

# Varieties of Capitalism, Varieties of Innovation? A Comparison of Old and New EU Member States

Matthew M.C. Allen

*University of Manchester*

&

Maria L. Aldred

*Manchester Metropolitan University*

---

## Abstract

This article seeks, firstly, to shed light on the main claim of the *Varieties of Capitalism* (VoC) framework that socio-economic institutions can help to shape comparative advantage, and, secondly, to complement existing assessments that have relied predominantly on qualitative data and that have tended to focus on a few economic sectors. It examines the distribution of export success in a number of economic sectors, in which competitiveness is said to be characterised by either radical or incremental innovation, as well as exports in knowledge-intensive service sectors. Unlike previous studies it applies the framework to some of the new member states of the European Union in Central and Eastern Europe. This is an important area to examine the contentions of the VoC framework, because, if those arguments are correct, they should be applicable to the new member states. Moreover, it draws on the latest available data; for indicators measuring export success this is done at the lowest level of aggregation. In contrast to previous studies, a more appropriate measure of trade specialisation, revealed symmetric comparative advantage, is used. Whilst some of the evidence supports the VoC framework, much of it does not. This raises important conceptual and methodological issues that should be addressed by future research.

## Keywords

Comparative Business Systems; Varieties of Capitalism

---

IN RECENT YEARS, THERE HAS BEEN HEIGHTENED INTEREST INTO THE EFFECTS OF increased global competition (product-market de-regulation, technological advances, enhanced capital mobility, and the spread of the market system) on national public policies (Allen 2004; Allen *et al.* 2006; Berger and Dore 1996; Hall and Soskice 2001a; Whitley 1999). The mainstream view is that socio-economic frameworks that hinder the freedom of companies to adjust their strategies – for example, in terms of output or employment – will have to de-regulate their economies (Esping-Andersen and Regini 2000; Sapir *et al.* 2004; Scharpf and Schmidt 2000), so that firms operating there can

---

compete more effectively. The view that de-regulated economies perform better than those that hamper managers' prerogatives is especially prevalent in the public debate (Phelps, 2007). Such a view obviously assumes that there is one best way for countries – via the companies that operate in them – to achieve economic success. An important exception to this view is the recent volume on the *Varieties of Capitalism* (VoC) edited by Hall and Soskice (2001a; see also Hall 2001). It argued, in part at least, that 'non-market' socio-economic institutions, such as regulated labour markets, might offer distinct benefits to companies.

The main and innovative claim of the VoC framework is that different types of national institutional settings, which are categorised as either 'liberal market economies' (LMEs) or 'co-ordinated market economies' (CMEs) (or 'unclassified') (Hall and Soskice 2001b: 19-21), will favour contrasting innovation strategies (either, respectively, radical or incremental). These different innovation strategies are, in turn, likely to lead to success in different product markets. Indeed, as the subtitle of the volume makes clear, Hall and Soskice contend that nationally based socio-economic institutions lay the foundations for comparative advantage. They argue that these institutional differences will result in 'cross-national patterns of [product] specialization' Hall and Soskice (2001b: 38; see also Bartle 2002; Casper and Whitley 2004; Hall 2001; Soskice 1999). This article will seek to assess the validity of that main claim, from which two broad expectations can be drawn. Firstly, LMEs, compared to CMEs, will tend to have a higher number of sub-sectors in which they have a comparative advantage in sectors characterised by radical innovation, and, secondly, that CMEs should outperform LMEs in sectors characterised by incremental innovation.

Despite many empirical analyses within the *Varieties of Capitalism* volume edited by Hall and Soskice (2001a) and despite other studies that have, in broad terms, attempted to assess the paradigm (Casper and Mataves 2003; Casper and Whitley 2004; Hall and Gingerich 2001; Paunescu and Schneider 2004; Soskice 1999), the measure of trade specialisation used here, revealed symmetric comparative advantage (RSCA), has tended to be overlooked (Allen *et al.*, 2006), even though it is a more appropriate measure of comparative advantage than those used by other researchers. For instance, Hall and Soskice (2001b) use patent data for Germany and the US to assess their arguments. This measure, however, suffers from a number of drawbacks. Firstly, patents do not necessarily 'translate' into competitive advantages for firms and, hence, comparative advantages for countries. Secondly, comparing only Germany and the US ignores other countries that they apply their framework to. Finally, patents do not capture the full range of innovative activities that firms in both manufacturing and services may engage in to enhance their competitiveness.

This article uses a different measure, revealed symmetric comparative advantage, to include not only a broader range of countries in the analysis, but also to capture the competitive strengths of firms located within a country more directly. When this measure has been used before (Fioretos 2001), the data underpinning it come from 1990. Building on the work by Fioretos (2001), this article will classify economic sub-sectors according to whether they are characterised by incremental or radical innovation. It will then examine the distribution of comparative advantage at the sub-sectoral level for all of the new member states of the European Union (EU) in Central and Eastern Europe (CEE) for which international trade data exist as well as core 'co-ordinated' and 'liberal market economies', as identified by Hall and Soskice (2001b: 19-21). In addition, this article will also examine exports of knowledge-intensive services to explore the link, if any, between socio-economic institutions and firms' competitiveness.

This article, therefore, applies the arguments espoused within the VoC framework to selected countries in CEE as well as paradigmatic countries from Western Europe. If those

arguments are valid, then they should hold true not just for Western Europe, but for CEE, too. Although the VoC covered only a range of North American, West European countries along with Japan, the arguments within that framework are based upon an assessment of the difficulties that firms face on creating and developing certain competencies that are needed to compete in various economic sectors. Therefore, the generic problems that firms must overcome if they are to be successful in sub-sectors that are characterised by either radical or incremental innovation will be faced by all firms regardless of location. (For thorough discussions of the applicability of the VoC paradigm to the countries of CEE, see Drahekoupil, 2009; and Nölke and Vliegenthart, 2009.) It is, according to the VoC framework, the socio-economic institutions that will shape firms' ability to overcome these problems. As these, in broad terms, vary from country to country so, too, will patterns of comparative advantage. This is because some countries' institutions will be more suited to helping firms create the skills and competencies that are need to compete in sub-sectors that are characterised by radical innovation, whilst others will facilitate the provision of organisational capabilities that are needed by firms if they are to be successful in sub-sectors in which the ability to carry out incremental innovation is a key determinant of success.

A further contribution of this article is that the analysis of trade statistics relies on data at the lowest possible level of data aggregation of the standard international trade classification (SITC) system (revision 3). This means that, in manufacturing sectors, a total of 754 sub-sectors in seven branches have been included in the analysis. By adopting a quantitative approach, this article aims to complement those assessments of the VoC paradigm that have been carried out at the sectoral level and that have relied predominantly on qualitative data (Casper and Mataves 2003; Casper and Whitley 2004). By seeking to provide a thorough assessment of the VoC framework, this article will also outline how many of the arguments in the VoC literature are based on the concept of *necessity* and not *sufficiency*. This has important ramifications for the type of analytical techniques used and the interpretation of the evidence.

The structure of this article is as follows. The next section will outline the VoC approach. It will then discuss the concept of 'necessity', and the way it applies to the VoC framework. The socio-economic frameworks of the new EU member states are then outlined, and the expectations that can be derived from the VoC arguments for their patterns of comparative advantage are discussed. Previous studies in this area are then outlined. This is followed by a section on the data and methodology used in this article; it will, *inter alia*, outline why revealed symmetric comparative advantage (RSCA) is a more appropriate measure than that used by Soskice (1999) in a similar analysis. This will be followed by an examination, and then a discussion, of the distribution of sub-sectors in which Germany, the UK and new EU member states in CEE have a comparative advantage. The sub-sectors form part of seven broader economic sectors that are characterised by either incremental or radical innovation. Data on knowledge intensive business services are then discussed. Finally, the broader ramifications of the findings of this article both for the VoC approach and for its application in CEE are assessed.

### **The importance of socio-economic institutions in the 'Varieties of Capitalism' framework**

The VoC framework focuses on many important socio-economic institutions. These can include the industrial-relations, corporate-governance systems, inter-firm relations, and vocational training systems. It will not be possible to go into the details of these different areas here. However, an overview of the main arguments espoused in the VoC paradigm as well as the ways in which different socio-economic institutions interlink within these broad arguments will be provided. In short, the VoC approach has two key stages. In the

first, it is argued that different national economic institutions offer distinct opportunities to companies. As companies are likely to be aware of these opportunities, they will, on the whole, adjust their production strategies to take advantages of these opportunities. This will be reflected in the types of organisational capabilities that firms develop and maintain. These differences will be apparent in, for example, firms' use of various forms of human capital (either general or firm specific). It is argued that these institutions and, hence, opportunities differ between countries or at least between groups of countries. Hall and Soskice (2001b) distinguish between CMEs, such as Germany and Sweden, and LMEs, such as the USA and the UK. To be sure significant sectoral and sub-national variations exist (see, for instance, Allen *et al.* 2007 and Crouch and Voelzkow 2009); however, such nuances are generally downplayed in the VoC paradigm.

In LMEs, labour-market institutions, such as works councils and industry-wide collective agreements, can promote the provision of firm-specific skills (Hall and Soskice 2001b: 24-25); this is also supported by the fact that many companies in these countries are financed by bank-based, and not equity, capital. This is said to facilitate a long-term outlook amongst companies (Casper and Matraves 2003: 1870). In the latter group of countries, by contrast, companies do not have to liaise with worker representatives; they are also freer to hire and fire workers as they please: "top management normally has unilateral control over the firm" (Hall and Soskice 2001b: 29). This will discourage firms from pursuing "production strategies based on promises of long-term employment" (Hall and Soskice 2001b: 30, see also 33). Such a strategy is also said to be discouraged by a financial system in which stock markets play a very prominent role. It is argued that financial markets place pressure on firms to post good financial results quarter after quarter (see Gospel and Pendleton 2004). This limits the long-term commitments firms can make to their employees as redundancies may have to be implemented to ensure good short-term profitability.

In the second key stage in the VoC framework, this reliance on, for example, different forms of human capital can help to facilitate success in certain product markets. Workers with firm-specific skills will be a prerequisite for, though not a guarantee of (Streeck 1992), success in product markets characterised by incremental innovation, which are said to be "marked by continuous small-scale improvements to existing product lines and production processes" (Hall and Soskice 2001b: 39). Workers with general skills, on the other hand, will be a *sine qua non* in markets in which radical innovation – "innovative design and rapid product development based on research" (Hall and Soskice 2001b: 39) – is the key to success. For instance, Soskice (1999: 113) has argued that products from firms in CMEs will "depend on skilled and experienced employees on whom responsibility can be devolved. By contrast, the United Kingdom and the United States have not been successful in these areas". In short, national economic frameworks lay the foundations for comparative advantage (Hall and Soskice 2001b: 41; see also Casper 2000; Whitley 1999). This differing success in various product markets will be reflected in comparative advantage or related data. Hall and Soskice (2001b: 37-38, 41) and Soskice (1999) have, indeed, used such data to bolster their arguments (see below).

### **Are certain socio-economic institutions *necessary* for success in some product markets?**

In many of their arguments, Hall and Soskice (2001b) either explicitly or implicitly argue that, in order to overcome the problems associated with a strategy of incremental innovation (opportunism by autonomous workers as well as by managers who have the potential to be exploitative), it is *necessary* to have institutional settings similar to those found in CMEs, paradigmatic examples of which are Germany and Sweden (Thelen 1993;

Pontusson and Swenson 1996). (For more on Germany's institutional framework regarding innovation and the attractiveness of that model, see Allen 2010; Funk and Plünnecke 2009; and Schweiger 2005). A *necessary* cause, as Ragin (2000: 91) has noted, is one that 'must be present for the outcome in question to occur'. Its presence does not, however, 'automatically' lead to the outcome. If a factor, in Ragin's words (2000: 92), "always [produces] the outcome in question", it is viewed as a *sufficient* cause.

In other words, within the VoC approach, it is not argued that CME-type institutions will always lead to production strategies based on incremental innovation. (For a more in-depth look at the assumptions underpinning the VoC approach, see Allen 2004.) For instance, Soskice (1999: 115, emphasis added) has argued that "efficiency [when pursuing a strategy of incremental innovation] *requires* a more consensus-based approach to decision making." He does not argue that a consensus-based approach to decision making is *sufficient* to lead to efficiency in this area. In a similar vein, Soskice (1999: 115, emphasis in the original) has also spoken of the 'need', or necessity, of having '*skilled employees with industry-technology skills as well as company-specific product knowledge skills*', if companies are to pursue a product strategy of incremental innovation successfully.

The fact that the concept of necessity lies behind many of the arguments within the VoC approach that relate to public policies has ramifications for the statistical technique used to assess such arguments. Many conventional statistical techniques, such as multivariate regressions, conflate the concepts of *sufficiency* and *necessity* (Ragin 2000: 96). Therefore, multivariate regressions are an inappropriate means to assess the VoC paradigm (Allen, 2005). The nature of the arguments within the VoC framework, therefore, militates against their use. This article, building on previous quantitative analyses of the VoC approach (see below), will, therefore, examine the number of sub-sectors in which a selection of the new EU member states in CEE as well as the UK and Germany have a comparative advantage in economic areas that are characterised by incremental or radical innovation. This means that the VoC framework, which can be interpreted as being applicable to all firms that seek to engage in either radical or incremental innovation, will be assessed using a far greater range of countries than has previously been the case. It should, of course, be noted that, given the nature of the VoC arguments, there is unlikely to be a clear dichotomy in the pattern of comparative advantage in the countries of CEE and the sub-sectors in which they have a comparative advantage. Despite this, there should still be a tendency for firms in LME-type systems to outperform those in countries with settings akin to a CME in sub-sectors characterized by radical innovation if the institutions found in those economies are *necessary* supports for the development of new technologies.

### **Socio-economic institutions in the new member states of the European Union in Central and Eastern Europe**

The new EU member states in CEE appear, at first sight, to have much in common with the CME model outlined by Hall and Soskice (2001b). For instance, corporate governance structures, in some respects, echo those found in Germany, and the education and vocational training systems in many CEE countries are structured along similar lines to Germany's. However, there are significant differences between the new EU member states in CEE and Germany's socio-economic framework to argue that they bear a closer resemblance to the LME type than they do to the CME model. (For detailed studies of some of the various elements that the VoC framework focuses on, see Feldmann 2006; Funk and Lesch 2004; Iankova 2002; Schulten 2005; Vaughan-Whitehead 2004; and Visser 2004.)

In terms of the differences, for instance, between the new EU member states and the 'typical' co-ordinated market economy, much collective bargaining occurs not at the



sectoral level, but at the company level with the possible exception of Slovakia (Schulten 2005). In addition, although agreements in some CEE states may be termed collective agreements, they do not always cover areas that would be deemed by many to be a central part of any collective agreement; that is, wages. This is, for instance, the case in Czech Republic (Pollert 2001). Similarly, in a survey of collective agreements in Hungary, 37% did not specify the wages that were to be paid (Neumann 2002). In addition to sectoral collective agreements functioning very differently in CEE countries to the expected manner in a co-ordinated market economy, worker representation is also much lower there compared to Germany. Therefore, in terms of employee representation at the workplace level, the new EU member states in CEE resemble more closely LMEs than they do CMEs.

Other important areas within the VoC framework are the related issues of corporate finance and corporate governance. Here, too, there are marked differences both between the countries in CEE and between them, on the one hand, and Germany and the UK, on the other. As Table 1 shows, the percentage of shares owned by foreign investors in Hungary, and Slovakia is much higher than it is in Germany and the UK. Poland has foreign-ownership levels that are comparable to the UK's. (Unfortunately, comparable data do not exist for the Czech Republic.) There may be many types of foreign investors. The largest two groups amongst them are likely to be, firstly, foreign firms that have bought shares in indigenous CEE firms, and, secondly, foreign institutional investors. As many firms from outside CEE have undertaken green-field FDI – that is, they have established new, wholly owned subsidiaries rather than joint ventures in the region that are may be listed on local stock exchanges – the largest group is likely to be the latter.

**Table 1:** *Share ownership in selected European countries (2005)*

Country	Foreign Investors	Private Financial Enterprises	Private Non-Financial Companies	Individual Investors	Public Sector	Not identified
Germany*	21	15	42	15	7	0
UK*	33	51	2	14	0	0
Hungary	77	6	5	4	8	0
Poland	38	17	8	17	20	0
Slovak Republic	60	5	19	5	1	10

**Notes:** \* data are for 2004; data for the Czech Republic are not available.

**Source:** FESE (2007)

Therefore, in the cases of Hungarian and Slovakian, it may be sensible to combine those percentages with those for ownership by domestic private financial enterprises, as both groups will exert pressures on companies to increase their short-term profitability ratios. This may take place even though it is detrimental to the firm's long-term profitability. The pressures of short-term financial goals are, therefore, likely to be greatest in Hungary and Slovakia. By contrast, these groups play a relatively minor role in Germany and Poland. In these latter two countries, pressures to increase short-term profits may be attenuated by the relatively large percentages of shares that are owned by either domestic private non-financial companies, in Germany's case, or the public sector, in Poland's case. The patterns of comparative advantage for Hungary and Slovakia may, therefore, resemble that for the UK than Germany's. By contrast, companies in Poland may be able to emulate the success of their counterparts in Germany.

In CEE, according to data from UNCTAD, FDI as a percentage of GDP is, in comparison to the old member states, high in the Czech Republic, Hungary and Slovakia. This has

important implications, too, for corporate governance. As noted above, if much of the FDI is in the form of green-field investment, this means that the subsidiary in CEE will not, usually, be listed on the stock exchanges there and, hence, subject to the corporate governance regulations in the relevant country. Instead, it will be part of a larger firm that is listed in say, the US or the UK. The head office of the multinational corporation would be required to conform to the corporate governance regulations in that country. Therefore, the dominant corporate governance regulations of the subsidiary in CEE are those of the investing firm's home country. This implies that major strategic decisions in such subsidiaries will be constrained less by the host-country's corporate governance regulations than they will by intra-firm bargaining within the multinational (Drahokoupil 2009; Nölke and Vliegenthart 2009).

The prevalence of foreign institutional investors and the reliance on foreign direct investment in CEE is likely to mean that the patterns of comparative advantage there may be more similar to the areas of specialisation found amongst LMEs than they are to those found in CMEs. In other words, the ability of firms to shift production and, potentially, employment within divisions in a company are likely to be less constrained by a variety of factors, including employee representation and labour mobility that is influenced by sectoral collective bargaining, in the new EU member states in CEE than they are in Germany or other CMEs. This is likely to be especially true if much direct and portfolio investment has come from LMEs.

### **Previous quantitative tests of the VoC paradigm**

The measure used in Hall and Soskice (2001b) to bolster their arguments is patent data. They classify different industries into either incremental or radical innovators. Examples, according to Hall and Soskice (2001b), of sectors characterised by incremental innovation are mechanical engineering, product handling, transport, consumer durables, and machine tools. Germany, they argue, is strong in these sectors. Hall and Soskice (2001b: 41-44) juxtapose these German strengths next to relative American weakness. The US is, however, seen as being strong in sectors that are characterised by radical innovation. It is in these sectors, such as medical engineering, and biotechnology, that Germany is seen as being weak. It should, however, be noted that patent data are an inappropriate measure of comparative advantage, as patents might only 'translate' very poorly into comparative advantage. For example, the fax machine, though patented in Europe, proved to be a great commercial success for many Japanese companies (Schröder 2002). Secondly, patents do not capture the full range of innovation activities in firms. For instance, in the engineering sector, firms may prefer to use secrecy to protect their innovations rather than patents that can be vitiated by 'work arounds'.

Researchers who have propounded the VoC approach have not just relied on patent data, however. They have also tried to bolster their arguments with comparative empirical evidence on export success in different industrial sectors. For instance, adducing data from Michael Porter (1990), Soskice (1999: 113) notes that, in 1985, Germany had 46 industries in the 'machine industry' sectors of the economy that were 'internationally competitive'. In the 'machine industry' sectors of the economy, Soskice (1999: 113) noted that the UK had just 18 industries that were internationally competitive. The contrast with Germany is, therefore, stark. Soskice's analysis does not stop there. He goes on to note that the UK, a good example of an LME (King and Wood 1999), has a strong export record in 'service industries', whilst Germany fares relatively badly. Soskice (1999: 114) notes that in these industries, Germany had seven sectors that were internationally competitive, whereas the UK had 27, and the US 44. Soskice argues that these industries rely on the individual skills of highly trained and mobile professionals. They include, amongst other things, management consultancy, advertising and related media services, and investment

banking. These data would, therefore, appear to support Hall and Soskice's (2001b: 38) arguments that there are 'cross-national patterns of specialization'. This article extends the analysis by examining patterns of revealed symmetric comparative advantage amongst the new EU member states in CEE.

A useful and rigorous way of classifying sectors as being characterised by either radical or incremental innovation has been drawn upon in the VoC literature by Fioretos (2001: 222). This latter classification was devised by the OECD to assign different economic sectors to one of five categories. The two categories that are of interest here are the 'specialised supplier' and 'science-based' ones, as they conform closely to industries characterised by incremental and radical innovation respectively. (The other three categories are 'resource intensive', 'labour intensive' and 'scale intensive'.) The benefits of using this classification are twofold. Firstly, it enables the research undertaken here to be replicated. Secondly, and most importantly, it enables comprehensive data to be drawn upon that are not only available for all OECD countries, but that are also available at a very low level of aggregation. This is especially relevant given the fact that the VoC applies to the competitiveness of firms within specific industries (Hall and Soskice 2001b; see also Allen *et al.* 2006).

### Data and methodology

The data used in the first part of the analysis in this article are drawn from the OECD's database on international trade by commodities statistics (revision 3) for Germany, the UK and all of the new member states in CEE for which data exist. Data at the lowest possible level of aggregation are used; this is usually the five-digit level, but, where this level does not exist, the four-digit level has been drawn upon. This means that 754 sub-sectors in seven branches have been included in the analysis. Data for 2004 are used as they are the latest year for which export data are available for all 32 OECD member states and territories. For the second part of the analysis, data that have been compiled by the EU (European Commission 2009) on exports of knowledge-intensive services are used.

Comparative advantages and disadvantages are based on the measure of revealed symmetric comparative advantage (RSCA), which, in turn, builds upon Balassa's (1965) index of revealed comparative advantage. The revealed comparative advantage (RCA) of sector *j* in country *i* is calculated as follows:

$$RCA = \frac{(\text{country } i \text{ exports in sector } j / \text{total exports from country } i)}{(\text{OECD exports in sector } j / \text{total OECD exports})}$$

The numerator in the above term represents the ratio between a country's exports in a given sector and the country's total exports; this ratio is then compared to the ratio for the same sector for the OECD as a whole (including country *i*'s exports). If the RCA equals 1 for a sector, the country's exports in that sector as a share of the country's total exports is the same as the 'average' for that sector for the OECD as a whole. When the RCA is greater than 1, the country under consideration has a revealed comparative advantage in that sector. When the RCA is less than 1, the country has a revealed comparative disadvantage in that sector. The RCA could take any value between 0 and infinity, and, thus, is difficult to use in cross-country comparisons. In order to overcome this problem, Laursen (1998) has suggested transforming the RCA as follows:

$$RSCA = (RCA - 1) / (RCA + 1)$$



This makes the index symmetrical about zero: values above zero indicate a comparative advantage; figures below zero indicate a comparative disadvantage. It can range from -1 to 1.

It should, of course, be noted that wage rates vary significantly between the old and new member states. This has implications for comparative advantage, as the strengths of any particular country may reflect favourable wage costs rather than the institutional contexts within which firms operate. However, within the group of new member states, such considerations are likely to be less marked. Therefore, the differences between those countries, which form an important part of the analysis, are likely to stem from the institutional differences between them rather than variations in labour cost. This is an important point as it suggests that, contrary to some analyses (see, for example, Nölke and Vliegenthart 2009), the new member states should be viewed as a collection of distinct countries rather than as a group whose similarities outweigh their differences. The data on RSCA do not, unfortunately, enable intra-firm trade to be identified. Whilst this, because of the prevalence of FDI in many CEE countries, would be interesting to know, the data that would enable this distinction to be made do not exist.

### Success in sectors characterised by incremental innovation

The next two sections set out the comparative advantages of the various OECD countries in sectors characterised by incremental and radical innovation. They are followed by an in-depth discussion of the data. Table 2 shows the number of sub-sectors, within the three broader economic sectors characterised by incremental innovation, in which the countries have a comparative advantage. The Table also ranks the countries. All of the rankings are based solely on the absolute number of sub-sectors in which the countries have a comparative advantage. They do not take into consideration the values of the actual exports or the magnitude of the RSCA scores. In situations in which two or more countries have the same number of sub-sectors with a comparative advantage, they are ranked in equal place.

**Table 2:** *Comparative advantage in sectors characterised by incremental innovation (2004)*

Country	Non-electrical machinery		Electrical machinery		Communications equipment & semiconductors	
	Rank	No. Sub-sectors	Rank	No. Sub-sectors	Rank	No. Sub-sectors
	i	ii	iii	iv	v	vi
Czech Republic	2	132	2	54	4	3
Hungary	5	62	1	55	1	14
Poland	4	68	4	37	5=	2
Slovak Republic	6	61	6	21	5=	2
Germany	1	228	3	53	3	4
United Kingdom	3	111	5	32	2	13
<b>Total no. sub-sectors in analysis</b>	-	<b>377</b>	-	<b>127</b>		<b>36</b>

**Source:** OECD International Trade by Commodities Statistics database; own calculations.

In the sectors shown in Table 2, CMEs should tend to do well, whereas LMEs should perform less well, if the VoC framework is correct. The evidence offers some support for

the contention that the new EU member states in CEE resemble LMEs than they do CMEs. For instance, in the 'non-electrical machinery' sector, Germany has a comparative advantage in a far greater number of sub-sectors within that broader sector than any other country. As might be expected from the VoC framework, the countries from CEE shown in the Table have a much lower number of sub-sectors in which they have a comparative advantage. The situation in the 'electrical machinery' sector is, however, somewhat different. The Czech Republic and Hungary have a higher number of sub-sectors in which they have a comparative advantage than Germany does. This suggests that those socio-economic institutions that do exist in those two countries may be able to help firms overcome the typical problems that are faced by firms in that sector. Evidence from the final sector, the 'communication equipment and semi-conductors' sector, suggests that the VoC framework is less suited to explaining competitiveness amongst firms in this sector than it is in the previous two. This is because, in contrast to theoretical expectations, Germany performs poorly in this sector. In addition, the UK has a strong record in this sector. Moreover, with the exception of Hungary, the CEE countries exhibit low levels of comparative advantage within this broad sector.

### Success in sectors characterised by radical innovation

Table 3 presents evidence in sectors in which, if the VoC is correct, LMEs should tend to perform better than CMEs; success in these sectors is said to rely on the ability to carry out radical innovations. Columns i and ii of Table 3 show the rank and number of sectors in which the selected OECD countries have a comparative advantage in the 'aerospace' sector. Unfortunately, data for 2004 for the 'aerospace' sector are not available for the UK. In the 'computers' sector, the evidence suggests that firms in the new EU member states have similar levels of competitiveness to those firms in Germany rather than the UK.

**Table 3:** Comparative advantage in sectors characterised by radical innovation (2004)

Country	Aerospace		Computers		Pharmaceuticals		Scientific Instruments	
	Rank	No. Sub-sectors	Rank	No. Sub-sectors	Rank	No. Sub-sectors	Rank	No. Sub-sectors
	i	ii	iii	iv	v	vi	vii	viii
Czech Republic	2	2	3	4	5	3	3	21
Hungary	4=	0	2	6	4	4	4	13
Poland	4=	0	6	1	6	2	5	11
Slovak Republic	3	1	4=	3	3	5	6	9
Germany	1	3	4=	3	2	16	1	60
United Kingdom	-	n.a.	1	15	1	22	2	50
<b>Total no. sub-sectors in analysis</b>	-	<b>13</b>	-	<b>30</b>	-	<b>45</b>		<b>126</b>
<b>Notes:</b> n.a. = no data available								

**Source:** OECD International Trade by Commodities Statistics database; own calculations.

In the final two sectors shown in Table 3, the patterns of comparative advantage amongst the new member states in CEE resemble neither Germany nor the UK. This is, especially for the pharmaceutical sector, not surprising as the establishment of firms in many sub-

sectors – though not all – of the pharmaceutical industry will require large initial outlays. In addition, the risks associated with developing new medicines are substantial. These factors may, therefore, preclude the establishment of firms – and, *a fortiori*, competitive firms – in countries that are transition economies. Similarly, the development of scientific instruments may require firms to draw on a range of different areas of expertise. If one of these areas is absent from the ‘innovation chain’, the development of radically new products may be fundamentally weakened.

Table 4 shows the levels of employment in knowledge-intensive services. Although Hall and Soskice (2001b) and Soskice (1999) do not examine the service sector, their arguments have clear implications for them. In particular, firms that provide those services that require them to shift their resources – including skilled employees – quickly to respond to shifting market demands will be helped by the socio-economic framework found in LMEs compared to CMEs. This is because, in the latter group of countries, employment regulations and corporate governance codes will hinder firms’ ability to hire and fire personnel to meet new market demands. In addition, the stratified education system in LMEs promotes the acquisition of general – rather than firm-specific – skills. From the perspective of employees, careers in sectors that enable them to increase their general skills and that do not tie them to one employer will be seen as advantageous. From the perspective of employers, a pool of skilled employees who are willing to move from one employer to another, whilst making the acquisition of firm-specific skills difficult, facilitates organisational capabilities that are based on employment flexibility. Therefore, the UK should have high levels of employment in knowledge-intensive service sectors compared to Germany. The expectations for the CEE countries are less clear.

As Table 4 shows, the UK does, indeed, have relatively high levels of employment in knowledge-intensive services; however, Germany outperforms all of the countries in CEE. There is a difference of at least a few percentage points between Germany and the individual CEE countries included in this study. Once again, this data reveal, firstly, potential weaknesses in the VoC framework and, secondly, the need to provide a more detailed assessment of the socio-economic institutions that are subsumed within the VoC paradigm. For instance, the low levels of employment in knowledge-intensive services may reflect the focus of education within universities and the general need for such services within the domestic economy.

**Table 4:** *Employment in knowledge-intensive services as percentage of the workforce (2007)*

Country	Percentage
Czech Republic	10.92
Hungary	11.35
Poland	10.33
Slovakia	9.86
Germany	15.58
United Kingdom	18.64

**Source:** European Commission (2009)

In terms of exports of knowledge-intensive services, the VoC theoretical framework would lead to expectations that the UK should outperform all other countries examined here. This is not, however, the case. As can be seen from Table 5, the UK’s exports of knowledge-intensive services as a percentage of all service exports are the lowest of the countries examined here. This is a striking finding. It highlights the need for the VoC framework to be examined in greater detail for individual sub-sectors within this broad sector to reveal the

causes of this outcome. Unfortunately, the data are not available that would allow such an assessment to be made.

**Table 5:** *Exports of knowledge-intensive services as percentage of total service exports (2006)*

Country	Percentage
Czech Republic	35.47
Hungary	25.60
Poland	27.93
Slovakia	20.83
Germany	53.84
United Kingdom	8.88

**Source:** European Commission (2009)

### Discussion and implications for future research

The evidence on comparative advantage for some of the new member states in CEE suggests that, in the 'non-electrical machinery' sector, firms' competitiveness in those countries resembles that of companies in LMEs. This is despite the fact that, in some respects, there may be superficial differences between the two groups of countries. In other respects, there are, not surprisingly, substantial differences in the comparative advantage patterns between, on the one hand, the new EU member states and, on the other, Germany and the UK. History, of course, is likely to play an important role. The traditional strength of countries, such as the Czech Republic and Hungary, in 'electrical machinery' is also a contributory factor to the greater competitiveness of firms in those two countries compared to those in the UK.

The importance of history – in particular, the collapse of Communism in the region two decades ago – has had a profound effect on the economies in CEE. One way in which this is apparent is the degree to which the socio-economic institutions that form the cardinal components of the VoC framework are embedded within those societies and economies in CEE is debatable. This means that there is likely to be more flexibility in the ways in which those institutions operate in CEE countries even though they, superficially, resemble those of Germany.

Another important distinction between CEE countries and those economies around which the VoC theoretical framework was developed is the level of foreign direct investment (FDI). In comparison to the UK and, in particular, Germany, those new EU member states in CEE have relatively high levels of FDI as a percentage of GDP. As a result, many foreign firms operate in these countries. Whilst they are highly likely to have firm-specific competitive advantages that they wish to maintain control over and that lead them to invest abroad – rather than, say, allow other firms to produce their goods under licence – they may be reluctant to establish strong links to local companies as that may risk knowledge spilling over to those local firms. Over time, this may undermine the foreign firm's competitive advantage (McDonald *et al.* 2008).

However, describing the new member states as representing 'dependent market economies' (DMEs) (see Nölke and Vliegenthart 2009) overlooks important differences between them. For instance, if the new member states are seen, as a group, as DMEs, the question arises as to which countries the investors, upon whom the firms in CEE depend, come from. If, for example, they are largely from CMEs, then it could be expected that, in

some respects, the new member states will resemble CMEs. However, it is unclear at present whether direct investors are more likely to come from CMEs or LMEs. In addition, the home countries of portfolio investors are also unknown. Therefore, future research should aim to clarify the extent to which various kinds of investors are important in the different EU member states in CEE. Indeed, as other research has shown (Keune *et al.* 2009; Tüselmann *et al.* 2007, 2008), the home-country setting of multinational corporations helps to explain their preferences and the workplaces practices that they adopt in their subsidiaries abroad.

Nölke and Vliegenthart (2009) also suggest that much investment in CEE has been undertaken to benefit from the lower wages there. This implies that the patterns of comparative advantage between the new member states are likely to be similar. As this article has shown, however, this is not the case. For instance, the Czech Republic is significantly more innovative than the other new member states in 'non-electrical machinery', and the Czech Republic and Hungary have more comparative advantages in 'electrical machinery' than Poland and Slovakia. Moreover, Nölke and Vliegenthart's (2009: 677-8) contention that the new member states will not have comparative advantages in either incremental or radical innovation compared to those countries from which the investing firms come is not borne out by the evidence presented here. In some sectors characterized by incremental innovation, both the Czech Republic and Hungary perform better either individually or collectively than Germany and/or the UK. This indicates that those CEE countries can provide the conditions to support the competitive advantages of firms operating there. They are not merely carrying out lower value-added tasks.

In addition, Nölke and Vliegenthart's (2009) arguments suggest that the comparative advantages of the new member states are likely to be concentrated in sectors characterized by incremental innovation, as the processes of improving existing technologies are likely to be better understood in these sectors than they are in economic branches marked by radical innovation. If this is the case, firms may well seek to gain an advantage by carrying out their incremental innovations in relatively low-wage countries. This is, once again, however, not the case. Some of the new member states have significant comparative advantages in sectors characterized by radical innovation, such as scientific instruments (Czech Republic) and computers (Hungary).

In general, however, the new member states have stronger records in sectors marked by incremental innovation. As this article has noted, the links between comparative advantage and institutions in the new member states is more difficult to trace than in the old member states. The situation is complicated by the high share of FDI as a percentage of GDP in many new member states, the role of foreign institutional investors, and the ways in which institutions, such as collective wage agreements, operate in CEE compared to some of the old member states. This means that more research should be carried out at both the macro and micro levels to reveal the complex interplay between the range of domestic and foreign strategic actors and patterns of commercial specialization (Drahokoupil, 2009). As the data here have revealed, the new member states are not DMEs (Nölke and Vliegenthart, 2009), and domestic institutions play an important role in shaping the competitive strengths of firms in the new member states. Indeed, firms operating in CEE are able to compete strongly in a range of sectors. These strengths vary from country to country. This, too, suggests that the individual institutional characteristics of the new member states should be analysed in greater detail.



## References

- Allen, M. (2004), 'The Varieties of Capitalism Paradigm: Not Enough Variety?', *Socio-Economic Review*, 2 (1), pp. 87-108.
- Allen, M. M. C. (2005), 'Which Variety of Measure and Test are Best to Assess the "Varieties of Capitalism" Framework?', *Journal of Applied Social Science Studies*, 125(2), pp. 315-22.
- Allen, M. M. C. (2010), 'Germany's National Innovation System', in V. K. Narayanan and G. C. O'Connor (eds), *Encyclopaedia of Technology and Innovation*, Blackwell, Oxford.
- Allen, M. M. C., Funk, L. and Tüselmann, H. (2006), 'Can Variation in Public Policies account for Differences in Comparative Advantage?', *Journal of Public Policy*, 26(1), pp. 1-19.
- Allen, M. M. C., Tüselmann, H., El-Sa'id, H. and Windrum, P. (2007) 'Sectoral Collective Agreements: Remuneration Straitjackets for German Workplaces?', *Personnel Review*, 36(6), pp. 963-77.
- Balassa, B. (1965), 'Trade Liberalisation and Revealed Comparative Advantage', *Manchester School of Economics and Social Studies*, 33, pp. 99-123.
- Bartle, I. (2002), 'When Institutions No Longer Matter: Reform of Telecommunications and Electricity in Germany, France and Britain', *Journal of Public Policy*, 22(1), pp.1-27.
- Berger, S. and Dore, R. (eds.) (1996), *National Diversity and Global Capitalism*, Ithaca, NY: Cornell University Press.
- Casper, S. (2000), 'Institutional Adaptiveness, Technology Policy, and the Diffusion of new Business Models: the Case of German Biotechnology', *Organization Studies*, 21, pp. 887-914.
- Casper, S. and Mataves, C. (2003), 'Institutional Frameworks and Innovation in the German and UK Pharmaceutical Industry', *Research Policy*, 32(10), pp.1865-79.
- Casper, S. and Whitley, R. (2004), 'Managing competences in entrepreneurial technology firms: a comparative institutional analysis of Germany, Sweden and the UK', *Research Policy*, 33(1), pp. 89-106.
- Crouch, C. and Voelzkow, H. (2009), *Innovation in Local Economies: Germany in Comparative Context*, Oxford: Oxford University Press.
- Drahokoupil, J. (2009), 'After Transition: Varieties of Political-Economic Development in Eastern Europe and the Former Soviet Union', *Comparative European Politics*, 7(2), pp. 279-98.
- Esping-Andersen, G. and Regini, M. (eds) (2000), *Why Deregulate Labour Markets?*, Oxford: Oxford University Press.
- European Commission (2009), *European Innovation Scoreboard 2008: Comparative Analysis of Innovation Performance*, Luxembourg.
- Feldmann, M. (2006), 'Emerging Varieties of Capitalism in Transition Countries: Industrial Relations and Wage Bargaining in Estonia and Slovenia', *Comparative Political Studies*, 39, pp. 829
- FESE (Federation of European Securities Exchanges) (2007), *Share Ownership Structure in Europe*, available at: <http://www.fese.be/lib/files/FESE%20Share%20Ownership%20Structure%20in%20Europe%202006.pdf>, last accessed 1 June 2009.
- Fioretos, O. (2001), 'The Domestic Sources of Multilateral Preferences: Varieties of Capitalism in the European Community. In P. A. Hall and D. Soskice (eds), *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*, Oxford: Oxford University Press, pp. 213-46.
- Funk, L. and Lesch, H. (2004), 'Industrial Relations in Central and Eastern Europe: Organisational Characteristics, Co-determination, and Labour Disputes', *Intereconomics: Review of European Economic Policy*, 39(5): 264-70.
- Funk, L. and Plünnecke, A. (2009), 'Selected Innovation Factors: An International Comparison' in P. J. J. Welfens and J. T. Addison (eds), *Innovation, Employment and Growth Policy Issues in the EU and the US*, Berlin: Springer Verlag, pp. 152-71.

- Gospel, H. and Pendleton, A. (2004), *Corporate Governance and Labour Management: An International Comparison*, Oxford: Oxford University Press.
- Hall, P. A. (2001), The Evolution of Economic Policy-Making in the European Union. In A. Menon and V. Wright (eds), *From Nation State to Europe? Essays in Honour of Jack Hayward*, Oxford: Oxford University Press, pp. 214-45.
- Hall, P. A. and Gingerich, D. W. (2001), 'Varieties of Capitalism and Institutional Complementarities in the Macroeconomy: An Empirical Analysis', Cambridge, MA: unpublished manuscript, available at: <http://www.cepremap.ens.fr/~amable/comple/papiers/Peter%20Hall.pdf>, accessed 15 May 2003.
- Hall, P. A. and Soskice, D. (eds) (2001a), *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*, Oxford: Oxford University Press.
- Hall, P. A. and Soskice, D. (2001b), 'Introduction', in P. A. Hall and D. Soskice (eds), *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*, Oxford: Oxford University Press, pp. 1-68.
- Iankova, E. (2002), *Eastern European Capitalism in the Making*, Cambridge: Cambridge University Press.
- Keune, M., Piotti, G., Tóth, A. and Crouch, C. (2009), 'Testing the West German Model in East Germany and Hungary: The Motor Industry in Zwickau and Győr', in C. Crouch and H. Voelzkow (eds) (2009), *Innovation in Local Economies: Germany in Comparative Context*, Oxford: Oxford University Press, pp. 91-120.
- King, D. and Wood, S. (1999), The Political Economy of Neo-liberalism: Britain and the United States in the 1980s. In H. Kitschelt, P. Lange, G. Marks and J. D. Stephens (eds), *Continuity and Change in Contemporary Capitalism*, Cambridge: Cambridge University Press, pp. 371-97.
- Laursen, K. (1998), 'Revealed Comparative Advantage and the Alternatives as Measures of International Specialisation', *Druid wp* 98-30.
- McDonald, F., Warhurst, S. and Allen, M. M. C. (2008), 'Autonomy, Embeddedness and the Performance of Foreign-Owned Subsidiaries', *Multinational Business Review*, 16(3).
- Neumann, L. (2002), 'Does Decentralized Collective Bargaining Have an Impact on the Labour Market in Hungary?', *European Journal of Industrial Relations*, 8(1), pp. 11-31.
- Nölke, A. and Vliegenthart, A. (2009), 'Enlarging the Varieties of Capitalism: The Emergence of Dependent Market Economies in East Central Europe', *World Politics*, 61(4), pp. 670-702.
- Paunescu, M. and Schneider, M. (2004), 'Wettbewerbsfähigkeit und Dynamik institutioneller Standortbedingungen: Ein empirischer Test des "Varieties-of-Capitalism"-Ansatzes', *Schmollers Jahrbuch*, 124 (1), pp. 31-59.
- Phelps, E. (2007), 'Innovative Thinking for European Business', *Financial Times*, 17 December 2007, p. 13.
- Pollert, A. (2001), 'Labor and Trade Unions in the Czech Republic, 1989-2000', in S. Crowley and D. Ost, (eds), *Workers after Workers' States*, New York: Rowman and Littlefield.
- Pontusson, J. and Swenson, P. (1996), 'Labour Markets, Production Strategies, and Wage Bargaining Institutions: the Swedish Employer Offensive in Comparative Perspective', *Comparative Political Studies*, 29, pp. 223-50.
- Porter, M. E. (1990), *The Competitive Advantage of Nations*, New York: Free Press.
- Ragin, C. C. (2000), *Fuzzy-Set Social Science*, Chicago and London: Chicago University Press.
- Sapir, A., Aghion, P., Bertola, G., Hellwig, M., Pisani-Ferry, J., Rosati, D., Vinals, J., and Wallace, H. (2004), *An Agenda for a Growing Europe. The Sapir Report*, Oxford: Oxford University Press.
- Scharpf, F. and Schmidt, V. A. (eds.) (2000), *Welfare and Work in the Open Economy: Diverse Responses to Common Challenges*, Vol. ii, Oxford: Oxford University Press.
- Schröder, G. (2002), 'Kommentar: Industriepolitik – eine Aufgabe für Europa', *Financial Times Deutschland*, 29 April 2002. Available at: <http://www.ftd.de/pw/de/1014399052952.html>, accessed 1 June 2009.

- Schulten, T. (2005), 'Changes in National Collective Bargaining Systems since 1990' *European Industrial Relations Observatory On-Line*. Available at: <http://www.eiro.eurofound.eu.int/2005/03/study/tn0503102s.html>, accessed 8 May 2009.
- Schweiger, C. (2005), 'The Role of the Modell Deutschland in the Enlarged European Union', *Debatte: Journal of Contemporary Central and Eastern Europe*. 13(3), pp. 243-63.
- Soskice, D. (1999), Divergent Production Regimes: Co-ordinated and Uncoordinated Market Economies in the 1980s and 1990s. In H. Kitschelt, P. Lange, G. Marks and J. D. Stephens (eds), *Continuity and Change in Contemporary Capitalism*. Cambridge: Cambridge University Press, pp. 101-34.
- Streeck, W. (1992), Productive Constraints: On the Institutional Conditions of Diversified Quality Production. In W. Streeck, *Social Institutions and Economic Performance: Studies of Industrial Relations in Advanced Capitalist Economies*. London: Sage Publications, pp. 1-40.
- Thelen, K. (1993), 'West European Labor in Transition: Sweden and Germany compared', *World Politics*. 46, pp. 23-49.
- Tüselmann, H.-J., McDonald, F., Heise, A., Allen, M. M. C. and Voronkova, S. (2007), *Employee Relations in Foreign-Owned Subsidiaries: German Multinational Companies in the UK*, London: Palgrave Macmillan.
- Tüselmann, H.-J., Allen, M. M. C., Barrett, S., McDonald, F. (2008), 'Varieties and Variability of Employee Relations Approaches in US Subsidiaries: Country-of-Origin Effects and the Level and Type of Industry Internationalisation', *International Journal of Human Resource Management*, 19(9), pp. 1622-35
- Vaughan-Whitehead, D. (2003), *EU Enlargement versus Social Europe? The Uncertain Future of the European Social Model*. Edward Elgar.
- Visser, J. (2004), 'Patterns and Variations in European Industrial Relations', in *Industrial Relations in Europe 2004*. Luxembourg: Office for the Official Publications of the European Communities.
- Whitley, R. (1999), *Divergent Capitalisms: The Social Structuring and Change of Business Systems*, Oxford: Oxford University Press.

\*\*\*