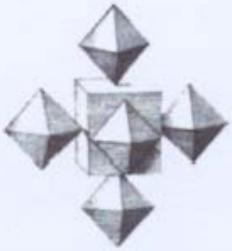

IKERLANAK

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2016

Working Paper Series: IL. 101/16

Departamento de Fundamentos del Análisis Económico I

Ekonomi Analisiaren Oinarriak I Saila

University of the Basque Country

Do Majoritarian Electoral Rules Favour Larger Industries in the Economy?

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Abstract

Electoral rules translate votes into seats on different basis. Politicians respond differently to alternative electoral rules, and consequently, economic performance is expected to vary across rules. This paper empirically investigates whether electoral rules have an effect –and if so, under which circumstances–on the economic performance of industries. Applying panel data techniques to an extensive dataset covering 61 manufacturing industries from 58 democracies over 1990-2010, we find that industry size –measured by the number of workers to total population– grinds industry economic growth. However, we find very robust evidence that large industries grow less slowly under majoritarian rules than under proportional representation and mixed systems. Based on previous theories suggesting that majoritarian rules are more likely to target narrow-interest groups, we conjecture a multilateral political linkage among officed-oriented politicians, industries and voters which might explain the differential effect of electoral rules on the economic performance of industries.

Keywords: Electoral rules, manufacturing industry growth, industry size, special interest groups
JEL Classification: D72, H11, L60

1. Introduction

The electoral rule of a national parliament is one of the main elements of a political constitution. Not only does it translate votes into seats but it also provides incentives to politicians to respond to different groups of people. Two major types of electoral rules are identified, namely majoritarian rules and proportional representation. Together with district magnitude, provision for supplementary seat, electoral thresholds and ballot structures, electoral rule is a defining dimension of an electoral system (Lijphart, 2012). This paper empirically investigates whether electoral systems have an effect –and if so, under which circumstances– on the economic performance of industries.

*I acknowledge financial support from the Spanish Ministry of Economy and Competitiveness predoctoral scholarship program Formacion del Personal Investigador (FPI) (ECON2012-31346). This work has been partly supported by COST Action IC1205 on Computational Social Choice.

We show empirically that majoritarian electoral systems –relative to proportional representation and mixed systems– favour large manufacturing industries in the economy.

Majoritarian rules (hereafter, MR) implicitly embrace the political philosophy that the government should represent the wills of the majority of the society (Risse, 2004). The most popular form of majoritarian rules is the First-Past-the-Post (FPTP), which partitions a political entity into numerous single-member electoral districts wherein a representative is elected in each district through plurality voting. A major alternative of FPTP is the majority run-off system adopted by France and its former colonies. By having a second-stage election with only two finalists, the system ensures that the winner is backed by the mandate of at least 50 percent of the effective votes. The whole category is sometimes called winner-takes-all system (WTA). The common consequence of majoritarian rules is that the largest party could easily take control of the parliament and the government.

Proportional representation (hereafter PR), to the contrary, accepts the ideology of consensus democracy that the parliament should represent the whole society and the voice of minorities should also be heard (Lijphart and Aitkin, 1994). The simplest form of PR systems allows voters to chose between lists of candidates in multi-member electoral districts. Seats will then be located in proportion to the share of votes received[1]. A usual consequence is that no party obtains more than 50 percent of the seats, which may cue the formation of coalitions of parties. For instance, a party receiving 30 percent of the votes may form a majority government under a majoritarian rule in a multiple-party competition, but would have obtained roughly 30 percent of the seats under PR.

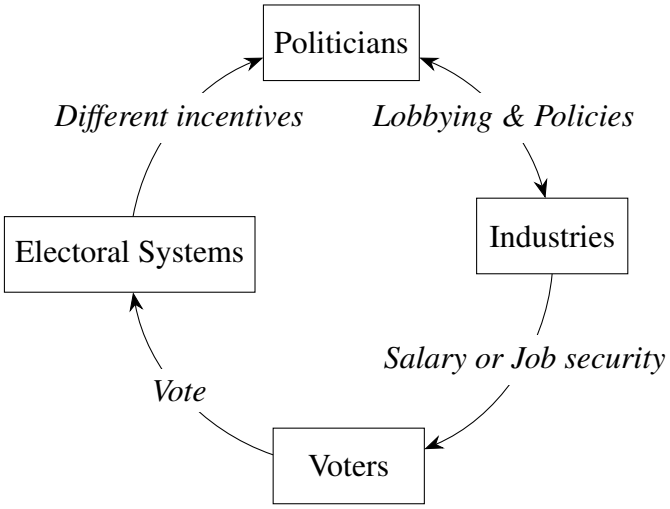
Another type of electoral system, which has become more widespread recently, is the mixed system. The system is a mixture of the former two types and parliamentary members elected by either type carry out legislative works in the same parliament, though in some cases in separate chambers.

Electoral formulas have clear implications in the vote-seat proportionality, the party formation, and thus the representation of social groups in parliaments. PR systems are believed to translate more accurately parties' vote-shares into parliamentary seat-shares than MR systems. A straightforward trade-off between accountability and representation arises in the choice of electoral systems. While the virtues of PR reside in providing a better representation of societal preferences for policies, its vices rely on that politicians under PR are less accountable than MR. Deemed this trade-off, one might consider a plausible interplay of electoral systems in shaping policy outcomes. In this work we reckon the impact of alternative electoral rules on economic performance, and specifically, on industry growth.

To explain the different incentives facing politicians under the two major types of electoral

[1] See Bormann and Golder (2013) for an extense clasiffication of electoral formulas

Figure 1: A Multilateral Political Linkage



systems, this work proposes a synthesis of the lobbying hypothesis and the vote-buying hypothesis. Narrow-interest groups are often powerful in influencing policies. As Grossman and Helpman (1994) suggest, trade unions, recognized as special-interest groups, are more organized than consumers, and thus possess a stronger say in policy-makings. Industrial policies, for example tariffs and subsidies, sacrifice the interest of the general public to the benefit of small groups of producers, and are often taken as evidence of favouritism towards narrow-interest groups (Rickard, 2012a). However, a favoured narrow-interest groups could not be too small. Should it be the case, they would be simply negligible in the eyes of the politicians. On the other hand, according to the literature of constitutional political economy, politicians under majoritarian rules are more prone to serve the interests of special groups, based on the vote-buying explanation. Persson (2005) suggests that PR tends to favour the benefit of the general public. Under PR, governments, usually formed by coalitions, obtain at least 50 percent of the votes, thus it represents and responds to at least half of the population. Since the governments under PR are more concerned with the general support, they are inclined to protect the broad-interest groups, or at least not to overly favour the narrow-interest groups. MR, to the contrary, are mainly implemented along with numerous single-member electoral districts, and hence politicians, aiming to secure an electoral victory, tend to target the voters of some pivotal districts. Consequently, policies under MR are less favourable to the interests of the general public.

In this paper we empirically show how higher levels of employment of industries are associated with a diminishing effect on output growth rates of industries. This inimical effect is however significantly reduced if countries have adopted MR to form their parliaments. To explain this striking result, we conjecture a mechanism, depicted by Figure 1, that engages office-oriented politicians, industries and voters. The mechanism, functions as follows: voters work for an industry

in return for income. Meanwhile, the industry communicates with office-oriented politicians and lobbies for their preferred, favourable industrial policies. Politicians may not only benefit from direct monetary contribution, but also indirectly by winning the votes from workers of the favoured industries. Given the same amount of lobbying effort, the larger is the group of workers, the more effective is the lobbying effort because of the more sizable return of the tilted policy in terms of votes. Politicians and industries are therefore interdependently connected in the exchange of benefits. Industries benefit from their efforts in swaying industrial policies –tariffs, subsidies or other favourable policies–, which are translated in salary maintenance or rise, or job security for employees/voters. Voters cast their ballots based on the favouritism of the policitians. In other words, whenever more voters are involved in the cycle of this multilateral relationship, the industry is more likely be targeted by the government and benefit from favourable policies. However, votes are translated into seats differently via alternative electoral rules, which might not impose the same constraints onto politicians. The economic performance of industries might differ depending on the interrelation between the industry size the adopted electoral rule.

A crucial consideration of our investigation is that we expect this multilateral relationship to be more profound under MR than under PR or MS. Inspired by the seminal works of Persson, Roland and Tabellini (Persson and Tabellini, 2005; Persson et al., 2003; Persson, 2005), our conjecture supplements the argument that electoral systems are a crucial determinant of the incentives that motivate politicians to promote and implement broad or narrow spending programs. Theoretical and empirical findings ground the view that PR systems produce policies serving broader interests than MR, either directly through the incentives to politicians or indirectly via party formation and the incidence of coalition governments, which are more likely to appear in PR parliaments. Along this line, we consider that MR politicians might find higher incentives to woo certain industry interests at the expense of broader, general public interests. The redistributive effect of tariffs and favourable industrial policies may be translated in the electoral support of industry workers, which ultimately may be sufficient to ensure a majority under MR but not under PR or MS.

In a sense, our conjecture challenges the well-known Olson's argument in the collective action literature (Olson, 1965), which states that smaller groups are better able to overcome the free-rider problem and eventually succeed in further its common interests. In fact, the political benefits that an industry gains from gathering a large number of employees have been already accounted in the literature (Esteban and Ray, 2001; Becker, 1983).

This paper's contribution is threefold. First, we study the economic aftermath of electoral rules and depart from the previous scholarship by adopting an industry-level standpoint. We focus on the disaggregated economic performance of industries, which enables us to uncover within-industry patterns that remain hidden in aggregate cross-national analyses. To the best of our knowledge, this work is the first empirical attempt to investigate the impact of electoral rules on economic growth

of industries. Second, we look at the industry output growth rate, rather than the national amount of tariffs or protectionist policies studied in existing research. This approach not only allows us to study the ultimate effect of any favourable policy, but also adds an additional dimension to the ongoing debate over the economic consequences of electoral rules. To that aim, we construct a highly informative panel dataset that covers a remarkable number of countries and manufacturing industries. The dataset employed throughout this investigation includes information on a great variety of variables that allows us to identify the traces of electoral rules. Finally, we contribute to the empirical strand of constitutional political economy field by providing evidence on that the effect of electoral rules on the economic performance of industries. We surmise a multilateral linkage among workers, industries and politicians to explain how alternative electoral rules could differently affect economic performance of industries.

We exclusively focus on manufacturing sector for the following reasons. Trade and industrial policy is thought to be a politically efficient way to target key voters (McGillivray, 2004). The most common instrument of industrial policy are tariffs, and they mainly favour the manufacturing industries. Shielded by tariffs and other trade barriers, local manufacturers are able to capture the domestic market in the absence of influxes of cheap foreign goods. Although tariffs may be an effective instrument for enhancing the domestic economic development, consumer prices are consequently higher and quality is lower due to the lack of competition of foreign goods. It is a policy that favours the narrow-interest groups (producers) at the expense of the general public (consumers). In contrast, services are not tradable, which motives its exclusion from our analysis. A favourable policy for the service sector may not significantly harm the welfare of consumers because it could in fact lower the consumer price. We exclude agriculture from our study because it is negligible in many countries. Additionally, the agricultural policy in Europe is mainly determined at the European level through the Common Agricultural Policy (CAP), posing a difficulty in discerning national politics. In contrast, industrial policies are generally crafted at the national level. Finally, one may be concerned with the actual size of the industries in the sample. Generally speaking, one single industry employs a rather small portion of the total electorate, and hence their interests might have been dismissed from the targets of politicians[2]. However, we believe that the employees of an industry is only the primary layer of the target. Their choices may then influence the preferences of their family members, and thus the favourable industrial policies are intended to win the votes from a much larger group of voters than merely the employees of the industry.

We will discuss the literature in Section 2. Section 3 details the data employed. Section 4 presents our basic econometric specifications and results. In Section 5, we present several robust-

[2]The sample average of the industry employment to total population in our dataset is 0.12 percent

ness checks. The final section concludes.

2. Literature review

The economic effects of electoral systems have long been analyzed in the fields of political economy and electoral studies. Notwithstanding the theoretical and empirical attempts, the results still remain inconclusive.

A large body of the literature devotes its attention to discern which electoral rule tends to cater the needs of narrow-interest groups. Many studies argue that politicians under MR are more prone to cater to narrow-interests, while the government under PR tends to be more responsive to the general public. Persson and Tabellini (2005) explain that a party only needs 25 percent of the votes (50 percent of the votes in 50 percent of the districts) to secure a majority of the legislature under plurality rule, suggesting that the government tends to target the voters in some pivotal districts. Persson and Tabellini (1999) and Persson et al. (2007) find that majoritarian democracies are associated with lower government spendings and welfare spendings. They explain in Persson and Tabellini (1999) that majoritarian elections intensify competition between parties, who thus focus their attention to key marginal districts, leading to less public goods, more redistributions and a larger government. A similar argument is discussed in Lizzeri and Persico (2001), which presents a trade-off between efficiency and targetability of the provision of public goods. Despite that the benefit from public goods might surpass on average that of pork-barrel projects, they cannot be targeted as easily as the latter, thus pork-barrel spendings are more effective tools to buy votes. They find that public goods are less often provided under winner-takes-all systems than under PR. Grossman and Helpman (2005) turn to trade policy and show with a model of campaign contribution that majoritarian rules impart a protectionist bias. Rickard (2010) finds that governments under plurality rules tend to be more protectionist against free-trade, as shown by the fact that they are more often accused of violating restrictions set by GATT/WTO. However, some theoretical works and empirical findings suggest otherwise. Rogowski and Kayser (2002) argue that politicians under PR can cater to the needs of minorities while not being concerned very much with a general electoral loss. Therefore they put forward that PR is more responsive to narrow-interest groups. Along this line of thought, Pagano and Volpin (2005) show that PR favours the more organized entrepreneurs and employees over consumers and shareholders.

Another strand of the literature addresses the effects of electoral rules on the overall economic performance of countries. There are both theoretical arguments supporting that majoritarian rules either promote or grind economic growth. The debate is mainly based on the trade-off between representation and accountability that electoral rules might incur (Persson and Tabellini, 2005). It is conventionally agreed that a majoritarian parliament is more accountable because the electorate is able to identify poorly performing politicians, and consequently vote them out of office. In the

case of PR, which is normally associated with coalition governments, voters find it more difficult to pinpoint the politicians to blame on. Even if voters can differentiate politicians in terms of performance, they cannot directly vote them out due to the party-list voting system. Lijphart (2012) finds a small and positive effect of PR on GDP growth rates, consistently with Persson and Tabellini (2005), although the results of the latter are not robust. More recently, Knutsen (2011), using a sample of 107 countries, finds that PR systems produce a higher economic growth. However, accountability or representation alone may not be growth-enhancing (Alfano and Baraldi, 2014). They find that mixed systems overcome this dilemma and induce a higher level of income. We depart from this literature by digging deeper into the impact of electoral rules on economic performance at the industry-level, while keeping the trade-off implicitly in the analysis.

The central result of this paper is that industry size plays a role in the effect that electoral rules have on the economic performance of industries. We conjecture that industries receive preferential treatment through the redistributive effect of trade and industrial policy and their employees are aware of it and respond through electoral support. Building on existing insights suggesting that MR politicians are more likely to cater to narrow-interest groups relative to their PR and MS counterparts, we surmise that MR fuel the interplay between office-oriented politicians and large industries, resulting in higher growth rates of larger industries.

3. Data

This work constructs an unbalanced panel data consisting of 2,667 country-industry observations across 58 countries and 61 International Standard Industrial Classification (ISIC) over the period 1990-2010. Regarding the industrial data, we employ the Industrial Statistics Database (INDSTAT 4) from the United Nations Industrial Development Organization (henceforth UNIDO dataset), at a 3 digit-level (2010, revision 3). Our dependent variable is the annual growth rate of output of industry i in country c over a year t, and therefore the observations have a tridimensional nature. From the same data, we aggregate the information of the whole manufacturing sector from the same data source (UNIDO).

As concerns electoral systems data, we make use of the data collected by Bormann and Golder (2013) on 212 democratic national-level lower-chamber legislative elections taken place in the 58 countries over 1990-2010. All the countries included in the sample are classified as democratic regimes in the sense of Przeworski (2000) [3]. The vast majority of the countries are parliamentary democracies, and others are semi-presidential and presidential democracies. Our classification of

[3] A regime is deemed democratic when the following conditions hold simultaneously: i) the chief of the executive is elected, ii) the legislature is elected, iii) there is more than one party running the elections and iv) an alternation under the identical electoral rule has taken place.

Table A: Sample Countries by Electoral System

MR	PR		MS
Australia	Albania (MS to PR, 2009)	Kyrgyzstan	Bolivia (PR to MS, 1997)
Canada	Argentina	Latvia	Bulgaria (PR to MS, 2009)
France	Austria	Luxembourg	Ecuador (PR to MS, 1998)
India	Belgium	Malta	Georgia
Malawi	Brazil	Moldova	Germany
Mauritius	Sri Lanka	Netherlands	Greece (PR to MS,2007)
Mongolia	Chile	Norway	Italy (PR to MS,1994)
Trinidad and Tobago	Colombia	Paraguay	Japan (MR to MS, 1996)
United Kingdom	Cyprus	Peru	South Korea
United States of America	Czech Republic	Portugal	Lithuania
	Denmark	Slovakia	Madagascar
	Estonia	Slovenia	Mexico
	Finland	Spain	Panama
	Indonesia	Sweden	Philippines (MR to MS,1998)
	Ireland	Macedonia (MR to PR,1998)	Romania (PR to MS,2008)
	Israel	Uruguay	Senegal

electoral rules follows Golder (2005), in which they are typified into three categories: majoritarian, proportional representation and mixed systems. Table A depicts our sample countries by electoral systems, and includes the electoral switches undergone by certain countries and the year those changes took place. Following Bormann and Golder (2013), we construct a dichotomous variable which equals one if legislators are elected on the basis of a majoritatian rule, aka plurality rule/winner-takes-all/first-past-take-post, otherwise the value is zero. For non-electoral years, we input the same value of the previous electoral year. As the period of observation is short (1990-2010), we find that the majoritarian variable presents no variability over time. We group mixed systems and PR together because both of them depart from majoritarian rules in the sense that they aim at introducing minorities into a parliament.[4] Subsequent sections describe the control variable sets used in our empirical investigation, and the appendix summarizes data sources and some descriptive statistics on key variables.

4. Empirical Specifications and Results

Most of the empirical studies on the effects of alternative electoral rules are carried out at the aggregate cross-national level by using GDP per capita or growth rates thereof. We believe that looking at the disaggregate industry output uncovers certain patterns that remain hidden otherwise. Indeed, throughout this investigation we provide evidence of a pattern that is not shown at the

[4]One will find that PR and mixed systems do not present significant differences in the following estimations.

aggregate level, and more importantly, it is persistent and robust to different specifications at the disaggregated level.

Consider the following econometric model:

$$Growth_{ict} = \beta_0 + \beta_1 MR_{ct} + \beta_2 IndustryEmploy_{ict} + \beta_3 MR_{ct} * IndustryEmploy_{ict} + X_{ict}\gamma + \alpha_i + \nu_c + \mu_t + \varepsilon_{ict} \quad (1)$$

The dependent variable ($Growth_{ict}$) is the industry output growth rate, in wich i stands for industry, c country and t year[5]. Our key explanatory variables are a majoritarian rule binary variable (MR_{ct}), the industry employment size as a ratio to the total population ($IndustryEmploy_{ict}$), and the interaction between them ($MR_{ct} * IndustryEmploy_{ict}$).

The baseline model includes a set of control co-variates (X_{ict}). We include some variables at a country-level so as to control for the overall importance of the manufacturing sector in a economy: the total employment in the manufacturing sector to total popluation ratio ($Manu.Employ_{ct}$), the output of the manufacturing sector ($lnManuOutput_{ct}$) and output growth rate of the sector ($ManuGrowth_{ct}$). We additionally attempt to control for the lobbying ability of the industries, and thus isolate the influence of the size of the industry in terms of employment from other variables that could affect the effectiveness of lobbying. The industry output share as a ratio of the total manufacturing sector at the 61 ISIC industry-level ($IndustryOutputShare_{ict}$) is included to capture how influential or how financially powerful the industry is relative to other industries. The natural logarithm of the industry output ($lnIndustryOutput_{ict}$) and both the GDP per capita ($lnGDPpc$) and its growth rate ($GDPpcGrowth$) are included[6]. The terms α_i, ν_c, μ_t respectively stand for the coefficients of industry, country and year fixed effects. We may not control for the country-industry fixed-effect and assume that the country-industry specific effect is uncorrelated with the independent variables. Both random-effect and fixed-effect models are shown side by side for comparison.

Before we look into the disaggregated manufacturing industries, it is illustrative to examine the pattern at the aggregate country level, that is, at the whole manufacturing sector level. The comparison with the disaggregated results may show us what are hidden in the aggregate information. Columns (1) and (2) of Table 1 display results of the random and fixed-effect estimations at the aggregate level, as stated in the following model:

[5]The dependent variable output growth rates is restricted up to 1 to avoid outliers.

[6]Due to how UNIDO (3 digit-level 2010, rev. 3) is reported, all monetary variables are expressed in current U.S. dollars.

$$Growth_{ct} = \beta_0 + \beta_1 MR_{ct} + \beta_2 ManuEmploy_{ct} + \beta_3 MR_{ct} * ManuEmploy_{ct} + X_{ct}\gamma + \nu_c + \mu_t + \varepsilon_{ct} \quad (2)$$

where the dependent variable is the manufacturing sector output growth rate in country c and year t, and the terms ν_c and μ_t stand for the country and year fixed effects respectively. Likewise the model in (1), the ratio of the manufacturing sector employment to total population and its interaction with the dichotomous variable MR are the main explanatory variables of the model. Neither the dichotomous variable MR nor its interaction with the size of manufacturing sector are statistically significant, variables in which our main hypothesis is based upon. Nevertheless, the manufacturing sector size is statistically significant and negative in the fixed-effects model (Column 2), implying that increasing employment relative to the total population is associated with a negative effect on the manufacturing sector output growth rate. This result is puzzling since we expect the bargaining power of the sector to be greater when the sector employs more workers.

From now on, we embrace a country-industry level standpoint. The results brought out at the disaggregated level substantially differ from those of at aggregate level. Columns (3) and (4) present estimations at the 61 ISIC industry-level but suppress the interaction term. We find a positive and significant correlation between MR and the industry growth rate, and the employment ratio –our measure of industry size– is negative and significant. Had we focused on the aggregate level this pattern would have gone unnoticed. According to the estimation of column (3), an increase of the employment ratio by 0.1 percentage point is associated with a fall of growth rate by 1.04 percentage points, which is statistically significant. A larger sector may grow slower because it is more well-established with little room for innovations.

The size of the manufacturing sector is associated with a negative coefficient, althought it is not statistically significant. Both the industry output share and the log of the industry output are positive. Applying the lobbying hypothesis, the pattern could be explained by the stronger lobbying ability of a more productive (in terms of output) industry. The log of the total manufacturing output is however negatively associated with the growth rate. Both GDP per capita and its growth rate are statistically significant.

Columns (5) and (6) include as well the interaction term. Consistent with the hypothesis we suggest, the interaction term is positive and significant. A 0.1 percentage point increase in the employment ratio is on average associated with a fall of growth rate of 1.41-2.95 percentage points under non-majoritarian rules. The magnitude is only 0.56-1.23 percentage points under majoritarian rules. The bottom of Table 1 shows the confidence intervals of the marginal effect of industry employment ratio. Note that the two 95% confidence intervals exclude each other in the random-effect model, while they slightly overlap in the fixed-effect model. The baseline result does not

reject our hypothesis and convincingly shows a substantial difference between majoritarian rules and non-majoritarian rules.

5. Robustness Checks

5.1. Isolating PR from Mixed Systems

In the baseline estimation, we group PR and mixed systems together in one category. This grouping is reasonable since in practice both PR and mixed systems produce a much higher representation in the parliament than majoritarian rules. Still, we are interested in isolating PR from mixed systems. Columns (1) and (2) displayed in Table 2 exclude all observations associated with a mixed system from the sample. Notice that the majoritarian binary variable is time-invariant and thus its estimate is absent in the fixed-effect model. The main results remain similar. A 0.1 percentage point increase in the industry employment ratio is on average associated with a fall of growth rate of 1.23-2.87 percentage points under PR. The magnitude is 0.5-0.98 percentage points under majoritarian rules. The two 95% confidence intervals exclude each other comfortably, showing a stark difference between the effect of majoritarian rules and that of PR.

Columns (3) and (4) include and isolate three types of electoral systems. The PR binary variable and its interaction with industry employment ratio are omitted to highlight the comparison between majoritarian rules and PR. A 0.1 percentage point increase in the industry employment ratio is associated with a fall of industry growth rate of 1.4 to 2.93 percentage point under PR. The magnitude is 0.56 to 1.3 percentage points under majoritarian rules. The 95% confidence interval of majoritarian rules and that of PR exclude each other in the random-effect model, and slightly overlap in the fixed-effect model. Meanwhile, we do not find significant differences between PR and mixed systems, justifying the grouping of PR and mixed systems in the baseline estimation.

5.2. Socio-Political Factors

A set of control variables are additionally taken into account, in which we include measures of human capital, civil liberties, population size, trade openness and sector-specific trade protection.

Empirical findings suggest that human capital is a strong predictor for the subsequent economic growth (Glaeser et al., 2004). Human capital externalities are not only associated with technology level in previous studies (Lucas, 1988) but also with politics (Alesina et al., 1996). As stated in Lipset (1963), more abundant human capital leads to more benign politics, less violence and more political stability. In this sense, different levels of human capital could have an impact on the monitoring power of citizens over their legislators, independent of which kind of electoral rule is adopted. We proxy human capital by the Gross Enrollment ratio in Secondary Schools (GER) collected by the UNESCO Institute for Statistics.

Bearing in mind that all the countries included in the sample are defined as democracies, we control for different levels of institutional quality which could either shape the political process in a country or determine the industry growth rates. Based on the Freedom House rating of civil liberties, we include a re-scaled variable of the original one which ranges from 1 (the lowest) to 7 (the highest).

The population size of a country has been concerned in previous scholarship on electoral systems (Rokkan (1970) and Blais and Massicotte (1997)). The findings of Rogowski (1987) provides evidence of a negative correlation between population size and the adoption of proportional representation systems. To isolate the effect that MR might exert on industry growth rates via population size, we include also the log of total population, collected by the World Development Indicators (Word Bank, version April 2014).

We finally concern the important implications that electoral rules have for trade policy and trade openness (McGillivray (2004), Rickard (2012b), Kono (2009)). Kono states that the nature of electoral institutions make politicians more responsive to narrow protectionist interests and, consistently with Rogowski (1987), he associates trade openness to PR systems. We include the World Bank indicators of trade openness -measured by the sum of exports and imports to GDP ratio- and tariffs on manufacturing products to minimize the possibility of reporting a spurious correlation between electoral rules and the economic performance of manufacturing industries.

On top of the baseline specification, these five socio-political and economic factors are considered and the estimations are shown in columns (5) and (6) of Table 2. The inclusion of them do not significantly alter the baseline results. Only the log of the size of population in the fixed-effect model is marginally (at 10% significance level) significant.

5.3. Legal Origins

Most of the Anglo-Saxon countries are associated with majoritarian rules, despite the fact that their political systems vary. Our results may be in fact driven by an unknown mechanism within the British common-law countries. Therefore, we partition our sample into two: countries of British legal origin and countries of other legal origins. The codification of legal origins is borrowed from La Porta et al. (2008). Results are shown in Table 3.

All columns of Table 3 include also the socio-political control variables, following columns (5) and (6) of Table 2. In the first two columns, only observations of British legal origins are included.[7] We find a more pronounced effect. Refer to the fixed-effect model of column (2), we find that a 0.1 percentage point increase in the industry employment ratio on average leads to a rise of growth

[7]In the sample of British Origin, 1,537 observations, or 37.2 percent, are associated with PR. And no country had adopted any one type of mixed systems.

rate by 2.67 percentage points under majoritarian rules, while this effect is negative under PR (-4.45 percentage points).

Columns (3) to (6) show the estimations of the sample of non-British origins.[8] Similar results are obtained and the difference between majoritarian and other rules is not to be neglected. As displayed in column (4), the effect of a 0.1 percentage point increase of employment ratio is associated with a fall of growth rate by roughly 3.46 percentage points under non-majoritarian rules, but only 1.71 percentage points otherwise. Columns (5) and (6) separate mixed systems from PR, but their differences from columns (3) and (4) are negligible. This finding, along with several other checks performed and available from authors[9], support the pattern of a differential effect of electoral rules on industries as a function of the industry size measured by the employment to total population ratio.

5.4. Partition by Level of Corruption

This paper suggests a link between politicians and industries, an activity generally regarded as lobbying, and which could be hidden or revealed. Monetary lobbying is illegal in many countries, and is believed to be highly correlated with corruption. For instance, in a more corrupt country, the link between politicians and industries is much tighter and involves more money and benefits. Hence, we expect the effect of the electoral system on the industry growth to be stronger in countries with a higher level of corruption.

To delve into this, we use the control of corruption indicator from the Worldwide Governance Indicators collected by the World Bank[10]. We first partition the sample into two sub-samples of similar sizes by locating the median of the control of corruption in the sample[11], which is 0.96, then estimate separately to check if significant differences exist between higher-corruption and lower-corruption countries. Table 4 presents the results. Columns (1) and (2) show the estimations of the sample of higher-corruption observations. We find similar results as those of the baseline model. Columns (3) and (4) turn to the sample of lower-corruption observations. Now we no longer find a significant interaction term in the random-effect estimation. The two confidence intervals overlap for a considerable range. The marginal effect is not even significantly different from zero in the fixed-effect model, as shown by the estimates of the two 95% confidence intervals

[8] In the sample of non-British origins, only 1,306 observations, or 6.99 percent, are associated with majoritarian rules.

[9] Additional tests include isolation of OECD countries, waves of democratization, levels of democracy measured by PolityIV index (PolityIV Project) and specification changes.

[10] As stated in Kaufmann et al. (2011), this indicator "captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests".

[11] Control of corruption ranges from -2.5 to 2.5, higher values mean better control of corruption.

of column (4), implying that the employment ratio may not be a determinant of industry growth rates if the country is politically clean and transparent.

The stark difference between higher and lower-corruption countries is in effect an indirect test of our hypothesis, since the pattern only persists in countries with high corruption, where politicians are more prone to the influence of big corporations, but not in those with low corruption.

6. Discussion and Conclusion

Electoral rules translate votes into seats on different basis, shaping policy outcomes either via incentives to politicians or indirectly through the government formation process. Alternative electoral rules may promote political behaviours towards advancing certain constituencies at the expense of broader interests. Along this line of thought, a great body of evidence suggests that politicians under majoritarian rules are more prone to advance special interest groups at the expense of the general public than under proportional representation or mixed systems. Therefore, it is plausible to reckon that economic performance varies across rules. In this paper, we query whether electoral rules have an effect –and if so, under which circumstances– on the economic performance of industries. Employing a panel data covering information of 212 legislative elections in 58 countries and 61 ISIC manufacturing industries over the 1990-2010, we find that industry size –the ratio of industry employees to the total population– is negatively associated with annual industry output growth rate. However, this growth-diminishing effect lessens significantly in countries employing majoritarian electoral rules relative to proportional representation and mixed systems. The difference is statistically significant and robust to different specifications. To explain this dissimilar effect of alternative electoral rules on industry growth, we conjecture a multilateral relationship among office-oriented politicians, industries and workers, which is more pronounced under majoritarian electoral rules. Office-oriented politicians advance industry interests at the expense of broad interest in return for electoral support provided by wooed industry workers through voting. Given lobbying efforts constant, we surmise that the larger the industry in terms of employment, the more incentives have politicians to engage in the interplay. This interrelation is more profound under majoritarian electoral rules due to its inherent propensity to cater to narrow-interest groups, which has long been documented *inter alia* by the seminal works of Persson, Roland and Tabellini. The central result of this paper is therefore consistent with the extant literature suggesting that politicians under majoritarian electoral rules may be more prone to foster interest groups relative to proportional representation or mixed systems, and we based this argument on the greater misalignment between vote share and seat share under majoritarian rules parliaments. Interestingly, the pattern we find is more pronounced in those countries in which corruption is more rampant, which is in accordance with the rationale of the link discussed in the text, and thus reinforces our main finding. A natural extension of this investigation is a theoretical

work to model formally the effects that the interaction between electoral rules and larger groups might have on the incentives of politicians to engage in narrow-interest policies, and consequently on the economic performance of industries. Additionally, we consider other empirical extensions such as the inclusion of geographical concerns in the formation of the favouritism in the political game. Finally, other economic sectors beyond the manufacturing sector might be considered to get a bigger picture of the impact of electoral rules on the disaggregated economic performance of countries.

Acknowledges

We would like to thank the audiences of the 2016 Annual Meeting of the European Public Choice Society in Freiburg (Germany), the 20th Annual Conference of the Society for Institutional & Organizational Economics in Paris (France) and the 1st Doctoral Conference of the University of the Basque Country in Bilbao (Spain).

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Tables

Table 1: Aggregate vs Disaggregated data: Baseline model

	(1)	(2)	(3)	(4)	(5)	(6)
	Country level		Country-Industry level			
	RE	FE	RE	FE	RE	FE
MR	-0.012	0.005	0.073***	0.065***	0.065***	0.048***
	(0.032)	(0.052)	(0.019)	(0.017)	(0.019)	(0.019)
Manu. Employ	-0.529**	-5.060***	-0.367	-0.337	-0.279	-0.280
	(0.230)	(0.815)	(0.368)	(0.427)	(0.366)	(0.421)
MR*ManuEmploy	-0.041	0.146				
	(0.511)	(1.008)				
Industry Employ			-10.424***	-25.609***	-14.058***	-29.465***
			(2.833)	(4.972)	(1.556)	(3.997)
MR*Industry Employ					8.447***	16.483***
					(2.030)	(5.860)
ln Manu. Output	0.004	0.326***	-0.006	-0.091***	-0.007	-0.094***
	(0.003)	(0.054)	(0.018)	(0.022)	(0.018)	(0.022)
Industry Output Share			0.008	0.726**	0.006	0.689**
			(0.102)	(0.304)	(0.101)	(0.297)
ln Industry Output			0.061***	0.166***	0.062***	0.168***
			(0.003)	(0.008)	(0.003)	(0.008)
Manu. Growth			0.472***	0.496***	0.472***	0.496***
			(0.027)	(0.027)	(0.027)	(0.027)
GDPpc Growth	0.719***	0.769***	0.356***	0.325***	0.356***	0.325***
	(0.071)	(0.073)	(0.025)	(0.025)	(0.025)	(0.025)
ln GDPpc	-0.005	-0.255***	-0.064***	-0.083***	-0.065***	-0.084***
	(0.009)	(0.055)	(0.016)	(0.019)	(0.016)	(0.018)
Constant	-0.075	-5.350***	-0.536**	-0.327	-0.510*	-0.284
	(0.082)	(0.909)	(0.265)	(0.352)	(0.265)	(0.352)
No. of Obs	622	622	24692	24692	24692	24692
No. of Groups	57.000	57.000	2609.000	2609.000	2609.000	2609.000
log-likelihood		689.951		7134.992		7141.589
Within R-squared	0.675	0.718	0.305	0.337	0.306	0.337
Between R-squared	0.288	0.011	0.323	0.097	0.325	0.098
Overall R-squared	0.655	0.014	0.308	0.102	0.309	0.103
	95% Confidence Intervals (Industry Employ)					
MR					[-8.97 -2.25]	[-23.1 -2.87]
Non-MR					[-17.1 -11.0]	[-37.29 -21.63]

Clustered standard errors in parentheses

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 2: Isolating PR from Mixed, and More Controls Included

	(1)	(2)	(3)	(4)	(5)	(6)
	Mixed systems excluded		Whole Sample			
	RE	FE	RE	FE	RE	FE
MR	-0.175*	0.000	0.076***	0.063***	0.012	0.001
	(0.094)	(.)	(0.021)	(0.021)	(0.019)	(0.020)
Industry Employ	-12.669***	-28.745***	-13.958***	-29.285***	-14.299***	-30.485***
	(1.649)	(4.172)	(1.617)	(4.022)	(1.673)	(4.759)
MR*Industry Employ	7.810***	18.918***	8.352***	16.212***	8.703***	16.733***
	(1.816)	(4.814)	(2.088)	(5.980)	(2.288)	(4.784)
Manu. Employ	-0.207	-0.086	-0.239	-0.225	0.269	0.182
	(0.396)	(0.456)	(0.367)	(0.422)	(0.428)	(0.480)
Industry Output Share	0.035	0.645**	0.006	0.690**	-0.061	1.021***
	(0.111)	(0.317)	(0.101)	(0.297)	(0.112)	(0.364)
ln Industry Output	0.057***	0.162***	0.062***	0.168***	0.066***	0.169***
	(0.003)	(0.009)	(0.003)	(0.008)	(0.003)	(0.009)
Manu. Growth	0.446***	0.469***	0.471***	0.495***	0.536***	0.547***
	(0.030)	(0.030)	(0.027)	(0.027)	(0.030)	(0.030)
ln Manu. Output	-0.009	-0.096***	-0.009	-0.096***	-0.034	-0.124***
	(0.019)	(0.023)	(0.018)	(0.022)	(0.022)	(0.025)
GDPpc Growth	0.361***	0.326***	0.357***	0.327***	0.274***	0.252***
	(0.028)	(0.028)	(0.026)	(0.026)	(0.028)	(0.028)
ln GDPpc	-0.054***	-0.071***	-0.065***	-0.084***	-0.043**	-0.052**
	(0.018)	(0.021)	(0.016)	(0.019)	(0.020)	(0.022)
Mixed			0.011	0.016		
			(0.009)	(0.010)		
Mixed*Industry Employ			-0.531	-2.425		
			(2.369)	(4.435)		
Human Capital					0.018	0.010
					(0.018)	(0.020)
Civil Liberties					-0.002	-0.007
					(0.005)	(0.005)
ln Pop					0.005	0.091
					(0.066)	(0.081)
Trade (% of GDP)					0.000*	0.000**
					(0.000)	(0.000)
Tariff					-0.000	0.001
					(0.001)	(0.001)
Constant	-0.431	-0.231	-0.484*	-0.234	-0.303	-1.359
	(0.291)	(0.374)	(0.267)	(0.355)	(1.016)	(1.412)
No. of Obs	20653	20653	24692	24692	21002	21002
No. of Groups	2323	2323	2609	2609	2508	2508
log-likelihood		5994.806		7143.272		6776.370
Within R-squared	0.292	0.323	0.306	0.337	0.316	0.348
Between R-squared	0.331	0.106	0.325	0.098	0.315	0.067
Overall R-squared	0.303	0.112	0.309	0.103	0.315	0.076
	95% Confidence Intervals (Industry Employ)					
MR	[-7.5 -2.22]	[-16.79 -2.87]	[-8.97 -2.48]	[-23.35 -2.8]	[-9.49 -1.7]	[-21.22 -6.29]
PR	[-16.0 -9.44]	[-36.92 -20.57]	[-17.13 -10.79]	[-37.17 -21.4]	[-17.58 -11.02]	[-39.81 -21.16]
Mixed			[-19.22 -9.76]	[-42.6 -20.87]		

Clustered standard errors in parentheses (country-industry level)

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 3: Partition: By Legal Origins

	(1)	(2)	(3)	(4)	(5)	(6)
	British Origin		Non-British Origins			
	RE	FE	RE	FE	RE	FE
MR	0.000	0.000	0.014	0.003	0.011	0.007
	(.)	(.)	(0.023)	(0.024)	(0.025)	(0.026)
Industry Employ	-26.993***	-44.531*	-14.577***	-34.591***	-14.661***	-34.466***
	(8.054)	(23.040)	(1.770)	(5.466)	(1.843)	(5.478)
MR*IndustryEmploy	19.900***	71.243***	9.636***	17.476***	9.739***	17.125***
	(7.439)	(22.797)	(1.905)	(5.169)	(1.985)	(5.357)
Manu. Employ	-2.871*	-2.765*	0.699	0.836	0.699	0.840
	(1.517)	(1.567)	(0.470)	(0.534)	(0.470)	(0.534)
Industry Output Share	-0.244	-0.150	-0.023	1.514***	-0.023	1.518***
	(0.251)	(0.444)	(0.130)	(0.428)	(0.129)	(0.428)
ln Industry Output	0.078***	0.141***	0.064***	0.174***	0.064***	0.174***
	(0.009)	(0.019)	(0.004)	(0.010)	(0.004)	(0.010)
Manu. Growth	0.793***	0.797***	0.534***	0.550***	0.534***	0.550***
	(0.133)	(0.126)	(0.032)	(0.032)	(0.032)	(0.032)
ln Manu. Output	-0.181*	-0.245**	-0.043*	-0.133***	-0.042*	-0.134***
	(0.105)	(0.104)	(0.024)	(0.028)	(0.024)	(0.028)
GDPpc Growth	0.217	0.194	0.275***	0.255***	0.274***	0.256***
	(0.161)	(0.160)	(0.028)	(0.029)	(0.029)	(0.029)
ln GDPpc	0.121	0.140	-0.039*	-0.065***	-0.039*	-0.064***
	(0.092)	(0.092)	(0.021)	(0.024)	(0.021)	(0.024)
Human Capital	-0.057	-0.121	0.007	0.001	0.006	0.002
	(0.198)	(0.194)	(0.019)	(0.021)	(0.019)	(0.021)
Civil Liberties	0.001	-0.003	-0.001	-0.005	-0.001	-0.005
	(0.018)	(0.018)	(0.005)	(0.005)	(0.005)	(0.006)
ln Pop	0.936**	0.811*	-0.042	-0.038	-0.045	-0.034
	(0.475)	(0.474)	(0.075)	(0.087)	(0.076)	(0.088)
Trade (% of GDP)	0.001	0.001	0.000**	0.001**	0.000**	0.001**
	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Tariff	-0.004	-0.003	-0.000	0.001	-0.000	0.001
	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)
Mixed					-0.003	0.006
					(0.009)	(0.011)
Mixed*Industry Employ					0.824	-2.607
					(2.417)	(4.570)
Constant	0.000	-11.580*	0.558	0.943	0.594	0.884
	(.)	(6.855)	(1.188)	(1.516)	(1.198)	(1.530)
No. of Obs.	3493	3493	17509	17509	17509	17509
No. of Groups	452	452	2056	2056	2056	2056
log-likelihood		1683.812		5234.222		5234.416
Within R-squared	0.263	0.277	0.324	0.360	0.324	0.360
Between R-squared	0.243	0.003	0.346	0.106	0.347	0.106
Overall R-squared	0.255	0.003	0.326	0.128	0.326	0.128
	95% Confidence Intervals (Industry Employ)					
MR	[-23.34 9.15]	[1.13 52.3]	[-7.33 -2.35]	[-24.3 -9.61]	[-7.52 -2.33]	[-25.02 -9.67]
PR	[-42.78 -11.2]	[-89.69 0.63]	[-18.1 -11.19]	[-45.24 -24.02]	[-18.27 -11.05]	[-45.2 -23.73]
Mixed					[-18.78 -8.89]	[-49.8 -24.34]

Clustered standard errors in parentheses (country-industry level)

* $p < .1$, ** $p < .05$, *** $p < .01$

Table 4: Partition: By Corruption Level

	(1)	(2)	(3)	(4)
	Higher-Corruption		Lower-Corruption	
	RE	FE	RE	FE
MR	-0.680	0.000	2.156	0.000
	(0.869)	(.)	(2.619)	(.)
Industry Employ	-14.089***	-43.427***	-15.287***	-10.728
	(2.566)	(7.044)	(3.076)	(13.245)
MR*Industry Employ	11.385***	29.422***	2.044	35.229*
	(2.481)	(6.643)	(3.451)	(19.104)
Manu. Employ	1.662*	1.005	-0.402	-1.244
	(0.850)	(0.901)	(0.860)	(0.911)
Industry Output Share	-0.245*	1.100**	0.141	1.428*
	(0.140)	(0.537)	(0.171)	(0.758)
ln Industry Output	0.069***	0.207***	0.042***	0.167***
	(0.005)	(0.015)	(0.005)	(0.014)
Manu. Growth	0.459***	0.469***	0.445***	0.494***
	(0.053)	(0.053)	(0.060)	(0.058)
ln Manu. Output	-0.025	-0.111**	-0.056	-0.152***
	(0.043)	(0.048)	(0.045)	(0.049)
GDPpc Growth	0.291***	0.277***	0.432***	0.373***
	(0.049)	(0.050)	(0.070)	(0.068)
ln GDPpc	-0.051	-0.108**	0.031	0.017
	(0.045)	(0.050)	(0.038)	(0.039)
Human Capital	-0.116	-0.100	0.056**	0.071**
	(0.092)	(0.095)	(0.027)	(0.030)
Civil Liberties	0.001	-0.001	0.008	0.006
	(0.009)	(0.009)	(0.009)	(0.009)
ln Pop	0.081	0.008	-0.130	-0.039
	(0.154)	(0.164)	(0.160)	(0.167)
Trade (% of GDP)	0.001	0.001	0.000	0.000
	(0.001)	(0.001)	(0.000)	(0.000)
Tariff	-0.001	0.000	-0.009	-0.010
	(0.001)	(0.001)	(0.006)	(0.007)
Constant	-1.425	-0.499	0.000	0.834
	(2.376)	(2.776)	(.)	(2.702)
No. of Obs.	7576	7576	8250	8250
No. of Groups	1566	1566	1261	1261
log-likelihood		1609.242		4415.062
Within R-squared	0.307	0.350	0.325	0.381
Between R-squared	0.333	0.069	0.343	0.053
Overall R-squared	0.324	0.101	0.334	0.086
	95% Confidence Intervals (Industry Employ)			
MR	[-4.78 -0.63]	[-22.07 -8.13]	[-22.3 -3.78]	[-27.57 43.33]
Non-MR	[-19.12 -9.06]	[-56.68 -28.99]	[-21.32 -9.26]	[-36.3 15.86]

Clustered standard errors in parentheses (country-industry level)

* $p < .1$, ** $p < .05$, *** $p < .01$

Appendix

Table A1: Summary statistics

Variable	Mean	Std. Dev.	Min.	Max.	N
Growth	0.055	0.24	-0.999	0.998	21002
MR	0.152	0.359	0	1	21002
Industry Employ	0.001	0.002	0	0.063	21002
Manufacturing Employ	0.061	0.027	0.002	0.14	21002
Industry Output Share	0.02	0.029	0	0.617	21002
ln Industry Output	20.417	2.576	7.857	27.34	21002
Manufacturing Growth	0.071	0.145	-0.423	0.62	21002
ln Manu. Output	25.203	2.029	19.514	29.332	21002
GDPpc Growth	0.062	0.12	-1.023	0.373	21002
ln GDPpc	9.51	1.194	5.006	11.634	21002
Human Capital	0.987	0.183	0.161	1.566	21002
Civil Liberties	6.255	0.909	3	7	21002
ln Population	16.477	1.575	12.896	20.897	21002
Trade (% of GDP)	79.206	39.909	16.75	348.393	21002
Tariff	3.852	4.265	0.11	32.75	21002

Observations used in regression models in Table 2 (Columns 5 and 6)

Table A2: Data Sources

Variable	Description	Data Source
Growth	Annual growth rates at manufacturing industry-level	UNIDO
Manu. Employ	Employment in manufacturing sector to total population ratio	UNIDO & World Bank
Industry Employ	Industry employment to total population ratio.	UNIDO & World Bank
Industry Output Share	Industry output to manufacturing sector output ratio.	UNIDO
ln Industry Output	Natural logarithm of industry output.	UNIDO
ln Manu. Output	Natural logarithm of manufacturing sector output.	UNIDO
Manu. Growth	Annual growth rates of manufacturing sector output.	UNIDO
MR	Dichotomous variable that takes on the value 1 when a country is a majoritarian system, 0 otherwise.	Bormann and Golder (2013)
PR	Dichotomous variable that takes on the value 1 when a country is a proportional representation system, 0 otherwise.	Bormann and Golder (2013)
Mixed	Dichotomous variable that takes on the value 1 when a country is a mixed system, 0 otherwise.	Bormann and Golder (2013)
ln GDPpc	Natural logarithm of gross domestic product divided by midyear population in current U.S. dollars.	World Bank
GDPpc Growth	Annual growth rate of GDP Per Capita.	World Bank
Human Capital	Total enrollment in secondary education as a percentage of the population of official secondary education age.	UNESCO, World Bank
Civil Liberties (CL)	Survey indicator based on freedom of expression and belief, associational and organizational rights, rule of law, and personal and individual rights, rescaled and ranging from 1 (lowest) to 7 (highest level of CL).	Freedom House
ln Population	Natural logarithm of total population.	World Bank (ver. April 2014)
Trade (% of GDP)	The sum of exports and imports of goods and services measured as a share of gross domestic product.	World Bank
Tariff on Manufacturing	Simple mean applied tariff is the unweighted average of effectively applied rates for manufacturing products subject to tariffs calculated for traded goods	World Bank
Control of Corruption (CoC)	Perception-based indicator of petty and grand corruption, scaled over -2.5 to +2.5, with higher score indicating better governance.	WGI (World Bank)
Legal Origins (LO)	Codification of countries based on their legal origins (in our dataset: British (1) and non-British origins (0)).	La Porta et al. (2008)

Table A3: Countries in the Sample

Country	Growth	IndustryEmploy	IndustryOutputShare	CL	CoC	LO
Albania	0.20	0.001	0.066	4.88	-0.72	0
Argentina	-0.08	0.000	0.021	5.13	-0.31	0
Australia	0.09	0.001	0.018	7.00	2.04	1
Austria	0.04	0.001	0.019	7.00	2.01	0
Belgium	0.02	0.001	0.018	6.59	1.34	0
Bolivia	-0.07	0.000	0.024	5.00	-0.28	0
Brazil	0.15	0.001	0.018	5.24	0.00	0
Bulgaria	0.11	0.002	0.017	5.62	-0.15	0
Canada	0.03	0.001	0.019	7.00	2.08	1
Sri Lanka	0.12	0.001	0.022	4.00	-0.40	1
Chile	0.11	0.001	0.023	7.00	1.36	0
Colombia	0.15	0.000	0.021	4.37	-0.21	0
Cyprus	0.05	0.001	0.026	7.00	1.09	1
Czech Republic	0.12	0.002	0.016	6.34	0.38	0
Denmark	0.03	0.002	0.018	7.00	2.45	0
Ecuador	0.06	0.000	0.021	4.90	-0.87	0
Estonia	0.15	0.002	0.026	6.71	0.87	0
Finland	0.02	0.002	0.021	7.00	2.45	0
France	0.01	0.001	0.017	6.54	1.37	0
Georgia	0.23	0.000	0.029	4.34	-0.27	0
Germany	0.05	0.002	0.018	6.72	1.84	0
Greece	0.05	0.000	0.019	5.45	0.48	0
India	0.14	0.000	0.017	5.00	-0.41	1
Indonesia	0.07	0.000	0.018	4.49	-0.82	0
Ireland	0.06	0.001	0.021	6.86	1.59	1
Israel	0.04	0.001	0.022	5.50	1.00	1
Italy	0.05	0.001	0.018	6.29	0.42	0
Japan	0.00	0.001	0.018	6.00	1.20	0
Kyrgyzstan	0.08	0.000	0.020	3.43	-1.17	0
Latvia	0.12	0.002	0.023	6.30	0.02	0
Lithuania	0.12	0.001	0.018	6.61	0.15	0
Luxembourg	0.05	0.004	0.041	7.00	1.94	0
Madagascar	-0.03	0.001	0.040	5.00	-0.01	0

Malawi	0.10	0.000	0.042	4.38	-0.51	1
Mauritius	0.05	0.005	0.056	6.14	0.52	0
Mexico	0.14	0.000	0.023	5.00	-0.30	0
Mongolia	-0.10	0.001	0.039	5.25	-0.37	0
Moldova	0.14	0.001	0.055	4.10	-0.72	0
Netherlands	0.04	0.001	0.017	7.00	2.15	0
Norway	0.08	0.001	0.018	7.00	2.11	0
Panama	-0.01	0.001	0.038	5.71		0
Paraguay	-0.07	0.000	0.038	5.00	-1.28	0
Peru	0.05	0.001	0.023	5.00	-0.23	0
Philippines	-0.05	0.000	0.024	5.00	-0.47	0
Portugal	0.03	0.002	0.019	7.00	1.11	0
Romania	0.08	0.003	0.023	5.66	-0.25	0
Senegal	0.11	0.000	0.028	4.50	0.31	0
Slovakia	0.13	0.002	0.017	6.06	0.27	0
Slovenia	0.02	0.002	0.019	6.57	0.97	0
Spain	0.07	0.001	0.016	6.50	1.21	0
Sweden	0.03	0.001	0.019	7.00	2.25	0
Macedonia	0.05	0.002	0.027	4.96	-0.30	0
United Kingdom	0.03	0.001	0.017	6.43	2.02	1
United States of America	0.01	0.001	0.019	7.00	1.54	1
Uruguay	-0.01	0.000	0.022	6.84	0.87	0

Mean values on key variables over 1990-2010 observations used in the model in Table 2 Column 5

Table A4: Industries in the Sample

151 Processed meat,fish,fruit,vegetables,fats	273 Casting of metals
1520 Dairy products	281 Struct.metal products;tanks;steam generators
153 Grain mill products; starches; animal feeds	289 Other metal products; metal working services
154 Other food products	291 General purpose machinery
155 Beverages	292 Special purpose machinery
1600 Tobacco products	2930 Domestic appliances n.e.c.
171 Spinning, weaving and finishing of textiles	3000 Office, accounting and computing machinery
172 Other textiles	3110 Electric motors, generators and transformers
1730 Knitted and crocheted fabrics and articles	3120 Electricity distribution & control apparatus
1810 Wearing apparel, except fur apparel	3130 Insulated wire and cable
1820 Dressing & dyeing of fur; processing of fur	3140 Accumulators, primary cells and batteries
191 Tanning, dressing and processing of leather	3150 Lighting equipment and electric lamps
1920 Footwear	3190 Other electrical equipment n.e.c.
2010 Sawmilling and planing of wood	3210 Electronic valves, tubes, etc.
202 Products of wood, cork, straw, etc.	3220 TV/radio transmitters; line comm. apparatus
210 Paper and paper products	3230 TV and radio receivers and associated goods
221 Publishing	331 Medical, measuring, testing appliances, etc.
222 Printing and related service activities	3320 Optical instruments & photographic equipment
2230 Reproduction of recorded media	3330 Watches and clocks
2310 Coke oven products	3410 Motor vehicles
2320 Refined petroleum products	3420 Automobile bodies, trailers & semi-trailers
2330 Processing of nuclear fuel	3430 Parts/accessories for automobiles
241 Basic chemicals	351 Building and repairing of ships and boats
242 Other chemicals	3520 Railway/tramway locomotives & rolling stock
2430 Man-made fibres	3530 Aircraft and spacecraft
251 Rubber products	359 Transport equipment n.e.c.
2520 Plastic products	3610 Furniture
2610 Glass and glass products	369 Manufacturing n.e.c.
269 Non-metallic mineral products n.e.c.	3710 Recycling of metal waste and scrap
2710 Basic iron and steel	3720 Recycling of non-metal waste and scrap
2720 Basic precious and non-ferrous metals	

61 ISIC industries from INDSTAT from UNIDO (3 digit-level 2010, rev. 3)