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Economic Prosperity under Varieties of Capitalism

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Economic Prosperity under Varieties of Capitalism

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Abstract

The structural change of 12 developed states over the years 1973-2008 was analysed with a focus on the manufacturing sector. Key indicators were sectoral parameters (employment, output, produc¬tivity), exports (export rate, trade balance) and inequality indicators (GINI index, S90/S10 ratio). By comparative analysis, three state clusters were identified. Their paths of development were put in rela¬tion with the politico-economic regimes of the analysed states as described by models of capitalism. It was found that the Varieties of Capitalism (VoC) approach by Hall and Soskice (2001a) provides a sound explanatory basis for macro-economic developments triggered by the manufacturing sector: 1) Manufacturing requires incremental innovation, a path that is paved by coordinated market economies (CME). Austria, Finland, Germany, Sweden, also (to a lesser extent) Belgium and the Netherlands belong to this group. 2) Due to their institutional structures, liberal market economies (LME) aim at disruptive innovation and put less effort into incremental innovation as required to achieve a high manufacturing productivity. Countries of that group are UK and USA. This notwithstanding, the explanatory power of the VoC dichotomy was found to be incomprehensive. A sample of CMEs (France, Italy, Japan, Spain) was found to be less successful in reaching a cutting-edge manufacturing productivity. For this deviating group, drawing from the model of Schmidt (2003), an extraordinarily strong role of the state in their national economies was identified as the decisive factor for their deviance. State economic guidance and interference kept the respective economies from living up to their full potential in manufacturing and thus hampered economic success. Path dependency as predicted by Hall and Soskice (2001a) was generally confirmed by the actual economic analysis and backed by a comparison with historical developments in the first phase of industrialisation.

Keywords: Comparative Capitalism, Varieties of Capitalism, Structural Change, Manufacturing, Productivity.

Introduction

Comparative Capitalism is a stream of economic theory that strives at distinguishing certain types of capitalism by their determinants of economic development and, in more recent publications, also in their relation to social inequality (Nölke, 2010).

In this study covering the years 1973-2008, the structural change of 12 mature states is contrasted with varieties of capitalism. The manufacturing sector is the core sector of the analysis. Patterns of socio-economic development are identified and put in relation with models of Comparative Capitalism, starting from the Varieties of Capitalism (VoC) approach (Hall & Soskice, 2001a).

Literature Review

The theories of Comparative Capitalism are based on the assumption of path-dependent developments triggered by cultural and historical pre-conditions. In this study, their explanatory applicability on structural change with a focus on the development of the manufacturing sector is explored. Accordingly, this literature review involves the following topics:

- comparative analysis of capitalism,
- the role of manufacturing in national economies.

Comparative Analysis of Capitalism

According to a well-established definition by Edgar Schein, organizational culture consists of "the basic assumptions and beliefs that are shared by members of an organisation, that operate unconsciously and define in a basic taken-for-granted fashion an organisation's view of itself and its environment" (Schein, 2004, p. 6). The behaviour of members of an organization is influenced by partly overlapping specific cultures, constituting cultural frames of reference of the following spheres (Johnson et al., 2014):

- national/regional,
- organisational field,
- organisation,
- functional/divisional.

Attitudes to work, authority, equality and other important factors for the development of firms and their functions and divisions, economic sectors and national economies may vary largely at all these aggregate levels of an economy. Yet, national/regional cultural differences have an impact on all organisations of the respective national/regional economy. Such differences are shaped by factors like geography, religion, politics and socio-economic history over many centuries (Johnson et al., 2014), so they are deeply rooted in the cultural memory of the

people of the respective country or region. The related taken-for-granted assumptions and behaviours pervade the actions of political and economic decision-makers and co-workers at all hierarchical stages, so national culture may exert large influence on the course of socio-economic development of a country.

The Role of the State in Economic Debate

In the course of industrialization, more than one nation took the leading role. In parallel to economic development, the modern welfare state emerged. From its early beginnings, e.g. in Germany from the late 19th century, it was conceived as a stronghold against the labour movement (Ajaß, 2010). Today, all developed states are if not welfare states, but (to a sometimes very different extent) social states.

The expected role of the state within the economy is seen differently from nation to nation. As the notion of the 'land of the free' reveals, very many US citizens have not been in favour of a strong state, while the opposite may be the case in countries minted by social-democrat or even socialist traditions. This notwithstanding, Roosevelt's 'New Deal' helped overcome the US Great Depression around 1930. The emerging stronger role of the state was only pushed back by the neo-liberal movement around 1980 as an answer to economic stagnation in England and the USA (Temin, 1989).

The economic mainstream was very much influenced by at a time actual Anglo-Saxon policies. From the 1950s, massive state interventions were advocated, i.e. for import substitutions by (heavy) manufacturing. By the 1990s, economic mainstream thinking had undergone a complete paradigm change. Leading economists (not only the neo-liberalist extremists) and institutions like the IMF and the World Bank propagated the 'Washington Consensus' and a bundle of related measures like deregulation and international competition, even almost complete state withdrawal. The 2005 World Development Report did not even mention industrial policies anymore (Lin, 2012).

The globalization period after the fall of the Iron Curtain was thus marked by the ideas of free trade, deregulation and international competition. Supra-national organizations like the WTO, the EU and NAFTA created the institutional framework that bolstered the thrive and prosper of the world economy, more and more driven by FDIs of the leading MNCs. The neo-liberal form of a national economy seemed to be superior to any other form of government. Many researchers believed that sooner or later, all economies would converge into that model. Due to the Great Recession 2008/9, this belief was substantially shaken. Meanwhile, the pendulum of economic mainstream thinking has swung back to a certain extent, with economists advising a stronger role of the state and a wider range of economic orientation (Lin, 2012).

While the economic policies of national states were influenced by the actual mainstream, nations still followed their own often very different approaches towards economic development. Based on different national cultural backgrounds, related concepts of the state and its institutions evolved, thereby creating specific comparative advantages of their economies.

Varieties of Capitalism

Comparative Capitalism is a stream of economic theory that strives at distinguishing certain types of capitalism by their determinants of economic development and, in more recent publications, also in their relation to social inequality (Nölke, 2010). Starting with the seminal work by Shonfield (1965), a number of typologies of national models of capitalism were developed by writers of different theoretical background, i.e. Neo-Marxism (Coates, 2000), New Institutionalism (Hall & Soskice, 2001a) and the French regulation school (cf. Boyer, 2018) which aims at describing a set of institutional laws, norms, forms of state, policy paradigms, and other practices that as "modes of regulation" provide the context for the accumulation of wealth. Amable (2003) is a representative of that school, although his methodology of value decomposition and principle component analysis is not strictly in line with the French regulation school's typical methods (cf. Labrousse & Michel, 2018).

Like the work of their popular predecessor Albert (1991) who coined the term 'Rhine capitalism' in contrary to the 'Anglo-Saxon' form, the work of Hall and Soskice is based on a juxtaposition of two types of economies (LME vs. CME, cf. Table 1). Probably due to this parsimonious approach in combination with a sound framework of institutional analysis (Hoffmann, 2003), their 'Varieties of Capitalism' version has gained much acceptance and led to many empirical studies (Nölke, 2010). Even for writers in a Neo-Marxist perspective it offered a starting point of analysis since it predicted path dependency rather than superiority of a single economic model (Bieling, 2011). The institutional grounds of Hall and Soskice's (2001b) analysis have become widely accepted.

Table 1. *VoC Dichotomy by Hall and Soskice*

Type of capitalism	**Countries**
Liberal Market Economy (LME)	UK, USA, Ireland, Canada, New Zealand, Australia
Coordinated Market Economy (CME)	Germany, Austria, Switzerland, Belgium, France, Netherlands, Italy, Sweden, Denmark, Finland, Norway, Iceland, Japan

Source: Hall & Soskice (2001b, p. 20), amended.

Crouch (2005) detected several pitfalls resulting from a mere dichotomy of types, even when limiting the analysis to the around 25 fully developed countries. When either stressing or shrouding certain specific features of the economic reality, Mediterranean countries are either squeezed into the binary model, or a third group is constituted, e.g. by Schmidt (2003). She notices certain similarities between Mediterranean countries, France and Japan. The two latter are compared in detail by Theret (2011). Basing on the seminal paper of Esping-Andersen (1990) on forms of Welfare Capitalism, Schröder (2013), by integrating VoC and welfare state research, arrived at a unified typology of three forms of capitalism.

Whitley (1999) found national economies too different for any form of typification and instead offered a sophisticated multivariate set of parameters for classification. Although such a multivariate analysis is at the bottom of any kind of

typology, not presenting any further kind of grouping has not become widely accepted.

While the VoC approach was originally aimed at mature countries, in recent years more and more research was carried out on emerging economies. Mostly, these investigations focused on regions, i.e. Latin America (e.g. Schneider, 2013), East Europe & CIS (e.g. Nölke & Vliegenthart, 2009), Asia (e.g. Andriesse, 2010), but also comparative studies on the biggest emerging economies (BRIC or BICS states) have been conducted (Nölke, 2010; May & Nölke, 2014). Also here, the French regulation school contributed with studies on East Europe (e.g. Contrepois et al., 2011; Delteil & Dieuaide, 2012, Chavance, 2008; Magnin, 1999) and Latin America (e.g. Bizberg, 2010, 2014).

The Varieties of Capitalism (VoC) Dichotomy

The central actor in the model of Hall and Soskice (2001a) is the firm. It is in relation with other actors, namely its own employees (internal) and a range of external actors that include supply chain partners, stakeholders, trade unions, business associations and governments. Hall and Soskice (2001b) distinguish a fundamental difference in five spheres (institutions) of liberal market economies (LMEs), e.g. the USA, and coordinated market economies (CMEs), e.g. Germany. The five interdependent spheres of institutions are (Nölke, 2010):

(1)corporate finance,
(2)corporate governance,
(3)industrial relations,
(4)education/training,
(5)transfer of innovation within the economy.

In all these spheres, coordination needs to be achieved for successful outcomes, i.e. minimized transaction costs and avoidance of problems from principal-agent relationships, i.e. moral hazard, adverse selection, hold-up and shirking. The fundamental difference between LMEs and CMEs lies in the prevalent form of coordination. LME firms coordinate their activities by market relations in a context of competition and formal contracting while CME firms rather depend on non-market relationships, i.e. incomplete contracting, exchange of private information inside networks, a generally more collaborative approach. The involved institutions include strong employer associations, trade unions, networks of cross-shareholding and legal systems that allow information sharing and collaboration (Hall & Soskice, 2001b).

From their analysis, Hall and Soskice contend that a particular institutional environment brings specific conditions for development and eventual competitive advantage to a firm. The authors name that concept “comparative institutional advantage” (Hall & Soskice, 2001b, p. 37). It shows in the prevalent mode of product innovation. While radical innovation is necessary in fast-moving technology sectors like biotechnology, semiconductors, software development,

telecommunications, incremental innovation is essential for keeping competitive advantage in the production of capital goods from the machine building sector, e.g. machine tools, factory equipment, consumer durables, transport equipment.

From their analysis, Hall and Soskice deduce that LMEs are better suited for bringing about radical innovation while inhibiting incremental innovation. In CMEs, it is exactly the opposite:

- In CMEs, the (vocational) training systems provide firms with skilled labour at all levels of the firm, required for incremental progress. Cooperation of firms along the value chain is supported by business associations and appropriate contract laws. Moreover, trade unions aim at labour protection and long-term employment. All this is highly indicative for incremental innovation, while radical innovation is hampered by lacking risk capital and labour mobility.
- In LMEs, short-term employment and high market pressure in combination with unilateral control at the firm top prevents the development of a labour force with skills and determination towards incremental innovation. Hire-and-fire policies just do not meet these requirements. On the other hand, available venture capital allows to finance new and risky endeavours with good prospects, drawing from an adaptable and available workforce ready to acquire new skills when paid accordingly. Thus, a good basis for radical innovation is laid.

In most sectors of an LME, production relies on low-cost standardized production driven by employees of low qualification and a correspondingly low wage level. This is in sharp contrast to the few high-technology markets, resulting in high wage differentials, indicated by a high GINI index and low levels of social security. The opposite is the case with CMEs.

Central to the VoC theory is the path dependency of both capitalisms. There is no single optimum policy, no convergence towards one system (presumably LME), but two very different approaches leading to very different results on the basis of specific comparative advantages (Hall, 2005). Path dependency of economies is based on institutional complementarities, i.e. “institutions within a successful economy are mutually reinforcing, balanced, and complementing” (Nölke & Vliegenthart, 2009: 672). National institutional arrangements tend to push firms towards certain corporate strategies especially in terms of innovation.

Further to that, paths cannot easily be changed or altered, since firms develop long-term strategies complementary to the institutions in place (Whitley, 2003). They adapt to their environment, creating sensitive equilibria. Thus, policy-making can neither simply replace one system by another nor put elements of systems together on a voluntary basis, but has to acknowledge the inherited culturally grounded ‘rule of the game’ within each type. If changes are intended aiming at improved coordination of institutions, delicate trust-based equilibria need to be respected. These exist especially in CMEs. In the case of LMEs, such trust and respective institutions are difficult to build up, e.g. vocational training fostering the necessary workforce for technology-based small and medium-sized firms is often

lacking since firms are afraid of possible agency effects and poaching (Hoffmann, 2003).

Path dependency shows in the detail. Market pressure from globalization was thought to weaken the influence of unions in CMEs, but the more the firms became lean and focused on core competencies, the more dependent they became on their skilled workers. The unions as intermediaries in wage negotiations could retain their strong position in CMEs like Germany and Sweden (Hoffmann, 2003).

Models Containing Additional Types of Capitalism

The outlined dichotomy is not absolutely straightforward, e.g. Crouch (2005) made the remark that its large state-led military sector does not fit into the usual scheme of US capitalism. Although Hall and Soskice (2001b) acknowledged big differences between institutions of states of one type (e.g. Germany's formation of industry-specific skills in contrast to Japan's formation of skills required in business groups) and also sectoral institutional differences within states, they considered the similarities in both groups big enough to justify a dichotomous approach.

Other authors found certain institutional differences meaningful enough to come up with a more differentiated grouping. The most prominent of these typologies are introduced in the following. A synopsis is given in Table 2.

- Schmidt (2003) focussed on the role of the state in national institutions. Despite of a tendency towards more liberal markets in the globalization era from the 1990s, she still distinguished three different market models, with France as the central actor of the state-led group characterized by high direct influence of the state in terms of economic guidance and interference, e.g. in wage settlements. As Crouch (2005) remarked, Hall and Soskice (2001b) also recognized a 'Mediterranean' group (France, Italy, Spain, Portugal, Greece and Turkey), seen as "empirically poised somewhere between the LME and the CME model" (Crouch 2005, p. 445), but without requiring a specific definition and in most of their text treated as standard CMEs. Schröder (2013) put his emphasis of analysis on the strength of social security systems and made an attempt of integrating varieties of capitalism and welfare state research. He gave an overview of five typologies consisting of three to five types of capitalism. By then connecting the VoC approach with the classical welfare state typology by Esping-Andersen (1990), he arrived at his own typology of three variations. Compared to the VoC dichotomy, the Anglophone group of LMEs remained unaltered under the caption 'liberal capitalism'. The group of CMEs was split up into the more welfare-state oriented Scandinavian group labelled as 'social democratically coordinated capitalism' and the intermediate group named as 'conservatively coordinated capitalism'.
- Amable (2003), on the basis of a vast range of empirical institutional data, came up with five geo-cultural clusters of capitalism.

A different basic approach was taken by Baumol et al. (2012) who centred their model on firm ownership in relation to innovations. They claimed that recent successful forms of capitalism are hybrids of entrepreneurial small and medium-sized enterprises generating innovation and powerful firms large enough to succeed in global markets and to constantly acquire innovations from the inventors. Unlike Hall and Soskice (2001b) who connected radical innovation with LMEs and incremental innovation with CMEs, they connect radical innovation with entrepreneurial small and medium-sized enterprises and incremental innovation with oligopolistic big firms. Thus, no juxtaposition of German and US capitalism is resulting, but different accentuations of a similar form of capitalism. The approach of Baumol et al. (2012) is not limited to mature economies, but encompasses all global economies.

Table 2. *Amended Typologies of Capitalism*

Author(s)	Type of capitalism	Countries
Schmidt (2003)	Market (MR)	UK, USA, Ireland, Canada, New Zealand, Australia
	Managed (MD)	Germany, Austria, Denmark, Sweden, Netherlands
	State-led (S-L)	France, Italy, Spain, Japan, Taiwan, Korea
Schröder (2013)	Liberal (LIB)	UK, USA, Ireland, Canada, New Zealand, Australia
	Conservatively coordinated (CC)	Germany, Austria, Switzerland, Belgium, France, Netherlands, Italy, Spain, Portugal, Japan
	Social-democratically coordinated (SD)	Sweden, Denmark, Finland, Norway
Amable (2003)	Market-based (M-B)	Anglophone countries
	Social democratic (S-D)	Nordic
	Asian (AS)	Japan, Korea
	Mediterranean MED	Southern Europe
	Continental European (CE1, CE2)	Continental Western European less Nordic and Mediterranean i. Netherlands, Switzerland ii. Austria, Belgium, France, Germany
Baumol et al. (2012)	Oligarchic	Latin America, Africa, Middle East, Russia
	State-guided	Korea, China
	Big-firm	Japan
	Entrepreneurial	(small and medium-sized enterprises)
	Mixed entrepreneurial-oligopolistic	USA, Germany

Source: Own compilation based on Schmidt (2003), Schröder (2013), Crouch (2005), p. 447, Baumol et al.(2012), pp. 119-121.

The Role of Manufacturing in National Economies

The three-sector hypothesis, introduced by Fisher (1935) and Clark (1940) and taken further by Fourastié (1949), is a politico-economic theory describing the sectoral structural change of a national economy (Klodt, 2014c). On a low level of development, the primary sector (agriculture) dominates, later the secondary sector (industrial production) and, as the final achievement, the tertiary sector (services) (Klodt, 2014b).

On a low income level, the demand for goods is focused on the coverage of basic needs and thus relatively inelastic. With rising income, the elasticity of demand rises. Thus, industrial goods and – in the course of development – services become more and more favoured. Moreover, technical progress leads to different patterns of growth per sector. In the secondary sector (capital-intensive production), the labour content becomes reduced by automation, so deindustrialization as a relative decline in sectoral employment results. Possibilities for productivity rises in the tertiary sector were considered as limited by the authors of the middle 20th century (Klodt, 2014b).

While the outlined pattern of structural change has been demonstrated in general by empirical studies (Pohl, 1970), the presumption of a general backlog in productivity of the tertiary sector did not prove to be appropriate. It was based on the notion of services as typically being consumer-oriented. In recent decades, modern information and communication technologies (ICT services) have played an important and still growing role in enterprise-oriented services and have improved the productivity of many other fields of service (Klodt, 2014a). Therefore, the dominant factor for the advancement of services can be seen in a shift of demand (Klodt, 2014b).

The socio-economic debate on de-industrialization focussed on manufacturing as the core industrial sector (Kollmeyer, 2009). Central to economic thought on manufacturing was the idea that "there is something special about manufacturing" (Kitson & Michie, 2014: 322). Among the first authors that argued in that direction were Young (1928), Lewis (1954) and Kaldor (1966). The British economist Nicholas Kaldor (1908-1986) was of major influence not only in scientific debate, but as a policy advisor for the British Labour government since 1964 (Dasgupta & Singh, 2006). He estimated the productivity growth of manufacturing higher than that of both other sectors because of its exclusive potential of economies of scale (Kitson & Michie, 2014) and thus assumed manufacturing to be the central cause of GDP growth, its 'engine of growth' (Thirlwall, 1983: 345).

In this context, Kitson and Michie alluded that in many states the manufacturing sector has closely been linked with other economic sectors, not only services, but namely higher education and the public sector. The authors state that by active industrial policies, governments like those of Germany, Japanese and the USA "have been picking winners […] whilst hiding behind the convenient veil of the free market" (Kitson & Michie, 2014: 325). Hence, they are referring to the institutional underpinning of the manufacturing sector.

As Singh (1977) noted, the manufacturing sector is of crucial influence on the external balance of a country. He followed that idea three decades later when

noticing that UK manufacturing accounted for less than 20 % of the GDP, but still for 60 % of its foreign trade (Dasgupta & Singh, 2006). Kitson and Michie (2014) underlined this by stating that from the early 1980s, the UK for the first time since the industrial revolution had a negative balance on manufactures. They blamed ill-led capital flows, e.g. into a too big financial sector, for the weak manufacturing sector in the UK and the subsequent economic distortions as the trade deficit and regional imbalances.

To wind up the discussion on whether there is something special about manufacturing, the following can be stated (Przywara 2017):

- Economic welfare may also be achieved by competitive advantages in other sectors (e.g. KIBS, oil and gas production).
- Any sectoral weakness needs to be compensated by imports. Sectoral specialisation may be the source of wealth (e.g. oil and gas exports) but often weakens other sectors (e.g. manufacturing) by drawing away investments (so-called 'Dutch disease').
- Both as an exporter (e.g. of oil and gas) and as an importer (e.g. in manufacturing), the unbalanced economy is put at an extra risk of being very susceptible to blackmail from their respective customers or suppliers. Close international cooperation is the only way to limit these risks.

Manufacturing is a typical sector of incremental innovation which requires skilled staff for enhancing productivity.

Methodology

This analysis is based on the central idea that development of the manufacturing sector should deviate significantly between countries of different types of capitalism. Country patterns to be identified by analysis of economic data will be compared with those suggested by various authors of varieties of capitalism. CMEs with their well-trained workers are expected to be more inclined towards manufacturing than LMEs, resulting in a larger and more successful manufacturing sector.

Other contingencies (e.g. extent of welfare state, state influence on the economy, national geography, firm size) may have an additional effect, but there are no presumptions regarding the outcome of the analysis.

The analysis was carried out with regard to long-term developments in the mature states listed in Table 3. The timeframe for the underlying analysis (Przywara, 2016) was the period from 1970 until 2010. This period exactly meets the frame of a utile statistical compilation resulting from an EU research project, the EU KLEMS database (Groningen Growth and Development Centre, 2012). In addition, World Bank (2014, 2019) data was used.

All monetary values were transferred into 2010 US dollars on the basis of exchange rates as utilized by the World Bank (2014) to assure international comparability over time. For the given purpose, it was found adequate to abstain

from the use of purchasing power parities (cf. Maddison, 1995).

Table 3. *Analysed Mature Economies (2010)*

Country	**Indicator Code**	**Population**	**Population density**	**GDP**	**GDP p/c**
(* Eurozone)		(million)	(per km²)	(bn USD)	(k USD)
Austria *	AUT	8.4	101.8	377.7	45.0
Belgium *	BEL	10.9	360.6	471.1	43.2
Finland *	FIN	5.4	17.6	236.7	44.1
France *	FRA	65.0	118.7	2,565.0	39.4
Germany *	DEU (GER)	81.8	234.6	3,304.4	40.4
Italy *	ITA	60.5	201.5	2,055.4	34.7
Japan	JPN	127.5	349.7	5,495.4	43.1
Netherlands *	NLD	16.6	492.6	777.2	46.8
Spain *	ESP	46.6	93.4	1,384.8	29.7
Sweden	SWE	9.4	22.9	462.9	49.4
UK	GBR (UK)	62.7	259.4	2,285.5	36.6
USA	USA	309.3	33.8	14,958.3	48.4

Source: World Bank (2014) data and codes (in brackets: codes utilized in this article), in constant 2010 USD.

Sectoral classifications follow the ISIC 4 standard of all economic activities (United Nations, 2008). It contains the following sections:

- Primary Sector (Agriculture):
  A Agriculture, forestry and fishing
- Secondary Sector (Industry):
  B Mining and quarrying
  C Manufacturing
  D Electricity, gas, steam and air conditioning supply
  E Water supply; sewerage, waste management and remediation activities
  F Construction
- Tertiary Sector (Services):
  G-U Private and public services

The manufacturing sector is no homogeneous entity, but involves production processes of very different kinds and technological levels. Its ISIC 4 classification is given in Table 4.

Table 4. *ISIC 4 Codes Including Technology Assessment*

ISIC 4	Classification	Technical level *
C	Manufacturing	
10	Manufacture of food products	low
11	Manufacture of beverages	low
12	Manufacture of tobacco products	low
13	Manufacture of textiles	low
14	Manufacture of wearing apparel	low
15	Manufacture of leather and related products	low
16	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	low
17	Manufacture of paper and paper products	low
18	Printing and reproduction of recorded media	low
19	Manufacture of coke and refined petroleum products	medium low
20	Manufacture of chemicals and chemical products	medium high
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations	high
22	Manufacture of rubber and plastic products	medium low
23	Manufacture of other non-metallic mineral products	medium low
24	Manufacture of basic metals	medium low
25	Manufacture of fabricated metal products, except machinery and equipment	medium low
26	Manufacture of computer, electronic and optical products	high
27	Manufacture of electrical equipment	medium high
28	Manufacture of machinery and equipment n.e.c.	medium high
29	Manufacture of motor vehicles, trailers and semi-trailers	medium high
30	Manufacture of other transport equipment	medium high
31	Manufacture of furniture	low
32	Other manufacturing	low
33	Repair and installation of machinery and equipment	medium low

Source: United Nations (2008), *European Commission (2014). The ISIC 4 sectors shaded grey are accounted as high-technology sectors.

In order to leave out distortions by the first oil crisis and the Great Recession, the period from 1973-2008 was chosen as the standard representation. The analysed period is divided by a historical caesura, the fall of the Iron Curtain in 1989/90. By opening the Eastern markets, it brought about the era of globalisation. Accordingly, in the underlying study (Przywara, 2016), the period from 1973 to 2008 was subdivided into 15 years of pre-transformation (1973-1988), five years of transition (1988-1993) and 15 years of post-transformative globalization (1993-2008). The globalized period (1993-2008) is of special relevance for this analysis.

The study draws from results of an underlying doctoral study (Przywara, 2016) on sectoral change, namely deindustrialization. Key results of this study were published in recent ATINER papers (Przywara, 2017; Przywara, 2019). Here, these results will be newly contextualized and complemented by additional data.

As a key finding from the underlying study (Przywara, 2016), the long-term developments before and after the fall of the Berlin Wall show great continuity. The transition years caused some turmoil but, at least for the mature countries, within very few years resulted in certain paths of development. In cases were some marked political change occurred, e.g. Finland and Sweden which became EU members and also Germany which became reunified, the new paths were clearly different from the old – but again, they were rather stable over the next fifteen years until the 2008 recession. Hence, long-term comparisons, i.e. the evaluation of growth rates over the 15-year or even 35-year periods, in general render meaningful results not deteriorated by short-term local occurrences.

Due to the continuous progression over time, the data for the reference points in 1973, 1988, 1993, 2008 provide meaningful information for the full period when abstracting from short-term fluctuations. Yet, in certain cases, a closer look at certain developments over time is helpful to gain additional insights.

To identify a country pattern of structural change, the following indicators for characteristic paths of industrial development were evaluated:

(1) State of the manufacturing sector by size (employees, output) and efficiency (productivity)
   - The role of manufacturing within a national economy is determined by the manufacturing share of input (% of total workforce) and output (% of GDP).
   - Productivity is the key indicator for scenarios of (de-)industrialization (Przywara, 2017). Here, manufacturing productivity is generally understood as labour productivity based on the sectoral gross value added, the more accurate value compared to GDP-based calculations (Freeman, 2008).

(2) Exports (export rate, trade balance, merchandise trade balance between developed countries)
   - In many cases, exports are largely determined by manufactured goods sold on the basis of technical superiority and/or low prices through mass production. Thus, the export rate is a meaningful indicator for the competitiveness of the manufacturing sector (Przywara, 2016).
   - The trade balance shows how successful a country is in terms of trade.
   - More specifically, trade of merchandise between developed states is considered to be a meaningful indicator for the state of development of the manufacturing industry of a country (Przywara, 2016).

(3) Income distribution (GINI index, ratio between top and lowest 10 % of income share)
   - Since LMEs promote simple production on the bottom end and highly innovative technology on the top end, the income difference should be much higher than in CMEs with their well-trained workers in sectors of incremental innovation, e.g. machine building. Therefore, a country's income distribution should be emblematic for the variety of capitalism of a national economy.

Results

First, the available VoC country patterns are displayed graphically. Second, the results of the economic analysis are given. These results are then grouped and graphically displayed to identify related country patterns. Finally, the identified VoC and economic patterns are compared.

VoC Patterns

In Table 5, the VoC typologies given by Table 2 are transferred into a simplified graphical representation. The typology of Baumol et al. (2012) is not specific in terms of the country sample, so it is not included. The dichotomy of Hall & Soskice (2001a) is supplemented in two different ways by Schmidt (2003) and Schröder (2013). Amable added two more varieties to the latter model.

Table 5. VoC Patterns

Author(s)	Grouping	AUT	BEL	FIN	FRA	GER	ITA	JPN	NLD	ESP	SWE	UK	USA
Hall & Soskice (2001a)	LME / CME											■	■
Schmidt (2003)	MR / MD / S-L				▒		▒	▒		▒		■	■
Schröder (2013)	LIB / CC / SD			▒							▒	■	■
Amable (2003)	MB / CE / SD / MED / AS			▒			▤	▤		▤	▒	■	■

Source: Own compilation based on Schmidt (2003), Schröder (2013), Crouch (2005), p. 447 (cf. Table 3).

Development of the Manufacturing Sector

The development of the manufacturing sector is characterized by the manufacturing share of input (employees) and output (GDP). Sectoral efficiency is described by productivity (manufacturing productivity). In Figure 6, the reference point data for these indicators is listed for 1973, 1988, 1993 and 2008, allowing a view on the investigated full 35-year period and the 15+5+15-year sub-periods including the one of ongoing full globalization. (For the full dataset 1970-2010 see Przywara, 2016).

Table 6. *Overview on Manufacturing Indicators*

Indicator		AUT	BEL	FIN*	FRA	GER	ITA	JPN	NLD	ESP	SWE	UK	USA*
Empl. (%)	**1973**	25.1	31.1	24.0	24.1	32.8	27.3	25.8	21.8	22.0	26.8	24.8	20.5
	1988	20.6	20.4	20.0	18.0	26.6	23.9	22.7	15.9	19.0	21.5	16.5	16.1
	CAGR 73-88	-1.3	-2.8	-1.4	-1.9	-1.4	-0.9	-0.8	-2.1	-1.0	-1.4	-2.7	-2.1
	1993	18.7	18.4	18.2	16.3	23.0	22.5	21.9	14.5	17.4	18.0	12.5	14.4
	2008	15.3	13.2	16.8	11.8	18.2	19.3	16.9	10.2	12.2	15.4	7.9	9.5
	CAGR 93-08	-1.3	-2.2	-0.5	-2.1	-1.5	-1.0	-1.7	-2.3	-2.3	-1.0	-3.0	-2.8
	CAGR 73-08	-1.4	-2.4	-1.1	-2.0	-1.7	-1.0	-1.2	-2.1	-1.7	-1.6	-3.2	-2.5
Output (USD)	**CAGR 73-88**	0.8	0.3	2.2	1.0	1.2	2.0	2.4	0.6	0.7	2.3	-0.2	1.3
	CAGR 93-08	2.6	0.6	3.6	-0.4	1.4	0.3	0.0	0.9	1.2	2.7	-0.8	1.0
	CAGR 73-08	1.6	0.2	2.1	0.2	0.9	0.7	1.1	0.8	0.3	1.6	-0.7	1.0
Productivity (USD/h)	**1973**	23.3	29.0	23.9	25.1	24.2	26.5	23.9	31.8	31.3	24.8	19.3	28.9
	1988	35.3	49.1	36.7	41.1	38.5	37.0	35.1	47.5	42.1	36.8	27.0	32.7
	CAGR 73-88	2.8	3.6	3.4	3.3	3.2	2.3	2.6	2.7	2.0	2.9	2.3	1.1
	1993	38.4	51.4	46.7	45.3	41.2	36.3	39.0	49.8	36.5	38.7	31.3	35.6
	2008	61.4	68.0	69.3	54.3	62.3	40.2	52.6	65.2	42.4	55.5	41.1	51.9
	CAGR 93-08	3.2	1.9	2.7	1.2	2.8	0.7	2.0	1.8	1.0	2.6	1.8	2.5
	CAGR 73-08	2.8	2.5	3.3	2.2	2.7	1.2	2.3	2.1	0.9	2.5	2.2	1.9

Source: Calculations based on World Bank (2014) and Groningen Growth and Development Centre (2012) data, in 2010 USD.
* Different starting points for output and productivity data: Finland: 1975, USA: 1977.

All countries deindustrialized in a sociological sense (i.e. by relative employment) in the long run. In declining order, the UK, the USA, Belgium, the Netherlands and France heralded this structural change in terms of the negative compound annual growth rate (CAGR). Germany, Spain and Sweden were in the midfield, while Italy, Japan, Finland and Austria had a relatively modest manufacturing workforce decline. In 2008, Italy, Germany, Japan, Finland, Sweden and Austria still retained more than 15 % of the workforce in the manufacturing sector. They clearly put more economic emphasis on manufacturing than the other half of the sample, with the UK and the USA already manoeuvring in the single-digit range. Further to a record reduction in employment, the United Kingdom even had to deal with a continuous reduction of its manufacturing output.

The phase of intense globalization (1993-2008) due to open Eastern markets brought about new frame conditions for the rich Western economies. Competition from low-cost countries evolved especially in markets with a low or medium levels of technology. In half of the countries (Belgium, France, Netherlands, Spain, the United Kingdom, USA), relative employment decreased massively. Still, all countries except of France and the UK managed to increase their output.

A grouping by share of employees in manufacturing in 2008 leads to the following results:

(1) High share in manufacturing employment (> 15 %):
- Austria, Finland, Germany, Sweden were the four countries most dedicated to manufacturing. They also achieved the highest manufacturing output growth rates (see below).
- While it boomed in the 1970s and 1980s, in the 1990s Japan's industry was more and more facing low-cost competition in its Asian neighbourhood. In the fully globalized period, it could barely keep its output.
- Italy pursued precautious strategies of limited productivity rises to avoid job losses.

(2) Medium share in manufacturing employment (10-15 %):
- Belgium and the Netherlands manoeuvred in the midfield.
- Spain fared comparatively well, given its limited industrial capabilities. Despite of the relative decline, the absolute number of employees in manufacturing even rose because of the rising number of women participating in the Spanish labour market.
- France did not really meet the competition but rather aimed at avoiding job losses by significantly reducing the workload (reduction to 35 weekly working hours). This resulted in poor productivity gains and a grave deterioration of its firms' international market position.

(3) Low share in manufacturing employment (< 10 %):
- Although finally being left with a one-digit percentage of employees in manufacturing, from the 1990s the USA followed a pretty determined strategy towards a better competitive position in comparison to previous decades.

- The United Kingdom's manufacturing industry kept losing out against its competition.

Concerning output, a grouping was made according to the compound annual growth rate (CAGR, %) achieved in the globalized period 1993-2008 (cf. Table 6):

(1) Fine performance in terms of manufacturing output growth (CAGR > 1.4 %):
   - Finland, Sweden and Austria clearly performed very well.
   - Germany also achieved an outstanding performance since it had to cope with the decline of its industry in the ex-communist Eastern part of the country. The performance of the West German manufacturing industry was probably the best of all countries of the sample.

(2) Medium performance in terms of manufacturing output growth (CAGR = 0.0-1.4 %)
   - Spain, the USA, Belgium and the Netherlands managed to stabilize their manufacturing output.
   - Over time, Italy and Japan could barely keep their output. They also counted for some years of recession.

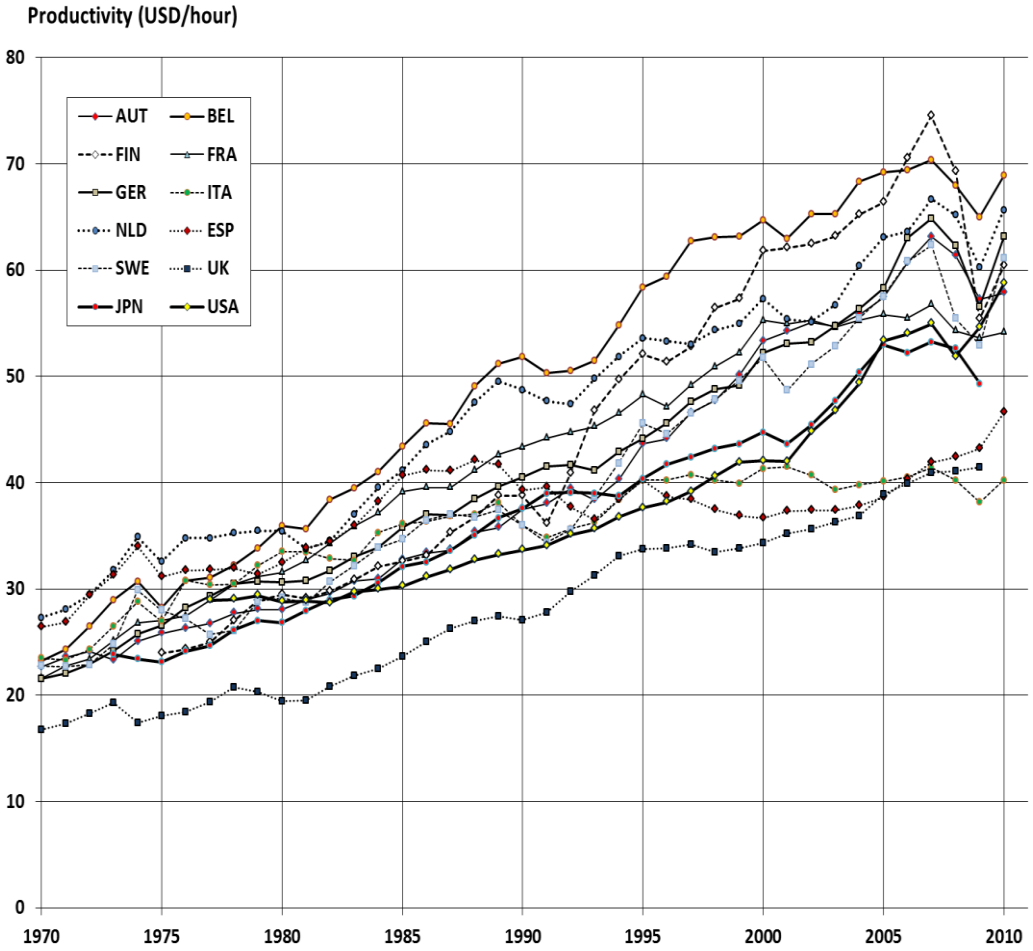
(3) Poor performance in terms of manufacturing output growth (CAGR < 0.0 %)
   - In the globalized period, the UK and France had to deal with a shrinking output of their manufacturing industries.
   - In the case of France, the introduction of the 35 hours working week hampered the international bargaining position.

Productivity is crucial for international competitiveness and thus, especially in the globalisation period, became more and more important over time. In Figure 1, the development of manufacturing productivity over time is shown. In the early 1970s, two states distinctly had the lead (Netherlands and Spain), nine other formed a broad midfield while the United Kingdom was lagging far behind. The UK manufacturing sector had only a good 60 % of the productivity of its Dutch equivalent. Over 35 years, this factor has remained more or less stable.

Until 1989, the year of epic change, the band width between most and least productive states had risen from 10 USD/h to 24 USD/h – almost 50 % of the maximum 51 USD/h. Belgium had replaced Spain in the top two group, even slightly outperforming the Netherlands. Spain, from around the early 1990s, had not pursued a productivity increase path anymore and stagnated (as already 1975-80) or even lost productivity. A midfield of nine other states from France (top) to the USA (bottom) is still identifiable, but the differences between states had become larger. The difference between France and the USA already amounted to a good 9 USD/h. The United Kingdom, despite of continuous efforts, was still lagging far behind.

Additional analyses (Przywara, 2016) showed that the manufacturing sector was in most states characterized by a shift to high-tech manufacturing, i.e. higher growth rates of high-tech products than of less advanced production. Such a development did not take place in France and the UK – a clear sign of technological backlog, in these cases well in line with limited sectoral success as demonstrated by a shrinking sector in the globalized period.

Figure 1. *Manufacturing Productivity*



Source: Based on Groningen Growth and Development Centre (2012) data, in 2010 USD.

At the end of the investigated period, in 2007 (before the 2008/9 crisis), the scenario had changed very much. Finland had become the outperformer, followed by Belgium. After these two, another group of four high-performers can be distinguished: Netherlands, Germany, Austria and Sweden. A group of three medium-well performers followed, consisting of USA, Japan and France. While for the first two, this result was realized by a catch-up process starting around millennium, with France it was just the opposite. France performed well until about 2000 when it started stagnating. Japan followed in 2005.

At the bottom end of performance, the UK had finally caught up with Spain and Italy which had turned to a course of stagnation around 1995. The spread between top (Finland) and bottom (UK) had remained almost constant in relative terms but had increased to 34 USD/h in absolute terms.

Summarizing the findings, these key developments were observed:

(1) A group of six states constantly improved their performance and reached a high level (clearly over 60 USD/h):

- Austria, Belgium, Finland, Germany, the Netherlands and Sweden were the top performers.

(2) Three states arrived in a medium-high productivity position (around 55 USD/h):
- the USA after continuous improvements,
- Japan after long and continuous improvements but recent stagnation,
- France after a decade of stagnation.

(3) Three states were in the low league (barely over 40 USD/h):
- Italy and Spain after long stagnation,
- the UK after a restless catch-up process.

Four states from a certain point in time drifted into manufacturing productivity stagnation, worsening their international bargaining position:

- Spain (from 1990),
- Italy (from 1995),
- France (from 2000),
- Japan (from 2005).

Exports

Export rates and the trade balance are key indicators for international competitiveness. In this context, high export rates can be caused by three different things or even two or all of them:

(1)A country is very focussed on manufacturing technology.
(2)A country is very much involved in international trade.
(3)A country is very involved in international manufacturing value chains.

Sometimes, certain pre-fabricates are exported, value is added by processing, then these products are re-imported and finally sold (=exported) as part of a finished product. Thus, their initial value is counted double for the export balance, and imports are also accounted (as long as the count is not limited to added value). When utilizing the trade balance, i.e. exports minus imports, this problem is omitted since the double count of export is compensated by the re-import. Yet, the trade balance does not render sufficient information on the magnitude of industrial production and exports. Both indicators need to be evaluated jointly.

All states have significantly increased their international activities over time, especially after the fall of the Iron Curtain. Their exports were mainly driven by manufacturing, as the key data for 2008 rendered in Table 7 shows. Only British North Sea oil and Belgian trade in diamonds (Salazar & McNutt, 2010) played a further significant role.

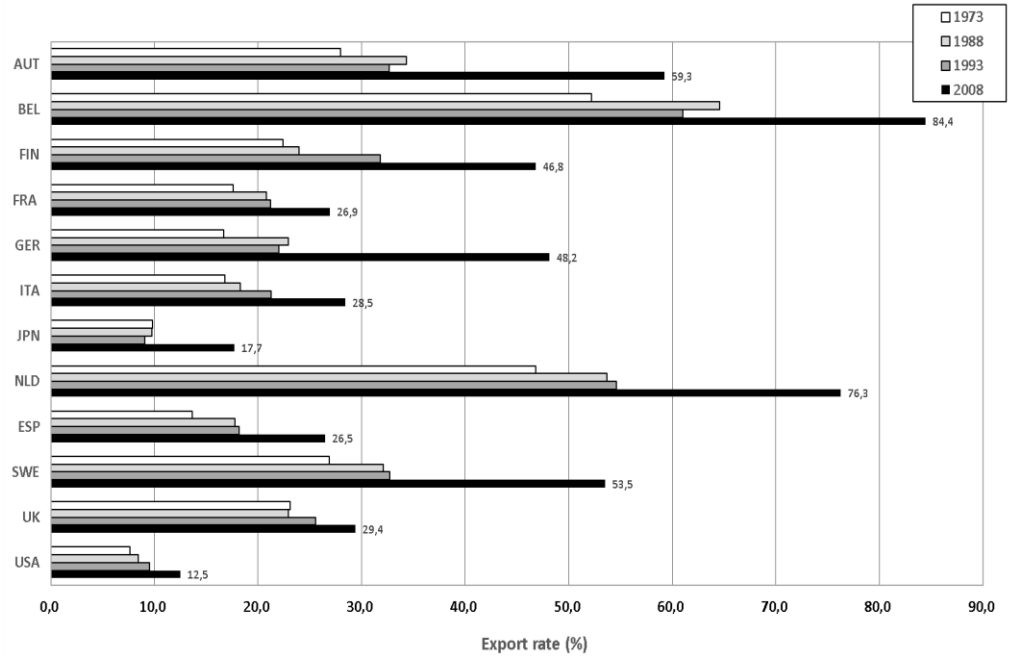
Table 7. *Overview on Exports (2008)*

Indicator	**AUT**	**BEL**	**FIN**	**FRA**	**GER**	**ITA**	**JPN**	**NLD**	**ESP**	**SWE**	**UK**	**USA**
Total (of GDP)	59.3	84.4	46.8	26.9	48.2	28.5	17.7	76.3	26.5	53.5	29.4	12.5
manufacturing (% of total)	60.0	63.0	61.4	62.6	68.0	68.8	81.2	53.3	48.8	52.9	41.9	51.7
oil and gas (% of total)	2.5	7.7	5.3	4.1	2.1	3.8	2.2	2.5	4.2	5.1	8.0	4.5
ore and metals (% of total)	2.6	10.5	3.3	2.1	2.6	1.6	2.3	2.2	1.8	2.8	2.7	2.9
Manufacturing (of GDP)	35.5	53.2	28.7	16.9	32.8	19.6	14.4	40.6	12.9	28.3	12.3	6.5
Merchandise to high-income countries (% of merchandise exports)	84.0	88.9	85.3	81.1	83.2	79.2	64.9	90.1	80.5	86.4	83.9	65.3
Trade balance (% of GDP)	5.8	0.9	3.8	-2.1	6.3	-0.8	0.2	8.3	-5.8	6.8	-2.2	-4.8

Source: Based on World Bank (2014) data and own calculations, constant 2010 prices

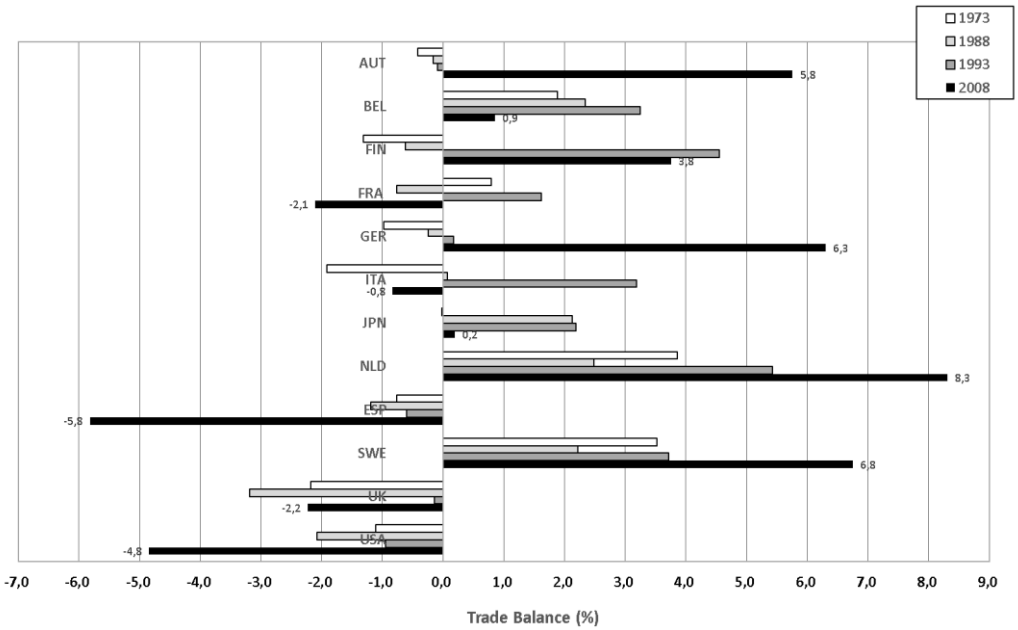
In Figures 2 and 3, the export volume and trade balances of the countries under investigation are charted for the initial state of this analysis (1973), immediately before (1988) and after the years of transition (1993) and the final state in 2008.

Figure 2. *Export Share of GDP*



Source: Own calculations, based on World Bank (2014) data.

Figure 3. *Trade Balance*



Source: Own calculations, based on World Bank (2014) data.

All states have significantly increased their international activities over time, especially after the fall of the Iron Curtain. But there are big differences between countries. A grouping by intervals of 20 % of exports renders the following results:

(1) Countries of very high export orientation (export rate 60+ %):
- Belgium, Netherlands both draw from their favourable location in the heart of Europe and are equipped with high-capacity North Sea ports. Their common region has been the traditional centre of European trade.
- Both countries have a positive trade balance. While the Dutch balance was moving into positive, the Belgian, coming from positive, almost became neutral.

(2) Countries of high export orientation (export rate 40-60 %):
- Austria, Finland, Germany, Sweden form a group of countries with a high affinity towards technology and of rich engineering traditions.
- Three countries of this group have managed to change from a negative to a positive balance over time. Sweden always had one.

(3) Countries of medium-low export orientation (export rate 20-40 %):
- France, Italy, Spain and the UK are countries with a certain industrial tradition, but no real deep-routed cultural affinity towards technology.
- All have a negative trade balance.

(4) Countries of low export orientation (export rate 0-20 %):
- Japan and the USA both have sizeable industries that are mainly producing for their large domestic markets, the by far largest in the investigated group of developed countries.

- The USA has turned from a positive to a very negative trade balance over the years, while Japan, starting around neutral, for a long time generated a trade surplus. In recent years, this surplus has almost vanished.

Success in high-income markets indicated by the share of merchandise exports from highly-developed to highly-developed countries ('North-North' trade following Kollmeyer's (2009) terminology) is normally associated with superior technology which shows in innovative products and also in a high productivity based on continuous improvement of processes. All European countries are on a similar North-North export level with around a good 80 % of total merchandise. The USA and Japan show much lower values of around 65 % (Table 7).

The North-North trade balance (Figure 4) renders more differentiated results. Apart from the Netherlands and Belgium, there are only four countries with a positive North-North trade balance: Sweden, Germany, Italy and Finland. All other countries are net importers of merchandise from other high-income countries, with France, the UK and especially Spain in the weakest position. Austria, coming from the last place, has managed to continuously improve its position.

Summarizing the findings, the results are as follows.

(1) Countries with a positive North-North trade balance (> 0.0 %):
- The Netherlands are clearly in the lead, so they must have a good technological basis. Nevertheless, a major portion of their excellent figures is to be attributed to favourable logistics and intra-trade of MNEs (see below). Besides its very favourable geographical position, an extremely company-friendly taxation that has attracted MNCs to open subsidiaries or even relocate their headquarters (Savelberg, 2013). Trade, especially intra-firm trade, in this respect results from tax avoiding policies which may overlay the findings and distort the results significantly. Since customer markets are not altered concomitantly, exports are resulting.
- A similar, but weaker development can be assumed for Belgium. Moreover, Belgium had a worse position in 2008 than in 1993.
- Finland, Germany and Sweden combine a high-tech share in manufacturing of above 3 % of the GDP with a positive North-North balance and are thus identified as carriers of superior technology in certain engineering and manufacturing fields.
- Italy has a clear surplus in North-North trade, so it might be assumed that it is in possession of superior technology in certain areas. Anyhow, the Italian exposition to trade flows is limited in general, and so it is in high technology.

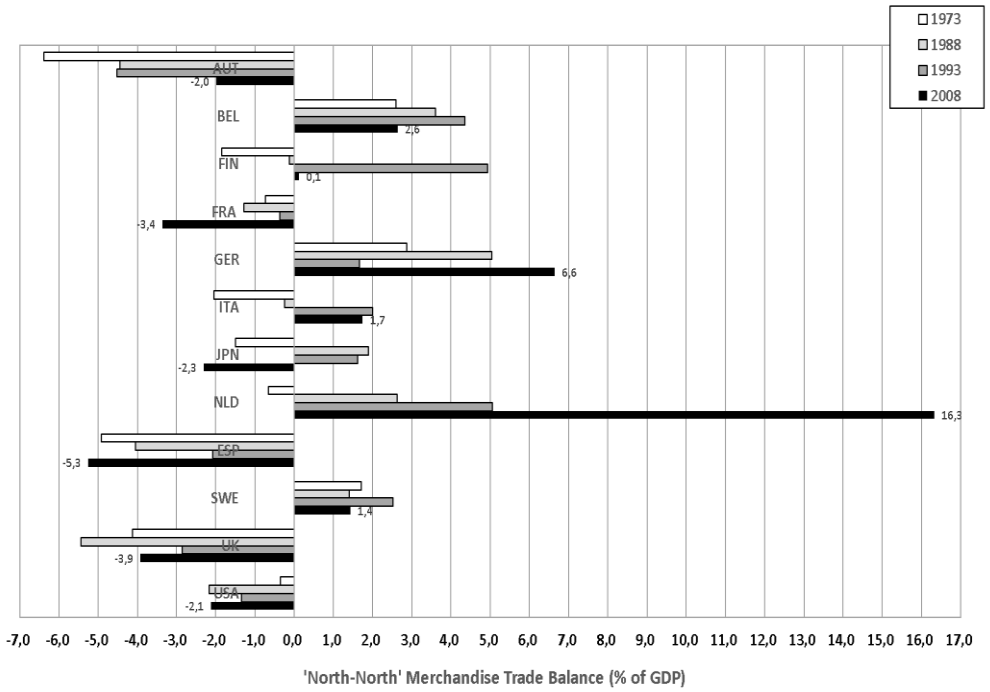
(2) Countries with a slightly negative North-North trade balance (-3.0-0.0 %):
- Austria, France and Japan are very involved in high-technology manufacturing but do not sell more to high-income economies than they buy from them.
- Despite of their impressively high share of high-tech exports which besides some rather narrow technological strength mainly reflects a very limited

exposition to trade, the USA is not very persuasive in their technological level.

(3) Countries with a very negative North-North trade balance (< -3.0 %):

- Spain is ranking last in almost all indicators concerning technology (cf. Przywara, 2016).
- France and the UK have a significant sectoral weakness in manufacturing. Their lacking move towards high-technology manufacturing (see above) shows in a poor international bargaining position especially concerning mature countries. They need to import a significant amount of the respective goods.

Figure 4. *Trade Balance of Merchandise between Developed Countries*



Source: Own calculations, based on World Bank (2014) and Groningen Growth and Development Centre (2012) data.
Belgium: values before 1997 extrapolated from 1997, following the trend of Germany.

Income Distribution

In Table 8, the income distribution of the country sample is displayed by the GINI index and the ratio between highest and lowest 10 % shares of total income (inter-decile income share ratio S90/S10).

Table 8. *Income Inequality (2008)*

	AUT	BEL	FIN	FRA	GER	ITA	JPN	NLD	ESP	SWE	UK	USA
GINI index (%)	30,4	28,4	27,8	33,0	31.2	33,8	32,1	29,3	34.2	28,1	34,1	41,1
S90/S10 income share ratio (%)	8.0	6,7	6,0	8,3	7,6	10,7	9,1	7,0	11,1	7,0	9,4	17,9

Source: World Bank (2019) data for 2008 (USA: 2007).

A grouping leads to the following results:

(1) High inequality countries (GINI > 40.0 %, S90/S10 > 15.0 %)
- Inequality is by far the highest in the USA.

(2) Medium inequality countries (GINI = 32.0-40.0 %, S90/S10 = 8.1-15.0 %)
- The UK are in the upper league of the European mainstream. In this respect, the UK are clearly closer to Europe than to the USA.
- Spain and Italy are relatively unequal, reflecting relatively high unemployment rates (11.3 %, 6.7 % in 2008 according to World Bank (2014) estimates) that lead to a very low income of the bottom 10 % of the workforce. France (unemployment rate of 7.4 % in 2008) was also moving into that direction.
- Japan has a similar level of inequality.

(3) Low inequality countries (GINI < 32.0 %, S90/S10 < 8.1 %)
- This group covers the Scandinavian countries (Sweden, Finland) and those in the heart of Europe (Belgium, the Netherlands, Austria and Germany). All of these have long welfare state traditions.

Patterns of Economic Development

In Table 10, the key findings on the manufacturing sector, exports and income inequality are combined in one table. A threefold grouping according to the relative performance identified in the previous sections was made as indicated in the legend.

- Most successful countries, i.e. those below the value in the < column, were left blank.
- Midfield countries, i.e. those within the < and > borders, were shaded in light grey.
- Most adverse values, i.e. those exceeding the ones in the > column, were shaded in dark grey.

Table 9. *Identified Patterns (2008)*

Indicators	<	>	AUT	BEL	FIN	FRA	GER	ITA	JPN	NLD	ESP	SWE	UK	USA
Manuf. employment (%)	10,0	15,0												
Manuf. output (CAGR, %)	0,0	1,4												
Manuf. productivity (USD/h)*	48,0	60,0												
Exports (%)	20,0	40,0												
Trade balance (%)	-3,0	0,0												
Balance of N-N trade (%)	-3,0	0,0												
Income inequality (GINI)	32,0	40,0												
Harmonized pattern														

Source: Own compilation based on World Bank (2014), World Bank (2019) and Groningen Growth and Development Centre (2012) data, in 2010 USD.

Grouping:

Performance below < level (poor)

Performance from < to > level (fair)

Performance above > level (fine)

In each row, a certain pattern evolves. Not all row patterns match exactly, but a common picture becomes visible. A harmonized pattern can be synthesized as the mean value of all columns. The result includes three country groups:

(1) Successful in manufacturing and trade, relatively equal:
- Finland, Germany and Sweden exactly fit into that group.
- Austria only deviates in terms of North-North trade. It has significantly improved also in that respect, so there is no doubt that it fits well into that group.
- Belgium and the Netherlands have a somewhat different economic structure due to their seaborne economy. A smaller share of their national economies is engaged in manufacturing, more investments and also labour go into their harbours and logistics. Their transformation into service economies has progressed faster than that of the other members of the group. Yet, there is no doubt that the Belgian and Dutch performance in manufacturing is at an equal level with these.

(2) Less successful in manufacturing and trade, less equal:
- France and Spain fit well into that group, performing differently in all aspects compared to the group of Finland, Germany and Sweden. In certain aspects, the performance is in the very low range. Both countries have stagnated in terms of productivity and need to import goods from other mature countries.

- Italy and Japan have relatively large manufacturing sectors. Although generally, the Italian productivity is in the comparably low range, it has a positive balance in North-North trade. This speaks for specialised fields in manufacturing where Italy is highly competitive while others are rather stagnating. Certainly, the country's economic divide between rich North and poor South plays a crucial role for these phenomena.

(3) Little inclination towards manufacturing, less successful in trade, relatively unequal:

- The United Kingdom is the weakest country of the sample in terms of manufacturing. Already starting at a very low level of productivity, the performance gap could never be closed. Consequently, the sector has constantly been shrinking, even in terms of output. Due to the crucial role of manufacturing for trade, the trade balance has been poor. Concerning inequality, the UK is within the European mainstream, only a little more unequal than the German-speaking and Scandinavian countries.
- In the USA, the situation is a little different. The country has deindustrialized early but still managed to reach a relatively high level of manufacturing productivity. Scale effects fostered by a large national market are likely drivers of this development.

Discussion

In the first section of this chapter, the actual results will be analysed more closely. This analysis will be contextualised by a section on the historic grounds of the actual varieties of capitalism.

National Economic Policies and Results

The globalized economy is characterized by international division of labour and worldwide competition in all sectors. Countries with a strong orientation towards manufacturing technology have become more and more export-oriented and -dependent. To succeed in the demanding environment of the globalised economy, firms have to improve their technologies constantly, resulting in high-technology products and ever-rising productivity. Stagnation means to fall behind the leading nations in manufacturing, i.e. to rely on less innovative products and eventually lower positions in international value chains.

Productivity is the key success factor in manufacturing, as was already shown in Przywara (2016) and Przywara (2017). It has a direct effect on output and export prices, so the productivity pattern also shows in these indicators. Limited efficiency and success in manufacturing may result in unemployment and finally rising societal inequality.

Four states stepped out of the line of constantly rising productivity in the period of globalization: Spain, Italy, France and Japan. The evolving negative pattern is quite consistent through all indicators. All well-meant state measures trying to avoid sectoral job losses – subventions for the ailing industry, reduction

of weekly working hours in France – made things worse in the long run. Consequently, the group that from a certain point in time was not able to raise its productivity is exactly the group of the state-led variety of capitalism identified by Schmidt (2003). Their state-led approach did not generate the necessary dynamism to meet the high pressure from global competition.

Managed economies stayed on track, based on well-adapted institutions to promote the required continuous incremental change. Also both liberal market economies (UK, USA) continuously increased their productivity.

In terms of sectoral decline by relative employment, the VoC approach predicts that LMEs are less apt for sectors of incremental change (e.g. mechanical and electric engineering) than CMEs, but have competitive advantages in high-technology sectors like KIBS (Hall & Soskice, 2001b). Faster employment shifts from traditional engineering to more radically innovative sectors are expected in the LMEs. Manufacturing is a sector of incremental change, so the employment in the UK and the USA should fall faster than in the CME economies. As the analysis has shown, this is really the case.

In sectoral decline of employment, the UK and USA are followed by Belgium and the Netherlands, both traditional countries of trade with a favourable location in the heart of Europe and by the North Sea. It might well be assumed that business opportunities in trade have crowded out industry with growing internationalization especially in these countries.

From the findings, the following groups of nations are distinguished by their success and inclination towards manufacturing:

- Industry-oriented managed winners (CME): Austria, Finland, Germany, Sweden
- Trade-oriented managed winners (CME): Belgium, Netherlands
- State-led industrial long-term losers (CME): France, Italy, Spain, Japan
- Industry-adverse market economies (LME): UK, USA

Clearly, the VoC approach renders meaningful results. This notwithstanding, institutions may largely vary within its groups. Certain contingencies were identified:

- Regional embeddedness leads countries towards common equilibria, at least if guided by strong overarching institutions like the EU, as the example of the far less social inequality of the UK compared with the USA shows.
- Geographic pre-conditions play an additional role, as the trade-orientation of seaborne nations like Belgium and the Netherlands illustrates which over centuries have acted as logistical hubs and managed to acquire respective wealth.
- There is a tendency of firms in countries with large home markets (especially Japan and the USA) to limit their activities within national borders.

Historical Grounds of Varieties of Capitalism in Mature States

When comparing the findings of the actual study with the history of early industrialization, the very deep cultural roots of varieties of capitalism and the resultant path dependency become even more clear, as a look on the historical industrial development of early modern states with a focus on the contributions of France, Great Britain, the United States and Germany with an eye on their cultural and institutional background reveals.

France –Cradle of Academic Teaching of Technology

In France, the mercantilists under Colbert had removed century-old traditions of the guilds, the institutions that had hindered technical developments by fiercely defending their artisan traditions. But as successful as in removing old development hurdles, the French were in putting up new ones by their system of state protectionism. Moreover, their intolerance towards religious minorities such as Huguenots, Protestants and Calvinists turned out to be of negative influence for the persecutors. Members of these religious orientations did not preferably seek gratifications for good conduct in afterlife, but considered the accumulation of wealth as the highest authentication for a life agreeable to God. Their ambition and mind-set was of major influence on the industrial development of the states that received them openly, namely England, the Netherlands, Prussia and the USA (Nedoluha, 1961).

At a time when in Great Britain free entrepreneurship blossomed, the French elite stubbornly stuck to their traditional ideas on state and economy until the *ancien régime* was swept away by the revolution of 1789. In its course and the subsequent Napoleonic era, France completely lost the big technological advance that it had built up and maintained for a good century (Buxbaum, 1921). Yet, its scientific and technical traditions, symbolized by institutions like the *Académie française*, were taken further. The first academic technical schools, the *École des Ponts et Chaussées* (founded in 1747) and notably the *École polytechnique* (founded in 1794), served as role models for academic teaching of science and technology (Spur, 1991). The idea of the technical university, drawing from Galileo's notion that "the book of nature is written in the language of mathematics" (Machamer, 2014), was especially picked up by the German countries. Though it took a while to lift off, it finally helped Germany to overcome its underdevelopment and industrial backwardness and leapfrog competition (Przywara, 2006).

Great Britain – Motherland of Industry driven by Entrepreneurship

Despite of the fact that in the 18th century, France was the by far leading nation in academic research and teaching of natural sciences (especially physics), the first country to industrialize was Great Britain (from 1801: United Kingdom).

This can chiefly be attributed to the fact that industrial progress at that time was rather driven by craftsmanship and private entrepreneurship (Great Britain) than by scientists and state initiative (France).

Great Britain was very different to France. Blessed with available natural resources (coal, wood, water), capital from colonial endeavours and inventive genius not hampered by tradition, it was the first country to industrialize. By improvements in agriculture like new ploughing techniques, Great Britain's primary sector was able to feed a rising number of people. In the enclosure movement, the available agricultural land had been re-shaped and concentrated in the hands of a few land-owners, mainly the local gentry, at the expense of the local commons (Fairlie, 2009; Hardin, 1968). The movement had three major effects:

- The land was more intensively cultivated.
- The disenfranchised commons had to make a living elsewhere, so enough people were ready to work in factories.
- The landlords became more and more business-minded and ready to invest, which later helped develop industrial structures (Niedhart, 1995).

Already the very early industrial development of Great Britain was driven by entrepreneurship and individual technical genius. It could blossom because, unlike in contemporary European countries like France and Germany, creativity was not hampered by narrow traditions of guilds and crafts or state regulations. Throughout the 18th and the first half of the 19th century, technical progress was mainly achieved by trial-and-error procedures executed by persons often outside the subject area. On this basis, and despite of not being the leading nation in natural and engineering sciences which clearly was France, Great Britain became the motherland of the industrial revolution (Przywara, 2006).

British inventors had improved the production process of garment, especially by removing the long-known bottleneck caused by the spinning process. Thereby, the industrial production of textiles was finally ready to beat the price of precedent proto-industrial structures involving home-based artisan steps of manufacture (Mommertz, 1987).

The key material for the industrial age was steel. In the late 18th century, British inventors had gained the ability to generate forgeable steel in large amounts utilizing available black coal instead of rather scarce wood in the production process. Thus, Great Britain became free from the necessity to import large amounts of steel from Sweden (Niedhart, 1995).

Yet, another obstacle had to be overcome to start into the industrial age. Until the very late 18th century, parts made of steel could only be shaped on a manual basis. Without available machinery, no production of standardized parts could be realized. It required a combination of technical genius and palmary mechanical skills to overcome these obstacles and build the first machine tools on the basis of craftsmanship before machines could be used to make machines. Henry Maudsley (1771-1831) was the man who made the first industrial lathe in 1797. With his machine, steel elements like screws and nuts could be cut at constant dimensions for the first time. Once this Gordian knot was cut, within a few years all other

machine tools (milling, drilling, grinding and slotting machines) were invented and built, facilitating mass production on the basis of precise and interchangeable parts (Przywara, 2006).

Despite of available machinery, firms in Great Britain did not change existing production processes requiring manual skills, e.g. for rifle production. New ways of production were chiefly used for new products in heavy industries (Spur, 1991), especially utilising the steam engine. Its grade of efficiency could be largely increased by precision manufacture, and so it became widespread in different heavy industry applications like the railway and the ship-building sector (Mommertz, 1987).

United States of America – Home of Mass Production

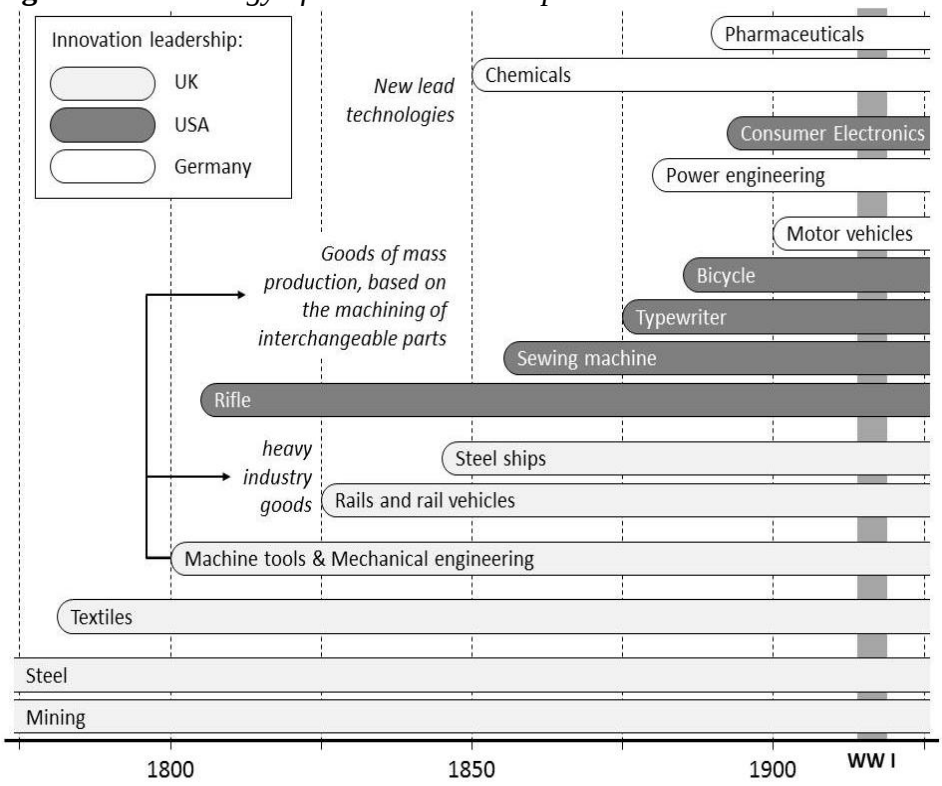
Utilizing machine tools in mass production was realized for the first time in a country free from the traditions, skills and limitations of craftsmanship. The young USA suffered from British sanctions on the export of goods and the emigration of highly-skilled people, so new ways of production had to be developed that would replace manual skills by machinery and organization. Production of rifles was the first sector where an interplay of high demand and ingenuity led to interchange-ability in the second decade of the 19th century. The 'American system of manufacturing', characterized by division of labour and use of machinery, was then successfully transferred to the manufacture of more and more consumer goods. American producers benefitted from the fact that they could utilize milling processes as their key steps of production due to the relatively soft American iron, whereas in Britain, milling tools did not withstand the more adverse local material properties (Przywara, 2006).

Germany – Role Model for Catch-up Modernization

In the late 19th century, innovations at the forefront of technical advance were no longer achieved on a mere trial-and-error basis, but required scientific underpinning. E.g. producing gears required a precise mathematical understanding of cycloids and a deep knowledge of grinding technologies for machining hardened surfaces. These skills were also necessary for the manufacture of rolling contact bearings, an invention crucial for the production of bicycles and later motor vehicles. Combining science and technology was the key competence of technical universities which became the more useful the more sophisticated technologies were implemented.

As outlined above, the German countries had picked up the French tradition of academic teaching of technology. In the long run, the early investments of Prussia and other German states paid off. After the German Empire was founded in 1871, Germany's industry gained technological leadership in several fields (e.g. power engineering, chemistry) and before World War I turned the British consumer warning "Made in Germany" into a seal of quality (Przywara, 2006).

Figure 5. *Chronology of Industrial Development*



Source: Own compilation, based on Henning (1995), Spur (1991), Przywara (2006).

The technical developments of the long 19th century, i.e. the time span from the French Revolution until the beginning of World War I, are characterized by three phases:

(1) Until around the middle of the 19th century, Great Britain was the undisputed 'workshop of the world' which presented itself proudly at the first world exposition in London in 1851. First, a raw material basis was assured (steel, mining). The textile industry was the vanguard sector. Great Britain also established the elementary technologies for industrial production (steelmaking and machine tools).

(2) Within a few years, the situation changed fundamentally. At the world exposition in Philadelphia in 1876, the USA demonstrated technological leadership especially in machine tools. For its fast-growing domestic market, fostered by excellent natural (coasts and rivers) and man-made (channels, railways) logistical connections, mass goods were produced on the basis of the 'American system of manufacturing'. High technical, organisational and capital demands were met.

(3) At the end of the 19th century, the German empire caught up and took the lead in some of the most demanding technological fields of that era (Spur, 1991). Scientific skills rendered by higher education helped to establish the most advanced technologies (chemicals, pharmaceuticals, power engineering, motor vehicles, electronics). Unlike its Anglo-Saxon competitors,

> Germany could draw from excellent technical education rendered by technical universities and vocational schools. Far-sighted investments of German states, especially the Prussian ministry of culture, eventually paid off (Przywara, 2006).

The early economic success of the UK and the USA was driven by entrepreneurship and a hands-on approach relying on trial-and-error methods rather than on applied natural sciences. When an innovation worked well, investments into continuous improvement were eschewed. Often the development stagnated, as the example of the British steel industry shows. It required ten times more energy per ton than the German by the end of the 19th century (Przywara, 2006). Already at that time, available private venture capital rather went into risky endeavours promising higher profit margins then into traditional technology.

In Germany, the role of the state was that of a facilitator, rendering necessary common goods like schools and universities to let firms succeed in their respective markets. Yet, the national government's role was limited by the fragmented state organization involving a number of federal states.

France is even drawing from a longer tradition of academic education in natural and engineering sciences. Still it is a very different case. Being unified already in medieval times, its central power was traditionally very strong. The French state organized the very successful catch-up modernization after World War II and so even added to the traditionally high expectations of the citizens in its problem-solving capacity.

Public expectations and available presidential power led to interventions in times of economic downturns and to daring economic experiments. By switching to 35 weekly working hours at full wage compensation around millennium, France weakened its international bargaining position in an instant. This burden could not be carried even by the then-strong French economy. In the sense of overstretching the capacity of a basically vital country by central measures, this is 18th century history repeating.

Conclusions

The case of the development of the manufacturing sector of 12 mature countries from 1973 to 2008 was utilised to test the explanatory power of the basic VoC approach by Hall & Soskice (2001a) and a number of related variants introduced by other authors. The identified economic pattern of industrial development meets the varieties of capitalism model of Schmidt (2003) which adds a variety of 'state-led' states to the dichotomy of liberal and coordinated market economy dichotomy of Hall and Soskice. As projected by these authors, CMEs have proven to be generally more inclined towards manufacturing than LMEs, since the basic mode of innovation is rather incremental than disruptive. Within CMEs, a group of four state-led economies performed significantly worse than their counterparts with less state interference. Unlike catch-up industrialisation, cutting-edge technology cannot be advised by central authorities.

The path dependency as a central element of the varieties of capitalism theory was found very plausible also in the historical context of industrialisation, as was demonstrated by the four examples of France, Great Britain, the United States of America and Germany.

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