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An Empirical Assessment of Economic Growth

Etzerodt, Søren Frank; Eriksen, Jesper

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Welfare State Capitalism:**

An Empirical Assessment of Economic Growth

Søren Frank Etzerodt & Jesper Eriksen

Centre for Comparative Welfare Studies
Working Paper
Editor: Per H. Jensen
E-mail: perh@dps.aau.dk

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Inge Merete Ejsing-Duun
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Varieties of Capitalism and Varieties of Welfare State
Capitalism:

An Empirical Assessment of Economic Growth

Working paper

Søren Frank Etzerodt & Jesper Eriksen

Aalborg University*

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Abstract

For several decades, political economists have taken interest in how institutional configurations influence economic performance in advanced capitalist democracies. In this paper, we argue that complementarities between the welfare state and the production system can help explain differences in long-run economic performance. Integrating core theoretical aspects from the Varieties of Capitalism (VoC) approach with welfare state research, we argue that long-run economic growth is conditioned by the extent to which different welfare state configurations are complementary to production systems. Using time-series cross-section (TSCS) data on 17 OECD-countries from 1974-2009 we find support for the hypothesis that highly strategically coordinated and de commodified economies, as well as a highly market coordinated and commodified economies economically, outperform economies with intermediate institutional setups over the long run. This supports the need for a new research agenda integrating production regimes and welfare state characteristics in explaining economic performance.

Keywords: Varieties of Capitalism, Varieties of Welfare State Capitalism, Welfare production regime, Economic Growth, Institutional Complementarity, OECD-countries, Time-series Cross-Section.

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Introduction

For several decades, political economists have been interested in how institutional configurations can influence increased economic performance. Since Shonfield's (1965) seminal work on national political-economic systems, it has become conventional wisdom that there is more than one viable road to economic growth. The question, however, remains: What determines these paths and what are their dynamics?

Several strands of research have contributed to our understanding of the interrelationship between institutions and economic growth. The most prominent are the *Varieties of Capitalism* (VoC) literature, which emphasizes institutional complementarity and coherence in production systems as a determinant of economic performance at the macro level (Hall & Soskice, 2001). Whereas Kenworthy (2006) argues that there is no apparent association between more institutional coherent varieties of coordination and economic performance at the macro level (see also Cambell & Pedersen, 2007), Hall and Gingerich (2009) have shown that market economies with higher degrees of coherence in labor market relations and corporate governance structures experience higher economic growth compared to less coherent market economies. Martin & Swank (2012) also find support for the framework, applying the argument more broadly to employers' organization as well as macro corporatist arrangements. It remains debatable within this literature whether economies that are more institutionally coherent create better economic performance than less coherent systems.

A second influential strand of literature links VoC and welfare state research and is most prominently represented by *welfare production regime* (WPR) theory (Estévez-Abe et al., 2001; Iversen & Soskice, 2001; Iversen, 2005; Schröder, 2009). These scholars contend that particular combinations of welfare state compositions and coordination institutions can create relatively more efficient economies. To the best of our knowledge, it is still to be tested if the interaction between coordination and social protection does influence economic growth – and under what conditions.

In this paper, we investigate both literatures in a twofold analysis, empirically testing the two perspectives using time-series cross-section (TSCS) regression techniques on 17 advanced capitalist systems from 1974-2009. We find that the results from Hall and Gingerich's (2009) study, emphasizing a quadratic relationship between coordination institutions and economic growth, only receive partial empirical support. However, more robust support appears for our revised WPR hypotheses. The results indicate that a small and commodified welfare state complements production in liberal

market economies (LMEs), whereas a large and decommodified welfare state complement production in coordinated market economies (CMEs).

To the best of our knowledge, we are the first to present a coherent empirical analysis that links the literature of varieties of coordination with varieties of welfare state capitalism in explaining economic growth at the macro level in industrialized democracies. Doing so fills an important gap in the literature as “*research linking institutional differences to specific economic outcomes has remained surprisingly underdeveloped*” (Witt & Jackson, 2016: 780).

The paper is structured as follows; Firstly, we outline the theoretical framework based on the VoC-framework and Welfare Production Regime (WPR) theory. Secondly, the framework is tested empirically, using time-series cross-section (TSCS) regression analysis on 17 OECD-countries, and finally, we conclude with remarks on the findings and suggestions for future research agendas.

Varieties of Capitalism

The analysis below builds on Varieties of Capitalism theory¹ (Hall & Soskice, 2001) and Welfare Production Regime theory (Iversen, 2005; Schröder, 2009).

From the VoC approach, we take the central insight that political economies are characterized by a particular institutional infrastructure that conditions firms’ endeavors (Hall & Soskice, 2001: 15). In their original formulation Hall & Soskice (2001) distinguish between two general forms of market capitalism – *liberal market economies* (LMEs) and *coordinated market economies* (CMEs). LMEs are most often found in the Anglophone countries (such as the United States, Australia, and the United Kingdom) where the institutional infrastructure is characterized by relative deregulated labor markets, a workforce with an abundance of general skills (often acquired through school-based training systems), short-term investments and arms-lengths contracting. CMEs are typically clustered in central and northern Europe (such as Germany, Austria, and Sweden), where the institutional infrastructure is generally characterized by a workforce with an abundance of specific skills (either specific at the firm or industry level), long-term investments and relational contracting.

¹ The VoC framework has been criticized for being too rigid and having trouble accounting for institutional change. Some of these critiques do have merit. However, since we are interested in institutional effects (*outcomes*) and not institutional *change*, we will not engage further in this debate. For an overview of critiques see Crouch (2005) and Becker (2007), and for some rebuttals see Hall & Soskice (2003) and Hall & Thelen (2008).

Furthermore, a key insight derived from the VoC-framework is that *institutional complementarities* among certain institutions can create *comparative institutional advantages* (Hall and Soskice, 2001: 36-40). The core argument, according to Hall & Soskice (2001), is that certain institutional infrastructures can increase firms' *innovative capacities*, which is crucial for their competitiveness and hence survival in the long run. The primary distinction in the literature is between *radical innovations* – such as the development of new products or major shifts in production methods – and *incremental innovations*, characterized by continuous and minor improvements of existing products and production methods. Firms in LMEs are generally superior in the development of radical innovations since the institutional infrastructure in LMEs – such as flexible labor markets, short-term, mobile investment capital and a labor force with general skills – is more compatible with rapid changes in volatile sectors. Firms in CMEs are, on the contrary, thought to be superior in the development of incremental innovations² since the institutional infrastructure – such as long-term investments and a highly specialized workforce – is highly compatible with incremental innovation strategies (e.g. civil engineering and engines). Firms in LMEs rely, in other words, on *market coordination*, where firms in CMEs to a larger extent rely more heavily on *strategic coordination*. Firms in LMEs *vis-à-vis* CMEs will, therefore, in general, specialize in distinct production strategies given the different institutional infrastructure and can hence create a competitive edge in certain product markets. According to Hall and Gingerich (2009), this translates into relatively higher economic growth rates at the aggregate level.

Welfare Production Regimes

Welfare Production Regime (WPR) theory builds on the core insights from VoC, but emphasizes the interaction between the welfare state and the production system more explicitly (Estevéz-Abe et al., 2001; Iversen, 2005.; Schröder, 2009). As such WPR tries to link welfare state research with the Varieties of Capitalism literature. Here we are interested in linking the social protection aspect of the welfare state (decommodification) with the coordination of the economy in explaining economic growth.

Mainstream welfare state research asserts that welfare policies tend to cluster into distinct welfare regimes³ that produce different social outcomes – or what Esping-Andersen (1990) calls *de-*

² Or *diversified quality production* in accordance with Streeck (1991).

³ As regards welfare regimes, the classical distinction is between *liberal welfare states* that produces low levels of decommodification, *conservative welfare regimes* that produces medium levels of decommodification and *social*

commodification. Esping-Andersen defines decommodification as that which “occurs when a service is rendered as a matter of right, and when a person can maintain a livelihood without reliance on the market” (Esping-Andersen 1990: 21-22).

There are several aspects of the welfare state that can be expected to condition the effects of coordination on economic growth arising in the literature. One key argument is that a decommodified welfare state can work as a *beneficial constraint* that gives firms incentives to specialize in quality production and workers to engage in high-productivity employment, given the higher production cost induced by the welfare state (Schröder, 2013: 77-78; Streeck, 1997). The *modus operandi* in LMEs is different. Assuming that workers’ livelihood to a large degree depends on the (labor)market in commodified welfare states, workers will have to be highly flexible and mobile. Since production in the private sector – and in particular price sensitive sectors – in LMEs depends on a flexible workforce, a commodified welfare state can be said to complement the production (Schröder, 2013). For the sake of simplicity, we will call this a *flexibility argument*.

Another argument that is highly compatible with the first, is what we term the *skill-asset/social-security* argument:⁴ Firms in CMEs are expected to demand highly qualified and specific skills in order to innovate incrementally⁵. At the same time workers investing in asset-specific skills demand social *security* since investments in specific skills are related with more risks (Cusack et al. 2006; Iversen, 2005: chapter 3; Iversen & Soskice, 2001). Given that the welfare state in a CME can provide the necessary security, the workers will be more willing to invest in asset-specific skills, which will result in an abundance of specific skills and hence comparative advantages in product markets requiring asset specific skills (Estevez Abe et al., 2001). Contrary to CMEs, firms in LMEs demand general skills in order to innovate radically. Since investment in general and transferable skills is related with less risk, workers in LMEs will tend to demand less social security relative to workers in CMEs (Iversen & Soskice, 2001). Given that the welfare state in a LME does not give the worker

democratic welfare states that produces high levels of decommodification (see Esping-Andersen, 1990: 26-29). However, rather than operationalizing regimes strictly, we operationalize degrees of Decommodification. This is a common strategy employed in most empirical studies

⁴ The argument presented here can be viewed as implicitly assuming size-homogenous firms, which does not conform to empirical facts. An often used and very helpful distinction is between *small, medium* and *large firms* or corporations. An aspect of relevance related to firm size, as well as the described complementarity, is within firm routines, which has gained considerable interest in the evolutionary economics literature (Becker, 2004). Depending on the dominating firm structure in a country (or sector/industry), different welfare state regimes (and policies) can have varying degrees of complementarity to firms’ endeavors (see for example Mares, 2001a). We do not delve further theoretically or empirically into this perspective here.

⁵ The account of the welfare state in this paper highly underscores the welfare state as being functional to the production system. However, the welfare state is obviously also about non-functional aspects such as redistribution, conflict, etc.

an incentive to invest in asset-specific skills (meaning providing the worker with a high degree of social security), the workers will tend to invest in general and transferable skills and hence give firms in LMEs relative advantages in product markets requiring general skills (Estevez Abe et al., 2001)⁶.

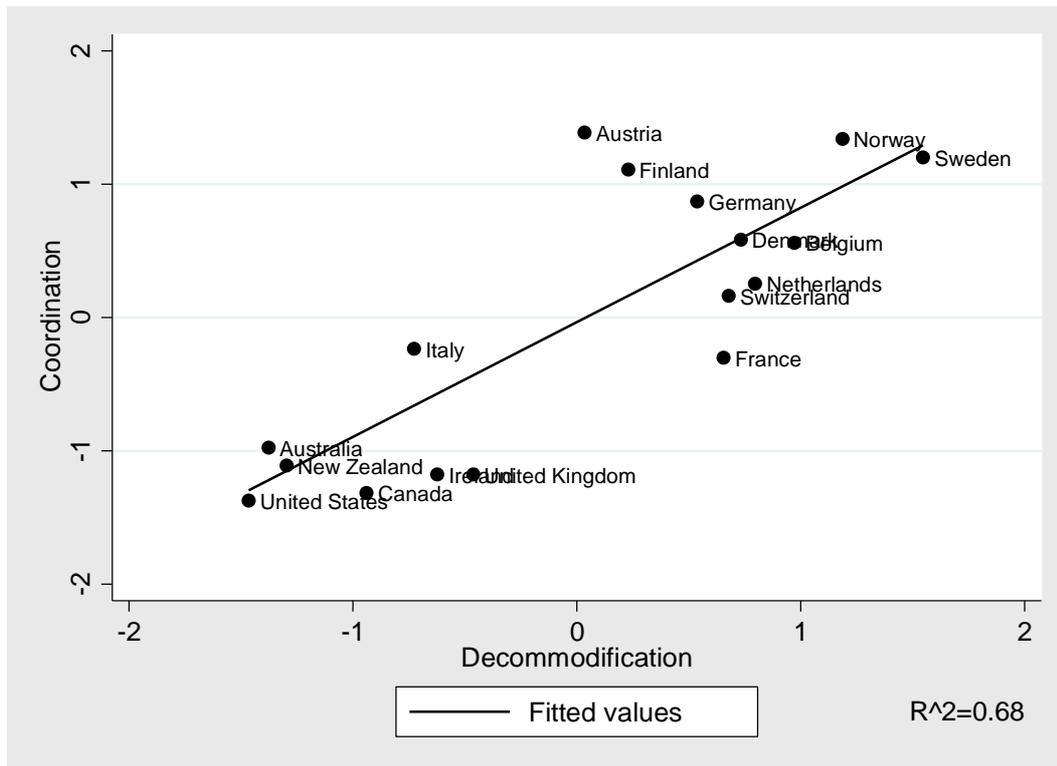
The welfare state is as such viewed as capable of providing incentives for the economy to specialize in different production strategies as well as providing the workers with the necessary security to supply the needed skills for production. As Iversen (2005: 74) puts it: “*firms do not develop competitive advantages in spite of systems of social protection but because of it*”.

Welfare states and production regimes, according to this perspective, are integrated and interacting elements of the political economy. Support for this is furthermore substantiated by the positive correlation between coordination and decommodification (see figure 2). As the figure shows, there is a strong correlation between coordination and decommodification ($R^2=0.66$). The figure moreover shows that countries seem to cluster around the north-east corner and the south-west corner of the figure. With some variation, we find in the north-eastern corner countries with relatively high degrees of (strategic) coordination and decommodification. In the south-west corner of the figure, we find countries with a relatively low degree of coordination (i.e. market coordination) and low levels of decommodification. That varieties of coordination is closely connected with different welfare state compositions, therefore, seems likely.

Although the list of possible complementarities between welfare states and varieties of coordination is extensive (for a thorough treatment see Schröder, 2009, 2013), it is difficult to determine exactly what complementarities are the most important. As we work at an aggregate level several alternate complementarities between production systems and welfare state regimes might also affect economic performance. The beneficial constraints and skill asset/social security arguments serve here as potential candidates and we will view them as the main arguments in the empirical analysis.

Figure 1. Correlation between coordination and decommodification, average values for the period 1974-2009.

⁶ Like Esteves-Abe et al. (2001: 146 fn. 2) we do not argue that social security is the only institution required for a successful investment strategy. The composition of industrial relations as well as corporate governance matters a great deal too. The skill asset/social security argument is merely an example, although an important example, of how the welfare state can complement the production system.



Note: Coordination data is an extrapolated version of Hicks & Kenworthy’s (1998) neo-corporatism index. Decommodification data is a slightly different version of Esping-Andersen’s (1990) decommodification index obtained from Scruggs et al. (2014).

Hypotheses

From each of the two perspectives, we have introduced we draw hypotheses that we will test empirically. Drawing solely on the VoC perspective, and in accordance with the initial analysis by Hall & Gingerich (2009), we expect that economies with more coherent coordination institutions will see relatively higher economic growth.

Hypothesis 1: Institutionally coherent varieties of coordination will excel in economic growth relative to less coherent market systems.

Building on the WPR framework we further expect LMEs with a commodified welfare state as well as CMEs with a decommodified welfare state to attain relatively higher rates of economic growth. As such we expect more institutionally coherent market systems to achieve relatively higher economic growth rates.

Hypothesis 2: Higher levels of coordination will have a positive effect on economic growth in de commodified economies.

Hypothesis 3: Lower levels of coordination will have a positive effect on economic growth in commodified economies.

Hypothesis 1 serves to reassess the existing empirical analysis within the VoC framework, whereas the latter hypotheses extend it by incorporating the insights from the WPR framework.

Methodology: Defining Economic performance, Institutional Variables, and Estimation

To test the three hypotheses, we apply time-series cross-section (TSCS) regression techniques on observations from 17 OECD countries⁷ over the period 1974-2009. The selection of countries is based on the theoretical emphasis on developed democratic economies. It has, however, been constrained by the availability of data.⁸ The choice of timeframe has been influenced partly by notions from Hicks & Kenworthy (1998) and Kenworthy (2006), suggesting that when estimating growth models this should be done within business cycles to prevent non-comparability across different stages of the business cycles. Estimating the models from 1974-2009 provides four fully completed business cycles – 1974-1979, 1980-1989, 1990-2000 and 2001-2009. In estimating the models, it would have been preferable to go even further back in time in order to test whether our argument can account for the high growth period in our sample of countries before the 1970s. Unfortunately, the availability of data before the 1970s is highly limited.

In the analysis, we center our attention on three variables: *Economic growth*, *coordination*, and *welfare states*. For all regressions, the dependent variable is *economic growth* measured by the rate of growth of real gross domestic product per capita – a widely used measure of economic performance in the literature (Hall & Gingerich, 2009). *Coordination* and *welfare states* are the explanatory variables of particular interest. The indicator for the degree of coordination is a composite in-

⁷ The countries are: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, New Zealand, Norway, Sweden, Switzerland, United Kingdom and United States.

⁸ Other contenders to be included in the analysis are countries such as Spain and Portugal, but it has, due to missing data problems, been necessary to exclude these countries from the analysis.

dex based on 11 indicators collected from Hicks and Kenworthy's (1998) data on neo-corporatism⁹ (Huber et al., 2004). The index captures some of the central differences between the two production systems, CMEs and LMEs (for a further description of the coordination index, see the appendix). Our welfare state indicator measures the degree of decommodification, using a slightly modified version of Esping-Andersen's decommodification index. This includes scores for unemployment, sickness, and pensions (Scruggs, et al., 2014).¹⁰ To test the first hypothesis, we include only *coordination* in the regressions whereas we include an interaction term between the two variables when testing the latter two hypotheses. We assume that for the combinations of institutions to have interacting effects, the interaction term must be significant. The effects on growth are determined by finding marginal effects, holding one set of institutions fixed at certain levels (Kam & Franzese, 2009).¹¹ Such a test can, according to Hall & Gingerich, 2009: 466), be considered a "*hard test for institutional analysis (...) [b]ecause aggregate rates of growth depend on the efficiency of the entire economy, specific sets of institutions will have to make substantial contributions to efficiency to show up in aggregate rates of growth*".

Aware of the potential conflicting variables that can be driving the empirical results, we include a number of economic and political control variables in the regression models.¹² These include *human capital*, for which we use a composite index based on average years of schooling (Barro & Lee, 2012) and returns to education (Psacharopoulos, 1994). *Human capital* is generally expected to be positively correlated with growth, often entering as a factor-input in economic growth models (Mankiw et al., 1992; Romer, 1990). *Inflation* is measured as percentage change in CPI per year (OECD, 2016). Higher levels of inflation rates are usually expected to be negatively correlated with economic growth as high rates of inflation may, among other things, lower exports and raise imports due to terms of trade, as well as induce uncertainty around real economic returns and hence reduce economic activity (Fischer, 1993; Levine & Renelt, 1992)¹³. *International Demand* is a measure of economic demand from other countries, computed as the mean growth rate of all other countries in each year, weighted by the country's trade openness (the ratio of the sum of imports

⁹ Since the data on coordination ends in 1994, we have extrapolated the data for the missing years. The tendency to time-invariance of the index suggest that this should introduce no major source of bias in the estimates.

¹⁰ Using de-commodification as a proxy for the welfare state has several advantages. First, using de-commodification as a proxy for social security says, contrary to levels of welfare state spending, a great deal about social citizenship and solidarity, which is integral to the understanding of the welfare state (Esping-Andersen, 1990: 19-20). Secondly, using the decommodification index allows one to look at the political economy in a broader manner, since it accounts for several welfare dimensions.

¹¹ As we standardize the indexes a one unit changes corresponds to a one standard deviation change in either variable.

¹² The economic controls are all from the Penn World Tables, unless otherwise noted.

¹³ However, Bruno (1995) and Levine & Renelt (1992) show that the relationship between economic growth and inflation is unstable and possibly contextually dependent.

and exports to GDP). Theory of aggregate demand suggests that higher international demand raises production, and as such the effect of international demand is assumed to be positively correlated with growth. Similar expectations can be attached to *Government spending*, measured as the share of government consumption as a percentage of GDP¹⁴. *Investment* is measured as a percentage share of GDP and is assumed to have a positive effect on economic growth due to demand effects. Higher investment levels may also amount to more capital, used to produce higher levels of GDP per capita (Solow, 1956; Barro, 1991). The *dependency ratio* is measured as the percentage of the population under 15 and over 64 as a share of the working-age population. A higher dependency ratio is expected to be negatively correlated with growth as a higher dependency ratio is an indication of relatively less available labor, and hence lower production levels in the neoclassical framework – especially in the long run. Finally, we include, as a last economic control variable, the logarithm of real GDP per capita in 1974. This is done in order to control for catch-up effects that any country may exhibit (Barro, 1991).

In recent years, it has become more common to include political variables in growth regressions in order to factor in more electoral-institutional related aspects of the political economy (Persson & Tabellini, 2003). Inspired by Hall & Gingerich (2009), we therefore include the following three political variables: *Plurality Voting*, *District Magnitude*, and *Left Cabinet*. *Plurality Voting* is an indicator measuring how legislators are elected. The value 1 indicates that legislators are elected by plurality voting (winner-takes-all) – values of 0 if not. *District Magnitude* is an indicator that measures the average district magnitude in the lower house. Plurality and District Magnitude are, due to political rents, expected to be positively correlated with economic growth (Hall & Gingerich, 2009: 467; see also Persson & Tabellini, 2003). *Left Cabinet* captures partisan preferences and is measured as the share of seats in parliament held by leftist parties as a percentage of all seats in government. The literature has not come to any consensus with respect to *Left Cabinet*¹⁵.

To estimate the regression models we use *Ordinary Least Squares* (OLS) with panel corrected standard errors (PCSE) to test the hypotheses (Beck & Katz, 1995). To test the first hypothesis, we include a regression model with a quadratic coordination variable:

$$y_{it} = \beta_0 + \beta_1 \text{Coordination}_{it} + \beta_2 \text{Coordination}_{it}^2 + \gamma X_{it} + e_{it},$$

¹⁴ This is; however, disputable as much economic research has shown that higher government spending may crowd out private investments (see for example Barro, 1991).

¹⁵ The disagreements on the effects of Left Cabinet are similar to the ones on government spending.

were y_{it} is the dependent variable for country i in year t . The coordination variable appears in quadratic term to allow for the expected non-linear effect on economic growth. X_{it} is a vector of the control variables with associated coefficients found in the vector λ . Finally, e_{it} is the panel clustered standard errors. For the second and third hypotheses, we change the specification by introducing a interaction term between decommodification variable and the coordination variable:

$$y_{it} = \beta_0 + \beta_1 \text{Coordination}_{it} + \beta_2 \text{Decommodification}_{it} + \beta_3 \text{Coordination} * \text{Decommodification} + \gamma X_{it} + e_{it}$$

As heterogeneity between countries (e.g. culture, religion, geography and the like) may not necessarily be assumed randomly distributed (not even after controlling for our institutional features) the models may exhibit endogeneity bias. Following Martin & Swank (2012) and Busemeyer (2015) we, however, refrain from using country fixed effects as these are too closely correlated with our institutional variables to allow for estimation. We do estimate the models with year fixed effects in order to control for individual year effects.

We also estimate panel unit root tests for heterogeneous panels (Im, et al., 2003; Enders, 2010: 243) to investigate whether potential issues of unit roots can be driving the resulting estimates¹⁶. The test indicates that there are no major problems with unit root non-stationarity, supporting the use of the model.

In all of the estimated models presented below, all right-hand-side time-varying variables are lagged by one period (including a lagged dependent variable in particular control settings, to take into consideration some of the autoregressive behavior of GDP growth rates), with the exception of the institutional variables, which are all lagged by 5 periods¹⁷. The choice of 5 periods follows from the expectations that changes in institutions may have a time-wise, long transition path to affecting growth rates.

¹⁶ A Fisher like Augmented Dickey Fuller unit root test, which is standard in the literature, has been estimated as well and shows similar results.

¹⁷ We have also estimated the models with 1 year lags. The results are generally robust to these changes.

Findings: The Effect of Institutional Complementarities between Production Regimes and Welfare States on Economic Growth

Table 1. Prais-Winsten estimates between coordination and economic growth.

	I	II	III	IV
	dGDPc	dGDPc	dGDPc	dGDPc
Lagged Dependent variable	0.358*** (0.0516)	0.315*** (0.0532)	—	—
sCoordination	-0.152 (0.0997)	-0.370*** (0.138)	-0.228 (0.146)	-0.588*** (0.190)
sCoordination ²	0.269*** (0.0895)	0.233*** (0.0890)	0.376*** (0.126)	0.310*** (0.120)
Human Capital	-0.493** (0.239)	-0.546** (0.246)	-0.581* (0.334)	-0.744** (0.326)
Inflation	-0.0727** (0.0299)	-0.0988*** (0.0314)	-0.130*** (0.0398)	-0.134*** (0.0382)
Investments	-5.919*** -1.980	-6.167*** -2.077	-6.265** -2.550	-6.464** -2.602
Government \$	-2.501 -2.240	-4.064* -2.286	-2.422 -3.288	-5.113 -3.132
LGDPc1974	-0.163 (0.151)	-0.119 (0.159)	-0.249 (0.220)	-0.121 (0.218)
Dependency ratio	0.00136 (0.0213)	-0.00851 (0.0213)	0.000201 (0.0332)	-0.0146 (0.0312)
IntDemand	0.00361*** (0.000968)	0.00257** (0.00112)	0.00428*** (0.00124)	0.00323** (0.00138)
Plurality	—	-0.741*** (0.220)	—	-1.145*** (0.289)
MDMH	—	-0.00685*** (0.00182)	—	-0.00886*** (0.00259)
LEFTC	—	0.00197 (0.00193)	—	0.00434* (0.00232)
<i>N</i>	612	612	612	612
adj. <i>R</i> ²	0.60	0.61	0.54	0.53

Standard errors in parentheses

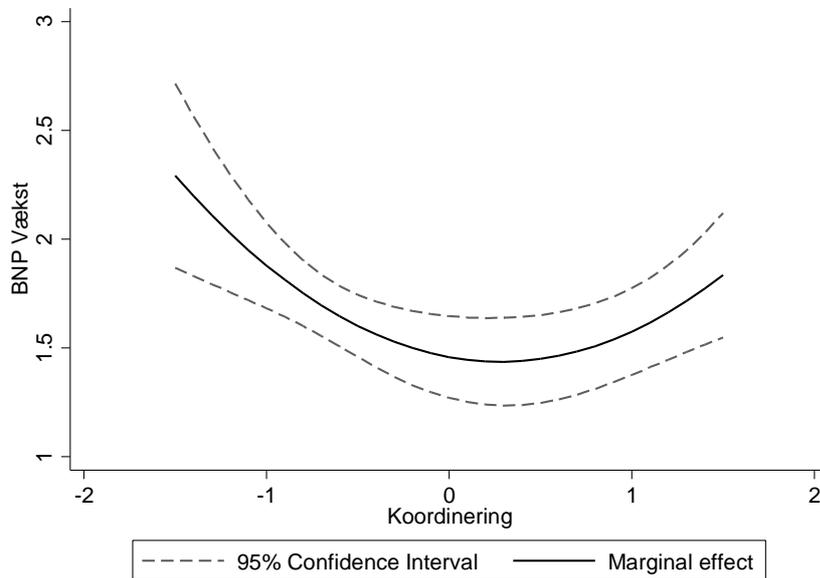
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The results from estimation of models related to the VoC hypothesis are presented in table 1. Model I estimates the base model including a lagged dependent variable and economic control variables. Model II includes the political control variables, and model III and IV reiterates without a lagged dependent variable. The evidence suggests that different varieties of coordination influence economic growth by highly significant estimate on the squared coordination variable across specifications. This seems to be the case even when we control for our three political factors as well as ex-

cluding the lagged dependent variable from the analysis. Figure two graphically depicts the estimated effects of the squared coordination variable. The figure shows the expected u-shaped effect as found by Hall and Gingerich (2009). However, only highly institutionally coherent LMEs experience a statistically significant effect on economic growth relative to political economies with more intermediate levels of coordination, whereas for coherent CMEs the effects of coordination are not statistically significant from more intermediate levels of coordination at the very extreme values. It is furthermore not possible to say if coherent LMEs outperform coherent CMEs.

One could, therefore, be inclined to conclude that it is only in highly market coordinated economies that the organization of production has a significantly different effect on economic performance. However, we would argue that two caveats should apply. Firstly, the effects of coordination can be conditioned by other central factors, such as the welfare state as we assert in our second and third hypotheses. Coordination can, therefore, as we would expect, have different effects on economic growth given distinct welfare configurations. Secondly, the VoC model fails to explain why several northern European countries have managed to perform equally well economically as their anglophone counterpart. The VoC model, as tested here, seems less suited at explaining real patterns of economic growth.

Figure 2. Marginal effects of coordination on economic growth. Based on model 1 in table 1.



Turning to the second and third hypotheses, table 2 shows the resulting regression models. The setup of control variables is similar to that of table 1. For all models, the interaction term between the degree of coordination and decommodification is significant at the 0.05 level. This renders strong support to our thesis that the welfare state complements the production system in creating economic growth. When the political variables are included, the interaction term between coordination and decommodification is still significantly correlated with economic growth (see model II & IV in table 2). The marginal effects in model II are also equal to those in model I (not shown). Since the inclusion of a lagged dependent variable can suppress the explanatory power of other variables (Achen, 2000), we also estimate the base model without a lagged dependent variable. As the OLS models (III & IV) show, excluding the lagged dependent variable does not change the results, although, the R^2 value drops (as expected). The empirical results, in general, therefore seem to be both rather robust, and supportive of the two hypotheses¹⁸.

¹⁸ We also have tried to estimate the models over different time periods (1980-2009) and we do in general get the same results (not shown).

Table 2. Interaction between coordination, decommodification and economic growth, 1974-2009

	OLS w/PCSE			
	I	II	III	IV
	dGDP	dGDP	dGDP	dGDP
Lagged Dependent variable	0.00125*** (0.000178)	0.00111*** (0.000183)	—	—
Human Capital	-1.306*** (0.390)	-1.425*** (0.400)	-1.112** (0.508)	-1.435*** (0.499)
Inflation	-0.133*** (0.0342)	-0.153*** (0.0342)	-0.163*** (0.0407)	-0.182*** (0.0387)
Investments	-7.216*** -1.986	-7.146*** -2.083	-7.457*** -2.545	-6.511** -2.567
Government \$	-1.399 -2.036	-3.637* -2.170	1.025 -3.430	-2.245 -3.439
LGDPc1974	-0.352* (0.188)	-0.273 (0.194)	-0.236 (0.274)	-0.0416 (0.265)
Dependency ratio	0.0312 (0.0531)	0.0139 (0.0536)	-0.0408 (0.0755)	-0.0745 (0.0687)
IntDemand	0.00524*** (0.00116)	0.00427*** (0.00135)	0.00537*** (0.00145)	0.00452*** (0.00157)
Plurality	—	-0.678*** (0.257)	—	-1.128*** (0.313)
MDMH	—	-0.00719*** (0.00202)	—	-0.0103*** (0.00292)
LEFTC	—	0.00167 (0.00211)	—	0.00459* (0.00234)
sCoordination	-0.0524 (0.125)	-0.239 (0.175)	0.125 (0.173)	-0.234 (0.238)
sDecommodification	-0.462*** (0.105)	-0.395*** (0.110)	-0.519*** (0.149)	-0.421*** (0.144)
sCoordination * sDecommodification	0.464*** (0.154)	0.482*** (0.152)	0.445** (0.201)	0.508*** (0.192)
<i>N</i>	578	578	595	595
Year Fixed Effects	Yes	Yes	Yes	Yes
adj. <i>R</i> ²	0.60	0.61	0.53	0.54

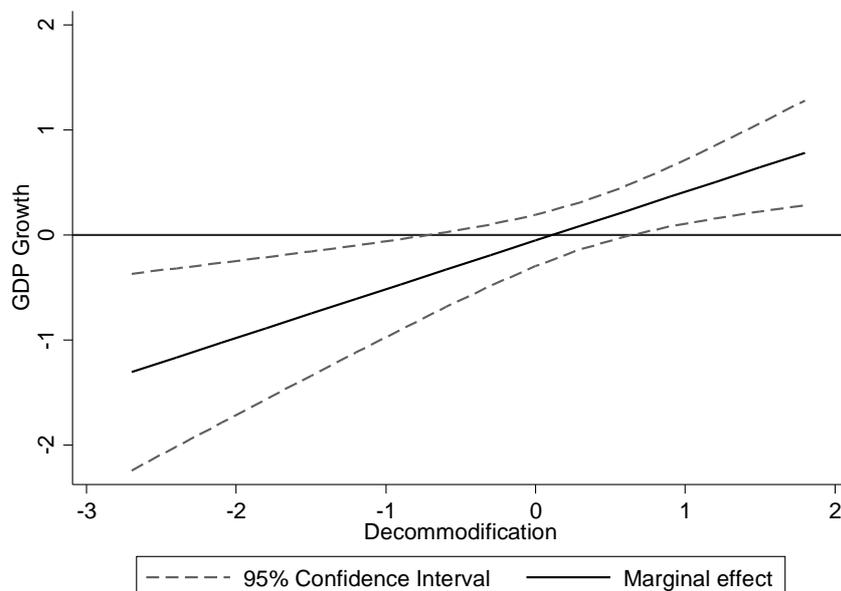
Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

To interpret the coefficients, we estimate and show the marginal effects of coordination given various levels of decommodification in figure 3 (Brambor, 2006).¹⁹ The figure indicates that coordination has a positive effect on economic growth in moderate to highly decommodified economies. The confidence interval, moreover, shows that the effects are different from 0. The figure also shows that an increase in coordination is negatively correlated with growth in moderately and highly commodified economies. The marginal effects from the interaction term therefore indicate that the combination of high levels of coordination and decommodification, as well as low levels of

¹⁹ The estimation is based on model I in table 1. Depending on the model the effects are either greater or smaller than the one presented.

coordination and decommodification, is positively correlated with economic growth, supporting the second and the third hypothesis (see also figure 4 in the appendix for a three-dimensional depiction that incorporates both assertions). In other words, an increase in coordination seems to be positively correlated with economic growth given that the economy is decommodified and a decrease positively correlated with growth given that the economy is commodified. These preliminary results from the base models seem to verify our core argument, namely that complementarities between production regimes and welfare states increase economic performance, measured as economic growth rates.

Figure 3. Marginal effects of coordination on economic growth at various levels of decommodification. Based on model I in table 2.



Of some curiosity, we find negative coefficients for variables that are normally expected to have positive effects on economic growth, including investment to GDP levels and human capital. This may, however, be attributed to the institutions creating much of the positive effects that we would otherwise confer to these variables. This argument seems to have merits regarding investments since the bivariate correlation between investments and GDP growth is positive (see table 3 in the appendix). However, this is not the case for human capital. One could, therefore, be inclined to conclude that human capital is retarding economic growth, which seems counter-intuitively. The negative effects of human capital have been noted before in a panel setting (see e.g. Islam, 1995) with

possible explanations stemming from either a too weak proxy of human capital levels or an inappropriately simple inclusion of the effects of education on economic development. Under this assumption, the effects of average years of education cannot be given the same expected effect as among a broader group of countries such as in Barro (1991) when levels of education are generally speaking high, and characteristics internal to education may be more important. In this respect, we lean towards the latter and note that the selection of countries under scrutiny consists of highly developed countries where modified years of education perhaps should be replaced with information about the institutional structure of the education system of the country.

Moreover, Plurality and District magnitude is, contrary to our expectation, systematically and negatively correlated with economic growth. Of less curiosity, we find inflation to be systematically and negatively correlated with economic growth in all the estimated models. We expect this to be driven by periods of stagflation in the 1970s. Finally, we note that international demand is, as expected, positively correlated with economic growth across all the estimated models.

Conclusion & Further research

According to Jackson & Deeg (2006: 31) “[o]ne major issue dividing opinion in the literature is whether the role of the state and the impact of the welfare state should be included”. As argued in this paper it *should* be included. Our findings indicate that interaction effects between the production system and the welfare can explain why some advanced capitalist democracies achieve better economic performance over the long term. The findings even suggest that our understanding of the economic effects of coordination is better understood and in accordance with real-world observations when we include the welfare state in the analysis. The findings more precisely indicate that a high degree of strategic coordination in combination with a high degree of decommodification as well as a high degree of market coordination in combination with a low degree of decommodification increases long-term economic growth. It appears, at least at an aggregate level, that the welfare state can be complementary to the production system, and hence create better economic performance.

We have argued that the complementarities induced by the beneficial constraint/flexibility argument and the skill-asset/social-security argument are important in linking VoC with welfare state research. However, some scholars might argue, and in their good right, that it is somewhat problematic to induce certain complementarities from empirical analyses at the aggregate level. An important task for future research is, therefore, to examine what these complementarities consist of at

a disaggregated level. We believe that such a research agenda would benefit from both quantitatively as well as qualitatively oriented analyses.

Moreover, if some major policy implication may be deduced from the analysis, it would be that in pursuit of increased economic performance, politicians and officials in affluent economies should pay close attention to how the welfare state can complement firms' investment strategies. The welfare state is, in our opinion, too often portrayed as an obstacle to creating growth and not as a possible prerequisite for creating growth. The results presented here suggest that a shift of emphasis should be in place.

References

- Achen, C. (2000). Why Lagged Dependent variables Can Suppress the Power of Other Independent variables. *Political Methodology Working Paper*.
- Barro, R.J. (1991). Economic growth in a cross section of countries, *Quarterly Journal of Economics*, vol. 106, no. 2, pp 407-443.
- Barro, Robert and Lee, Jong-Wha (2013). A New Data Set of Educational Attainment in the World, 1950-2010, *Journal of Development Economics* 104.
- Beck, N. & Katz, J. (1995). What to Do (And Not to do) with Time-Series Cross Section Data. *American Political Science Review*, Vol. 89, No, 3, pp. 634-647.
- Beck, T., Clarke, G., Groff, A., Keefer, P., Walsh, P. (2001). *New tools in comparative political economy: The Database of Political Institutions*. 15:1, 165-176 (September), *World Bank Economic Review*. <http://go.worldbank.org/2EAGGLRZ40>, accessed on August 4, 2016.
- Becker, U. (2007). Open Systems, Contested Reference Frames and Change. A Reformulation of the Varieties of Capitalism Theory, *Socio-Economic Review*, 5, pp. 261-286.
- Becker, Markus C. (2004). Organizational routines: A review of the literature. *Industrial and Corporate Change*, vol. 13, no. 4, pp. 643-677.
- Brady, D., Huber, E., Stephens, J.D. (2014). *Comparative Welfare States Data Set*, University of North Carolina and WZB Berlin Social Science Center.
- Brambor, T., Clark, W.R. & Golder, M. (2006). Understanding interaction models: Improving empirical analysis. *Political Analysis* 14(1), pp. 63-82.
- Bruno, M. (1995). Does Inflation Really Lower Growth, *Finance and Development*, Vol. 32, No. 3, pp. 35-38.
- Bussemeyer, M.R. (2015). *Skills and Inequality. Partisan Politics and the Political Economy of Education Reforms in Western Welfare States*. Cambridge University Press.
- Campbell, J. & Pedersen, O.K. (2007). The varieties of capitalism and hybrid success: Denmark in the global economy. *Peace Research Abstracts Journal*, vol. 44, no. 3.
- Crouch, C. (2005). Models of capitalism, *New Political Economy*, Vol 10, No 4, pp. 439-456.
- Cusack, T., Iversen, T., Rehm, P. (2006). Risk at Work: The Demand and Supply sides of Government Redistribution. *Oxford Review Of Economic Policy*, vol. 22, no. 3
- Drukker, D.M. (2003). Testing for serial correlation in linear panel-data models. *The Stata Journal*, Vol. 3, no. 2, pp. 168-177.
- Enders, W. (2015). *Applied Econometric Time Series*, Wiley, 4'th edition, University of Alabama.
- Engle, R., & Granger, C.W.J. (1987). Co-Integration and Error-Correction: Representation, Estimation and Testing, *Econometrica*, 55, pp. 251-276.
- Esping-Andersen, G. (1990). *The Three Worlds of Welfare Capitalism*, Cambridge: Polity Press.
- Estevez-Abe, M., Iversen, T. & Soskice, D. (2001). Social Protection and the Formation of Skills: A Reinterpretation of the Welfare State, in, P.A. Hall & D. Soskice (eds.) *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*, Oxford University Press, pp. 145-183.
- Feenstra, R.C., Inklaar, R., Timmer, M.P. (2015). The Next Generation of the Penn World Table, *American Economic Review*, 105 (10), pp. 3150-3082.

- Fischer, S. (1993). The Role of Macroeconomic Factors in Growth, *Journal of Monetary Economics*, 32, pp. 485-512.
- Granger, C.W.J, Newbold, P. (1974). Spurious Regressions in Econometrics, *Journal of Econometrics*, 2, pp. 111-120.
- Greene, W.H. (2012). *Econometric Analysis*, Prentice Hall, 7th edition.
- Hall, P.A. & Soskice, D. (2001a) (eds.), *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*, Oxford University Press.
- Hall, P.A. & Soskice, D. (2001b). An Introduction to Varieties of Capitalism, in P.A. Hall & D. Soskice (eds.) *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*, Oxford University Press, pp. 1-70.
- Hall, P.A. & Soskice, D. (2003). Varieties of Capitalism and Institutional Change: A Response to Three Critics. *Comparative European Politics*, 1, pp. 241-250.
- Hall, P.A. & Gingerich, D.W. (2009). Varieties of Capitalism and Institutional Complementarities in the Political Economy: An Empirical Analysis, *British Journal of Political Science*, Vol. 39 No. 3, pp. 449-482.
- Hall, P.A. & Thelen, K. (2008). Institutional change in Varieties of Capitalism, *Socio-Economic Review*, Vol 7 No. 1.
- Hicks, A. & Kenworthy, L. (1998). Cooperation and Political Economic Performance in Affluent Democratic Capitalism, *American Journal of Sociology*, 103, pp. 1631-1672.
- Huber, E. & Stephens, J.D (2001). Welfare State and Production Regimes in the Era of Retrenchment, in Paul Pierson (eds.) *The New Politics of the Welfare State*, Oxford: Oxford University Press, pp 107-145.
- Huber, E., Ragin, C. & Stephens, J.D. (2004). *Comparative Welfare States Data Set*. Northwestern University, University of North Carolina, Duke University and Indiana University
- Im, K.S, Pesaran, M.H., Shin, Y. (2003). Testing for Unit Roots in Heterogenous Panels, *Journal of Econometrics*, 115, pp. 53-74.
- Islam, N. (1995). Growth Empirics: A Panel Data Approach, *The Quarterly Journal of Economics*, Vol 110, No. 4, pp. 1127-1170.
- Iversen, T. (2005) *Capitalism, democracy, and welfare*, Cambridge: Cambridge University Press.
- Iversen, T. & Soskice, D. (2001). An Asset Theory of Social Policy Preferences, *American Political Science Review*, Vol 95, No. 4, pp. 875-893.
- Jones, C. I. (2002). Sources of U.S. Economic Growth in a World of Ideas, *American Economic Review*, Vol. 92, No. 1, pp. 220-239.
- Jackson, G. & Deeg, R. (2006). How many varieties of capitalism? Comparing the comparative institutional analyses of capitalist diversity, *MPIfG Discussion Paper 06/2*, Max Planck Institute for the Study of Societies, Cologne, www.mpifg.de/pu/mpifg_dp/dp06-2.pdf.
- Kam, C. & Franzese, R. (2009). *Modelling and Interpreting Interactive Hypotheses in Regression Analysis*. Ann Arbor: University of Michigan Press.
- Kenworthy, L. (2006). Institutional coherence and macroeconomic performance. *Socio-Economic Review*, vol. 4, pp. 69-91.
- Levine, R. & Renelt, D. (1992). A Sensitivity Analysis of Cross-Country Growth Regressions. *The American Economic Review*, Vol. 82 No.4, pp. 942-963.

- Mankiw, N.G., Romer, D. & Weil, D.N. (1992). A contribution to the empirics of economic growth, *Quarterly Journal of Economics*, vol. 107, no. 2, pp 407-437.
- Manow, P. (2001a). Business coordination, wage bargaining and the welfare state. Germany and Japan in comparative historical perspective, in B. Ebbinghaus and P. Manow (eds.), *Comparing Welfare Capitalism: Social policy and political economy in Europe, Japan and the USA*, London: Routledge, pp. 27–51.
- Manow, P. (2001b). Comparative institutional advantages of welfare state regimes and new coalitions in welfare state reforms, in P. Pierson (eds.), *The New Politics of the Welfare State*, Oxford: Oxford University Press, pp. 146-164.
- Mares, I. (2001a). Firms and the welfare state: when, why, and how does social policy matter to employers?, in P. Hall and D. Soskice (eds.), *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*, Oxford: Oxford University Press, pp 184-212.
- Mares, I. (2001b). Strategic bargaining and social policy development: unemployment insurance in France and Germany, in B. Ebbinghaus and P. Manow (eds.), *Comparing Welfare Capitalism: Social policy and political economy in Europe, Japan and the USA*, London: Routledge, pp. 52-75.
- Marshall, T.H. (1950). *Citizenship and Social Class: And Other Essays*, Cambridge Eng.: University Press.
- OECD (2016). Consumer Prices (MEI), http://stats.oecd.org/Index.aspx?DataSetCode=MEI_PRICES, accessed on August 4, 2016.
- Psacharopoulos, George (1994). Returns to Investment in Education: A Global Update, *World Development*, 22 (9), pp. 1325-1343.
- Persson, T. & Tabellini, G. (2003). *The Economic Effects of Constitutions*. Cambridge Mass., MIT Press.
- Schröder, M. (2009) Integrating Welfare and Production Typologies: How Refinements of the Varieties of Capitalism Approach call for a Combination of Welfare Typologies, *Journal of social policy*, vol. 38, no. 1, pp. 19-43.
- Schröder, M. (2013). *Integrating Varieties of Capitalism and Welfare State Research: A Unified Typology of Capitalism*. New York: Palgrave Macmillan
- Scruggs, L., Jahn, D. & Kuitto, K (2014). *Comparative Welfare Entitlements Data Set 2*, Version 2014.
- Shonfield, A. (1965). *Modern Capitalism*. New York: Oxford University Press.
- Solow, R.M. (1956). A Contribution to the Theory of Economic Growth, *The Quarterly Journal of Economics*, vol. 70, no. 1, pp. 65-94.
- Streeck, W. (1991). On the Institutional Conditions for Diversified Quality Production. I E. Matzner & W.Streeck (red.), *Beyond Keynesianism*, London: Edward Elgar, 21–61.
- Streeck, W. (1997). Beneficial Constraints: On the Economic Limits of Rational Voluntarism. In: J. Rogers Hollingsworth & Robert Boyer (eds.), *Contemporary Capitalism: The Embeddedness of Institutions*. Cambridge: Cambridge University Press, 197–219.
- The World Bank (2016), *World Development Indicators*, <http://data.worldbank.org/data-catalog/world-development-indicators>, accessed on August 4, 2016.

Appendix

Figure 4: Plot of Marginal Effects (Model I):

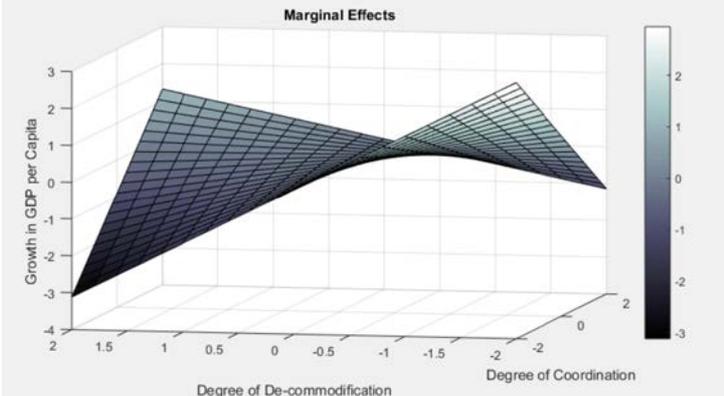


Table 3. Correlation matrix (1974-2009)

	dGDPc	Human Capital	Inflation	Investments	Government \$	LogGDP1971	Plurality	MDMH	LEFTC	Deprat	IntDemand	Coordination	Decommodification
dGDPc	1.0												
Human Capital	-0.1417	1.0											
Inflation	-0.0187	-0.2813	1.0										
Investments	0.1842	-0.2628	0.2440	1.0									
Government \$	-0.0509	-0.1642	0.2447	-0.1211	1.0								
LGDPc1971	-0.0539	-0.1089	-0.0665	0.2405	0.2996	1.0							
Plurality	-0.1310	0.1619	-0.0583	-0.1399	-0.4344	0.5768	1.0						
MDMH	0.0006	-0.0819	-0.0516	0.0314	0.0897	-0.1261	-0.2915	1.0					
LEFTC	0.0801	-0.1269	0.0202	0.0867	0.1953	-0.1857	-0.1445	-0.0170	1.0				
Deprat	0.1331	-0.1505	0.5180	-0.0269	0.3172	-0.1942	-0.1336	-0.0401	0.1058	1.0			
IntDemand	0.6252	-0.0815	-0.0512	0.1137	0.0235	-0.2430	-0.2685	0.1666	0.0364	0.0813	1.0		
Coordination	0.0380	-0.4056	-0.0614	0.3182	0.2640	-0.3053	-0.6151	0.2378	0.3514	-0.0413	0.1196	1.0	
Decommodification	-0.0293	-0.2672	-0.2189	0.0759	0.3201	-0.2440	-0.5153	0.2405	0.2264	-0.1128	0.1898	0.7441	1.0

List of Variables:

Variable	Description	Source
dGDPc	Percentage growth rate in Real Gross Domestic Product per Capita (rGDPc). rGDPc is constructed from real GDP at constant 2005 PPP's, US\$ in millions, divided with population size in millions.	Feenstra, Inklaar & Timmer (2015), Penn World Tables 8.1.
Human Capital	A measure of country average years of schooling from Barro & Lee (2013), adjusted by rates of returns for levels of education introduced in Psacharopoulos (1994).	Feenstra, Inklaar & Timmer (2015), Penn World Tables 8.1.
Inflation	Percentage growth in the OECD Consumer Prices Indices (total) from the OECD MEI database. For Ireland datapoints are missing for the years 1971-1974. Several solutions to obtaining the data are available, including imputation and the use of data from other sources. We have chosen to use data that is compatible from the World Development Indicators for the four years.	OECD (2016). The World Bank (2016).
Investments	Share of current GDP (output-side) of gross capital formation at current PPP's.	Feenstra, Inklaar & Timmer (2015), Penn World Tables 8.1.
Government	Share of current GDP (output-side) of government consumption at current PPP's.	Feenstra, Inklaar & Timmer (2015), Penn World Tables 8.1.
LGDPc1971	Logarithm of rGDPc in 1974.	Feenstra, Inklaar & Timmer (2015), Penn World Tables 8.1.
Plurality	Measure of whether the legislators were elected using winner-takes-all system, or not.	Beck, et al. (2001)
MDMH	Mean District Magnitude (MDM), House and Senate. A measure of number of representatives elected by constituency size.	Beck, et al. (2001)
LEFTC	Share of seats in parliament won by leftist parties in the most recent government as a percentage of all seats held by the government.	Brady, Hubert & Stevens (2014).
Dependency	Age Dependency: The ratio of depends as persons under 15 and over 64 divided by the working-age population.	The World Bank (2016).
IntDemand	Measure of total international demand, constructed as the total country average growth rates by year, excluding the country of interest of measurement. This is weighted by trade openness, the sum of imports and exports divided by GDP, from the CWS dataset.	Feenstra, Inklaar & Timmer (2015), Penn World Tables 8.1. Brady, Hubert & Stevens (2014)
sCoordination	Standardized composite measure of neo-corporatism based on eleven items originally proposed in Hicks & Kenworthy (1998). The index is consistent with theoretical aspects of the Varieties of Capitalism framework. Higher values correspond to higher degrees of consistency between measured institutions and the theoretical CME insti-	Huber, et al. (2004).

	<p>tutional structure, whereas lower values are associated with higher degrees of consistency with the theoretical LME institutional structure.</p> <p>For missing years (following 1994) the available data has been extrapolated. This is not expected to have strong effects on the integrity of the measure due to general stability in the index.</p>	
sDecommodification	<p>Standardized composite measure of unemployment, sickness, and pension generosity. See Scruggs, et al. (2014).</p> <p>Higher values are associated with a higher degree of decommodification.</p>	Scruggs, et al. (2014).