

Article

Combined modes of gradual change: the case of academic upgrading and declining collectivism in German skill formation

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Abstract

The corporatist-governed dual-training system has been a key example of collective governance in the German capitalist model. However, high-end dual-training is increasingly being offered within post-secondary higher education. Here, firms and universities, not chambers of commerce or trade unions, are the actors negotiating the curricula of and access to a range of 'dual-study programmes'. This article traces the emergence and expansion of this more firm-specific skills provision system, which diminishes the beneficial constraints for strategic cooperation and, in turn, the provision of collective training standards and transferable skills. The case study builds on the 'gradual institutional change' taxonomy, while pointing to the potential benefits of using different modes of change in combination. Through analysing firms' strategies to initiate change in an institutional grey area between established socio-economic spheres, the article shows how *layering*, *conversion* and *drift* can become interlinked and how each individual process can trigger and feed the next.

Key words: institutional change, institutional political economy, skills, cooperation, industrial relations, trade unions

JEL classification: J24 human capital, skills, occupational choice, labour productivity, J5 labour-management relations, trade unions, and collective bargaining, I24 education and inequality

1. Introduction: new challenges to traditional collective skill formation and combined modes of gradual change

The dual-apprenticeship training system—which links firms and vocational schools through an integrated curriculum—is deeply embedded in Germany's socio-economic production model (Baethge, 2006). In fact, it has been praised as a classic case of collective skill formation and as a foundational pillar of Germany's coordinated market economy (CME; e.g.

Thelen, 2004; Busemeyer and Trampusch, 2012). It is characterized by a decentralized mode of governance placing beneficial constraints on firms (Streeck, 1997), thus prompting them to move beyond individual short-term profit maximization strategies in skill formation. This reduces the risk of poaching and also encourages apprentices and workers to invest in industry-specific rather than firm-specific skills. Thus, this institutional configuration encourages firms to make substantial investments in workers' general, transferable skills (e.g. Culpepper, 2003) and has been identified as one of the institutional conditions of diversified quality production (Streeck, 1992).

Yet, there are currently several challenges to the traditional mode of dual-apprenticeship training. Key examples include the shift from a manufacturing to a service and knowledge economy (Mayer and Solga, 2008; Andersen and Hassel, 2013), the growing conflicts between large export-oriented and smaller firms (Thelen and Busemeyer, 2012), and firms' increasing demand for skills relating to their specific production process and culture (Crouch *et al.*, 2004). Furthermore, in Germany, the vocational education and training (VET) and higher education (HE) systems have been historically separated by an 'educational schism' (Baethge, 2006; Baethge and Wolter, 2015, p. 100). That is, each of these two systems follows a different institutional logic, which hinders educational and social mobility between the two organizational fields (see also Finegold, 1999; Busemeyer, 2009). However, the ongoing global academization of labour markets (Baker, 2014), a potential academic drift in vocational training (Severing and Teichler, 2013) and rising individual educational expectations (Powell and Solga, 2010) have prompted pressure to increase the permeability between VET and HE. Hence, sustaining recruitment of talented young people into traditional apprenticeship programmes has become a key challenge for German employers. Against this backdrop, the present historical institutionalist analysis addresses pertinent questions about employer strategies in a period of rapid technological change and academic upgrading.

The article shows that, in the early 1970s, some German firms began to introduce institutional innovations at the margins of the traditional VET system. The most dynamic development here was the creation of dual-study programmes as a layer on top of the traditional dual-apprenticeship training system. Dual-study programmes can be considered hybrid organizations as they mix selected elements of the traditional VET system and the HE system—especially in terms of curricula, teaching staff and funding. They combine training in a firm with courses in a HE institution (HEI) rather than a vocational school. Thus, the learning environments of the firm and the university are integrated in one curriculum. Dual-study programmes lead to a Bachelor's degree and often to an official VET certificate as well. As shown here, access to these programmes is controlled by the firms, which seek to recruit talented high-school graduates with higher education entrance qualifications for customized, firm-specific vocational training. Students enrol at a university but have a contract with a specific firm, which also pays them. Although the absolute number of around 95 000 students is still rather low (BIBB, 2015, p. 12), the massive expansion of dual-study programmes—between 2004 and 2013 the number of dual-study places increased by around 55% (BIBB, 2014b)—challenges the traditional understanding of how vocationally oriented skill formation is organized in Germany.

What is the impact of these rapidly expanding dual-study programmes on collective skill formation? The article argues that their expansion represents a destandardization of the traditional collective governance mode. Thus, as firms have insinuated their way into the

HE system to recruit young talent for work-based training programmes that meet their firm-specific skill demands, they have partly withdrawn from the beneficial constraints set in the traditional system of dual-apprenticeship training. In this process, national VET standards have been dismantled as dual-study programmes are implemented in very different ways throughout Germany. In the absence of balancing forces such as unions, chambers of commerce or employer associations, individual firms more directly influence the curricula of these programmes, which puts at risk polyvalent and transferable skills as a collective good. Furthermore, as firms now play a key role as gatekeepers for access to high-quality work-based HE programmes, this partly reduces the capacity of the German skill formation system to help youth from disadvantaged socio-economic backgrounds to secure relatively well-paid jobs. Thus, the stakes for the renowned traditional dual-apprenticeship training system are high.

However, how did firms come to evade the—deeply institutionalized and partially self-imposed—beneficial constraints built into the hitherto rather stable dual-training system? In a quest to understand how such changes are possible in an institutional setting that is otherwise strongly path dependent, I refer to historical institutionalists who have developed theoretical tools providing insights into modes of gradual institutional change (e.g. Streeck and Thelen, 2005; Mahoney and Thelen, 2010). Here, I apply the theory of gradual institutional change in combination with process tracing (George and Bennett, 2005). Thus, the present article conducts a process analysis to explain how firms managed to unleash institutional changes at the intersection of two distinct but related organizational fields (VET and HE) to create and advance ‘hybrid’ dual-study programmes. Concurrently, I seek to contribute to the institutional change literature by exploring to what extent the well-established taxonomy of gradual change is also pertinent in a case where feedback effects between institutional changes in two or more fields (here VET and HE) are expected.

The analysis finds that large firms have promoted different modes of gradual institutional change in the two different political contexts (VET and HE) around the same institution, namely the dual-training principle. That is, the process tracing did not identify one dominant mode of change, but rather complex, cumulative patterns of gradual institutional change: in other words, a pattern whereby one process, associated with a specific mode of gradual institutional change, triggers and feeds others. Thus, firms initially managed to introduce change by moving parts of their training activities into an institutional grey area that does not fall under the traditional governance structures of VET or HE. However, this initial change in the form of layering is only the first stage in a combination of modes of gradual change. More specifically, the long-term impact of this *layering* on dual-apprenticeship training exerts its effect indirectly via subsequent *conversions* triggered in HE that eventually led to the *drift* of traditional collectivist dual training. In other words, modes of gradual institutional change can condition each other. That is, they can appear in stages, and an earlier mode can have a cumulative effect via another mode. These findings suggest that at least in cases where feedback effects between related organizational fields or political arenas are likely—for example, when actor strategies in one field over time relate to those in others—it is plausible that two or more modes of gradual institutional change can get interlinked.

In Section 2, I briefly locate dual-study programmes within the German system of skill formation. I then present an analytical framework for understanding current institutional changes in collective skill formation (Section 3). By analysing the key stages in the

development of dual-study programmes (Section 4), I can compare these stages and their implications for collective skill formation in the German CME (Section 5). The concluding section discusses the findings. The most significant policy implication is that universities have begun to play a core role in the interactions between actors that should—ideally—maintain the beneficial constraints for strategic coordination in collective skill formation.

2. Skill formation in Germany and the rise of dual-study programmes

This article argues that the political economy of collective skill formation—which has hitherto mainly focused on VET—needs to pay more attention to HE if it aims to capture the essence of skill formation in CMEs in future. Consequently, in order to make sense of current developments in advanced skill formation in Germany, this section briefly describes the organizational fields of both firm-based vocational training, and academic education and HE. In the field of initial VET (IVET) at the upper secondary level, dual vocational training combines training in a firm with classroom teaching in part-time vocational schools and leads to a recognized certificate according to the Vocational Training Act or the Crafts Code. In the post-secondary VET sector, trade and technical schools and *Meister* (master craftsman) schools offer further vocational training to the holders of IVET qualifications who are seeking to become technicians or *Meister*. By contrast, universities and universities of applied science dominate the German HE system. The main pathway to HE entry involves full-time schooling in a general academic secondary school (*Gymnasium*).

Not only do VET and HE offer distinct educational pathways, their actor constellations and modes of governance also differ significantly—which, at first sight, makes the rise of ‘hybrid’ dual-study programmes rather unlikely. Thus, academic secondary schools and HEIs are regulated at state level by the 16 German *Länder*, which are also responsible for financing them. In the ideal-typical Humboldtian university model, German HEIs and the ‘academic oligarchy’ (Clark, 1983) have relatively far-reaching autonomy with regard to teaching and research in most fields of study (German Basic Law, article 5 paragraph 3). This has contributed to considerable differentiation within the German HE system at degree-programme level, in academic disciplines, and between HEIs (Banscherus *et al.*, 2015). Note also that with regard to work-based forms of HE, there are no established, nation-wide standards regulating employer involvement.

In contrast, employers, their associations and work-based learning practices have traditionally played a central role in the German VET system. The Federal Institute for Vocational Education and Training (BIBB) and the social partners develop the nationally standardized curricula for VET programmes (Streeck, 1992, p. 33). Together with trade unions, Germany’s broadly based employer associations follow consensual procedures (Fingold, 1999) and are thus well positioned to organize forums to discuss the structure and content of these training programmes and to monitor the system (Bosch and Charest, 2008).¹ Trade unions participate in the collective bargaining process and in several governance functions in the dual vocational-training system. The chambers of industry and commerce are responsible for a number of economic self-governance tasks, such as the testing system for apprentices.

1 This is one of the key differences to the institutional conditions for skill formation in liberal market economies (see Thelen, 2004; Fortwengel and Jackson, 2016).

More generally, collectively binding standards are a key element in this decentralized cooperation process, as they help actors to address coordination problems (Culpepper, 2003). In the traditional dual VET system, the ‘provision of equal educational standards nationwide’ (Allmendinger, 1989, p. 231) positively influences the transferability of vocational qualifications between different employers and industrial sectors (see also Busemeyer, 2009). In fact, the vocational training law stipulates that stakeholders must reflect on whether the occupational profile will remain an adequate standard in the medium to long term (Wegge and Weber, 1999, p. 145). Overall, this collectivist standard setting in traditional dual VET allows for adaptations to specific education and training contexts, while still ensuring a high degree of standardization at the national level. As such, it represents a key benchmark when comparing the institutional changes associated with the rise of work-based HE in Germany.

2.1 Innovation at the nexus of VET and HE: dual-study programmes

Within the German skill formation system, dual-study programmes occupy a special ‘hybrid’ position at the nexus of VET and HE—combining institutional elements from both fields. Therefore, analysing them offers insights into the overall dynamics of skill formation in Germany. They thus create a bridge between two organizational fields that have been kept strictly separate in the German context. Importantly, these programmes integrate HEIs and firms as distinct learning locations. Dual-study programmes typically lead to a Bachelor’s degree in about 3–4 years (dual programmes at Master’s level are still rare) and connect two didactic principles, namely practical training and theoretical grounding. Currently, around 39 622 cooperative arrangements exist between firms and different educational providers (BIBB, 2014a, p. 29). Academic organizations and employers work together when designing training curricula. Thus, students are trained by both academic faculty and company experts, while employers cover the costs of training during the practical term. The students’ salary usually varies between around €400 and €1000 per month, depending on the industrial sector (Becker, 2012).

Dual programmes are offered by universities of applied science (59%), the Baden-Wuerttemberg Cooperative State University (20%), vocational academies (15%) and universities (6%) (BIBB, 2014a, p. 28).² There are currently 1505 dual-study programmes (BIBB, 2015, p. 7) with around 95 000 students (BIBB, 2015, p. 12). Dual-study programmes are expanding rapidly (by 11% in 2013 alone) and at present make up roughly 6% of all higher education programmes or 3.3% of all students in HE (Faßhauer and Severing, 2016, p. 9). They are mostly offered in engineering (including IT) (51%) and business studies (32%) but also in the fields of health, care, education and social work (11%)—all of which are relatively closely linked to the ‘world of work’ (BIBB, 2015, p. 9). Even if the growth of dual-study programmes depends on the demands of employers for academically trained skilled workers and their willingness to supply salaried training positions (Section 4.3), in the abovementioned subject areas, dual-study programmes already represent a sizeable proportion of the relevant student groups. In Baden-Wuerttemberg—where these programmes were first established—about 10% of students are now enrolled in dual-study programmes (Statistik-BW, 2016). While the total number of apprentices in the traditional dual system at

2 Please note that I sometimes use the terms universities or higher education institutions (HEIs) to refer to the whole range of academic organizational forms at the post-secondary level offering dual-study programmes.

the upper secondary level is far higher (approx. 1.3 million) (DESTATIS, 2016), dual-study programmes can be considered disproportionately relevant because they are increasingly diverting the most capable and motivated youths from this traditional system, not least due to rising educational aspirations (Severing and Teichler, 2013; see Section 4.3).

Policymakers and the general public are increasingly aware of the dynamic development around dual-study programmes and its growing importance for the German skill formation system. Several authors have pointed to the increasing relevance of expanding dual-study programmes (Sorge, 2007, p. 240; Bosch and Charest, 2008, p. 435; Busemeyer and Trampusch, 2012, p. 30; Graf, 2013; Baethge and Wolter, 2015, pp. 107–108). According to Thelen (2014, pp. 89–90), dual-study programmes show that the dual-training principle is part of a shoring-up process within the traditional VET model. It is also telling that key national intermediary organizations in both sectors, like the Federal Institute for Vocational Education and Training or the German Higher Education Rectors' Conference, have recently started to develop explicit strategies regarding dual-study programmes. However, the genesis and expansion of dual-study programmes is still underexplored in the literature.

The following section presents a framework for analysing institutional stasis and change in collectively organized systems of skill formation and prepares the ground for the development of a combined application of modes of gradual change.

3. Analytical framework: institutional change in collectively organized skill formation

There are powerful constraints built into the German CME that prevent an outright defection from the nationally standardized collective governance of VET. These constraints include institutional complementarities between VET and the industrial relations system, such as collective bargaining, and labour-market and job security regulations (e.g. Estévez-Abe *et al.*, 2001; cf. Emmenegger, 2009) that link the VET system to the overall institutional configuration of the German CME. In such a context, the theory of gradual institutional change is a suitable means for identifying institutional changes for which no critical juncture is necessarily required, and, thus, for analysing how dual-study programmes could nevertheless emerge and expand to their current status as the newest core element of the German skill formation system.

Definitions of institutions usually refer to some sort of regulative, normative or cultural-cognitive social ordering (Scott, 2008). Thus, institutional theory has long tended to explain institutional stability rather than institutional change. Classical institutional theory has typically accounted for change processes via exogenous shocks that unsettle a given social institutional ordering and lead to critical junctures. However, in the past few years, institutionalists have developed more fine-grained concepts to analyse institutional change. For example, while Campbell (2004) sees institutional change as 'constrained innovation', Ebbinghaus (2005) discusses several 'branching pathways' (path cessation, path switch, path departure and path stabilization). Here, I apply the typology of *modes of gradual institutional change*. Streeck and Thelen (2005) describe four specific modes of gradual change: (a) displacement, (b) layering, (c) drift and (d) conversion.³ In all four modes, incremental

3 I exclude the mode of exhaustion, because—as Streeck and Thelen (2005, p. 29) also note—this mode eventually leads to a breakdown of the institution rather than its change.

changes over time can add up to transformative change (Thelen, 2004), and substantial institutional change may be masked by relative stability on the surface. (a) When existing rules are removed and new ones are introduced, this is *displacement*. (b) When, instead of replacing existing institutions, new institutions are added on top of existing institutions, this is *layering* (see also Schickler, 2001). (c) Following Hacker (2005), *drift* refers to shifts occurring in the external conditions of a rule, implying that the rule formally stays the same but that its impact changes. (d) When rules are interpreted and implemented in new ways but formally stay the same, this redirection or redeployment is called *conversion*.

Does the development of dual-study programmes represent any of these modes of gradual institutional change? Recent work by Mahoney and Thelen (2010, pp. 18–22) is instructive in this regard, as it links each of these modes of gradual institutional change to a typical combination of (1) key characteristics of the *political context* and (2) the *targeted institution* (Table 1). The political context is defined in terms of the veto possibilities (strong or weak), whereas the characteristics of the targeted institution refer to the level of discretion in the interpretation or enforcement of a particular institution (low or high):

- (1) Where the *political context* gives the defenders of the *status quo* strong veto possibilities, potential change agents will find strategies of displacement and conversion less feasible; this is because—unlike layering and drift—they require direct changes to the targeted institution.
- (2) Where the *targeted institution* offers potential change agents a low level of discretion in interpreting or enforcing that institution, drift and conversion strategies are less likely to be successful, as both these modes rely on significant leeway in how the institutions are implemented: drift often builds on a gap between rules and how they are enforced; this usually occurs when a specific institution is not strongly enforced. Conversion builds on the ambiguities related to a specific institution, which allow it to be reinterpreted for a different purpose.

This article applies the theory of gradual institutional change to structure the analysis of the development of dual-study programmes. Thus, each of the three major stages (Sections 4.1, 4.2 and 4.3) identified in the process analysis begins with a short preview of the related conceptual arguments. At a more aggregate level, the article then suggests a *stages approach* to modes of gradual institutional change, taking the example of the fields of VET and HE, and firms' attempts to upgrade the dual-training principle. This stages approach turns out to be especially relevant in the present context, where the focus is not on one institutional sphere, but on two or more spheres (here VET and HE) that each represents closely related but distinct organizational fields. In such cases, significant institutional changes in one of the spheres are likely to directly or indirectly interact with changes in the other over time. Thus, in view of the theory of gradual institutional change, the present article explores the possibility of complex cumulative patterns of gradual institutional change. That is, it aims to contribute to our understanding of how one process, associated with a specific mode of gradual institutional change, may trigger or feed another one.

3.1 Methods and data

The analysis covers the time period from the genesis of dual-study programmes in the late 1960s up to 2013. I use process tracing, which is the analysis of sequences of events to explore the relevant linking mechanisms and intervening processes in specific cases

Table 1. Modes of change in relation to characteristics of political context and targeted institution

		Characteristics of targeted institution (A)	
		Low level of discretion in interpretation/enforcement (A.1)	High level of discretion in interpretation/enforcement (A.2)
Characteristics of the political context (B)	Strong veto possibilities (B.1)	<i>Layering</i>	<i>Drift</i>
	Weak veto possibilities (B.2)	<i>Displacement</i>	<i>Conversion</i>

Source: Mahoney and Thelen (2010, p. 19), annotations added by author.

(Mahoney, 2004, pp. 88–89). The goal is to offer a narrative account of crucial sequential events (or processes) that facilitate an understanding of a particular outcome. Ideally, each significant historical step contributing to the outcome should be explained with reference to a theory (George and Bennett, 2005, p. 30), in this case the theory of gradual institutional change. In terms of data, in addition to secondary sources, I analysed official documents from national stakeholders such as statements by state ministries, political parties, social partners and the educational organizations. To uncover and explore pertinent developments at the nexus of VET and HE, and understand contemporary change processes not adequately represented in the available literature and quantitative data sets, I conducted 17 semi-standardized interviews with experts from 2011 to 2016. The experts were selected as a representative sample of the key stakeholders in VET and HE, i.e. responsible state agencies (e.g. Federal Institute of Vocational Education and Training; Rectors' Conference of the German Universities), intermediary organizations such as employer associations and trade unions, and firms themselves. After I selected the relevant organizations, I chose the interviewees based on their expertise with regard to the development of dual-study programmes. The interviews lasted for at least 45 min, and in some cases, up to 2 h. To interpret the interviews, I applied the instruments of theory-guided qualitative content analysis (Gläser and Laudel, 2009), which allowed me to inductively build up analytical categories based on the interview material.⁴

4. Explaining the rise of dual-study programmes: the interplay between layering, conversion and drift at the nexus of VET and HE

4.1 Stage I: the genesis of dual-study programmes through layering (late 1960s)

The rise of dual-study programmes implies an 'extension' of the dual principle up to the HE sector (Interviews DE2, DE3, DE5; Sorge, 2007, p. 240). But how could 'hybrid' dual-study programmes arise in a context in which VET and HE are strictly institutionally divided by the traditional German educational schism? In this section, I argue that by placing the dual-study programmes in a grey area on top of traditional dual-apprenticeship training, large firms

4 DE1_2011-03-10 (Berlin); DE2_2011-03-10 (Berlin); DE3_2011-03-16 (Bonn); DE4_2011-03-17 (Bonn); DE5_2011-03-17 (Bonn); DE6_2011-03-18 (Bonn); DE7_2011-03-18 (Bonn); DE8_2011-06-06 (Berlin); DE9_2011-10-14 (Duisburg); DE10_2011-10-14 (Duisburg); DE11_2012-03-08 (Berlin); DE12_2013-12-09 (Stuttgart); DE13_2013-12-11 (Darmstadt); DE14_2013-12-12 (Bonn); DE15_2013-12-13 (Bonn); DE16_2015-06-15 (Bonn); DE17_2016-03-07 (Mannheim).

circumvented the low level of discretion in traditional VET (see 'A.1' in Tables 1 and 2). At the same time, this location in a grey area made it possible to avoid opposition by trade unions and smaller firms to changes in the traditional system in favour of their specific skills demands (B.1).⁵ As a result, the genesis of dual-study programmes was characterized by a creative bottom-up *layering* process involving large industrial firms and local stakeholders.

The concept of dual training at the HE level originated from the so-called vocational academies: 'The cradle ... of dual training in the field of higher education is the vocational academy' (Interview DE8, translation by author). In 1972, on the initiative of large industrial firms, such as Bosch, Daimler-Benz and Standard Elektrik Lorenz (Kramer, 1981, p. 19), the Wuerttemberg Academy of Administration and Business (VWA) and the Chamber of Industry and Commerce of the Stuttgart region cooperated to create the first vocational academies, the prototype for dual-study programmes (Beschner, 2009, p. 13).⁶ The so-called 'Stuttgarter Modell' aimed to help these firms recruit talented young people who had general academic skills and held a university-entrance diploma (*Abitur*) into vocationally specific training. Given the growing demand for academically qualified workers with experience of and a strong affinity for actual work practice (Waldhausen and Werner, 2005, p. 49), one of these large firms' key motives was to recruit qualified personnel who were more attuned to the firm's specific skills demands than regular HE graduates (Mucke and Schwiedrzik, 2000, p. 9). In addition, dual-study programmes also minimized the time new employees needed to familiarize themselves with the job.

Initially, vocational academies were not taken seriously by most of the established actors in the VET and HE fields (Interview DE3). This is because vocational academies were placed in a niche or *grey area* between the established but institutionally separated fields of VET and HE. Indeed, in some German *Länder*, vocational academies are categorized as part of the HE sector, and in others, they are part of the higher VET sector (Schwiedrzik, 2001, p. 163). The vocational academies also have a unique status regarding their representation at the national level, as they are neither part of the German Rectors' Conference, nor do they fall under the remit of the Federal Institute for Vocational Education and Training (Interviews DE4 and DE7). This location in an institutional grey area—which offered far more room for a more flexible interpretation of dual forms of training—is crucial, as it implies that neither the standardization procedures of the collectively governed dualist VET sector nor those in the HE sector directly applied to these newly created programmes. The discovery of this grey area allowed employers to initiate this new type of work-based training.

Another indicator of their unique status and location in an institutional grey area is the absence of vocational academies from any general education policy plan (see also Kahlert, 2006). They were first created by firms defensively, at a time when the newly established universities of applied science threatened firms' ability to recruit promising young people: between 1969 and 1972 the first universities of applied science were established through a politically planned upgrading of technical and engineering schools (Metzner, 1997) to meet increased demand for tertiary education and improve the international reputation of this

5 The annotations (A.1, B.1, etc.) refer to both Table 1 'Modes of gradual change in relation to characteristics of political context and targeted institution' and Table 2 'Summary and comparison of key findings with regard to change processes'.

6 The VWA-Wuerttemberg has existed since 1928, providing advanced further education and training in the public and private sectors (Walitzek-Schmidt, 2014; Interview DE17).

type of training (BMBF, 2004, p. 6). However, influential large firms in Baden-Wuerttemberg responded by launching the first dual-study programmes to secure their hold on high-end VET. These firms feared increasing academization (Interview DE16; Schwiedrzik, 2001, p. 164) and a loss of influence due to the greater institutional autonomy of the new universities of applied science (Kahlert, 2006). In addition, in the aftermath of the mass student protests of 1968, these firms were sceptical of the capacity of these new universities of applied science to produce ‘loyal employees’ (Hillmert and Kröhnert, 2003, p. 199). In this context, large firms were actively looking for new options that would allow them to (a) recruit talented young people for their work-based training programmes and (b) ensure that these programmes would generate the skills they needed. Thus, large firms acted as institutional entrepreneurs (Interview DE16) in pushing for greater differentiation in the established skills system. Hence, the emergence of dual-study programmes could also be considered a largely unexplored instance of a more general trend that Thelen and Busemeyer (2012) characterize as a shift in VET in Germany from collectivism to segmentalism—to a system in which larger firms are gradually increasing their influence on the overall shape of skill formation (see also Sections 4.2 and 4.3).⁷

However, large firms did not have sufficient influence within HE in Germany—which is typically dominated by ‘political legalism’ (Goldschmidt, 1991), the ‘academic oligarchy’ (Clark, 1983) and the *Bildungsbürgertum* (middle-class intellectuals)—to directly influence the upgrading of the engineering and technical schools into universities of applied science. And the traditional dual-apprenticeship system, with its strongly institutionalized collective governance system, also did not provide the level of leeway the firms needed to make more radical changes in response to a broader academization (A.1). Thus, these firms opted to establish a new organizational form that specifically catered to their needs and integrated institutional elements from traditional dual-apprenticeship training with those of HE. They neither sought to entirely displace the newly established universities of applied science nor the traditional dual vocational training programmes, but instead established a new organizational form in a grey area between these two established ones. In grafting dual-study programmes—by way of a bottom-up *layering* process—on top of traditional dual-apprenticeship training, the firms managed to evade the veto power of both trade unions and smaller firms, whose influence in the policy field of education is firmly grounded in the traditional apprenticeship system alone (B.1) (see also Table 2: ‘Stage I’).

In fact, the German Trade Union Confederation (DGB) was very critical of the launch of dual-study programmes, which it described as a short-term, narrow-gauge mono-education (Walitzek-Schmidt, 2014). Smaller firms also opposed this development, albeit for different reasons. While trade unions are typically largely in favour of increasing the academic content of apprenticeship training, they feared that more differentiation and flexibilization of the system would lead to a greater dominance of firm-specific instead of industry-specific skills. This would increase the dependence of apprentices and workers on specific employers, thus reducing the power of labour associations. In contrast, the main issue for smaller firms is that they do not need high-level academic skills as much as larger firms. Large firms, especially export-oriented ones, often experience a greater demand to upgrade their workers’

7 Instances of segmentalism analysed by Thelen and Busemeyer (2012) are the introduction of shorter apprenticeship programmes, modularization, and the introduction and persistence of the transition system (*Übergangssystem*).

skills and they usually have greater financial leverage to do so. Yet, smaller firms' interest in maintaining the traditional model tends to be rather the result of the wage compression that comes with national collective bargaining and certification, which allows them to recruit relatively well-qualified apprentices at a low cost. Indeed, smaller firms' involvement in apprenticeship training often depends on the productivity or added value of apprentices during the training phase. Hence, as an increase in academic skills means less time spent in the workplace, this would reduce the economic viability of apprenticeship training for smaller firms (see Section 4.2 for more details on the position of opponents).

Large firms' initial move to create vocational academies can be characterized as a defensive response to increasing academization and especially the rising numbers of young people entering academic secondary schooling—partly enabled by social democrats as key proponents of making selective academic secondary schools more accessible to the lower middle classes (Nikolai and Rothe 2013). However, these firms subsequently realized that they had created a new institution on which the trade unions and smaller firms did not have any direct governance claim. And it is in this regard that dual-study programmes differ from the more traditional *sequential* VET–HE model, in which ambitious, academically motivated individuals first complete dual-apprenticeship training and later move on to study at a university of applied science (e.g. in engineering). In this sequential model, the overall training period is longer and, more importantly, the two sequences are firmly embedded within either the VET or the HE governance mode. For example, trade unions and works councils are well positioned to organize apprentices and workers below the level of HE trained engineers (see Herrigel, 2015, p. 146)—and, therefore, trade unions are still somewhat connected to engineers coming out of the sequential model. Yet, this is no longer true for most HE graduates from dual-study programmes. Additionally, from the firms' perspective, dual-study programmes decrease the risk that candidates hired for an apprenticeship programme at the upper secondary level will later decide to acquire a higher education certificate and leave the firm (Interview DE10).

4.2 Stage II: the expansion of dual-study programmes through conversion within the field of HE (1970s to present)

Due to the success of the first vocational academies in Baden-Wuerttemberg, the dual-study principle spread and is today present in all 16 German *Länder*. This section shows that given the higher level of discretion within HE (A.2) and the weak veto possibilities of opponents of dual-study programmes (B.2), there was space for experimentation with the dual-training principle at the post-secondary level. Consequently, this expansion occurred through a *conversion* of more traditional higher education programmes but also by exploiting the more flexible institutional environment within the higher education field.

Driving factors behind the massive expansion of dual-study programmes

The beginning of Stage II was marked by the nation-wide diffusion of dual-study programmes and involved significant organizational differentiation and destandardization. Ironically, from the 1980s onwards dual-study programmes were also offered as model projects at universities of applied science, a development that gathered pace in the 1990s (Interview DE5; Harney *et al.*, 2001, p. 23). This was because the representatives of universities of applied science had started to realize that dual-study programmes would help them

to recruit talented students and position themselves vis-à-vis traditional research universities (Interview DES; Jahn, 1999, p. 19).

Besides HEIs themselves, the other key change agents were firms, who grasped the opportunity to expand the dual-study principle within the traditional field of HE. As it became increasingly difficult to find engineers on the German jobs market, a cheaper and safer option was to recruit suitable candidates by providing dual-study programmes (Kupfer *et al.*, 2014). Beyond that, firms benefitted from the state sponsorship of dual-study programmes, for example, through state financing of the classroom-based part of HE programmes (Schwiedrzik, 2001, p. 166). At the same time, as the work-based part of the training is financed by the firm, dual programmes were still cheaper for the state than most standard programmes at universities of applied science (Deißinger, 2000, p. 621), which is one of the key reasons for the increase in state support for dual-study programmes (Kupfer and Stertz, 2011, p. 29).

In fact, financial considerations are also relevant with regard to students' motives, as they earn a regular income during their dual-study courses. Yet, these dual-study programmes are often of limited benefit for children from educationally disadvantaged families (Gensch, 2014, p. 43), as access to these programmes requires a higher education entrance qualification and is highly competitive. However, those students who do manage to gain access to dual-study programmes expect enhanced career opportunities (Kupfer and Stertz, 2011) and high employment security after graduation. Around 90% of all graduates from dual-study programmes get a job offer from the firm that trained them (Becker, 2012). Another incentive for many students is that the overall duration of these programmes is relatively short (Hillmert and Kröhnert, 2003, p. 206). All these factors have contributed to the expansion of dual-study programmes within the field of HE that started in Stage II.

However, the increasing engagement of firms within HE through dual-study programmes was not only facilitated by students' interest and a supportive state, but also by the relatively weak position of potential veto players, namely trade unions and small firms. Thus, small firms, which traditionally argue for the maintenance and coherence of the traditional dual-apprenticeship system (e.g. Thelen, 2014, p. 96), were left behind when large- and medium-sized firms acted opportunistically and converted a growing proportion of traditional HE to dual-training programmes. The few available studies on dual-study programmes have found that the majority of firms involved have more than 500 employees (Mucke and Schwiedrzik, 2000, p. 7; Hillmert and Kröhnert, 2003, p. 203). The typical firm interested in dual-study programmes is one that is exposed to internal (domestic) and external (international) processes of rapid innovation and change (Harney *et al.*, 2001, p. 65), which applies to the majority of large but also to many medium-sized firms (*Mittelständler*) in Germany (Beschoner, 2009, p. 15; Becker, 2012). In contrast, for small firms, dual-study programmes are often not a feasible option, especially because they would find it difficult to attract applicants with a HE entrance qualification. Beyond that, large- and medium-sized firms also faced little opposition from the trade unions when they set up an increasing number of dual-study programmes. This is because trade unions are not strongly represented in the field of HE, as HE is not part of the German corporatist governance system in the same way as VET is (B.2).

The role of discretion and destandardization in the expansion of dual-study programmes

The expansion of dual-study programmes within the field of HE has also been enabled by considerable ambiguity in how they link VET and HE elements. Because employee associations and trade unions have a very weak HE presence, and HEIs enjoy much more

autonomy in setting up work-based study programmes than vocational schools, firms have significant discretion in how they implement dual-training principles with a partnering HEI (A.2). In other words, there is a lot of flexibility in the specific forms of coordination between firms and HEIs (several interviews). Thus, the dual-study programmes no longer play by the ‘old’ rules of social partnership and, hence, do not comply with the traditional collectivist character of vocational training in Germany. For instance, few employer/works council agreements cover dual-study programmes (Busse, 2009). Crucially, the growth of dual-study programmes is linked to a decline in associational self-regulation relative to traditional dual-apprenticeship training. Individual firms take advantage of the more loosely regulated environment in HE to strategically set-up dual-study programmes with individual HEIs. The actual process of learning and official status of students in the workplace largely depends on the specific agreements between the firm and the student as well as on the internal negotiations between firms and HEIs (Mucke and Schwiedrzik, 2000, p. 15; Interview DE16). More generally, the degree of curriculum coordination greatly depends on the practices in specific dual-study programmes.

As a result, the ongoing expansion of dual-study programmes is occurring through a partial *conversion* of the HE system (see also Table 2: ‘Stage II’). The related destandardization is facilitated by the considerable discretion in the interpretation of the dual principle of training within the HE field, which is one of the key incentives for firms to set up dual-study programmes. In fact, firms’ bargaining power relative to universities—with regard to shaping a curriculum that fits their specific needs—ultimately derives from firms being able to threaten the university to withdraw their students and place them in another university’s programme (Krone, 2015). Furthermore, it is common practice for large firms to ‘cherry pick’ a dual-study provider somewhere in Germany. This means firms often send their dual students to a carefully selected location for the theoretical component of training, even if the firm is located somewhere else in Germany. For example, it is not unusual for a firm based in one state to send its students to an institution in another state, as firms can basically shop around for the HE provider that best fits their specific requirements. As a result, national standardization of dual-study programmes is low. Thus, dual-study programmes take very different forms in different locations in Germany.

Moreover, their diffusion and expansion is not and legally cannot be centrally guided by the federal government. As one interviewee confirms: ‘At the end of the day the actors are located on-site in the HEIs and in the firms. . . . It is not so much a top-down process as a process that is desired’ (Interview DE8, translation by author). A further negative side effect of this uncontrolled growth is that individuals—especially those that lack advice from their social networks—cannot easily access information about dual-study programmes. For instance, due to the low level of standardization of the emerging field, the available (online) databases on dual-study programmes are not yet comprehensive.

Crucially, in Stage II, the dual principle has been converted to serve new purposes within the field of HE as carefully defined traditional occupations were partly adjusted to firms’ more specific skill demands.

4.3 Stage III: the institutionalization of dual-study programmes and the drift of traditional high-end dual-apprenticeship training (mid-2000s to present)

During this third stage, the gradual institutional changes in the traditionally separated fields of VET and HE—layering in VET (Stage I) and conversion in HE (Stage II)—started to

critically interact. As I show in this section, this was facilitated by the increased level of discretion in implementing the dual-training principle, because there were now two competing dual-training alternatives (A.2). At the same time, in the traditional VET system at upper secondary level, trade unions and smaller firms still had considerable scope to oppose the demands by large- and medium-sized firms (B.1). As a result, in this third stage, the continued growth of dual-study programmes started to fundamentally challenge the traditional model of collectivist skill formation, leading to the *drift* of traditional high-end dual-apprenticeship training.

When the providers of dual-study programmes adopted the internationally recognized Bachelor's degrees in the mid-2000s, this legitimized them as a formal part of the German HE system. The Bologna process, which is the key Europeanization policy for HE and led to the introduction of Bachelor's degrees in Germany, stresses shorter study programmes that are vocationally oriented and that enhance students' 'employability' (Powell *et al.*, 2012). Young people are increasingly attracted to the globally recognized Bachelor's degrees, making it important for firms to control access to Bachelor's programmes to recruit talented young people. This general trend towards shorter HE degrees and the new European ideal of HE graduates who should be immediately 'employable' happens to fit the characteristics of dual-study programmes.

In this third stage, the different interests of large- and medium-sized firms, on the one hand, and small firms, on the other, and their relationship are again crucial. Recent studies of the German vocational training system point to cleavages among employers as one of the major factors shaping the system's current pattern of institutional change (e.g. Trampusch, 2010; Thelen and Busemeyer, 2012). Similarly, the extent to which large firms use dual-study programmes as a substitute for dual-apprenticeship training will crucially shape the future character of collective skill formation in Germany. Here, it is important to distinguish between training for blue-collar and white-collar occupations. As dual-study programmes usually lead to middle-management positions, their graduates usually cannot substitute for the skilled factory worker (*Facharbeiter*) (Interviews DE5, DE10, DE13, DE15), which limits the growth of dual-study programmes (see also Section 2). However, when it comes to high-end white-collar training programmes in the traditional apprenticeship system, the relationship with dual-study programmes becomes more competitive, as candidates with an *Abitur* are a major target group in both cases (Milde and Kroll, 2015)—pointing to a high level of discretion in the interpretation of educational levels in Stage III. Moreover, firms now tend to place graduates of dual-study programmes in positions that used to be filled by apprentices who completed higher VET training leading to master craftsman, technician or senior clerk (*Fachwirt*) certifications, thus limiting career opportunities for apprentices (Heidemann and Koch, 2013, p. 56).

At a more aggregate level, the growth of dual-study programmes and the presence of two competing dual-training alternatives have led to increased discretion and allow firms to play the two options off against each other (A.2). This, in combination with the trade unions' and small firms' still strong veto powers in the traditional VET system (B.1), creates an incentive for larger and medium-sized firms to continue shifting parts of their training—especially at the high end—from IVET programmes to dual-study programmes. In turn, this results in a continuous *drift* of the dual-apprenticeship training system (Table 2: 'Stage

III’)—which is also no longer sufficiently updated because the existence of the dual-study alternative reduces reform pressure. An additional effect is that the institutional logics of the traditional fields of VET and HE remain largely distinct. Consequently, the institutional distance between these two fields remains significant, which hinders greater educational and social mobility within the education system.

4.4 Synthesis: from layering to conversion to drift

This section compares the core findings of the process analysis and links them more directly to the theoretical concepts. It shows how one key change agent, large- and medium-sized firms, has promoted different modes of gradual institutional change in different but related political contexts (VET and HE) around the same institution, namely the dual-training principle. Table 2 provides an overview on the three key processes related to the genesis and expansion of dual-study programmes, with a focus on the role of (A) the relevant level of discretion and (B) the key veto players. Specifically, (A) the line ‘discretion in interpretation/enforcement’ in Table 2 refers to the ‘characteristics of the targeted institution’ in Table 1 and (B) the line ‘veto power of opponents’ in Table 2 to the ‘characteristics of the political context’ in Table 1. Thus, if Table 2 is read in combination with Table 1, it offers a theoretically grounded explanation of why a specific mode of gradual institutional change occurred within a specific stage.

Table 2. Summary and comparison of key findings with regard to change processes

	Stage I: genesis of dual-study programmes	Stage II: expansion of dual-study programmes	Stage III: institutionalization
Phase	Late 1960s/early 1970s	1970s onwards	Mid-2000s onwards
Key locus	VET	HE	VET
Key change agent	Large industrial firms	Large- and medium-sized firms; HEIs	Large- and medium-sized firms
<i>Discretion in interpretation/enforcement (A)*</i>	<i>Low, as traditional dual principle firmly embedded in VET (A.1)</i>	<i>High, as HE allows experimentation with dual principle (A.2)</i>	<i>High, as enforcement in VET weakened due to alternative in HE (A.2)</i>
<i>Veto power of opponents (B)**</i>	<i>Strong, as trade unions and small firms powerful in VET (B.1)</i>	<i>Weak, as trade unions and small firms not much involved in HE (B.2)</i>	<i>Strong, as trade unions and small firms still powerful in traditional VET (B.1)</i>
<i>Resultant key change process</i>	<i>Layering in a niche between VET and HE</i>	<i>Expansion through conversion within HE</i>	<i>Drift through neglect of high-end dual apprenticeships</i>
Role of state	Enabling	Supportive	Passive
Impact on collective governance in traditional VET	Not immediate; changes still marginal	Not immediate; changes mainly take place within HE field	Negative as changes start to transform traditional VET

*Refers to the characteristics of targeted institution (here dual principle), see Table 1.

**Refers to the characteristics of the political context, see Table 1.

Source: Author’s synthesis.

The process tracing also identified that over time these modes (layering, conversion, drift) have become interlinked and that one or the other can become the dominant mode. However, the findings do not point to a clear-cut sequence, that is, an arrangement of things in successive order, but rather to processes that can overlap and, in turn, trigger and feed others. Using process tracing and paying attention to the details of change over time makes it possible to put the different elements and stages of the overall development together analytically. Thus, in the beginning, change agents from the VET field—most notably large industrial firms—applied strategies of layering to introduce vocational academies, as the prototype of dual-study programmes, in a grey area between VET and HE (Stage I). At first, this layering had a limited impact on traditional VET but then it had a more substantive effect in HE as firms invaded HE to combine VET and HE elements in the form of ‘hybrid’ dual-study programmes, leading to a partial conversion of HE (Stage II). The broader institutionalization and expansion of dual-study programmes (Stage III)—which occurred in the context of European educational policy and the implementation of Bachelor’s degrees—then signifies a change in the external conditions of the traditional system of dual-apprenticeship training. This system is now increasingly affected by institutional drift and gradually losing its capacity to place institutional constraints on employers to adhere to a collective governance mode that safeguards collective goods such as the provision of transferable skills. Interestingly, throughout the three stages analysed, the state’s role has been either neutral or passively supportive. This reflects the fact that key developments have not been promoted by top-down state policies, but emerged from the bottom-up interaction between local stakeholders at a decentralized level.

5. Outlook: combined modes of gradual change and the new role of HE institutions in the political economy of skills

Dual work-based HE is expanding, but it differs from collectively governed traditional VET under the Vocational Training Act or Crafts Code in important ways. For instance, the influence of collective governance through social partnership is declining and the firm-specific character of skills is increasing. However, the case study presented also offers insights into more general employer strategies related to ongoing liberalization and deregulation processes. Thus, in a period of rapid socio-economic and technological change, firms have partly withdrawn from the beneficial institutional constraints set within collective skill formation. In an attempt to upgrade skill profiles, they have moved parts of their training activities—by way of layering—into an institutional grey area that falls neither under the traditional governance mode of VET nor of HE. In this unregulated zone, firms have found space for institutional innovations that can no longer be linked to the traditional coordinated market configuration within the German CME. This finding may contribute to our understanding of the general patterns of deregulation and liberalization in Germany (see e.g. [Streeck, 2009](#); [Thelen, 2014](#)). Furthermore, the analysis showed that firms’ strategies are also driven and facilitated by more general long-term socio-economic trends, linked, above all, to the academization of educational careers and job profiles as well as rising social and educational aspirations among ever larger parts of society—which has unsettled the former ‘equilibrium’ or ‘division of labour’ between VET and HE.

At a more conceptual level, the historical case study showed that the long-term impact of layering (Stage I) on dual-apprenticeship training exerted its effect indirectly via subsequent

conversions triggered in HE (Stage II) that eventually led to the drift of traditional dual training (Stage III)—and a weakening of the traditional collectivist governance mode. That is, the process tracing did not find one dominant mode of change, but rather identified stages in which different modes of gradual institutional change are dominant. For example, in the long term, an earlier mode (in this case: layering) can have a cumulative effect on the targeted institution (in this case: dual-apprenticeship training) via other modes. More specifically, in the case at hand, it emerges that the short-term and the long-term impact of layering—taking place at the nexus of two separate but related institutional spheres—can differ when it exerts its effect indirectly via another related institutional sphere (in this case: HE). This points to the possibility that when examining the details of institutional changes occurring at the nexus of two or more organizational fields, it is useful to combine types from the taxonomy of gradual institutional change. With the given case-study design, it is not possible to determine whether the particular linkage of modes observed in this case can also be expected in other cases. Yet, at a more aggregate level, the findings suggest that it can be useful to envisage how two or more modes of gradual institutional change become interlinked, for example, considering cases in which actor strategies in one field may ultimately relate to those in others. Further research is needed to establish to what extent this stage's approach to gradual institutional change may offer insights into more general patterns of how deregulation processes unfold in and between related institutional spheres in non-liberal capitalism.

Within HE, the main effect of the expansion of dual-study programmes is that firms now play a key role as gatekeepers to high-quality work-based HE programmes. Similarly, firms can now directly influence the curricula of HE programmes—without even having to deal with the balancing force of intermediary organizations such as chambers of commerce or employer associations, which still play a strong role in governing dual-apprenticeship training at the secondary level. The more flexible character of the arrangements that firms can make within the HE system—in the absence of strong trade unions arguing for a greater standardization and monitoring of skills—means that the expansion of dual-study programmes is contributing to a disorganization of the social-partnership model of collective skill formation. In this context, it is interesting to note that the Social Democratic Party has been one of the key proponents of making selective general academic secondary schooling more accessible to the lower middle classes. The irony of this is that as more and more young people entered academic secondary schooling and employers began to develop dual-study programmes to recruit these students for work-based training, social democrats have indirectly facilitated the creation and expansion of an educational pathway that is beyond the reach of social-partnership governance. Thus, social democrats, the supposed allies of the unions, have unwittingly supported the withdrawal of a growing proportion of work-based training from union influence. Moreover, the related decline of traditional dual-apprenticeship training is reducing the education system's capacity to support children from less-advantaged socio-economic backgrounds without an *Abitur* in landing secure and relatively well-paid jobs.

There are three plausible options for shoring up the organizational standards applying to dual-study programmes. The first would be to increase the influence of trade unions in the field of HE. Yet, this option seems improbable given the traditionally weak presence of trade unions in the field of HE, which is still under-discussed in the political economy of skills. The second option is to impose stricter and more detailed state regulations; however, this

would contradict the traditionally rather passive role of the state in the Humboldtian German HE model, which grants HEIs a significant degree of autonomy. The third approach would be to trust in the organizational capacity of HEIs themselves to take a strong position vis-à-vis firms and to ensure that they keep the sovereignty over interpretation with regard to the curricula of dual-study programmes to ensure that students in these programmes gain a broad and sufficiently academic skills portfolio. This third pathway requires no substantially new mode of governance. However, it asks academia to make better use of the influence it already has within HE. From this perspective, HEIs have a new responsibility in the domain of advanced vocational skill formation, as they have begun to play a core role in the interactions between the collective actors that can maintain the beneficial constraints for strategic coordination in skill formation. It follows that the political economy of collective skill formation—which has hitherto mainly focused on VET—needs to pay increased attention to HE if it aims to capture the essence of skill formation in CMEs in future.

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References

- Allmendinger, J. (1989) 'Educational Systems and Labor Market Outcomes', *European Sociological Review*, 5, 231–250.
- Andersen, K. M. and Hassel, A. (2013) 'Pathways of Change in CMEs'. In Wren, A. (ed) *The Political Economy of the Service Transition*, Oxford, Oxford University Press, pp. 171–194.
- Baethge, M. (2006) 'Das deutsche Bildungs-Schisma', *SOFI-Mitteilungen* 34, Soziologisches Forschungsinstitut Göttingen, pp. 13–27.
- Baethge, M. and Wolter, A. (2015) 'The German Skill Formation Model in Transition', *Journal for Labour Market Research*, 48, 97–112.
- Baker, D. P. (2014) *The Schooled Society*, Stanford, CA, Stanford University Press.
- Banscherus, U., Engel, O., Mindt, A., Spexard, A. and Wolter, A. (eds) (2015) *Differenzierung des Hochschulsystems in Deutschland und im Internationalen Vergleich*, Münster, Waxmann.
- Becker, L. (2012) 'Hochschule plus Ausbildung. Ein duales Studium gegen den Fachkräftemangel', Frankfurt/Main, Frankfurter Allgemeine Zeitung, accessed at <http://www.faz.net/aktuell/berufchance> on January 29, 2015.
- Beschoner, H. (2009) 'Die Zukunft der dualen Studiengänge', *Wirtschaft und Berufserziehung*, 61, 13–16.
- BIBB (2014a) *AusbildungPlus in Zahlen*, Bonn, Bundesinstitut für Berufsbildung (BIBB).
- BIBB (2014b) *Dynamisches Wachstum bei dualem Studium hält an*, Press release 23 November 2014, Bonn, Bundesinstitut für Berufsbildung (BIBB).
- BIBB (2015) *AusbildungPlus in Zahlen*, Bonn, Bundesinstitut für Berufsbildung (BIBB).

- BMBF (2004) *Die Fachhochschulen in Deutschland*, Berlin, Federal Ministry of Education and Research (BMBF).
- Bosch, G. and Charest, J. (2008) 'Vocational Training and Labour Market in Liberal and Coordinated Economies', *Industrial Relations Journal*, 39, 428–447.
- Busemeyer, M. R. (2009) 'Asset Specificity, Institutional Complementarities and the Variety of Skill Regimes in Coordinated Market Economies', *Socio-Economic Review*, 7, 375–406.
- Busemeyer, M. R. and Trampusch, C. (eds) (2012) *The Political Economy of Collective Skill Formation*, Oxford, Oxford University Press.
- Busse, G. (2009) *Duales Studium: Betriebliche Ausbildung und Studium*, Düsseldorf, Hans-Böckler-Stiftung.
- Campbell, J. L. (2004) *Institutional Change and Globalization*, Princeton, NJ, Princeton University Press.
- Clark, B. R. (1983) *The Higher Education System. Academic Organization in Cross-National Perspective*, Berkeley, CA, University of California Press.
- Crouch, C., Finegold, D. and Sako, M. (2004) *Are Skills the Answer?*, Oxford, Oxford University Press.
- Culpepper, P. D. (2003) *Creating Cooperation. How States Develop Human Capital in Europe*, Ithaca, NY, Cornell University Press.
- Deißinger, T. (2000) 'The German 'Philosophy' of Linking Academic and Work-based Learning in Higher Education', *Journal of Vocational Education & Training*, 52, 605–626.
- DESTATIS (2016) *0,4% weniger neue Ausbildungsverträge im Jahr 2015*, Press release 13 April 2016 (132/16), Wiesbaden, Statistisches Bundesamt (DESTATIS).
- Ebbinghaus, B. (2005) *Can Path Dependence Explain Institutional Change?*, MPIfG Discussion Paper No. 05/2, Cologne, Max Planck Institute for the Study of Societies (MPIfG).
- Emmenegger, P. (2009) 'Specificity versus Replaceability: The Relationship Between Skills and Preferences for Job Security Regulations', *Socio-Economic Review*, 7, 407–430.
- Estévez-Abe, M., Iversen, T. and Soskice, D. (2001) 'Social Protection and the Formation of Skills'. In Hall, P. A. and Soskice, D. (eds) *Varieties of Capitalism*, Oxford, Oxford University Press, pp. 145–183.
- Faßhauer, U. and Severing, E. (2016) 'Duale Studiengänge'. In Faßhauer, U. and Severing, E. (eds) *Verzahnung beruflicher und akademischer Bildung*, Bielefeld, W. Bertelsmann, pp. 7–17.
- Finegold, D. (1999) 'The Future of the German Skill-Creation System'. In Culpepper, P. D. and Finegold, D. (eds) *The German Skills Machine*, New York, NY, Berghahn Books, pp. 403–430.
- Fortwengel, J. and Jackson, G. (2016) 'Legitimizing the Apprenticeship Practice in a Distant Environment: Institutional Entrepreneurship Through Inter-Organizational Networks', *Journal of World Business*, 51, 895–909.
- Gensch, K. (2014) *Dual Studierende in Bayern – Sozioökonomische Merkmale, Zufriedenheit, Perspektiven*, München, Bayerisches Staatsinstitut für Hochschulforschung.
- George, A. L. and Bennett, A. (2005) *Case Studies and Theory Development in the Social Sciences*, Cambridge, MA, MIT Press.
- Gläser, J. and Laudel, G. (2009) *Experteninterviews und Qualitative Inhaltsanalyse als Instrumente Rekonstruierender Untersuchungen*, Wiesbaden, VS Verlag für Sozialwissenschaften.
- Goldschmidt, D. (1991) 'Idealtypische Charakterisierung sieben westlicher Hochschulsysteme', *Zeitschrift für Sozialforschung und Erziehungssoziologie*, 11, 3–17.
- Graf, L. (2013) *The Hybridization of Vocational Training and Higher Education in Austria, Germany and Switzerland*, Opladen, Budrich UniPress.
- Hacker, J. (2005) 'Policy Drift'. In Streeck, W. and Thelen, K. (eds) *Beyond Continuity*, Oxford, Oxford University Press, pp. 40–82.

- Harney, K., Hartz, S. and Weischet, M. (2001) *Beziehungen zwischen Berufsbildungs- und Hochschulsystem im Medium dualer Studiengänge*, Recklinghausen, Forschungsinstitut für Arbeiterbildung.
- Heidemann, W. and Koch, J. (2013) 'Duale Studiengänge: Konkurrenz für die klassische Ausbildung?', *WSI-Mitteilungen*, **1**, 52–56.
- Herrigel, G. (2015) 'Globalization and the German Industrial Production Model', *Journal for Labour Market Research*, **48**, 133–149.
- Hillmert, S. and Kröhnert, S. (2003) 'Differenzierung und Erfolg tertiärer Ausbildungen: die Berufsakademien im Vergleich', *Zeitschrift für Personalforschung*, **17**, 195–214.
- Jahn, H. (1999) 'Dualisierung und Modularisierung der Fachhochschulstudiengänge'. In Gützkow, F. and Köhler, G. (eds) *Differenzierung, Durchlässigkeit und Kooperation*, Frankfurt/Main, Gewerkschaft für Erziehung und Wissenschaft, pp. 17–34.
- Kahlert, H. (2006) *Vergessene Aktion – Wie die Fachhochschule entstanden ist*, Bremen, Stiftung für Sozialgeschichte des 20. Jahrhunderts, accessed at <http://www.stiftung-sozialgeschichte.de> on January 25, 2015.
- Kramer, W. (1981) 'Abiturientenprogramme und Traineeprogramme in der Wirtschaft'. In Kramer, W. and Landsberg, G. v. (eds) *Abiturientenprogramme in der Wirtschaft*, Berlin, Schmidt, pp. 11–53.
- Krone, S. (2015) 'Neue Karrierepfade in den Betrieben: Nachwuchsbindung oder Akademisierung?'. In Krone, S. (ed) *Dual Studieren im Blick*, Wiesbaden, Springer VS, pp. 51–88.
- Kupfer, F., Köhlmann-Eckel, C. and Kolter, C. (2014) *Duale Studiengänge*, Bonn, Bundesinstitut für Berufsbildung (BIBB).
- Kupfer, F. and Stertz, A. (2011) 'Dual Courses of Study – The Supply and Demand Situation', *BWP, Special Edition 2011*, 29–30.
- Mahoney, J. (2004) 'Comparative-Historical Methodology', *Annual Review of Sociology*, **30**, 81–101.
- Mahoney, J. and Thelen, K. (2010) 'A Theory of Gradual Institutional Change'. In Mahoney, J. and Thelen, K. (eds) *Explaining Institutional Change*, New York, NY, Cambridge University Press, pp. 1–37.
- Mayer, K. U. and Solga, H. (eds) (2008) *Skill Formation*, New York, NY, Cambridge University Press.
- Metzner, J. (1997) 'Die Gründerzeit ist schon Geschichte'. In Bode, C., Becker, W., Habbich, C. and Klofat, R. (eds) *Fachhochschulen in Deutschland*, Munich, Prestel, pp. 14–20.
- Milde, B. and Kroll, S. (2015) 'Duale Berufsausbildung – Noch attraktiv für Studienberechtigte?', *Berufsbildung in Wissenschaft und Praxis*, **4**, 4–5.
- Mucke, K. and Schwiedrzik, B. (2000) *Duale berufliche Bildungsgänge im tertiären Bereich*, Bonn, Bundesinstitut für Berufsbildung (BIBB).
- Nikolai, R. and Rothe, K. (2013) 'Konvergenz in der Schulstruktur? Programmatik von CDU und SPD im Vergleich', *Zeitschrift für Politikwissenschaft*, **23**, 545–572.
- Powell, J. J. W., Bernhard, N. and Graf, L. (2012) 'The Emerging European Model in Skill Formation', *Sociology of Education*, **85**, 240–258.
- Powell, J. J. W. and Solga, H. (2010) 'Analyzing the Nexus of Higher Education and Vocational Training in Europe', *Studies in Higher Education*, **35**, 705–721.
- Schickler, E. (2001) *Disjointed Pluralism*, Princeton, NJ, Princeton University Press.
- Schwiedrzik, B. (2001) 'Duale Studiengänge und Hochschulzugang'. In Lischka, I. and Wolter, A. (eds) *Hochschulzugang im Wandel?*, Basel, Beltz.
- Scott, W. R. (2008) *Institutions and Organizations*, Thousand Oaks, CA, Sage.
- Severing, E. and Teichler, U. (2013) *Akademisierung der Berufswelt?*, Bielefeld, W. Bertelsmann.

- Sorge, A. (2007) 'Was ist von einer produktiven Wissensgesellschaft durch nachhaltige Innovation und Berufsbildung zu erwarten?'. In Kocka, J. (ed) *Zukunftsfähigkeit Deutschlands*, Berlin, Sigma, pp. 229–249.
- Statistik-BW (2016) *Studierende und Studienanfänger an Hochschulen in Baden-Württemberg im Wintersemester 2014/2015*, Stuttgart, Statistisches Landesamt Baden-Württemberg, accessed at http://www.statistik.baden-wuerttemberg.de/BildungKultur/Hochschulen/HS_StudentenAkt.jsp on June 02, 2016.
- Streeck, W. (1992) *Social Institutions and Economic Performance*, London, Sage.
- Streeck, W. (1997) 'Beneficial Constrains'. In Hollingsworth, J. R. and Boyer, R. (eds) *Contemporary Capitalism*, Cambridge, Cambridge University Press, pp. 197–219.
- Streeck, W. (2009) *Re-Forming Capitalism*, Oxford, Oxford University Press.
- Streeck, W. and Thelen, K. (2005) 'Introduction'. In Streeck, W. and Thelen, K. (eds) *Beyond Continuity*, New York, NY, Oxford University Press, pp. 1–39.
- Thelen, K. (2004) *How Institutions Evolve: The Political Economy of Skills in Germany, Britain, the United States, and Japan*, New York, NY, Cambridge University Press.
- Thelen, K. (2014) *Varieties of Liberalization and the New Politics of Social Solidarity*, New York, NY, Cambridge University Press.
- Thelen, K. and Busemeyer, M. R. (2012) 'Institutional Change in German Vocational Training: From Collectivism to Segmentalism'. In Busemeyer, M. R. and Trampusch, C. (eds) *The Political Economy of Collective Skill Formation*, Oxford, Oxford University Press, pp. 68–100.
- Trampusch, C. (2010) 'Employers, the State and the Politics of Institutional Change: Vocational Education and Training in Austria, Germany and Switzerland', *European Journal of Political Research*, 49, 545–573.
- Waldhausen, V. and Werner, D. (2005) *Innovative Ansätze in der Berufsbildung*, Cologne, Deutscher Instituts-Verlag.
- Walitzek-Schmidtke, E. (2014) 'Vom Stuttgarter Modell zur Dualen Hochschule Baden-Württemberg', *d13 - Das DHBW Magazin*, 2, 7–17.
- Wegge, M. and Weber, H. (1999) 'Steuerung in der Berufsausbildung', *Zeitschrift für Pädagogik*, 40, 137–156.