

IS THERE AN OPTIMAL LEVEL OF POLITICAL COMPETITION IN TERMS OF
ECONOMIC GROWTH? EVIDENCE FROM ITALY

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Abstract

As competition in the economic market yields consumer benefits, political competition is supposed to be welfare-enhancing for citizens in terms of providing information, increasing political choice, promoting competence and good behaviour. Even so, recent literature concerning the benefits of political competition underlines its costs, opening the possibility of a non-biunivocal way in which the degree of political competition affects economic growth. The parallel between economic and political competition allows the use of the normalized Herfindahl index as a measure of competition among parties. Within the Italian regional elections scenario from 1980 to 2008, our findings confirm an inverted-U relationship between the degree of political competition and the regional growth rate. An “optimal” level of political competition allows for a reduction in the trade-off between political accountability and government instability. Moreover, political competition can be used as a “tool” for the growth enhancement of political corruption. However, the question posed by the findings is how to drive political competition to its optimal value.

Keywords: *Economic Growth, Political competition, Herfindahl index*

JEL Classification: O43, H11, P16

1. Introduction

In a democratic system, the mechanism of representation of political parties is fundamental. It depends on the goals and preferences of political decision-makers, the electoral processes by which these decision-makers are selected and the consequences of alternative decision-making structures, all with the ultimate (though often unstated) objective of evaluating the extent to which the actions and decisions of policymakers reflect and serve the preferences and interests of citizens. The degree of political competition among political parties at elections is a characteristic of this mechanism.

Political competition can be interpreted as the degree of democracy in a society or, in other words, the increase in the number of parties competing for public office. As competition in the economic market yields consumer benefits, political competition is supposed to be welfare-enhancing for citizens. Political competition provides information, increases political choice, promotes competence and good behaviour. Nevertheless, theoretical literature on this field also underlines its costs. Although political competition (viewed as *electoral competition*; that is, competition among parties and candidates *in elections* in order to obtain public support through the votes of citizens – Bardhan and Yang, 2004) reduces private benefits available in political markets and encourages policy suppliers to act in the interest of the demand groups, it can have negative effects on policy outcomes for two reasons. Firstly, if the incumbent politician's probability to be re-elected is sufficiently unlikely, he may be induced to extract private benefits during his remaining time in office. Secondly, intense political competition may cause politicians to adopt pork-barrel policies rather than policies that benefit the electorate as a whole to cater to their narrow support base (Acemoglu and Robinson, 2005; Besley and Ghatak, 2005; Besley, 2006; Persson et al., 1997; Lizzeri and Persico, 2005).

In a democratic structure, the mechanism of representation is also characterized by the conflict between voters and candidates which derives from the possibility that the latter, once in office, retain political rents, distorting resources from growth-enhancing activities; we are referring to *political corruption*. Under certain conditions, political competition may minimize political corruption in terms of personal rents. If intense political competition can reduce the degree of political corruption, this may induce more efficient economic policy decisions.

In the fields of political economy growth, the theoretical and empirical literature on how political competition affects economic growth is both inconclusive and still limited. In this light, the present paper explores two key issues. In analyzing the relationship between political competitiveness and growth, a new approach is proposed. The existing literature (which will be examined in section 2) was not able to give a unanimous answer about how political competition affects economic growth, probably because it looked for a biunivocal relationship among them:

economic growth may be an increasing or decreasing function of political competition. Instead, combining the effects of benefits and costs of political competition, we may think that an “optimal” level of political competition¹ exists. That is, for extreme levels of political competition, its costs may overcompensate its benefits and depress economic growth, while the contrary happens for intermediate levels. In order to test the latter intuition, we need a continuous measure of political competition moving from high to low values for formulating expectations regarding its effects on economic growth. Looking at the votes market in terms of any goods market, we measure the degree of political competition by the normalized Herfindahl index of the concentration of votes in the hands of political parties at elections. A higher value of the normalized Herfindahl index (which corresponds to a high value of the standard Herfindahl index) not only indicates that the greatest part of the vote is placed in the hands of a few political parties, but also that there are political parties which “dominate” others; if the index shows low values, it means that votes are spread over many political parties of almost equal size. We are speaking of *ex ante* political competition (at elections) which can be moved into *ex post* competition (competition among political parties within a parliament/committee), depending on both the share of votes collected by each party and the electoral system which determines the mechanism for translating votes into seats.

By using such measures of political competition in an empirical growth model, we are able to test the quadratic relationship between the degree of political competition and growth. We estimate the model using Italian regional data. The Italian regions are characterized by the direct election of their committees which decide the economic policies of each region. The Italian regions provide an appropriate testing scenario for the non linearity of the effect of political competition on economic performance because the regional electoral reform (occurred in 1995 which interested all the Italian regions with ordinary statute at the same time) caused a change in the degree of political competition, as measures by the vote concentration index. In line with the Padovano and Ricciuti’s (2009) paper, we consider that the regional electoral reform of 1995 constituted a structural event which affected political competition in a long-run view; but, wide change in political competitiveness may occur even under the same electoral system as short-run electoral outcomes².

We regress the normalized Herfindahl index (calculated on the basis of the regional committee electoral outcomes) on the regional per capita GDP rate of growth. The dynamic panel data (over the 20 Italian regions from 1980 to 2008) estimation results confirmed that the coefficients of the quadratic specification are significant, displaying an inverted-U relationship between the degree of

¹ In section 2 the various definition of political competition in the political literature are examined. The present analysis focuses on political competition as the number of political parties engaged in electoral competition.

² This is the reason why the sample used in the empirical analysis is made of all the 20 Italian regions (both the regions with ordinary and special statute). See below.

political competition at the regional committee elections and per capita regional growth. This means that intermediate degrees of political competition reduce the trade-off between the incentive of incumbent politicians to be engaged in productive activities and their opposite incentive to promote pork-barrel policies, enhancing economic growth. In this sense, we can speak of an “optimal” level of political competition. Moreover, given the nature of the Italian electoral system, an *ex ante* intense political competition translates into an as much *ex post* intense political competition, leading to *government instability*. Therefore, reaching the optimal level of political competition might reduce another trade-off between political accountability and government instability. This is the first issue addressed by the present work. Recent literature states that electoral competition may affect the corrupt behaviour of politicians which, in turn, affects economic growth. The second issue the paper analyses is about *if* and *how* the relationship between political corruption and growth depends on the degree of competition among political parties at the elections. The results showed that the above relation is negatively affected by the degree of political competition. Moreover, if political competition reaches its optimal level, corruption may have a beneficial effect on regional growth.

The question that the present paper opens is how governors can manage the level of political competition. Inspired by the Duverger’s (1954) Law, the party system is a function of the electoral system and, within a multiparty system (e.g.: the Italian system), a higher proportionality of the electoral rule may encourage the proliferation of political parties with similar manifesto policies to promote political competition. However, the analysis of the Italian scenario partially refutes this conclusion. By designing an electoral system which contemplates a sort of threshold of votes that political parties have to collect in order to obtain seats in parliament, the following goal might be achieved: a lower (higher) threshold will promote an intense (scarce) political competition because many (few) political parties will hope to be represented in parliament.

This paper is organized as follows: section 2 summarizes the theoretical and empirical literature; section 3 describes the measure of political competition we used; section 4 explores the econometric model and variables; section 5 shows the results; section 6 presents the concluding remarks.

2. The literature

The political economy debate on how political regimes affect growth is still open. The Nondemocratic view argues that authoritarian regimes are better for growth because incumbents are not subject to short-run political pressures, and allow for more accurate plans. On the other hand, democracies, acting in the general interest, avoid inefficiency and perform better than dictatorships (Alesina and Perotti, 1994; Przeworski and Limongi, 1993), promoting economic growth (North

and Weingast, 1989). The empirical literature results are inconclusive: the democracies have done much better than the worst dictatorships, but not as well as some of the most successful dictatorships.

An increase in political competition (i.e.: the number of political parties engaged in electoral competition) can be seen as a sign of the democratization of a society. A Party system is largely determined by the choice of the electoral system (Cox, 1997; Duverger, 1954; Lijphart, 1994, 1999; Sartori, 1976; Taagepera and Shugart, 1989) and it (i.e.: the party system) determines the degree of bargaining complexity that may affect government formation and maintenance (De Winter and Dumont, 2003; Lijphart, 1999; Müller and Strøm, 2003; Van Roozendaal, 1997) and feature among the determinants of public policy.

In order to analyse how political competition affects economic growth, the first step is to review the definitions of political competition proposed by political literature. Political competition is interpreted as *accountability for incumbents* (Persson, et al. 1997): if political competition is intense, the incumbent politician is more accountable for his actions in office; the incumbent has an incentive for good performances because, otherwise, he can be easily removed and replaced by the public, with challengers. This concept of political competition focuses on the process of “political turnover”. In other words, a high degree of political competition may be growth enhancing. On the other hand, if the threat of dismissal for incumbents becomes too strong (that is, the probability to be re-elected is very low), they can act in a myopic way, maximizing rents during their remaining time in office (Bardhan and Yang, 2004)³. This concept of political competition seems close to that of *electoral competition*: competition among parties and candidates *in elections* to obtain public support through votes of citizens (Bardhan and Yang, 2004)⁴. The votes market could be considered as a goods market, with politicians competing with each other to win the elections. In this sense, more intense political competition means less rent-seeking behaviour by politicians and by the groups supporting them: if incumbent politicians act in the public interest, they maximize their probability of being re-elected (Mulligan and Tsui, 2006). Indeed, political competition creates *ex ante veto* on policy making, thereby favouring the creation of policies that enhance social welfare over those that enhance rent-seeking; it also provides mechanisms to sanction public officials who do not abide by their promises or who engage in rent-seeking (Haber, 2004).

³ Acemoglu and Robinson (2000 and 2002) show that where political competition is strong, political leadership tends to undertake public investments because public investments are economically productive but politically destabilizing, meaning that incumbent rulers must balance their incentive to expand their tax base (through investment) against their incentive to keep their position secure (through non-investment). According to this view, more intense political competition is detrimental to growth.

⁴ In the Downs (1957) model political competition is defined as competition of *two* candidates in choosing a platform from a set of feasible policies.

Political competition is also interpreted as *decentralization of political authority*. There is strong political competition when political authority is in the hands of many distinct political jurisdictions. That is to say, political competition encourages jurisdictions to act efficiently in order to attract more resources (Persson and Tabellini, 2000, Drazen, 2001).

In the following, we will refer to political competition as electoral competition. The theoretical literature is not conclusive in saying whether political competition is or is not growth enhancing. Indeed, the way in which governors engage in productive or non productive activities depends on their incentives for doing so. Political competition can affect such incentives, dissipating rents in the political market as in the economic market (Becker, 1983): without political competition, incumbents can distort policies for themselves or for their favoured groups. Increasing political competition, however, leads governments to address policies towards representative and pivotal citizens (the median voter in the standard case) rather than incumbent favoured groups. As a result, these groups will have fewer incentives to lobby for government favours. On the other hand, when political competition is intense, the electoral base of each party tends to be smaller. In order to cater to their narrow support base, politicians find it expedient to promise pork-barrel policies rather than policies that benefit the electorate as a whole. The resulting policies benefit the supporters of the winning politician, but do not necessarily maximize aggregate welfare (Lizzeri and Persico, 2005). Those are the political instruments that connect politics to economics.

The empirical literature on the effects of political competition on economic growth is still poor and lacks in giving an unanimous answer. Recently, the analysis of the relationship between political competition and economic performance focused on the different sources of growth (Pinto and Timmons, 2005). If political competition affects the multiple channels of growth in different ways, its effect on growth can be unpredictable. Political competition discourages physical capital (e.g.: investments/GDP) and labour accumulation, and it encourages human capital accumulation and productivity (e.g.: technological innovation). Therefore, under various degrees of political competition, the strength (or magnitude) of these sources of growth will drive economic growth in different ways.

Besley et al. (2010) ask if competition between political parties has similar virtuous consequences to competition between firms. Their response is positive: political competition may affect policy and economic growth via the “quality of politicians”. They define political competition as “an electoral advantage of one party arising from a surplus of committed voters, due to the parties’ non-pliable stance on non-economic issues which we can think about as race”. Analyzing the relationship between political competition, economic policy, and economic performance in the United States, they find that higher political competition is associated with a change in the policy

mix towards policies that are widely believed to be pro-business and growth promoting⁵. They justify their results saying that political competition provides benefits to economic development by inducing parties to pursue growth-promoting policies rather than their private agendas.

Padovano and Ricciuti (2009) analyse the effect of an institutional reform (i. e.: the change in the regional electoral system) on the competitiveness of the Italian regional politics. They estimate a linear relationship between political competition and economic performance and find evidence of a positive correlation among them for the 15 Italian regions with Ordinary Statute.

The concept of political competition refers to the outcome of elections. Stigler (1972) defines a *competitive* party structure in terms of the following: 1) when the average share of votes of the losing party is not *much* less than 50%, and 2) when the parties do not have long runs of electoral success or failure. In this case, the more competitive the parties, the more responsive the political system will be to the desires of the majority. If the voters' preferences change rapidly and unpredictably, intense political competition will allow multiple parties to succeed frequently in governing⁶. In this case, political competition is similar to economic competition: political effectiveness is an increasing function of the size of a political party. Indeed, if the political minority grows in relative size, the political effectiveness declines, such as in the economic market. This is because political minorities, increasing their relative size, hold: 1) the vote-trading power in order to obtain a particular policy; 2) the power to reduce the cost of getting the support of sub-coalitions of the "majority" to obtain the desired policy; 3) the power to hold a greater share of minor offices; 4) the power to increase costs upon the majority in enforcing policies to which the minority is opposed. Therefore, as for the goods market, given that the larger a party's majority in the legislature, the greater its control over the government, a political party will tend to maximize its probability of determining public policy and have an increasing function of its share of legislative seats. Stigler's analysis allows us to translate the *ex ante* political competition into *ex post* competition. But, as we will explain in the following, this depends on the nature of the electoral system.

A well consolidated body of the literature analyses how economic growth is affected by corruption which, in turn, is affected by political competition. The theoretical literature on the field of the relationship between corruption and economic growth is split. Rose-Ackerman (1978), Murphy et al. (1991, 1993), and Shleifer and Vishny (1993) provide theoretical arguments that corruption deteriorates economic growth through the misallocation of talent, technology and capital and affects the quality of the public infrastructure and services by causing politicians and

⁵ Besley et al. (2005) use a party-neutral measure of political competition as: $p_{st} = -abs(d_{st}-0.5)$ where d_{st} is the vote share of the Democrats in state s at time t , according to the Ansolabehere and Snyder data.

⁶ This is known as *government instability*: governments with a short lifespan.

bureaucrats to distort resources for personal use rather than for productive activities (Mauro 1998). On the other hand, Leff (1964) and Huntington (1968) argue that corruption could be positively correlated to economic performance in the presence of a thick and cumbersome bureaucracy: bribery may allow firms to get things done, thus increasing the efficiency and enhancing economic growth. Aidt et al. (2008) argue that corruption, economic growth and the quality of political institutions are connected through a complex web. The quality of institutions determines the political accountability which can play a critical role in defining the relationship between corruption and economic growth.

The empirical evidence tends to support the theorists who argue that corruption slows down growth (Mauro, 1995). On observing the Italian regions Del Monte and Papagni (2001), strong negative effects of corruption on economic growth can be found; they find that corruption reduces the amount and quality of public infrastructure and services and, therefore, the efficiency of public expenditure is lower if corruption is higher.

Looking at political competition and corruption, Polo (1998) studies conditions on the knowledge of voters' preferences by candidates under which political competition can lead to complete rent dissipation or rent accumulation. Intense political competition may alter the form of corrupt behaviour. Indeed, policy distortions resulting from lobbying activities are likely to be greater when there is little electoral competition. However, when politicians have discretion over the way in which political contributions are spent, greater electoral competition increases the incentive to divert funds for personal use (Damania and Yalcin, 2005).

This complex web leads us to consider that political competition may play a significant role in the relationship between political corruption and growth. That is, political competitiveness among parties at elections can affect economic growth directly and through its effect on corruption.

3. The measure of political competition

The number of political parties competing at the elections is an important feature of the political system: the extent to which political power is fragmented or non-fragmented, dispersed or concentrated (Sartori, 1976). The simple criterion of the number of parties competing at the elections is at the heart of the seminal distinction between two-party systems and multiparty systems made by Duverger (1954). Even so, characterizing a party system according to the number of parties that gained seats in parliament is not a correct criterion to identify “relevant parties” because it treats each party equally. It is important, indeed, to consider their differences in size to analyse the influence in the competition for office. There is the need of an *index based on both the number of parties and their relative size*.

Stigler's analysis helps us in doing that by underlining the similarities between political and economic competition; as the supply side of the goods market is composed of firms, the supply side of the votes market is composed of political parties that mainly produce policies. This allows us to measure political competition through an index of the concentration of votes in the hands of political parties at the elections, as well as for firms in an economic market. The **Herfindahl index**, also known as **Herfindahl-Hirschman Index** or **HHI**, is a measure of the size of firms in relation to the industry, and an indicator of the amount of competition among them⁷. It is defined as the sum of the squares of the market shares of the firms within the industry, where the market shares are expressed as fractions. The result is proportional to the average market share, weighted by market share. As such, it ranges from $1/n$ (n is the number of firms) to 1, moving from a huge number of very small firms to a monopoly. Increases in the Herfindahl index generally indicate a decrease in competition and an increase in market power, whereas decreases indicate a competitive industry with no dominant players. Therefore, it is an inverse measure of competition.

We considered the election of the Italian⁸ regional committee from 1980 to 2008 and we constructed the (standard) Herfindahl index as

$$Herf = \sum_{i=1}^N v_i^2$$

where v_i is the vote share of a single political party ($i = 1, \dots, n$ political parties) at each regional election from 1980 to 2008⁹. It is based on two factors: the number of parties and the distribution of their share of votes. A small value of the index indicates a competitive market of votes with no dominant political parties. An increase in the index shows that votes are concentrated in the hands of few political parties. This index gives additional weight to firms of a larger size.

A deficiency in the Herfindahl index is that it does not give weight to the *relative* size of each party with respect to each other which, instead, is fundamental in our political analysis. Here is an example to make the point clearer: consider four equally sized parties which share the market of votes; *Herf* is equal to $1/n=0.25$. Now Consider two equally sized parties sharing the market; *Herf* is equal to 0.5. Even if in the second case the index increases, no dominant party emerges. In this particular framework, given the high degree of proportionality characterizing the Italian regional

⁷ Rae D. (1967) proposed a fractionalization index of political parties "as the proportion of pairs of members in a system which contains persons who have voted for (or belonged to) different parties in the last previous election" which is the complement to unit of the Herfindahl index.

⁸ Italy is divided into regions, 15 with ordinary statute and 5 with special statute. Regions with ordinary statute are: Piemonte, Lombardia, Veneto, Liguria Emilia Romagna, Toscana, Umbria, Marche, Lazio, Abruzzo, Molise, Campania, Puglia Basilicata, Calabria. Regions with special statute are: Valle d'Aosta, Friuli Venezia Giulia, Trentino Alto Adige, Sicilia, Sardegna. The difference is in their degree of autonomy (legislative, financial, regulatory, fiscal, administrative, etc) which is greater for regions with special statute.

⁹ The regional election dates were: 1980, 1985, 1990, 1995, 2000 and 2005 for regions with ordinary statute (NB: Molise - 2001 and 2006 only); for regions with special statute such as Valle d'Aosta, Trentino Alto Adige and Friuli Venezia Giulia the dates were 1978, 1983, 1988, 1993, 1998, 2003 and 2008; for Sicilia they were 1976, 1981, 1986, 1991, 1996, 2001 and 2006; for Sardegna they were 1979, 1984, 1989, 1994, 1999 and 2004.

electoral system in the period under consideration, the distribution of votes between parties almost faithfully reflects the distribution of seats within the regional committee (at least for political parties obtaining the committee's representation). If the difference in votes between the parties is wide, it means that there are "dominant parties" in the votes market which, in turn, translates to a more *stable* majority of seats leading the committee.

This is why we prefer the **normalized Herfindahl index** as a measure of political competitiveness in a political market. It ranges from 0 (theoretically perfect competition with n equally sized parties) to 1 (monopoly). It is computed as:

$$NHerf = \frac{(Herf - \frac{1}{n})}{1 - 1/n}$$

where again, n is the number of political parties at an election, and *Herf* is the standard Herfindahl index. In the previous numerical example, the *NHerf* is equal to zero in both two and four equally sized parties. The normalized Herfindahl index positively depends on both the standard Herfindahl index and the number of parties¹⁰. The *NHerf* overcomes another weakness in the *Herf* in studying political party competition. Indeed, in analysing how political competition can generate good or bad performance of incumbent politicians, the number of competing parties is fundamental because it determines the supply of manifesto policies by political parties at elections. Another example will clarify what we mean. Consider a party system composed of four parties with the first three having a vote share of 0.32 each and the last party a vote share of 0.04. The corresponding Herfindahl index is 0.3088 and the normalized Herfindahl is 0.07. If, instead, the party system is composed of seven parties with three having a vote share of 0.32 each and four having 0.01 each, the Herfindahl index is 0.3076 and the normalized index is 0.19. That is, where the Herfindahl with seven parties is lower, the normalized index is higher: even if in both cases three parties hold 0.32 of the market share of votes, the relative weight of the three biggest parties is higher when the market comprises a greater number of parties. This effect is grasped by the normalized Herfindahl. Contemporaneously, therefore, the normalized index takes into account the concentration of votes in the hands of parties and of their relative market power. We will use the normalized Herfindahl index in the empirical analysis.

Padovano and Ricciuti (2009), in their analysis on the Italian scenario, used another measure of political competition, that is the electoral margin between the two largest parties. But, as widely explained above, in the meaning of political competition as economic competition an appropriate

¹⁰ The first derivative of the normalized Herfindahl index with respect to the number of parties is $\frac{\partial NHerf}{\partial n} = \frac{Herf(n-1) - (n * Herf - 1)}{(n-1)^2} > 0$ if $Herf(n-1) - (n * Herf - 1) > 0$ which is always true because $Herf < 1$.

measure of political competitiveness requires the consideration of both the *number of parties* and their *relative size*, as the normalized Herfindahl index does.

It is well known that economic policy is the result of political struggle within an institutional structure. The measure of political competition which we constructed considers the distribution of *votes* among political parties, not the distribution of *seats* within the committee. We can speak of an *ex ante* (the number of political parties competing to obtain votes) and *ex post* (the number of political parties represented within a committee) political competition. A higher *ex ante* political competition translates to a higher *ex post* political competition depending on the proportionality degree of the electoral system: under complete proportionality, the distribution of votes and the distribution of seats are identical. In practice, however, the distribution of votes and the distribution of seats are never completely identical because of the deviation from complete proportionality¹¹. The proportional representation rule characterizing the Italian regional electoral system in the period 1980-2008 was proportional until the electoral reform of 1995, and later it was mixed. The reform (which affected only the 15 regions with ordinary statute) starting with the regional election of 1995 added a majoritarian premium while maintaining a high degree of proportionality of the electoral system¹². Therefore, we can actually imagine that the distribution of votes is almost faithfully repeated in the distribution of seats within the regional committee (at least for political parties obtaining the committee's representation). This strong link between the votes and seats distribution for Italian regional elections enforces the similarities between political competition and economic competition underlined by Stigler (1972), and allows the consideration of another drawback of an intense political competition: *government instability*.

Figures B.1 in Appendix B show the graphs of the normalized Herfindahl index for the 20 Italian regions over the whole period 1980-2008. Generally, looking at the goods market, the literature groups the standard Herfindahl index values in three ranges: lower than 0.1 (low concentration), between 0.1 and 0.18 (moderate concentration) and greater than 0.18 (high concentration). Given the parallel we made between the market of goods and the market of votes, we use such ranges in order to comment on the graphs in appendix B¹³. The values of the normalized Herfindahl index vary from a minimum of 0.03 to a maximum of 0.32¹⁴ (among regions and over the years) falling, therefore, in each of the three ranges above. In figure A.1 in Appendix A we compare the mean of values assumed by the normalized Herfindahl index before and after the

¹¹ More proportional electoral systems are more representative of the minorities in a parliament/committee than less proportional (or more majoritarian) electoral rules.

¹² The majoritarian premium affected in approximately 20% of the distribution of seats. The remaining 80% of the regional committee seats are assigned according to the proportional criterion.

¹³ The three ranges also hold for the normalized Herfindahl index.

¹⁴ See table A.1 of the descriptive statistics in Appendix A.

reform for every region. Looking at the regions with ordinary statute (but the same holds for regions with special statute) the regional electoral reform contributed to increase political competition: the $NHerf$ after 1995 is always below.

The generalized decrease in the normalized Herfindahl index depended on the strong decrease in the standard Herfindahl index, so much so that it more than compensated for the positive effect of the increase in the number of political parties. Figure A.2 in appendix A shows the mean (i.e.: over regions with ordinary statute) of the number of political parties at each regional committee election between 1980-2008. The situation that emerges is an increasing number of political parties engaged in the election race. At the 1980, 1985 and 1990 regional elections, three major political parties (DC, PCI, PSI) shared the market vote; the evolution of the Italian political system has seen the break-up of the leading political parties in many small parties often engaged in coalitions before and after elections. In analyzing, in parallel, the dynamics of the index and political parties, it emerged that the decrease in the proportionality degree of the regional electoral system (from proportional to mixed) in 1995 lead to the proliferation of political parties (contrary to what one might expect) that have divided the market vote more fairly.

As in the Padovano and Ricchiuti's (2009) work, we also consider that the regional electoral reform of 1995 constituted a shock which affected political competition in a long-run term; but, wide change in political competition may occur even under the same electoral system as short-run electoral outcomes. Table A2, Appendix A shows the standard deviation of the normalized Herfindahl index for every Italian region. The standard deviation of regions with special statute (do not affected by the electoral reform) is greater than that of certain regions with ordinary statute. The reasons which induce voters to concentrate or not their votes in the hands of few or many political parties could not depend on institutional features. That is, political competition as electoral competition may be affected by the change in the electoral system, but it essentially depends on what voters choose. This is why our empirical analysis comprises all the 20 Italian regions (and not only the 15 regions with ordinary statute).

4. The econometric model and the variables

In estimating the Italian regional empirical growth model, we use the Arellano-Bond panel data estimation techniques in order to avoid the problem of inconsistent estimation procedures of a cross-regional growth model (in terms of measure of the rate of convergence) as pointed out by Caselli et al. (1996). The neoclassical dynamic panel data growth model proposed by Islam (1995) is

$$\ln Y_{it} = (1 + \beta) \ln Y_{it-\tau} + \delta X_{it} + \alpha_i + \mu_t + \varepsilon_{it} \quad (1)$$

where $\ln Y_{i,t}$ is the natural logarithm of the per-capita GDP of region i in period t , $X_{i,t}$ is a row vector of determinants of economic growth, α_i is a country specific effect, μ_t is a time-specific effect¹⁵, and $\varepsilon_{i,t}$ is an error term; τ is the years interval. The growth equation contains a lagged output as a consequence of the hypothesis of *conditional convergence*: if $\beta < 0$ there is conditional convergence, i.e.: regions converge to their own steady-state. The panel data covers the 20 Italian regions in the time period 1980 - 2008.

As mentioned above, if an intermediate degree of political competition is better for growth than more extreme values, we are hypothesizing that the relationship between the degree of political competition and regional economic growth will be, say, quadratic. To test this statement we introduce in the estimating equation a linear and a quadratic term of the normalized Herfindahl index as regressors. If our hypothesis is confirmed, the index coefficient should be positive, and negative if the index is squared.

As the classical growth model prescribes, we control for the regional private investment (as a proxy for the saving rate) and for the rate of schooling to highlight the effect of physical and human capital on regional growth¹⁶. We expect such variables to have a positive sign because larger investments, as well as higher level of schooling, increase economic activity. We control for the rate of growth of regional population whose coefficient is expected to be negative. We also control for an indicator of regional labour productivity, obtained as the ratio between the total added value and the unit of labour at regional level. In order to adequately consider public budget management in the classical growth model, we look at the level of regional public consumption spending over GDP¹⁷ whose effect on economic growth is not predictable¹⁸.

In the growth model involving Italian regions, it is important to carry out a control for the so-called “social capital” (Putnam, 1994)¹⁹. As a measure of social capital, we have chosen a percentage of voters at regional committee elections and the number of daily and weekly journals sold.

As the mentioned literature points out, political competition, political corruption and economic growth are related to each other. We are interested in testing if and how the impact of political corruption on economic growth depends on the degree of political competition. In order to do that,

¹⁵ The inclusion of the time specific effect is important in growth models because the mean of the log output series typically increases over time.

¹⁶ See Grossman (1972), Barro and Sala-i-Martin (2000).

¹⁷ Italian regional public consumption spending, according to the ISTAT SEC95 classification, includes expenses in general services, defense, education, health, social services and securities, housing, culture, economic services, public order and the environment.

¹⁸ Barro (1991) finds a negative relationship between government consumption/GDP and GDP rate of growth. Gallup et al. (1998) analyzing government expenditures on health and education (as a share of GDP) find a positive sign.

¹⁹ See Alfano and Baraldi (2010).

we introduce, in the estimated equation, an interaction term given by the product of a measure of corruption per capita and the normalized Herfindahl index (see below).

The regional electoral reform we have spoken about instituted the direct election of the Governor (of each region) by the citizens. We constructed an interaction variable (obtained by multiplying the normalized Herfindahl index with a dummy variable by initially taking a value of 1 in the first year of the direct election of the regional Committee Governor²⁰) to test whether the direct election of the regional committee Governor influenced the effect of political competition on economic growth. Tables from A.1 to A.4 in appendix A show the descriptive statistics of all the described variables and the correlations among them respectively.

In order to estimate the growth model (as the greatest part of the panel data studies related to economic growth fields do in order to control for the business cycle), we divided the time period in ten 3-year intervals, therefore each observation is the mean of the 3-year interval from 1980 to 2008, so that τ in the estimating equation (1) is 3²¹. All regressors are taken at time $t-1$ (i.e.: the average of each variable between $t-1$ and $t-4$) because we presume that variables will show their effects on the GDP rate of growth one year later²². The data we used comes from the ISTAT database and the Annals of Judicial Statistics produced for the 20 Italian regions over 29 years (1980 - 2008).

Choosing regional observations within the same country allows us to reduce the probability of missing variable bias due to cultural differences or radically different historical legacies which, with cross-country data, should be controlled.

5. Results

We estimate a dynamic panel data growth model, as specified in equation (1), using the Arellano-Bond techniques²³. The dependent variable ($\ln Y_{i,t}$) is the log of the per capita GDP of region i at time t (taken at a constant 1995 price), and $\ln Y_{i,t-\tau}$ is the lag of the dependent variable. In order to interpret the results, we write equation (1) as

²⁰ In the regions with ordinary statute, the year of the election of the Governor was 2000, except for Molise where the Governor was first elected in 2001. With reference to the regions with special statute, i.e.: Valle d'Aosta, Friuli Venezia Giulia and Trentino Alto Adige, the year of the first Governor election was 2003, while for Sicilia it was 2001 and for Sardegna it was 2004.

²¹ We choose a 3-year period instead of a 5-year period (as many empirical growth papers do) in order to have more data, given the short regional dimension of the panel. But the robustness checks of the estimations will be done by using the 5-year intervals. See section 5 of the results.

²² If regressors are taken at time $t-1$, we avoid the problem of endogeneity of some variables such as private investments, private expenditure in education and corruption. The correct model specification will be confirmed by the Sargan test.

²³ See Arellano and Bond (1991).

$$\ln Y_{i,t} - \ln Y_{i,t-\tau} = \beta \ln Y_{i,t-\tau} + \gamma X_{i,t-1} + \alpha_i + \mu_t + \varepsilon_{i,t} \quad (2)$$

where the dependent variable ($\ln Y_{i,t} - \ln Y_{i,t-\tau}$) is the per capita GDP rate of growth of region i at time t . The estimation results are shown in table 1. Columns from (a) to (g) contain the coefficients of the Arellano-Bond estimations. Every estimated equation has robust standard error. The last row in table 1 displays the p-value of the Arellano-Bond test for second-order autocorrelation in the first-differenced residual; we do not reject the null hypothesis of no second-order autocorrelation. In case of robust standard errors, the distribution of the Sargan test is not known, therefore it cannot be computed²⁴.

The coefficient β of the $\ln Y_{i,t-\tau}$ shows conditional convergence of the Italian regions. Its negative sign (between -1 and 0, but equation (g)) means that Italian regions converge to their own steady state, but this convergence is not statistically significant in the Arellano-Bond estimations. Many papers examine the convergence of the Italian regions (Acconcia, 2002; Boldrin and Canova 2001; Mauro and Podrecca, 1994; Cosci and Mattesini, 1995); the interest in that kind of research is due to the fact that, within Europe, Italy remains one of the countries with the widest regional growth differentials. The argument common to all those papers is that during the 60s and the first part of the 70s the process of convergence reached its apex, while the later decades were characterized by a tendency for regional economies to diverge. More precisely, those authors stated the absence of convergence of the Italian regions between 1980 and 2000.

The estimation results shown in table 1 are consistent with our predictions regarding the relationship between the degree of political competition and regional growth. Column (a) includes the linear and the square term of the normalized Herfindahl index; we found that the $NHerf$ had a positive sign and the $NHerf^2$ had a negative sign, which are both significant. This means that the effect of political competition on growth shapes as an inverted-U. In order to give an idea of our findings graphically, we constructed a scale of normalized Herfindahl index values starting from its minimum value (among regions) and increasing it by 0.01 up to its maximum value; then the per capita GDP rate of growth ($\Delta GDP = \ln Y_{i,t} - \ln Y_{i,t-\tau}$) is calculated using the estimated $NHerf$ and $NHerf^2$ coefficients of in column (a) of table 1 as

$$\Delta GDP = 0.21 * NHerf - 0.48 * NHerf^2.$$

²⁴ We estimated (but we did not show) the Arellano-Bond one-step estimation considering the homoskedastic case in order to compute the Sargan test; the chi-squared of the one-step Sargan test does not reject the null hypothesis that the over-identification restrictions are valid, therefore the over-identifying conditions are correctly specified. Here is the chi-squared of the Sargan test:

| chi ² (7) | p-value |
|----------------------|---------|
| 9.72 | 0.20 |

This ensure that the model is correctly specified, that is, there are not endogeneity problems.

The following graph is presented in figure 1 where on the horizontal axis there are the normalized Herfindahl index values and on the vertical axis the computed per capita GDP rate of growth.

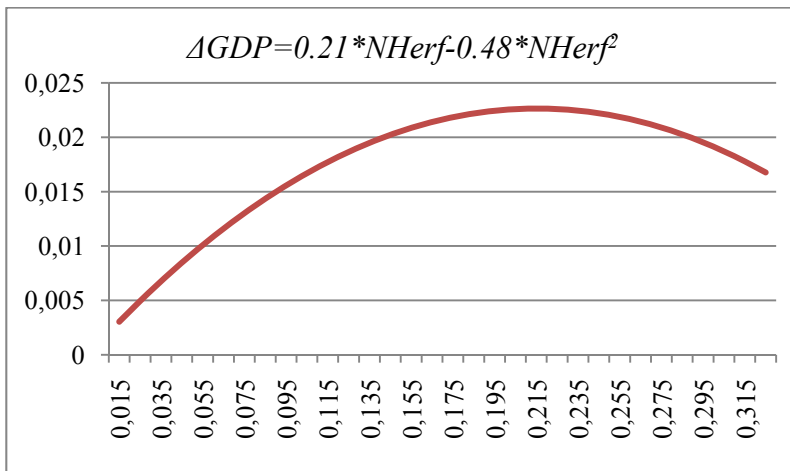


Figure 1

The above graph shows that an “optimal” level of political competition among political parties (which maximizes the regional per capita growth) at Italian regional elections may be computed and is about 0.2²⁵. Intermediate levels of political competition reduce the trade-off between political accountability of incumbent politicians, together with the incentive to implement pork-barrel policies and to act myopically, which encourages politicians to behave in the public interest and maximize economic growth. Within the Italian regional electoral scenario, a normalized Herfindahl index value of 0.2 was reached at the elections between 1980 and 1990 (see Lombardia, Veneto, Emilia Romagna, Toscana, Umbria, Marche in appendix B) where the number of political parties was lower than the successive electoral dates. But what does an optimal level of the *NHurf* equal to 0.2 mean? Its interpretation requires to recall that the normalized index positively depends on both the standard Herfindahl index and the number of parties. Given that the Italian party system is a production of the electoral multiparty system which is traditionally proportional, the number of political parties competing at the elections can slightly change across elections. Therefore, the resulting optimal level of political competition at regional elections strictly depends on the ability a party has of collecting votes, which determines where the market of votes is concentrated (that is, the standard Herfindahl). The mean of the number of political parties at the elections between 1980 and 1990 was about 12. Therefore, with $n=12$, an *NHurf* value of 0.2 implies a *Herf* equal to 0.27, indicating a concentrated market vote. For forecasting, we can actually imagine that the mean of the number of political parties at future elections will remain the same (no radical changes in the

²⁵ 0.2 is the value of the *NHurf* such that the first derivative of $\Delta GDP = 0,17 * NHurf - 0,42 * NHurf^2$ with respect to *NHurf* is zero.

regional electoral system are expected). Given that this mean for the whole period 1980-2008 was about 14, an $NHerf$ equal to 0.2 should imply an $Herf$ equal to 0.25. This means not only that the votes market should be concentrated in the hands of few political parties, but also that there should be market share differences held by political parties; that is, there should be parties which “dominate” others.

The calculation of the concentration index is based on the distribution of votes by parties in committee elections, but of course a similar operation can be done for the distribution of seats within the committee, thus inquiring into the committee index of concentration. As mentioned above, the indices computed on votes and on seats do not perfectly coincide due to a deviation from the complete proportionality of electoral systems, but under a proportional representation rule - which characterizes the Italian regional electoral system in the period 1980-2008 - we can actually envisage that the distribution of votes is almost faithfully mirrored by the distribution of seats within the regional committee (at least for political parties obtaining the committee’s representation). This belief is confirmed by the very high correlation between the normalized Herfindahl index calculated on the share of the vote between political parties at the elections and the same index calculated on the share of seats displayed in table A.3, Appendix A. Agreements on economic policy are difficult to achieve because intense *ex ante* political competition translates into many political parties with different goals represented within a committee. The consequences can be an extension of time to implement policies and/or the collapse of the committee. The frequency of collapses in government is known as *government instability*. An unstable committee has a lower incentive to save and invest, reducing economic growth. We can justify our findings even in this light: an intermediate level of political competition encourages incumbent politicians to be engaged in productive activities with no possibilities of pursuing rents for themselves, allowing governments to be more stable.

The previous numerical example underlines the question that this paper poses: how can the level of political competition be managed? We will try to answer this question in the conclusions.

ΔPop is the regional population rate of growth; it is negative and significant everywhere. This is not surprising: as the population grows, if all else is constant, the per capita rate of growth of the regional economy decreases. The result is perfectly in line with the classical assumption of the Solow growth model.

The variable I/Y represents the ratio between private investment and the GDP (both taken at the constant 1995 price). It is a proxy for the capital accumulation process. Its effect on regional growth is positive, as expected, but not significant; this finding is coherent with the literature on the Italian

case²⁶. Highly significant in every specification presented in table 1 is, indeed, the effect of the variable G/Y , the government consumption ratio (taken at constant 1995 price) on regional growth. G/Y is the level of public consumption spending/GDP. Its coefficient is negative, meaning that public consumption spending negatively affects Italian regional growth. This means that the greatest portion of public consumption spending is made of non-productive expenses; the magnitude and the sign of the coefficient implies that public consumption spending is financed by distortionary taxes²⁷. *School* is the measure of the human capital. It is the rate of schooling constructed by dividing the number of students registered in high schools over the population in class age 15-19. The effect of the rate of schooling on regional growth is positive and significant everywhere, but its magnitude is very low: regions with a more developed labour force, in terms of better education, are likely to be able to produce more from a given resource base than with less-skilled workers. The *Prod* variable is a measure of labour productivity constructed as the ratio between the total added value in agriculture, industry, market services and non-market services and the unit of labour. As expected, it is positively related to regional economic growth because improvements in productivity imply that more output can be produced with the same amount of inputs. With an increase in per capita income, the regional economy can provide higher living standards and well-being for the regional population.

The dummy variable *DI995* controls for the regional electoral reform occurred in 1995 for regions with ordinary statute: it takes value 0 before 1995 and 1 from 1995 to 2008 (only for regions with ordinary statute). It is not significant everywhere.

In order to control for *social capital*, we introduce the variables *Voters* (the percentage of voters at the regional committee elections) and *Newspapers* (the number of daily and weekly journals sold). As expected, their signs are positive but not significant.

As mentioned above, political competition, political corruption and growth are related in a web. Political competition may be a channel through which corruption may affect economic growth. In our analysis, corruption is measured as the number of crimes against public administration (crimes of *embezzlement* and *misappropriation*) reported to the police in each of the 20 Italian regions between 1980 and 2005, based on Statutes no. 286 to 294²⁸ (per capita). In equation (f), we introduce the variable measuring corruption (called *Corr*) and an interaction term between corruption and the measure of political competition: $Corr * NHerf$. It is the product of the per capita

²⁶ See Iezzi (2001) and Daniele (2002).

²⁷ Barro and Sala-i-Martin (2000).

²⁸ ISTAT- Annals of Judicial Statistics. The statistics of crimes are always subject to measurement problems; this is typical for every illegal activity given that they are undeclared phenomena. In the paper, we used the official statistics of this type of crime, taken from ISTAT (Istituto Nazionale di Statistica). The same statistics have been already used by Del Monte and Papagni (2001). There is no available data after 2005.

corruption and the normalized Herfindahl index of region i at time t . The coefficient signs of $Corr$ and $Corr*NHerf$ (both significant) have an interesting interpretation

$$\frac{\partial \Delta GDP}{\partial Corr} = -0.32 + 2.68 * NHerf$$

The effect of corruption on economic growth negatively depends on the degree of competition of political systems. If political competition is high (which corresponds to a low index value), its decrease implies that an increase in per capita corruption is even less growth-depressing; if political competition is low, its further decrease implies that an increase in per capita corruption will be growth-enhancing. This result can be explained in the light of an inefficient Italian bureaucracy which is the arm through which governors implement policies. If, as in this case, *ex ante* political competition translates in as much *ex post* political competition, a higher concentration of votes and, consequently, of seats allows political corruption to effectively “grease the wheels” of bureaucracy, accelerating the process of policy implementations.

The two issues addressed by the present work can be analyzed together. From figure 1, it emerges that the “optimal” level of political competition at the Italian regional election, measured as the normalized Herfindahl index value, is about 0.2. An $NHerf$ value close to 0.2 makes the sign of $\frac{\partial \Delta GDP}{\partial Corr}$ positive. Therefore, by driving political competition closer to its optimal level, the maximum benefit can be reached of both government stability and political accountability on one side, and a positive corruption effect on growth on the other. This means that political competition may be seen as a “tool” for enhancing corruption growth.

Variable $NHerf*Gov$ is the interaction variable between the normalized Herfindahl index and a dummy indicating the year of the regional Governor election. It is not significant: the direct election of the regional committee Governor did not make a difference to the effect of the political competition index on economic growth.

In table 1, we have shown the coefficient of the time dummy variables from D_1 to D_8 ²⁹. D_1 refers to the 3-year period starting from 2008 onwards until D_8 . Dummy D_3 (with a value of 1 in the 3-year period 2001-2003) controls for 2 events. Firstly, in November 2001 there was an important Constitutional reform in Italy: “Title V” of the Constitution instituted new decentralization principles in order to implement *Fiscal Federalism*. This reform involved the regions with ordinary statute, but Constitutional Law no. 3/2001 (art.10) states that the rules of Title V should be applied to the regions with special statute as well. Secondly, we combined two different time series made available by ISTAT, one from 1980 to 2003 and the other from 2000 to 2008. Using statistical

²⁹ There are eight time dummies because we divided the interval from 1980 to 2008 in ten 3-year periods and we do not show in table 1 the constant term.

methods³⁰, we joined the data in a single time series. D_3 controls for the homogeneity of the series in the dataset.

We perform robustness checks of the previous analysis. The first one concerns the estimation procedure. Bond et al. (2001) demonstrated that in a growth regression scenario, a more efficient estimator - with respect to the Arellano-Bond - was proposed by Arellano and Bover (1995) and Blundell and Bond (1998). Columns (a') and (d') in table 1 show the estimation of the corresponding equations (a) and (d) by using the Blundell-Bond procedure. The signs of the normalized Herfindahl index and its square in (a') are the same as in (a) but, while the linear term of the index is significant, its square is slightly not; the same happens for the coefficient of the per capita corruption in (d'), while all other coefficients coincide in sign and significance with those in (d).

It could be argued that the main responsibilities of regional governments are health care, administration and some aspects of local transportation, housing culture and social services. Therefore, growth differentials among Italian regions may be also traced back to the intervention of the central government. In order to take into account the regional financial structure – for some features, derivative – we computed the normalized Herfindahl index on the basis of the Senate national elections. That is, we take the share of vote collected by each political parties at the Senate elections in 1979, 1983, 1987, 1992, 1994, 1996, 2001, 2006 and 2008³¹. Between 1980 and 2008, also at the national level, Italy experienced two changes in the electoral Law which affected the competition among parties. Indeed, since 1948, for the election to the Senate, the electoral system was mixed with a higher degree of proportionality; after the referendum of April 18, 1993, the Italian electoral system switched from a more proportional to more majoritarian one³²; Law no. 270, December 20, 2005, changed again the Italian electoral system into proportional. Figure A.3 Appendix A displays the mean (over regions) of the normalized Herfindahl index for the Senate elections from 1980 to 2008. The trend of the index was decreasing until 1993, then increasing until 2005, and decreasing again, showing how the proportionality degree of the electoral system affected the competitiveness among political parties. Therefore, by using the Arellano-Bond procedure, we

³⁰ We calculate the rate of growth of each variable in 2003 using the “new” series 2000-2008 $g=[V(2004)_N-V(2003)_N]/V(2003)_N$ (the subscript N stands for new); then we multiply this rate of growth to the value of the related variable in 2003 of the “old” series 1980-2003: $\Delta=g*V(2003)_O$ (the subscript O stands for old); at the end, we sum the variable in 2003 “old” series and the Δ to obtain the variable in 2004: $V(2004)_O = V(2003)_O+\Delta$. And so on for the variables in 2008.

³¹ The political party structure for national elections is faithfully reproduced for regional elections.

³² Starting from 1993, for the Senate (upper chamber), 3/4 of the 315 seats are assigned using the majoritarian criterion and the other 1/4 using the proportional one. For the Chamber of Deputies (lower chamber), 630 seats are distributed in 26 electoral districts; in each district, 75% of the seats are assigned by majoritarian and the resulting 25% by proportional.

regress the per capita GDP rate of growth on the normalized Herfindahl index for the national Senate elections and the results are in column (f) table 1. Both the signs and the significance of the linear and square coefficients do not change.

Finally, we perform the estimation of the growth model by dividing the sample in six 5-years interval (as many empirical growth papers do). The estimation result is shown in column (g): also in this case our prediction about the non linearity of the relationship between political competitiveness and growth is confirmed.

6. Concluding remarks

The present paper aims to enrich the poor empirical literature on how political competition affects economic growth. The scenario explored to conduct the empirical analysis is the Italian regional committee elections from 1980 to 2008. Given the similarities between the economic and political competition underlined by theoretical literature, we measured political competitiveness among parties engaged in an electoral race with the normalized Herfindahl index of votes concentration. The findings show why empirical literature in this field has been contradictory and inconclusive until now: the relationship between political competition and growth is an inverted-U and not biunivocal. The reason is that political competition has benefits and costs; brought together, an intermediate level of political competition may reduce an *ex ante* trade-off between the accountability of incumbent politicians and their incentive to promote pork-barrel policies, and an *ex post* trade-off between the incentive to act in the public interest to maximize the probability of being re-elected and the instability of the committee. The second key issue addressed by this work concerns the effect of political corruption on economic growth as a function of the degree of political competition. A decrease in political competition implies beneficial effects in terms of corruption on growth. Therefore, driving political competition to its optimal level may have a direct effect on enhancing growth and an indirect effect if growth enhancement is via political corruption.

However, how may governors lead political competition to its optimal level? Surely, inspired by Duverger's Law, we may assert that a more proportional electoral system should incentivize the proliferation of political parties with manifesto policies closer to each other, promoting political competition. But, the Italian scenario test does not confirm the belief that the switch to a less proportional system will increase the number of political parties competing at the regional committee elections, although while remaining distinct, political parties are in practice engaged in coalitions before and after the elections.

Instead, we can think of an electoral system design which implies a sort of threshold of votes that political parties must collect to obtain seats in parliament/committee. A lower threshold may

encourage smaller political parties to engage in an electoral race with the hope of obtaining seats, promoting and, therefore, compete politically, and vice versa. Maybe political science will have the answer.

Table 1: estimation results

| <i>ln(Y_{it})</i> | A-B estimation | | | | | | | B-B estimation | |
|-----------------------------|-------------------|-------------------|--------------------|--------------------|-------------------|------------------|--------------------|--------------------|------------------|
| | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (a') | (d') |
| <i>ln(Y_{it-3})</i> | -0.8 (1.2) | -0.8 (1.1) | -0.8 (1.3) | -0.7*** (1.8) | -0.8 (1.1) | -0.85 (0.8) | 0.5 (2.9) | -0.3* (8.1) | -0.2* (9) |
| <i>NHerf</i> | 0.21** (2.3) | 0.21** (2.3) | 0.21** (2.3) | -0.1 (-1) | 0.22** (2.1) | 0.83* (3.3) | 0.45*** (1.7) | 0.24** (2.1) | -0.08 (-0.7) |
| <i>NHerf²</i> | -0.48** (-2.3) | -0.5** (-2.3) | -0.40*** (-1.8) | | -0.53** (-2.2) | -1.8* (-3.3) | -1.15*** (-1.7) | -0.4 (-1.4) | |
| <i>ΔPop</i> | -0.9** (-2.3) | -0.88* (-2.34) | -1.27* (-2.7) | -1.02** (-2.1) | -0.88** (-2.3) | -0.95** (-2) | -2.9*** (-1.7) | -1.38* (-4.5) | -1.4* (-3.4) |
| <i>I/Y</i> | 0.02 (0.1) | 0.004 (0.04) | -0.05 (-0.5) | 0.07 (0.7) | 0.004 (0.03) | 0.008 (0.07) | 0.001 (0.01) | 0.04 (0.4) | 0.1 (1.1) |
| <i>G/Y</i> | -1.47* (-4.7) | -1.5* (-5) | -1.27* (-3.6) | -1.6* (-4.4) | -1.5* (-5) | -1.6* (-5.7) | -1.3* (-3.5) | -0.7** (-2.3) | -0.6** (-2.7) |
| <i>School</i> | 0.002*** (1.7) | 0.002*** (1.6) | 0.001*** (1.6) | 0.002* (2.5) | 0.002*** (1.6) | 0.002* (2.7) | 0.001 (0.7) | 0.001 (1.1) | 0.002** (2) |
| <i>Prod</i> | 0.007* (3.2) | 0.007* (3.3) | 0.007* (2.8) | 0.004 (1.37) | 0.007* (3.2) | 0.006* (2.7) | 0.004 (0.9) | 0.006* (2.47) | 0.003 (1.08) |
| <i>D1995</i> | -0.01 (-1.4) | -0.13 (-1.4) | -0.01 (-1.64) | -0.007 (-0.6) | -0.01 (-1.4) | | -0.01 (-0.7) | -0.01*** (-1.7) | -0.01 (-1.5) |
| <i>Voters</i> | | 0.0004 (0.7) | | 0.001 (0.5) | 0.003 (0.5) | | | | 0.002 (0.1) |
| <i>Newspapers</i> | | | 5.32e-09 (0.4) | | | | | | |
| <i>Corr</i> | | | | -0.32*** (-1.8) | | | | | -0.3 (-1.3) |
| <i>Corr*NHerf</i> | | | | 2.68** (2.04) | | | | | 3.4*** (1.7) |
| <i>Herf*Gov</i> | | | | | -0.01 (-0.3) | | | | |
| <i>D₁</i> | 0.1 (1.6) | 0.1** (2) | 0.07 (1.1) | | 0.1** (2) | 0.14** (2) | | -0.02 (-0.4) | |
| <i>D₂</i> | 0.1 (1.6) | 0.1** (2) | 0.06 (1.2) | 0.06 (1.04) | 0.1** (2) | 0.13** (2) | | -0.02 (-0.4) | -0.05 (-0.8) |
| <i>D₃</i> | 0.1*** (1.75) | 0.1** (2.1) | 0.06 (1.2) | 0.06 (1.13) | 0.1** (2.1) | 0.12** (2.08) | | -0.004 (-0.1) | -0.03 (-0.5) |
| <i>D₄</i> | 0.08*** (1.78) | 0.09** (2.1) | 0.04 (1.15) | 0.04 (1) | 0.09** (2.1) | 0.1** (2.06) | | 0.002 (0.07) | -0.02 (-0.4) |
| <i>D₅</i> | 0.05 (1.6) | 0.06** (1.96) | 0.01 (0.56) | 0.03 (0.9) | 0.06** (1.96) | 0.08** (2.2) | | -0.01 (-0.4) | -0.03 (-0.9) |
| <i>D₆</i> | 0.06*** (1.87) | 0.07** (2.2) | 0.1 (1.63) | 0.04 (1.1) | 0.07** (2.1) | 0.09* (2.5) | | -0.01 (-0.6) | -0.03 (-1.3) |
| <i>D₇</i> | 0.08* (4.2) | 0.08* (4.7) | 0.03* (2.7) | 0.07* (3.8) | 0.08* (4.7) | 0.1* (5.2) | | 0.03* (2.6) | 0.02 (1.6) |
| <i>D₈</i> | 0.04* (6.3) | 0.04* (6) | | 0.04* (5.3) | 0.04* (6.5) | 0.05* (7.2) | | 0.02*** (2.9) | 0.02** (2.2) |
| <i>N.obs</i> | 160 | 160 | 140 | 140 | 160 | 160 | 80 | 180 | 160 |
| <i>p-value (2-order)</i> | 0.15 | 0.15 | 0.38 | 0.33 | 0.14 | 0.5 | 0.21 | 0.15 | 0.25 |

A-B Estimation means Arellano-Bond estimation; B-B estimation means Blundell-Bond estimation.

The dependent variable is $[\ln Y_{it} - \ln Y_{i,t-\tau}]$; τ is 3 in every equation. Standardized normal z-test values are in parentheses.

*significant at 1% level; **significant at 5% level; ***significant at 10% level.

Equations (a), (b), (c), (d) and (e): Arellano-Bond one-step robust estimation; we include one lag of the dependent variable as instruments.

Equation (f): Arellano-Bond one-step robust estimation; the Herfindahl index is calculate on the basis of the national Senate elections; we include one lag of the dependent variable as instruments.

Equation (g): 5-years intervals; Arellano-Bond one-step robust estimation; we include three lags of the dependent variable as instruments.

Equations (a') and (d'): Blundell-Bond one-step robust estimation; we include two lags of the dependent variable as instruments.

Prob > z (2 order) in the last row is the p-value of the Arellano-Bond test for zero autocorrelation in first-differenced errors.

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Appendix A

Tab. A.1: Descriptive statistics

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|-------------------|-----|----------|-----------|---------|----------|
| <i>NHerf</i> | 580 | 0.157202 | 0.05274 | 0.03328 | 0.324662 |
| ΔPop | 580 | 0.001616 | 0.0065756 | -0.044 | 0.02 |
| <i>I/Y</i> | 560 | 0.215455 | 0.0409548 | 0.12 | 0.39 |
| <i>G/Y</i> | 560 | 0.211006 | 0.0511974 | 0.12 | 0.33 |
| <i>school</i> | 560 | 74.49911 | 16.85459 | 39.42 | 103.29 |
| <i>prod</i> | 560 | 34.8896 | 5.608777 | 21.88 | 46 |
| <i>corrpro</i> | 520 | 0.03215 | 0.0248772 | 0.0016 | 0.26 |
| <i>Edu/Y</i> | 560 | 0.206757 | 0.0981487 | 0.10 | 0.79 |
| <i>voters</i> | 580 | 80.8831 | 8.760761 | 63.5 | 94.64 |
| <i>newspapers</i> | 419 | 181204 | 203342 | 12 | 1563034 |

Tab. A.2: Mean and Standard Deviation of the Normalized Herfindahl index by regions

| Regions | Mean | Std. Dev. |
|----------------|----------|-----------|
| Piemonte | 0.138813 | 0.015314 |
| Lombardia | 0.157064 | 0.030512 |
| Veneto | 0.15373 | 0.061701 |
| Liguria | 0.154446 | 0.020093 |
| Emilia-Romagna | 0.209413 | 0.021698 |
| Toscana | 0.209013 | 0.030489 |
| Umbria | 0.189536 | 0.027374 |
| Marche | 0.180135 | 0.022448 |
| Lazio | 0.159961 | 0.013526 |
| Abruzzo | 0.167978 | 0.057624 |
| Molise | 0.188752 | 0.119785 |
| Campania | 0.143365 | 0.037639 |
| Puglia | 0.149584 | 0.041056 |
| Basilicata | 0.165528 | 0.060436 |
| Calabria | 0.137476 | 0.040992 |
| Valle d'Aosta | 0.159714 | 0.056011 |
| Trentino A. A. | 0.126489 | 0.035691 |
| Friuli V. G. | 0.103989 | 0.042208 |
| Sicilia | 0.132221 | 0.047505 |
| Sardegna | 0.093237 | 0.045742 |

Tab. A.3: Correlations

| | <i>NHerf</i> | ΔPop | <i>I/Y</i> | <i>G/Y</i> | <i>school</i> | <i>prod</i> | <i>corrpro</i> | <i>Edu/Y</i> | <i>voters</i> | <i>newspapers</i> |
|-------------------|--------------|--------------|------------|------------|---------------|-------------|----------------|--------------|---------------|-------------------|
| <i>NHerf</i> | 1 | | | | | | | | | |
| ΔPop | 0.0465 | 1 | | | | | | | | |
| <i>I/Y</i> | 0.0126 | 0.1371 | 1 | | | | | | | |
| <i>G/Y</i> | -0.0156 | -0.1988 | 0.5433 | 1 | | | | | | |
| <i>school</i> | -0.3980 | 0.0034 | -0.2709 | -0.2287 | 1 | | | | | |
| <i>prod</i> | -0.3703 | 0.1957 | -0.3577 | -0.6739 | 0.5945 | 1 | | | | |
| <i>corrpro</i> | -0.2606 | -0.3026 | 0.0219 | 0.2571 | 0.2901 | 0.1294 | 1 | | | |
| <i>Edu/Y</i> | 0.3575 | 0.0268 | 0.1317 | 0.0287 | -0.7876 | -0.4167 | -0.3033 | 1 | | |
| <i>voters</i> | 0.4890 | 0.0466 | -0.1501 | -0.3298 | -0.5740 | -0.2024 | -0.3414 | 0.6578 | 1 | |
| <i>newspapers</i> | -0.0260 | 0.1237 | -0.4451 | -0.5209 | 0.0491 | 0.4373 | -0.1479 | -0.2020 | 0.1072 | 1 |

Tab. A.4: Correlations between the normalized Herfindahl indices calculated on the basis of the votes and on the seats per regions (across 1980-2008)

| | |
|----------------|----------|
| Piemonte | 0.92747 |
| Lombardia | 0.993885 |
| Veneto | 0.998854 |
| Liguria | 0.782888 |
| Emilia Romagna | 0.879341 |
| Toscana | 0.950505 |
| Umbria | 0.86977 |
| Marche | 0.989054 |
| Lazio | 0.944548 |
| Abruzzo | 0.994711 |
| Molise | 0.997504 |
| Campania | 0.980334 |
| Puglia | 0.961608 |
| Basilicata | 0.98925 |
| Calabria | 0.991383 |
| Valle D'Aosta | 0.944836 |
| Trentino A. A. | 0.9674 |
| Friuli V. G. | 0.992319 |
| Sicilia | 0.678984 |
| Sardegna | 0.972182 |

Fig. A.1: Mean of the Normalized Herfindahl index between 1980-1994 and 1995-2008 for each regions

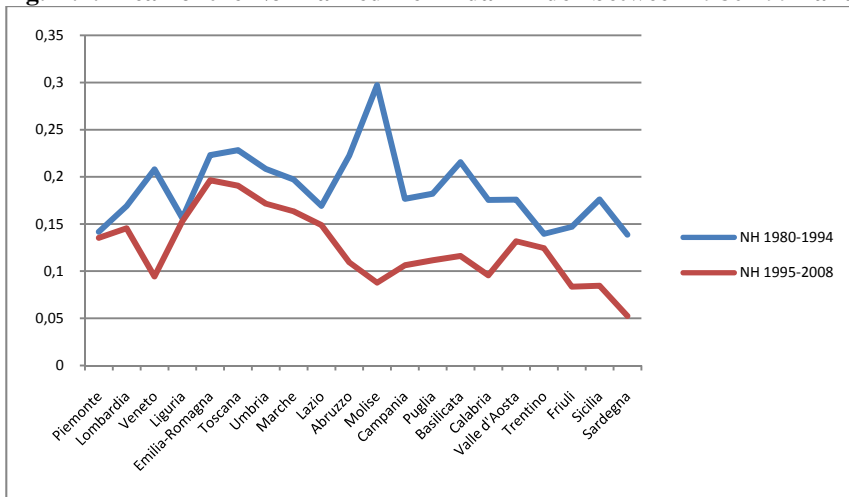


Fig. A.2: Mean (over regions) of the number of political parties at each regional committee election for regions with ordinary statute

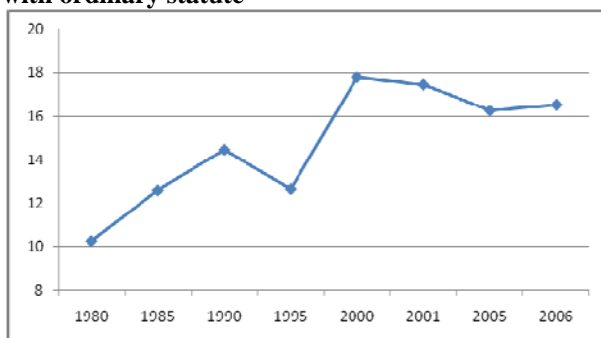
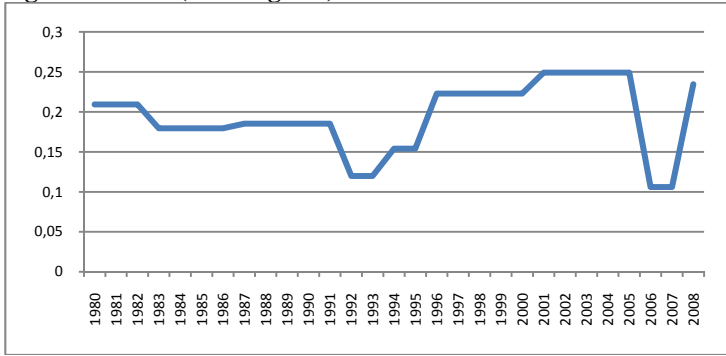


Fig. A.3: Mean (over regions) of the Normalized Herfindahl index for the Senate elections between 1980-2008



Appendix B

Fig B.1 Normalized Herfindahl Index regions with Ordinary and Special Statute

