham: Edward Elgar Publishing.
- Regini, Marino. 2011c. "Introduction: European universities meet the market." In *European universities and the challenge of the market: A comparative analysis*, edited by Marino Regini, 1-8. Cheltenham: Edward Elgar Publishing.
- Reichert, Sybille. 2010. "The Intended and Unintended Effects of the Bologna Reforms." *Higher Education Management and Policy* no. 22 (1):1-20.
- Robertson, Susan L. 2005. "Re-imagining and rescripting the future of education : global knowledge economy discourses and the challenge to education systems." *Comparative Education* no. 41 (2):151-171.
- Rowley, Chris, and Kil-Sang Yoo. 2013. "Workforce development and skill formation in South Korea: a driving force in the Korean miracle." In *Workforce Development and Skill Formation in Asia*, edited by John Benson, Howard Gospel and Ying Zhu, 67-88. Oxon: Routledge.
- Russell Group. 2015. Russell Group submission to the House of Commons Sub-Committee on Education, Skills and the Economy – Apprenticeships Inquiry. London: Russell Group.
- Schimank, Uwe, and Stefan Lange. 2009. "Germany: A latecomer to new public management." In *University Governance*, edited by Catherine Paradeise, Emanuela Reale, Ivar Bleiklie and Ewan Ferlie, 51-75. Dordrecht: Springer.
- Schmidt, Vivien A. 2008a. "Discursive institutionalism: The explanatory power of ideas and discourse." *Annual Review of Political Science* no. 11:303-326.
- Schmidt, Vivien A. 2008b. "European Political Economy: Labour out, State Back in, Firm to the Fore." *West European Politics* no. 31 (1-2):302-320.
- Schmidt, Vivien A. 2010. "Taking ideas and discourse seriously: explaining change through discursive institutionalism as the fourth 'new institutionalism'." *European Political Science Review* no. 2 (1):1-25.
- Schmidt, Vivien A, and Claudio M Radaelli. 2004. "Policy change and discourse in Europe: Conceptual and methodological issues." *West European Politics* no. 27 (2):183-210.
- Schomburg, Harald, and Ulrich Teichler. 2007. *Higher education and graduate employment In Europe: Results from graduates surveys from twelve countries*. Vol. 15: Springer Science & Business Media.
- Schulze-Cleven, Tobias. 2015. "Liberalizing the Academy: The Transformation Of Higher Education In the United States and Germany." *Research & Occasional Paper Series University of Berkley, California* no. CSHE.1.15.
- Schulze-Cleven, Tobias. 2016. Higher Education Reloaded: Studying the Politics of Institutional Change. In *EuropeNow*: Council for European Studies (CES).

- Schulze-Cleven, Tobias, and Jane R Olson. 2017. "Worlds of Higher Education Transformed: Toward Varieties of Academic Capitalism." *Higher Education* no. 73 (6):813-831.
- Schulze-Cleven, Tobias, Tilman Reitz, Jens Maesse, and Johannes Angermuller. 2017. "The new political economy of higher education: between distributional conflicts and discursive stratification." *Higher Education* no. 73 (6):795-812.
- Schweisfurth, Michele. 2012. "Beyond converging agendas in education." *Comparative Education* no. 48 (3):281-282.
- Seawright, Jason, and John Gerring. 2008. "Case selection techniques in case study research a menu of qualitative and quantitative options." *Political Research Quarterly* no. 61 (2):294-308.
- Seth, Michael J. 2005. Popular demand and education in South Korea: An historical overview. In *Profits and challenges of education in Korea*. Buenos Aires.
- Sharma, Yojana. 2012. "Universities must better prepare young people for labour market." *University World News*, 02 December 2012.
- Sharma, Yojana. 2013a. "A focus on skills increasingly links higher education with employment." *University World News*, 6th January 2013.
- Sharma, Yojana. 2013b. "A higher education avalanche is coming, says new report." *University World News*, 16 March 2013.
- Sharma, Yojana. 2014. "Universities and employability – Preparing for the demands of work." *University World News*, 05 September 2014.
- Shattock, Michael. 2012. *Making policy in British higher education 1945-2011*: McGraw-Hill Education (UK).
- Shaw, Claire. 2014. "Removing the cap on student numbers - six questions answered." *The Guardian*, 18th September 2014.
- Shin, Jung Cheol. 2012. "Higher education development in Korea: Western university ideas, Confucian tradition, and economic development." *Higher Education* no. 64 (1):59-72.
- Shin, Jung Cheol, and Robert K Toutkoushian. 2011. "The past, present, and future of university rankings." In *University rankings*, edited by Jung Cheol Shin, Robert K Toutkoushian and Ulrich Teichler, 1-16. Dordrecht: Springer.
- Slaughter, Sheila, and J. Taylor Barrett. 2016. "Introduction." In *Higher Education, Stratification, and Workforce Development*, edited by Sheila Slaughter and J. Taylor Barrett, 1-12. Dordrecht: Springer.
- Slaughter, Sheila, and Brendan Cantwell. 2012. "Transatlantic moves to the market: The United States and the European Union." *Higher Education* no. 63 (5):583-606.
- Slaughter, Sheila, and Larry L Leslie. 1997. *Academic capitalism: Politics, policies, and the entrepreneurial university*. Baltimore: The Johns Hopkins University Press.
- Slaughter, Sheila, and Gary Rhoades. 2004. *Academic capitalism and the new economy: Markets, state, and higher education*. Washington DC: JHU Press.
- Soskice, David. 1993. "Social skills from mass higher education: rethinking the company-based initial training paradigm." *Oxford Review of Economic Policy* no. 9 (3):101-113.
- Soskice, David. 1994. "Reconciling Markets and Institutions: The German Apprenticeship System." In *Training and the private sector: International comparisons*, edited by Lisa M. Lynch, 25-60. Chicago: University of Chicago Press.
- Soskice, David. 1999. "Divergent production regimes: coordinated and uncoordinated market economies in the 1980s and 1990s." In *Continuity and change in contemporary capitalism*, edited by Herbert Kitschelt, Peter Lange, Gary Marks and John D Stephens, 101-134. New York: Cambridge University Press.
- Spiezia, Vincenzo. 2016. "Jobs and skills in the digital economy." *OECD Observer*.

- Steedman, Hilary. 2012. Origins and recent development of higher level apprenticeship in England. In *Berufliche Erstausbildung im Tertiärbereich*. Bonn.
- Streeck, Wolfgang. 1991. "On the Institutional Conditions of Diversified Quality Production." In *Beyond Keynesianism*, edited by Wolfgang Streeck and Egon Matzner, 21-61. Aldershot: Edward Elgar.
- Streeck, Wolfgang. 1997a. "Beneficial constraints: on the economic limits of rational voluntarism." In *Contemporary capitalism: The embeddedness of institutions*, edited by Rogers J Hollingsworth and Robert Boyer, 197-219. New York: Cambridge University Press.
- Streeck, Wolfgang. 1997b. "German capitalism: does it exist? Can it survive?" *New political economy* no. 2 (2):237-256.
- Streeck, Wolfgang. 2009. *Re-forming Capitalism: Institutional Change in the German Political Economy*. Oxford: Oxford University Press.
- Streeck, Wolfgang. 2012. "Skills and Politics: General and Specific." In *The Political Economy of Collective Skill Formation*, edited by Marius R Busemeyer and Christine Trampusch, 317-352. New York: Oxford University Press.
- Streeck, Wolfgang, and Kathleen Thelen. 2005. *Beyond Continuity: Institutional Change in Advanced Political Economies*. Edited by Wolfgang Streeck and Kathleen Thelen. New York: Oxford University Press.
- Takayama, Keita. 2012. "Exploring the interweaving of contrary currents: Transnational policy enactment and path-dependent policy implementation in Australia and Japan." *Comparative Education* no. 48 (4):505-523.
- Tavoletti, Ernesto. 2010. "Matching higher education with the labour market in the knowledge economy The much-needed reform of university governance in Italy." *Industry and Higher Education* no. 24 (5):361-375.
- Teichler, Ulrich. 1989. "Government and curriculum innovation in the Netherlands." In *Governmental strategies and innovation in higher education*, edited by Frank A Van Vaught, 168-211. Bristol: Taylor and Francis.
- Teichler, Ulrich. 1996a. "Comparative higher education: potentials and limits." *Higher Education* no. 32 (4):431-465.
- Teichler, Ulrich. 1996b. "Diversity in higher education in Germany: The two-type structure." In *The Mockers and the Mocked: Comparative Perspectives on Differentiation, Convergence and Diversity in Higher Education*, edited by Lynn V Meek, Leo CJ Goedegebuure, Osmo Kivinen and Risto Rinne, 117-137. Oxford: Pergamon.
- Teichler, Ulrich. 1998. "The changing roles of the university and non-university sectors of higher education in Europe." *European Review* no. 6 (04):475-487.
- Teichler, Ulrich. 2003. "The future of higher education and the future of higher education research." *Tertiary Education and Management* no. 9 (3):171-185.
- Teichler, Ulrich. 2005. "Research on Higher Education in Europe." *European Journal of Education* no. 40 (4):447-469. doi: 10.1111/j.1465-3435.2005.00239.x.
- Teichler, Ulrich. 2006. "Changing Structures of the Higher Education Systems: The Increasing Complexity of Underlying Forces." *Higher Education Policy* no. 19 (4):447.
- The Chung-Ang Herald. 2016. PRIME Project; What Is a Pime University?
- The Economist. 2017. Growing competition between universities is changing student life. 25 February 2017.
- Thelen, Kathleen. 2004. *How Institutions Evolve: The Political Economy of Skills in Germany, Britain, the United States and Japan*. New York: Cambridge University Press.
- Thelen, Kathleen. 2007. "Contemporary Challenges to the German Vocational Training System." *Regulation & Governance* no. 1 (3):247-260.

- Thelen, Kathleen. 2014. *Varieties of Liberalization and the New Politics of Social Solidarity*. New York: Cambridge University Press.
- Thelen, Kathleen. forthcoming. "Transitions to the Knowledge Economy in Germany, Sweden and the Netherlands." *Comparative Politics*.
- Thelen, Kathleen, and Marius R Busemeyer. 2012. "Institutional change in German vocational training: From collectivism towards segmentalism." In *The political economy of collective skill formation*, edited by Marius R Busemeyer and Christine Trampusch, 68-100. Oxford: Oxford University Press.
- Toens, Katrin. 2009. "Modes of Governance in German Curricular Reform: Examining Transformative Change Before the Bologna Process." In *Governing Education. Rediscovering a Neglected Field for Political Science*, edited by Anja P Jakobi, Kerstin Martens and Klaus D Wolf, 73-87. Oxon: Routledge.
- Tolentino Frederiksen, Michael, and Milena Vuksanović. 2013. "Graduate employability and the social good." *University World News*, 13 July 2013.
- Trampusch, Christine. 2010. "Employers, the State and the Politics of Institutional Change: Vocational Education and Training in Austria, Germany And Switzerland." *European Journal of Political Research* no. 49 (4):545-573.
- Trow, Martin A. 1972. "The expansion and transformation of higher education." *International Review of Education* no. 18 (1):61-84.
- Trow, Martin A. 1974. Problems in the Transition from Elite to Mass Higher Education Policy for Higher Education. In *Organisation for Economic Co-operation and Development*. Paris.
- Trow, Martin A. 1976. "'Elite higher education': An endangered species?" *Minerva* no. 14 (3):355-376.
- Tsebelis, George. 2002. *Veto players: How political institutions work*. Princeton: Princeton University Press.
- TU9. 2014. Bachelor/Master Principles of Science Based Engineering Education in a Two Cycle System. Berlin: German Institutes of Technology.
- UKCES. 2013. OECD Review: Skills Beyond School Background Report for England. London: UK Commission for Employment and Skills.
- UNESCO. 2009. Education Indicators Technical Guidelines. Montreal: UNESCO Institute for Statistics.
- UNESCO. 2017. UIS.stat. Montreal: UNESCO Institute for Statistics.
- University Alliance. 2015. Mind the Gap: Engaging employers to secure the future of STEM in higher education. London: University Alliance.
- UUK. 2002. Enhancing employability, recognising diversity. London: Universities UK.
- UUK. 2016. University Funding Explained. London: Universities UK.
- Van de Graaff, John H, ed. 1978. *Academic Power. Patterns of Authority in Seven National Systems of Higher Education*. Santa Barbara: Praeger Publishers.
- van der Wende, Marijk. 2011. "Global institutions: The organization for economic co-operation and development." In *Handbook on globalization and higher education*, edited by Roger King, Simon Marginson and Naidoo Rajani, 95-113. Cheltenham: Edward Elgar.
- van Santen, Anna. 2014. *Varieties of Capitalism-Varieties of Degrees?: Undergraduate Education in Germany and the United States Compared*, Hertie School of Governance, Berlin.
- VDI. 2016. Ingenieurausbildung: Die Hochschulen „können“ Bologna. Düsseldorf: Verein Deutscher Ingenieure.
- Vincent-Lancrin, Stéphan, and Kiira Kärkkäinen. 2009. Higher Education to 2030, vol. 2, Globalisation. Paris: OECD Publishing.
- Warhurst, Chris. 2008. "The knowledge economy, skills and government labour market intervention." *Policy Studies* no. 29 (1):71-86.

- Welsh, Helga. 2010. "Higher Education in Germany: Fragmented Change Amid Paradigm Shifts." *German Politics and Society* no. 28 (2):53-70.
- Whitchurch, Celia. 2008. "Shifting identities and blurring boundaries: The emergence of third space professionals in UK higher education." *Higher Education Quarterly* no. 62 (4):377-396.
- Whiteley, Tim. 1995. "Enterprise in higher education-an overview from the Department for Education and Employment." *Education+ Training* no. 37 (9):4-8.
- Wilson, Tim. 2012. A review of business–university collaboration. London: Department for Business, Innovation and Skills.
- Winkel, Olaf. 2010. "Higher education reform in Germany: How the aims of the Bologna process can be simultaneously supported and missed." *International Journal of Educational Management* no. 24 (4):303-313.
- Wiß, Tobias. 2015. "From welfare states to welfare sectors: Explaining sectoral differences in occupational pensions with economic and political power of employees." *Journal of European Social Policy* no. 25 (5):489-504.
- Wissenschaftsrat. 2000. Theses for the Future Development of the System of Higher Education and Research in Germany. Cologne: Wissenschaftsrat.
- Witt, Michael A. 2012. South Korea: Plutocratic state-led capitalism reconfiguring. Singapore: INSEAD.
- Witte, Johanna. 2006. *Change of Degrees and Degrees of Change: Comparing Adaptations of European Higher Education Systems in the Context of the Bologna Process*, University of Twente, Twente.
- Witte, Johanna, Marijk Van der Wende, and Jeroen Huisman. 2008. "Blurring Boundaries: How the Bologna Process Changes the Relationship Between University and Non-University Higher Education in Germany, the Netherlands and France." *Studies in Higher Education* no. 33 (3):217-231.
- Wolter, Andrä, Caroline Kamm, Katharina Lenz, Peggy Renger, and Anna Spexard. 2014. Potenziale des dualen Studiums in den MINT-Fächern. München: acatech Deutsche Akademie der Technikwissenschaften.
- Woo, Cheonsik. 2002. Upgrading higher education in Korea Context and policy responses. Seoul: Korea Development Institute.
- Wren, Anne. 2013. "Introduction: The Political Economy of Post-Industrial Societies." In *The Political Economy of the Service Transition*, edited by Anne Wren, 1-70. New York: Oxford University Press.
- Yin, Robert K. 2003. *Case study research design and methods*. Thousand Oaks: SAGE.
- Yonezawa, Akiyoshi, and Terri Kim. 2008. "The Future of Higher Education in the Context of a Shrinking Student Population." In *Higher Education to 2030, Volume 1, Demography*, edited by OECD, 199-220. Paris: OECD Publishing.
- Yoon, Min-sik. 2015a. "Job-focused education policy stirs controversy." *The Korea Herald*.
- Yoon, Min-sik. 2015b. "Korea to let colleges swap quotas." *The Korea Herald*.
- Zgaga, Pavel. 2009. "Higher Education and Citizenship: 'the full range of purposes'." *European educational research journal* no. 8 (2):175-188.