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Higher Education in knowledge-based labour markets

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The Political Economy of High Skills: Higher Education in Knowledge-based Labour Markets

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Abstract

A successful transition into the knowledge economy depends upon higher level skills, creating unprecedented pressure on university systems to provide labour markets with the skills needed. But what are the political economy dynamics underlying national patterns of high skill formation? The article proposes a framework to theorise the relationship between higher education systems and knowledge-based labour markets based on two dimensions: the type of knowledge economy predominant in a given country and the extent of inter-university competition. 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 us understanding why some higher education systems are more open to satisfying labour market demands compared to others. A set of diverse country case studies (Britain, Germany, South Korea and the Netherlands) is employed to illustrate the theory.

Keywords

Knowledge economy; higher education; skill formation; institutional change; varieties of capitalism.

Introduction

Scholars have noted how the transition to the knowledge economy has prompted institutional changes across policy areas (Ibsen and Thelen 2017; Iversen and Soskice 2015a; Hall 2015; Hassel and Palier 2017; Baccaro and Pontusson 2016). In the transition, one of the chief challenges facing governments has been ‘how to cultivate the skills required for non-routine positions’ (Hall 2015, 26) and higher education has emerged as a central tool to tackle this challenge (Hall 2015, 29). In this context, universities have come increasingly under pressure from policy-makers and businesses to form the ‘new’ knowledge workers and to contribute to national economic competitiveness (OECD 2004, 2012).

Pressures to align higher education to the needs of knowledge-based labour markets have translated however into distinct national trajectories of institutional change. Firstly, universities have opposed this process in some countries (e.g. Germany) while they have accepted – or even driven – it in others (e.g. the UK). Secondly, governments intervened strongly in shaping the supply of high skills in some countries (e.g. in Japan and South Korea) while they refrained from doing so in others (e.g. in the UK). More broadly, research shows significant variation as to how the skill formation process unfolds across national higher education systems (De Weert 2011; Regini 2011).

What explains this variation? The article seeks to answer this question in three steps: firstly, it shows that existing theories fall short of compelling explanations; secondly, it proposes an alternative theory inspired by the emergence over the last two decades of knowledge-based growth regimes and by the early literature on higher education systems; thirdly, building on 55 interviews¹ and document analysis, it tests the theory through case studies of institutional change in Britain, Germany and South

Korea and a shadow case of the Netherlands, where continuity prevailed over change. The dependent variable is ‘*high* skill formation’, as defined by adapting standard definitions of ‘skill formation’ (see e.g. Busemeyer and Vossiek 2016, 151) to the higher education sector. Specifically, high skill formation is defined as: the institutional set-up of a higher education system and its connection to the labour market, in particular to those segments of the labour market that are reliant on high skills (such as advanced manufacturing and dynamic services).

Higher Education and Labour Markets: Existing Theories

The question of how higher education systems align with labour markets was first tackled in the 1970s when a wave of expansion of higher education prompted the establishment of a tier of labour market-oriented higher education institutions by upgrading upper-secondary vocational institutions to the tertiary level. This strategy allowed governments to pursue simultaneously two goals: they could accommodate a growing proportion of secondary school-leavers seeking tertiary education; and they could counter fears of academic drift implied by the expansion of higher education exclusively in research universities (Grubb 1985; Trow 1974). Yet, this functional explanation based on the idea of expansion leading to horizontal differentiation does not travel well across time and space. As university systems expanded further, horizontal differentiation did not appear as the unequivocal policy response. Rather, several disjointed developments took place: some countries abolished the binary system in the 1990s (Britain) while others introduced it (Austria) and yet others maintained it (Germany; the Netherlands). Thus, a functional model of expansion and differentiation does not help us understanding the dynamics of alignment between higher education and labour market (Teichler 2006).

A second stream of literature highlights the diffusion of neoliberal ideas that pushed policy-makers to reframe higher education policy as an element of national economic competitiveness. As part of this strategic re-orientation, it is argued that universities were incentivised to create links with employers and prioritise those disciplines (e.g. hard sciences) that are thought of as having a strategic place in the knowledge economy vis-à-vis disciplines deemed of lower economic interest (e.g. humanities) (Slaughter and Rhoades 2004; George 2006; Olssen and Peters 2005; Pritchard 2011). Yet, ideational approaches suggest an underlying convergent trend that is hardly traceable once the relevant policy initiatives and the responses of the higher education sector are analysed. 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 in what a higher education system is (Musselin 2011, 461-6).

As theories positing convergence find limited empirical support, we move to the comparative political economy (CPE) and the Varieties of Capitalism (VoC) literature in particular, in search for lenses through which to theorise variation. Yet, we still fall short of convincing explanations. The CPE literature suggests that a major source of variation across models of skill formation lies precisely in the lack of higher education expansion in those countries commonly referred to as Coordinated Market Economies (CMEs) (Estevez-Abe, Iversen, and Soskice 2001; Hassel and Palier 2017; but see Graf 2017, for a notable exception). CMEs are expected to keep their university systems limited in favour of large vocational training systems that serve manufacturing-centred production regimes in need of ‘specific’ skills. Conversely, countries relying on ‘general’ skills and primarily identified in the Anglo-American Liberal Market Economies (LMEs) are expected to display large higher education systems. Yet, while accurate until the 1990s, such binary distinction holds increasingly less explanatory

power as enrolment rates in higher education have been booming across countries, including those where this development was *least* expected (Durazzi and Benassi 2018; Baethge and Wolter 2015), such as the East Asian and Continental European CMEs.

Lastly, a stream of CPE research theorised the partisan politics of higher education (Ansell 2008; Busemeyer 2009; Garritzmann 2016). These analyses shed light on party preferences for higher education and their distributional implications. Yet, a partisan political angle does not offer solid ground to theorise trajectories of high skill formation. Specifically, even if we assumed that right and left parties have systematically different preferences for labour market outcomes (Hibbs 1977), we would still expect both left and right to favour the alignment between higher education and labour market needs. For the former this would be a way to favour higher employment rates, while for the latter it would be a way to satisfy business' skills needs. High skill formation, in other words, fits squarely with the notion of politics *for* markets (Iversen and Soskice 2015b), whereby cross-party efforts are expected to provide the most competitive sectors of the economy with an appropriate institutional infrastructure.

Theorising High Skill Formation

How can we then theorise the relationship between higher education and knowledge-based labour markets? This section puts forward an alternative theory that rests on two core propositions: firstly, distinct knowledge economy profiles have emerged across countries and these thrive on different types of high skills; secondly, universities are embedded in institutional contexts providing them with different incentive sets in the relationship with governments and business.

The Demand for High Skills: Varieties of Knowledge Economies

Knowledge economies are denoted by common attributes, namely ‘greater dependence on knowledge, information and high skill levels’ (OECD 2005). Yet, they also vary significantly with respect to the weight of specific economic sectors, as illustrated in table 1, which ranks major OECD economies according to the contribution to Gross Value Added (GVA) of manufacturing and dynamic services.ⁱⁱ

[Table 1 near here]

I suggest that disentangling the *convergent* trend of higher education expansion in the context of *persistent differences* in national economic structures is crucial to explain the emergence of distinct trajectories of high skill formation. In particular, I argue that different ‘families’ of academic disciplines are *complementary* to different economic sectors and different economic sectors have, in turn, *broad* or *narrow* requirements in terms of high skills needed.

A short example illustrates this point: let us assume a knowledge economy 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 differ significantly: while both types will be requiring 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 be also in need of highly skilled workers from a relatively narrow set of disciplines – namely STEM graduates. Knowledge economies based on high-end services, conversely, will be much less constrained by the discipline background, as long as high ‘general’ skills are present. They rely, in other words, on a broad set of high skills. 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: 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. Cedefop 2016). Furthermore, the sociology of education demonstrated that labour market signals are only one among several factors influencing degree choice (Briggs 2006; Reay et al. 2001), and that STEM disciplines are often those avoided by students (see Haynes 2008, for a review of the reasons).

Hence, as far as the demand for high skills is concerned, we advance the following theoretical proposition: in countries that assign a strategic role to advanced manufacturing – and where employers have rather narrow skill needs – governments intervene more directly and actively to ensure the availability of STEM skills compared to countries pursuing knowledge-based growth centred on high-end services. In the latter, the political pressures to intervene in the supply of high skills are expected to be more modest as employers are relatively indifferent to the type of high skills supplied by the higher education system.

The Supply of High Skills: University Agency in Context

The development of knowledge economies triggered an interest by external actors in higher education to ‘an extent previously unknown’ (Regini 2011, 203). Yet, universities ‘are not simply acted upon by outside forces’ (Slaughter and Barrett 2016, 1). In particular, redefining universities’ educational offer to meet labour market demands is a political process, which entails eroding part of the academic freedom

retained by universities as to what and how should be taught. Borrowing Korpi's categories, (when) should universities be expected to act as 'protagonists', 'consenters' or 'antagonists' (Korpi 2006)?

The early literature on higher education provides significant insights to hypothesise a theoretically-informed answer. Seminal work by Burton Clark conceptualises university systems as being caught in a triangular tension between markets, states or academic oligarchies as key organising principle. He argues that systems that rely on markets are the most amenable to change as they might be willing to engage '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) making market-heavy higher education systems 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. This dimension is captured in figure 1 through the share of private spending in higher education – which is strongly driven by tuition fees, i.e. the crucial element identified by Clark as characterising market-based models.ⁱⁱⁱ

[Figure 1 near here]

As far as the supply of high skills is concerned, we advance therefore the following theoretical proposition: universities operating in highly-competitive institutional contexts will be relatively more open to the demands of external stakeholders (acting as protagonists of or consenters to change) compared to universities operating in low-competition settings (acting rather as antagonists of change). The role of universities has implications for patterns of institutional change. In particular, low competition settings – and the inter-related universities' 'antagonism'

– approximate what Mahoney and Thelen (2009, 19) identify as a political context characterised by strong veto possibilities. In such context, it is expected that institutional change will be, at least initially, marginal, e.g. by side-stepping veto-players, as opposed to encompassing, i.e. affecting the entire higher education system.

Piecing Demand and Supply Together

The two previous sub-sections argued that trajectories of high skill formation can be understood within a bi-dimensional space in which the type of knowledge economy and the degree of inter-university competition shape the specific pattern of high skill formation that we observe in a given country, as captured in figure 2.

[Figure 2 near here]

Given the bi-dimensional space, we opt for a ‘diverse cases’ design (Seawright and Gerring 2008) to test the theory. We select two cases of knowledge economies geared towards the advanced manufacturing (Germany and Korea), but differing in the degree of inter-university competition (low in Germany and high in Korea); and two cases that share a knowledge economy based on dynamic services (Britain and the Netherlands) but that also have distinct higher education systems, characterised by high competition in Britain and low competition in the Netherlands. 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).

Britain: Universities’ Protagonism and General Skill Formation

High skill formation became a salient issue in British higher education policy in the 1990s, in connection with the increasing importance assigned to knowledge-based economic growth (Wilson 2012, 18). The key piece of higher education policy

commissioned by the government in the 1990s – the Dearing report – pointed to the expansion of employment in the service sector as a key socio-economic trend (Dearing 1997, 56). As hypothesised, the Dearing report linked the expansion of service-based employment to the development of ‘generic or transferable skills which are valuable to many contexts’ (Dearing 1997, 59). 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 was demanded and how universities redesigned their programmes. Universities UK – representing all British universities – illustrated the commitment of the higher education sector to even ‘go beyond the proposals in the Dearing Report’ and ‘to develop a long-term [...] strategy for employability that maximises links with employers, [and] embeds employability in the curriculum’ (UUK 2002, 5-6).

Yet, neither the Dearing Report nor any reform provided explicit regulation to guide universities through such process of recalibration of their curricular offer. Why did universities then comply with these demands? The increasing dependence of universities on student fees since the late 1990s in the context of a ‘real market’ for higher education (Shattock 2012, 155) emerged as the key driver of engagement with employers. A representative of a think-tank promoting dialogue between universities and businesses illustrated how such engagement was driven by ‘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_6). Indeed, we find at the macro-level a positive correlation between the extent to which students support the involvement of employers in course design and the extent to which they pay tuition fees (Durazzi 2018): according to Eurobarometer data, British students are among those in Western Europe that see more favourably the

involvement of private firms in higher education management and curricular design (Gallup 2009, 43).

In this context, it is not surprising the otherwise rather ‘curious’ coalition between the National Union of Students (NUS) and the Confederation of British Business (CBI) that produced in 2011 a joint policy paper on how to make their curricula more attuned to labour market needs so that they ‘can help students achieve a return on their investment by securing good jobs’ (CBI and NUS 2011, 5). Universities, aware of students’ expectations and of the competitive market within which they operate, strategically placed skill formation at the core of their offer. This reasoning emerges from the policy positions of university associations that illustrate how enhancing institutional reputation is a key factor for universities’ engagement with employers (University Alliance 2015, 11; CFE Research 2014, 7-14).

Universities strove therefore to increase the provision of professional skills, proactively sought employers’ views and embedded these into curricula (interviews UK_12, UK_18, UK_20). As they engaged with employers in the design of curricula, the structural composition of the labour market, heavily geared towards the service sector, pulled the educational offer of universities towards general skills – as hypothesised in the theoretical framework and as anticipated by the Dearing report. Particularly enlightening in this respect was the reflection of interviewees who described how in STEM subjects, the university underwent a process to make the degrees less narrowly focussed on technical issues and more focussed 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’ (interview UK_12). Graduate employment data corroborate this

assessment: high-end services receive the majority of engineering graduates (HESA 2016).

Thus, the British case offers a picture of proactive engagement of universities, which acted as ‘protagonists’, to align their educational offer to labour market demands, primarily driven by strategic considerations in the context of a highly competitive higher education market. The type of skills offered were in turn strongly shaped by a labour-market heavily geared towards high-end services, prompting the prioritisation of general skills in university curricula. A similar strategic reasoning was found across institutions that are commonly perceived as more and less prestigious, although the urgency of developing tight links with employers was higher in the latter. Relatively more prestigious institutions tended to introduce rather limited changes to ensure that they would not fall behind in rankings, while radical changes were more common in less prestigious institutions, driven by fears of insufficient student recruitment (see section 4.3 in Durazzi 2018).

Germany: Feeding a Separate Layer, Nurturing Engineers

The higher education system in Germany has been traditionally limited in size (Ansell 2008) and dominated by the ‘academic oligarchy’ in research universities (Clark 1983). These historically accounted for a much larger share of the student population than universities of applied sciences, a sub-set of higher education institutions established in the 1960s with strong links with the labour market. Indeed, the development of the latter was kept at bay by politically powerful research universities who feared the transfer of resources that an expansion of universities of applied sciences would have entailed (Toens 2009). As a result, only a minority of higher education students were traditionally enrolled in universities of applied science (typically less than one third).

In the late 1990s, this picture changed radically. Higher education started expanding significantly (Baethge and Wolter 2015) and in this context the public perception of universities changed too: they were no longer seen as the place educating the elites but they were asked to align closely with societal demands, including taking on an unprecedented skill formation role (BMBF 1999; BDA 2003). Governments and businesses put pressure particularly on research universities given that they accommodated the majority of students and given their traditional reluctance to engage with labour market demands (Wissenschaftsrat 2000, 15; Toens 2009). Yet, despite a powerful government-business alliance, the reform process was at best incomplete (BDA et al. 2009; BMBF 2007). Relatively insulated from competitive pressures, research universities defended the status quo as they argued that restructuring their degrees consistently with employers' and government's demands would lead to a downgrading of university education to short-term training (interviews DE_15, DE_16, DE_20). The antagonist role of universities was recognized by governments and employers as they argued that the transition to a more practice-oriented higher education did not achieve significant results (BDA 2006; BMBF 2007) and ascribed the truncated reform to an obstruction 'on the ground' by the 'academic oligarchy' (Gillmann 2006, interview DE_4).

Yet, a further wave of rapid expansion provided the functional underpinnings for the government to devise a strategy that could simultaneously satisfy employers while circumventing the *de facto* veto point of research universities. Net entry rates skyrocketed from 36% to over 50% between 2007 and 2012 (Hüther and Krücken 2014, 104). Employers put the expansion of STEM skills at the heart of their demands as the lack of over 70,000 engineers in 2007 alone was perceived to threaten the backbone of the export-led German economy (BDA 2008). In this context, the interests of businesses

converged not only with those of the government, but also with those of universities of applied sciences. The latter, which have traditionally had engineering at the core of their educational offer, stood to gain financially from additional resources poured into those disciplines and institutions that aligned the most with labour market needs. Simultaneously, the government would have provided businesses with the high skills needed (VDI 2016, , interviews DE_6, DE_7). This alignment of strategic interests found its policy implementation in the Higher Education Pact (HEP), which provided additional funds to higher education institutions with the specific commitment to increase study places in STEM subjects and universities of applied sciences (BMBF 2009).

The crucial difference from previous failed attempts to expand universities of applied sciences laid in the context of rapid expansion of higher education, which allowed governments to deploy a strategy of differential growth, i.e. feeding universities of applied sciences more than traditional universities (interviews DE_6, DE_7), rather than shifting resources from the latter to the former, thus effectively sidestepping the opposition of traditional universities. Indeed, following the implementation of the HEP, the distribution of high skills changed significantly to the primary benefit of engineering and universities of applied sciences (GWK 2016; Durazzi and Benassi 2018, 8-9). Government officials reported how campaigns conducted by business made public opinion and policy-makers aware of the shortage of STEM skills (Durazzi and Benassi 2018, 9-10). Employers themselves 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 since 2008, ‘the lack of skilled labour is no longer a threat’ (Gillmann 2015).

The German case mirrors the British case, as expected, along both variables. On the supply side, universities resisted the call to engage more with employers and satisfy the needs of the labour market, performing the hypothesised ‘antagonist’ role. In this context, institutional change proceeded mostly through governments feeding a separate layer of the higher education system, namely that of universities of applied sciences, which, unlike traditional universities, were ready to meet labour market demands. On the demand side, the strategic reliance on advanced manufacturing determined that the expansion of higher education was channelled particularly into those disciplines – STEM, and engineering in particular – that were deemed crucial for the success of this sector.

South Korea: Replacing Humanities and Social Sciences with Engineering

The 1990s brought about sharp changes in the Korean political economy, primarily through liberalizing reforms (Fleckenstein and Lee 2017). The university sector was part and parcel of the liberalization process as the government actively promoted a market-based expansion of higher education, financed for the most part through private resources, in the form of tuition fees (Green 2015; Park 2013). GER in tertiary education almost trebled between 1990 and 2013 and Korea quickly became one of the OECD countries most heavily relying on private financing (recall figure 3) (Kim and Lee 2006). Universities found themselves in a fiercely competitive environment as they not only strived to attract student fees but also government funding (interviews KR_6, KR_14), 90% of which was also competitively allocated (Shin 2012).

Yet, a large university system characterized by intense competition, while heralded in the early 1990s as crucial for a successful transition into the knowledge economy (Park 2013, 301), did not deliver the results that the government had expected

(Cheon 2014, 224). Problems of skills shortages arose already in the early 2000s and businesses complained for the lack of STEM graduates, particularly in engineering (Yonezawa and Kim 2008, 206; KEF 2005). In response, successive governments tried to adjust higher education provision with labour market needs.

Two policies stand out in this respect: Leaders in Industry-University Cooperation (LINC) and Program for Industry-Matched Education (PRIME). In both cases, the government offered financial support to selected universities to ensure that they provided the skills needed in the labour market (interviews KR_1, KR_3, KR_6, KR_14). Since 2012, LINC has provided funding to over 50 universities ‘to match the educational and research activities [...] to the demands of industry’. PRIME, instead, intervened directly on the distribution of high skills following a 2014 report of the Ministry of Employment and Labour titled ‘Prospects of Manpower Conditions Classified by Majors from 2014 to 2024’ which noted an over-supply of social science and liberal arts graduates and an under-supply of STEM graduates, despite employment outlooks were considerably more favourable for the latter (cf. Park 2016). As a consequence, the government actively stepped in to shape the supply of high skills: public financial support has been granted to universities that agreed to downsize their humanities and social science departments to increase enrolments in STEM, according to governments’ skills forecasts (MOSF 2015, 2).

As in the German case, lobbying from businesses for more STEM graduates has been identified as a driver of policy (interview KR_1), but, differently from the German case, the government did not face significant opposition from universities, who rather consented to change. Data on the implementation of LINC^{iv} shows how the pattern of conversion of curricular offer has been taking place across the entire higher education sector. Tables 2 compares the success at attracting LINC funds for research universities

and their professionally-oriented counterparts, i.e. junior colleges, and they show that the former have been both more active and more successful than the latter.

[Table 2 near here]

The incentive-set to satisfy government's demands was directly linked to the highly competitive pressures that universities are subject to: as universities compete for funds, students and positions in ranking, taking part in government-sponsored projects was perceived both as a strategy to attract additional funds and as a way to promote the university's reputation towards perspective applicants (interviews KR_1; KR_3; KR_4; KR_14).

As expected, the Korean case shares similarities and differences with both the German and British cases. Similarly to Germany, the government prioritised the supply of STEM skills, which were considered pivotal for the success of the Korean export-oriented manufacturing sector. But similarly to Britain, the pattern of institutional change affected the higher education system at large, due to the competitive pressures that universities are subject to.

The Netherlands: High Skills in Political-Economic Equilibrium

The Dutch case illustrates yet another logic of adjustment, dominated by continuity over change. Indeed, the largest share of higher education students were traditionally enrolled in vocationally-oriented higher education institutions, making the Dutch university system aligned with labour market needs 'at the outset'. The comparison is particularly stark with Germany in highlighting how the 'centre of gravity'^v of the Dutch higher education system is located in the *hogeschool* sector, i.e. its vocational sub-set (see table 3).

[Table 3 near here]

Reconstructing the reform process, Witte finds that: ‘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, (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 vocational higher education institutions, which, unlike the German case, made it unnecessary to push traditional universities towards a professionalisation of their degrees. ^{vi}

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 (Teichler 1989; Maassen, Moen, and Stensaker 2011). Consistently with these assessments, the association of the hogescholen (HBO-i) 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, through the development of ICT-related degree programmes (HBO-i 2010). This initiative conforms with the provision of high general skills, as universities of applied sciences embed ICT components across very different degrees ranging from ICT and business administration to ICT and software engineering. The wide applicability of the ICT degrees is also confirmed by the cross-section of firms that have contributed to the development of the degrees, covering sectors as diverse as software development, management consultancy, and finance (HBO-i 2010, 74).

Thus, a large professionally-oriented higher education system created the conditions for a political-economic equilibrium, in which the government had weak incentives to deviate from the existing system (Witte 2006, 371). Yet, despite the prevalence of continuity over change, the Dutch case also conforms to the theoretical framework. As in the German case, the alignment of higher education and the labour market was primarily channelled through the vocational sub-set of the higher education system (which however, compared to the German case, did not need ‘additional’ expansion). However, differently from the German and Korean cases, the government did not intervene to shape the supply of skills.

Conclusions

This article sought to explain how advanced capitalist countries create the high skills needed to succeed in knowledge-based labour markets. In doing so, it provided a single theoretical framework to make sense of the political economy of high skill formation across (advanced) manufacturing and (high-end) services, overcoming a traditional limitation of the literature on skill formation, namely its bias towards the manufacturing sector. It has been argued that trajectories of high skill formation can be understood through the interaction of two main variables: the dominant knowledge-based regime in a given country (in particular, advanced-manufacturing versus high-end services) and the incentive-set available to universities in a given higher education system to satisfy the demands of external stakeholders (chiefly, governments and employers). The former explains whether governments will take a pro-active role in shaping the supply of high skills, while the latter explains whether universities will be open to meeting the demands of governments and employers.

Three broader implications emerge from the analysis. Firstly, the article

highlights the role of universities as important political agents for patterns of institutional change in contemporary higher education systems, which calls for a systematic theorisation of the role of universities beyond the case of high skill formation. Secondly, the political economy of high skill formation points to a different constellation of actors compared to the ‘traditional’ political economy of skill formation. While the latter has been primarily understood as the outcome of different interactions between employers and unions, the former identifies governments, universities and employers – and their mutual and different relationships across contexts – as the key constellation of actors underpinning national trajectories of high skill formation. Thirdly, the article shows that advanced capitalist countries maintain their diversity even as they increasingly rely on the same policy areas. In particular, the article showed how CMEs have creatively adapted to their needs a policy area like higher education that was traditionally thought of as successfully complementing production regimes of LMEs.

Biography

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Supplemental material for this article can be accessed at [XXX](#).

Endnotes

ⁱ See online supplemental material for details of interviewees.

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

ⁱⁱⁱ A more detailed indicator of competition suggests that share of private financing is a reliable proxy as it correlates with other dimensions of competition, such as survey data on students' perception of the importance of rankings and of universities' prestige (see section 2.2 in Durazzi 2018).

^{iv} To the best of my knowledge, data on the implementation of PRIME with a similar level of detail have not been released at the time of writing.

^v 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.

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Table 1: Major sectors as a % of GVA in 2011

Country	Manufacturing	Country	Dynamic services
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%	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: WIOD (2014)

Note: Bold indicates above average countries-values.

Table 2: 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%

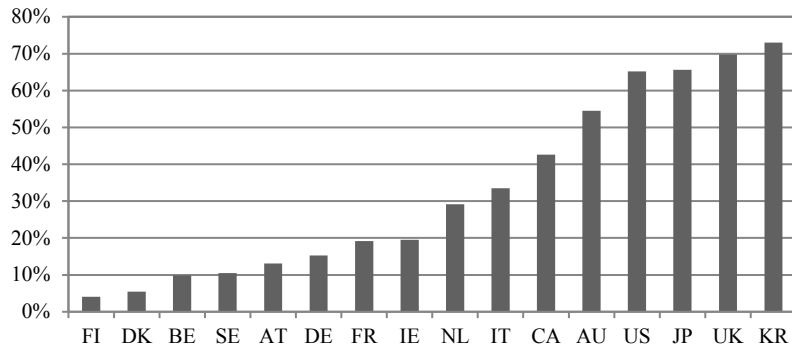
Source: own calculations based on MoE (2018)

Table 3: Identifying the centre of gravity of higher education systems in the second half of the 1990s

Country	Share of students in research universities	Share of students in universities of applied sciences
Germany	76%	24%
Netherlands	37%	63%

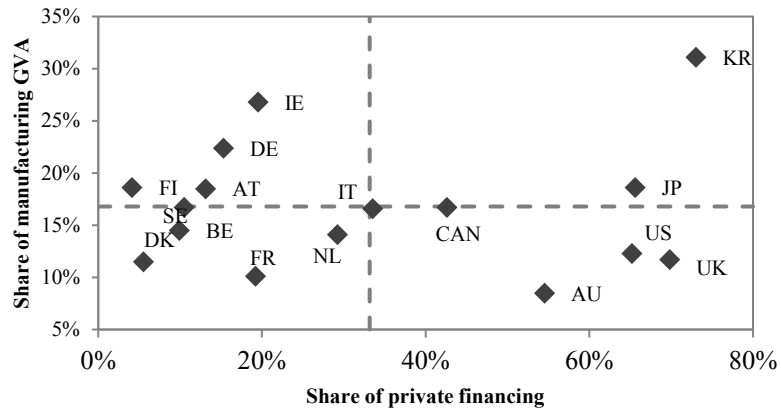
Source: Huisman and Kaiser (2001)

Figure 1: Share of private financing of higher education (2011)



Source: OECD (2017)

Figure 2: A bi-dimensional categorisation according to 'type' of knowledge economy and inter-university competition



Source: own calculations based on OECD (2017) and WIOD (2014)