The design of mixed electoral systems and their impact on Economic Growth: The Italian Regions Case

M. Rosaria Alfano[+]

A. Laura Baraldi[*]

Abstract

A recent issue in political economy is studying how different institutional, economic and social systems influence economic performance in term of per capita GDP. This work seeks to enrich the poor empirical literature concerning the effects of the mixed electoral systems on economic growth, referring to the Italian scenario in which, starting from '50, the following electoral Laws have implemented mixed electoral systems across over time characterized by different degrees of proportionality among Regions. Using a panel data for the 20 Italian Regions from 1981 to 2005 and the Arellano-Bond and Blundell-Bond dynamic panel data estimation techniques, we find that the degree of proportionality of the electoral system negatively affects economic growth; moreover, their link is not linear but quadratic, meaning that there is an inverted U shaped relation between the electoral system degree of proportionality and the per capita GDP regional growth: mixed rules better perform (in terms of growth) than pure proportional and pure majoritarian rules. Finally, we empirically verify that the way in which corruption affects regional growth, negatively depends on the proportionality of the electoral system.

Keywords: *Economic Growth, Electoral System, Corruption, Public expenditure, Education*

JEL Classification: D72, D73, H5

[+] Dipartimento di Diritto ed Economia, Seconda Università di Napoli, C.so Gran Priorato di Malta – 81043 Capua (Italy). +393489034035. mariarosaria.alfano@unina2.it

[*] Dipartimento di Studi Europei e Mediterranei, Seconda Università di Napoli, Via del Setificio, 81100 S. Leucio (Italy). +39823343340. laura.baraldi@unina2.it

1. Introduction

Several governments actively promote the spread of democracy as a means to improve the well-being of the citizens. In order to measure the probability of a democracy's success, it is important to consider how various forms of elections affect growth and development of a country. We are interested in studying one of the political determinants of growth: the *electoral rules* (majoritarian, proportional and mixed electoral systems).

Przeworski (2004) provides a definition of democratic elections: "a regime in which those who govern are selected through contested elections". In this framework we analyze the different electoral systems. An electoral system is defined as "a set of essentially unchanged election rules under which one or more successive elections are conducted in a particular democracy" (Lijphart, 1994).

In order to understand the implications of electoral systems on growth, we must firstly clarify the distinction between the classical classification of electoral systems: majoritarian, proportional and mixed. A majoritarian electoral system has a small number of districts and the winner of the elections is the candidate who gets the most votes in the district; it does not guarantee the representation of political minorities in Parliament. Proportional system has large districts with many candidates, and voters vote for a list of candidates drawn up by political parties, without expressing a preference for any particular candidate; the number of candidates elected in each list is proportional to the votes received by the list; it guarantees the presence in Parliament of a plurality of political parties. The third category, mixed systems, is a combination of the first two; it is typically implemented to achieve the benefits of having a majority while maintaining semi-proportional representation.

The evidence of the impact that political institutions have on economic growth is provided by Hall and Jones (1999), Acemoglu, Johnson and Robison (2001), Glaser et al. (2004), Rodrik, Subramanian and Trebbi (2004). Recently, Persson (2005) highlights the empirical evidence that parliamentary systems and proportional electoral rules both promote per capita GDP and also specify that the "research has no more that scratched the surface when it comes to structural policies to long-run economic performance".

Most of the research which has focused on the effect that electoral systems have on economic growth is in the field of comparative politics. Powell (2000) examines elections in 20 democracies over 25 years for a total of 155 elections. The notion that the majoritarian vision portrays elections as enabling citizens to choose directly between alternative governments, with the winner making all of the policies, supports the hypothesis that governments with majoritarian systems have an easier time passing economic policies and therefore cause higher economic growth

rates. Leduc et al. (1996) conclude that countries with majoritarian rule benefit from explicit accountability because the voters know whom to blame if something goes wrong. Lijphart (1984, 1999) disagrees with this stance pointing out that there is no tradeoff between governing effectiveness (accountability) and high quality democracy (responsiveness) concluding that proportional systems perform better than majoritarian ones overall. Differently, Abelman and Pesevento (2007) find that countries with mixed electoral systems have the highest levels of economic growth with respect to countries with totally majoritarian or totally proportional systems.

There are few research studies which evaluate the direct effects of mixed systems on economic growth. Due to the fact that mixed systems are an increasingly popular form of electoral rules, they are becoming an interesting topic in political science. Kostadinova (2002) compares mixed systems in Eastern European countries and finds that they allow countries to enjoy the benefits of minority representation without sizeable government fragmentation. Therefore, if mixed systems have these capabilities, it could be possible for countries to adopt these systems in order to achieve higher levels of growth, exploiting the contamination effects (Moses et al. 2007).

This work seeks to enrich the poor empirical literature concerning the effects of the mixed electoral systems on economic growth, looking at the Italian scenario; it is an ideal reality to investigate because mixed electoral systems alternated (at national and regional level), each of them characterized by different degrees of proportionality. Our research focused on the 20 Italian Regions. The Regional electoral system was set out in article 122 of the Italian Constitution of 1946; over the years, it has been modified: firstly in 1968 with Law 108; secondly in 1995 with Law 43, which has included a significant correction provided by the majoritarian premium[1]; finally in 1999 with Constitutional Law n. 1 which introduced the direct election of the Regional Council Governor by the citizens. The last two reforms have moved towards more majoritarian arrangements with the purpose of mitigating some dangers of excessively unstable[2], undisciplined, and fragmented party competition.

Choosing the Italian Regional reality is not a limit for the general scope of the analysis. In fact, starting from the origin of the Constitutional Republic, electoral Laws have experimented a mixed electoral systems over time characterized by different degrees of proportionality among

[1] The measure of this premium is linked to the results obtained by the winning regional coalition; in fact, if all the parties linked to the coalition obtain at least 50% of the seats, ½ of regional coalition list is elected, as happened in Umbria and Molise, and the remaining part of seats is distributed among parties which are not linked to the winning coalition. On the other hand, if the political parties close to the winning coalition obtain less than 50% of seats, the entire list of regional coalitions is elected.

[2] To guaranty the stability of regional government, the reform of regional election includes a sort of correction mechanism: in the case that the total of winning coalition seats is less that 55% or 60%, an additional number of seats is provided, which increase the number of regional committee seats. This way the number of seats within regional Committee is not fixed, as happened in Lombardia, Veneto, Liguria, Lazio, Puglia and Calabria.

regions; by now, the mixed system assesses that members of Regional Committees are elected both by proportional and majoritarian systems. In particular, the proportional system allows to elect 4/5 of the entire Regional Committee within province-based lists, and the remaining 1/5 of the seats is assigned with the majoritarian premium.

Of course, Regional Committee and Regional Governor hold the power in the political economy issues of the Region.

We use a panel data of the 20 Italian regions (15 with ordinary statute and 5 with special statute)[3] from 1981 to 2005 and the Arellano-Bond and Blundell-Bond dynamic panel data techniques to estimate the effects of the degree of proportionality of the electoral system on economic growth. In our knowledge, this is the first empirical work which uses a proportionality index, instead of a dummy variable, to identify mixed electoral system. This methodology allows us not only to verify if mixed electoral rules are better, in terms of economic growth, than pure proportional and pure majoritarian ones, but also to assess whether there exists a "best" degree of proportionality which should characterize a mixed electoral system. To do that it is sufficient to hypothesize an inverted U-shaped relation between the proportionality measure and the economic growth. In this context, using Italian regional data is not restricting at all, because Italian Regions, during the 25 years under analysis, have constituted a very different reality from a socio-political-economic point of view.

We measure the degree of proportionality of the Italian regional mixed electoral system by an index ranking from 0 to 1 (as explained below); based on its construction, this index assumes different values among Italian regions in the years of elections, which allows us to assimilate the Italian regions to countries with mixed electoral systems characterized by a different degrees of proportionality. This index is calculated on the basis of the Regional Committee electoral results; it points out in which way each political party is represented within the regional committee, in the sense that the representation depends on the way (a more proportional or a more majoritarian way) in which the seats are distributed among political parties; therefore, a change in this index implies a change in the mechanism of representation and also a change in the relation between the delegate and his/her voters. The Regional Committee, elected through a mixed electoral system, decides the annual and multiannual economic and financial plans that summarize the main choices of fiscal and

[3] Italy is divided into 15 Regions with ordinary statute (Piemonte, Lombardia, Veneto, Liguria Emilia Romagna, Toscana, Umbria, Marche, Lazio, Abruzzo, Molise, Campania, Puglia Basilicata, Calabria) and 5 Regions with special statute (Valle d'Aosta, Friuli Venezia Giulia, Trentino Alto Adige, Sicilia, Sardegna). The differences among them concern the different degree of autonomy: legislative, financial, regulatory, fiscal, administrative, etc.

financial policies; it also defines the path of regional policies for growth and development, hugely affecting the spatial economic growth.

The choice of regional data within a country as opposed to that of cross-country data is also supported by technical reasons. One problem that arises in the interpretation of regressions based on cross-country data is that countries differ greatly in levels of government efficiency, in many aspects of socio-economic life, in the effectiveness of economic policies. It may be more difficult, in regressions based on cross-country data, to analyse such differences with respect to regressions based on regional data within the same country.

The result of our investigation shows that the degree of proportionality of an electoral system negatively affects the per capita GDP rate of growth; the reason is that a more proportional legislature could have a harder time agreeing on which policies to implement with respect to a more majoritarian system; this argument underlies the statement that more majoritarian electoral systems produce governments that can better support economic growth. Moreover, to justify and enforce the increasing "success" of mixed electoral systems, we prove that, in terms of economic growth, mixed rules are better than pure proportional and pure majoritarian ones. We estimate a quadratic relation between the regional per capita GDP rate of growth and the proportionality index (valued over the Regional Committee elections), finding that it (the relation) looks like an inverted U. Our explanation is that majoritarian rule promotes the coalition of political parties with a common program in order to win the elections, leading to a reduction of *government instability*. But, on the other hand, majoritarian systems are also characterized by greater *political instability*. To this light, the choice of a mixed electoral system is justified by the intent of a reduction of both government and political instability.

In our mind, another important result of this investigation is based on the link between corruption and electoral rules (as better explained in section 2.2); we show that corruption affects economic growth depending on the degree of proportionality of the electoral system: the negative effect of corruption on economic growth positively depend on the degree of proportionality index. It is easier, therefore, to understand the implication of the last statement: choosing a more majoritarian electoral regime also allow to reduce the detrimental impact of corruption on growth.

This paper is organized as follows: in section 2 we summarize the theoretical literature about the institutional, economic and social determinants of economic growth; in section 3 we describe the data, the variables and the econometric specification; in section 4 we show the results and in section 5 we present the conclusions.

2. Political determinant of economic growth

The debate relating to the political determinants of economic growth has attracted considerable interest due to the importance of its implications in terms of economic policy and the number of theoretical and empirical analyses engendered by it.

2.1 Electoral system

Many political scientists (Powell 1982, 2000; Taagapera and Shugart 1989; Lijphart 1994; Cox 1997) usually discuss about the effects of electoral systems on the number of parties, accountability, and political stability. At the same time, several authors (Austen-Smith 2000, Milesi-Ferretti et al. 2002; Rogowski and Kayser 2002; Persson and Tabellini 2004) start to investigate the economic effects of electoral systems. This approach highlights that electoral rules turn out a substantial impact on the size and composition of government spending, consumer prices and tax policies.

Political economy is studying the effect of electoral rules (and other institutional systems) on economic policy outcomes. Hall and Jones (1999) firstly emphasized the importance of institutions on aggregate productivity and economic growth. As Acemoglu (2005) points out, this means "that different policies will map into different outcomes", therefore it becomes very interesting to analyze the causal effect of constitutions on specific policy outcomes (Persson and Tabellini, 2003).

Taken together, these forces jointly lead us to analyze the implications of electoral systems on growth; in order to reach this purpose we have to consider the characteristics of electoral systems: majoritarian, proportional and mixed. In the majoritarian elections the winner is the candidate who gets the most votes in the district and of course the minority parties have no representation in Parliament. Differently, the proportional system allows voters to express their consensus for a list of candidates drawn up by political parties, and the number of elected candidates in each list is proportional to the votes received by each list; therefore it guarantees the presence in Parliament of a plurality of political parties.

The general consensus among scholars is that "the choice between majoritarian and proportional elections is a tradeoff between accountability and responsiveness" (Persson and Tabellini, 2003). Majoritarian elections have the twin virtues of strong and accountable party government. "Strong" means a single-party (not coalition) government. Cohesive parties with a majority of parliamentary seats are able to implement their manifesto policies without the need to engage in post-election negotiations with coalition partners. The election result is decisive for the outcome. At the end of their tenure in office, governments remain accountable to the electorate,

who can throw them out if they wish to, but the government is not always responsive to change in the popular opinion[4].

Proportional elections grant accurate representation of voter desires without the assurance of a clear cut majority that can be held accountable for decisions. Moreover, proportional rule has a harder time agreeing on which policies to pass[5]. These reasons induce most political science scholars to believe that governments with majoritarian electoral systems have higher rates of economic growth.

The mixed systems combine the characteristics of the majoritarian and proportional systems and it allows to achieve the benefits of having a majority while maintaining semi-proportional representation. Nowadays mixed systems are one the most attractive electoral rules; this implies an increasing interest by political scientists to explore the direct effect that mixed systems have on economic growth.

It seems that governments implementing mixed systems provide a better environment for productive economic policy; following this prediction, more and more countries around the world are abandoning totally majoritarian or totally proportional electoral systems adopting mixed ones. Since 1948, Italy has experimented a mixed electoral system for the national elections[6]; on the regional level, instead, at the beginning of the 1995s the Regional electoral system switched from a proportional one to mixed one, introducing the majoritarian premium based on regional lists[7]. We can properly consider it as a mixed electoral system, characterized by a different degree of proportionality[8] across the Regions. Given this particular scenario, this work wants to enrich the

[4] Powell (2004) states that "responsiveness may be conceived as a series of linkage intended to ensure that governments respect the preferences of the governed"

[5] Differently, Milesi-Ferreti et al (2000, 2002) and Scartascini (2001) point out that proportional systems are more geared towards spending on transfers because it represents a greater variety on interests, while majoritarian systems are more prone to purchases of goods and services, typically targeted along geographical lines.

[6] After the April 18, 1993 referendum the Italian national electoral system switched from a more proportional one to a more majoritarian one. For the Senate (upper chamber), 3/4 of the 315 seats are assigned using the majoritarian criterion and the remaining 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 with the majoritarian system and the remaining 25% with the proportional one. This is why the Italian electoral system is a mixed one. Before the referendum in 1993 the elections of the representatives to the Chamber of Deputies was governed by Law 30 March 1957 no. 361 which introduced a purely proportional system. For the elections to the Senate, Law 6 February 1948 no. 28 initiated a mixed electoral system where just one candidate was presented in each district, and he/she was elected only if he/she reached at least 65% of votes. If no candidate was elected the seats were distributed using proportional criteria. In very few cases candidates reached 65% of preferences. At that time elections to the Senate were purely proportional. Law no. 270, December 20, 2005, changed again the Italian electoral system into proportional. Recently (September 18, 1992), along with Italy, only New Zealand, with a referendum, voted to change the electoral system but in the opposite direction with respect to Italy, from majoritarian to proportional.

[7] The previous regional electoral rule led to instability within the regional Committee and consequently to the decisional paralysis of regional governance.

[8] This is due to the characteristics of premium provides to regional winning coalition which is linked to the collected seats by the winning coalition and in some condition is reduced to ½, as happened in Umbria and Molise in the 2000

empirical literature concerning the effects of the mixed electoral system on economic growth. To do that we use a representativeness measure of political parties inside the Italian regional Committee, in terms of how votes are converted into seats. Recalling what we have just said about the way in which different electoral rules guarantee the representation of political parties, we can interpret this measure as an index of the proportionality degree of electoral systems. Using a proportionality index allow us to verify which degree of proportionality an electoral system may have to enhance economic growth.

2.2 Corruption

Corruption is defined as the ”abuse of public power for private benefit[9]”. Recently, corruption emerges where there are rents and when public officials have wide discretion power; therefore the bureaucrats have the opportunity to demand bribes or to accept offered bribes. One could think of corruption as a kind of *government inefficiency* in fact, it gives rise to social losses coming from the propping up of inefficient firms which imply the allocation of talent, technology and capital away from their socially most productive uses.

Very important is the link between corruption and electoral systems. In particular, looking at the *district size* (i.e. the number of seats in a district), small districts increase the barriers to entry (Myerson (1993), Ferejohn (1986)). Indeed, in a majoritarian system, where only one candidate is elected in each district, the incumbent, already well known in the constituency, is more likely to reach a relative majority; in a proportional system, large districts that appoint several candidates are more likely to reach new candidates who get a minority of votes. Thus proportional electoral systems with a large district magnitude will raise smaller entry barriers, associated to stiffer competition, and will lead to smaller incumbent rent, with respect to majoritarian electoral systems.

However referring to the *electoral formula* (i.e. how votes are translated into seats), when voters vote for an individual candidate, there is a direct link between individual performance and reappointment; in fact, voters base the valuation of their representatives on their ability to represent the interests of the community. Of course, the incumbent faces strong incentives to perform well to maximize the probability of re-election. Therefore in a proportional system the incentive to corruption is higher than in a majoritarian system (Persson and Tabellini (1999a)). Hence, the net effect is ambiguous but the empirical work of Persson, Tabellini and Trebbi (2000) suggests that

---

elections. Instead, in the case parties linked to the winning coalition obtain less than 50% of seats the whole list of regional coalitions is elected to guaranty the stability of regional government and more in the case seats collected by winning coalition is less that 55 or 60% the Law provided additional seats for increasing the number of regional committee seats, therefore, the number of seats within regional Committee is not jet fixed and of course influence the proportionality index.

[9] This is the definition used by the World Bank.

countries with proportional systems have much more widespread corruption (compared to countries with majoritarian systems).

Generally, theory suggests that corruption will slow economic growth discouraging economic agents to invest, reducing the quality of the public infrastructure and services, decreasing tax revenue and affecting the allocation of entrepreneurial skills. When corruption is widespread and institutionalized, some firms may devote resources to obtain valuable licenses and preferential market access, while others focus on improving productivity (Murphy, Shleifer and Vishny, 1991, 1993).

Corruption negatively influences the incentives of economic agents to invest (corruption acts as a tax in cases where entrepreneurs are asked for bribes before enterprises can be started, or corrupt officials later demand shares in the proceeds of their investments), and also influences the quality of the public infrastructure and services, decreasing tax revenue, causing talented people to engage in rent-seeking rather than productive activities (Mauro 1998b). Significant with this respect is the Del Monte and Papagni (2001) analysis regarding the Italian regions which shows the strong negative effects of corruption on economic growth; they observe that corruption reduces the amount and quality of public infrastructure and services, therefore the efficiency of public expenditure is lower if corruption is higher.

Scholars think that some types of corruption could be growth enhancing: they claim that bribery may allow firms to get things done in an economy plagued by bureaucratic hold-ups and bad, rigid laws (Leff, 1964; Huntington, 1968). A system built on bribery for allocating licenses and government contracts may lead to an outcome in which the most efficient firms will be able to afford of paying the highest bribes (Lui, 1985).

The empirical evidence from studies tends to support those theorists who argue that corruption slows down growth. Mauro (1995) is the first attempt to study the relationship between corruption and growth in a large cross-section of countries. Contrary to what is sometimes claimed, Mauro does not find robust evidence of a link between corruption and growth, although a broader measure of bureaucratic efficiency is correlated with investment and growth.

Huntington (1968) argued for a reverse causality between corruption and growth, as whether modernization and rapid growth may increase corruption. Powell (2004) notes that corruption is a key factor causing governments to stray from responsive actions. Corruption causes governments to stray from efficient behavior and adopt policies that are not always in the best interest of a nation. It is therefore relevant to control corruption in an economic growth model. We take into account of this double causality between corruption and economic growth in our econometric model. Indeed, in the estimated equation, we consider corruption as the endogenous variable.

Aidt et al. (2008) argue that corruption, economic growth and the quality of political institutions are related 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. We can grasp this web looking at Italy. Indeed in 1992, "Tangentopoli", a campaign against rampant corruption of those years, started, leading to a rapid reduction of corruption. But, also in 1992, there was a change in the Italian electoral system (as above said), from a more proportional to a more majoritarian one, which, according to the theory, could have contributed to the decrease in the Italian corruption. These reforms, which took place in the same period, make Italy a particular scenario to be studied, which allows us to grasp simultaneously the effects of different institutional changes on economic growth and their interactions.

2.3 Public expenditure

In the 1950s, some economists (Black (1948), Downs (1957), Buchanan and Tullock (1962), recently Mueller (1989)) applied the tools of their trade to non-market decision making: economic theory was extended to issues which had previously been in the domain of political science. This implied that the outcomes of the public sector are determined, in part, by institutions, their procedures and the people working in those institutions; therefore, fiscal institutions can determine outcomes[10]. Persson and Tabellini (2000) showed that countries with proportional electoral rules have higher government expenditure shares on GDP than countries with majoritarian election (Persson, Roland, and Tabellini (2006)) and government expenditure is tilted towards transfers rather than purchases of goods and services (Milesi-Ferretti, Perotti and Rostagno (2002)). Other empirical papers focused on the estimation of elasticity of government expenditure with respect to output providing an empirical test of the so-called "Wagner law"[11].

Baraldi (2008), using Italian data, showed that a more proportional electoral system increases public consumption spending because of the lesser political instability implied by this electoral rule.

Barro (1991) finds that growth is inversely related to the share of government consumption over GDP; Levine and Zervos (1993) measure the role of government in economic activity by using the ratio of government consumption over GDP and also find a negative insignificant relationship between government consumption over GDP and growth. Of course, where the composition of government expenditures on health and education (measured as a share of GDP) is taken, the above

[10] Buchanan and Wagner (1977) wrote "We are institutionalists in the sense that we think that arrangements or rules do affect outcomes".

[11] The main purpose is that public goods and services, including redistribution via transfers and the activities of public enterprises, have an income elastic greater than one, i.e., are superior goods.

conclusion has to be reconsidered because the relationship between government spending and growth of per capita income growth (Gallup et al. 1998) has a positive sign.

Others authors as Kolluri et al. (2000) investigate the G7 countries over the years 1960-1993 by country-specific single equation models, finding that government expenditure is generally cointegrated with income, both in the long-term (when the income elasticity of government expenditure is slightly above unity for government consumption and government transfers) and in the short-term (when elasticity has an average around 0.5). Recently, Arpaia and Turrini (2008), show that, using a sample of EU countries over the 1970-2003, the hypothesis of a common long-term elasticity between cyclically-adjusted primary expenditure and potential output close to unity cannot be rejected.

The mentioned theoretical and empirical literature clarify why public expenditure is considered as a political determinant of growth; generally we expect a negative sign of the impact of public expenditure on economic growth.

3. The data and variables of empirical analysis

This section addresses the link between growth, institutional reforms and both political and socio-economic environment. The purpose is to enrich the few empirical literature about the effect of the electoral systems degree of proportionality on economic growth. Moving from Barro and Sala-i-Martin (1995), the per capita GDP rate of growth is related to the previous per capita GDP rate of growth, to the composite institutional, to social and economic reform indicators, to investment, as well as to physical and human capital indicators. We specify an econometric model whose dependent variable is the Italian regional per capita GDP rate of growth. Table 3 in Appendix 3 summarizes the descriptive statistics related to the regional GDP.

As said above, we study Italy because it represents a particular case in the world scenario: in the ‘90s the Italian national and regional electoral system switched from a more proportional to a more majoritarian one. More precisely, the national electoral reform in 1993 has characterized the new mixed electoral system by a lower degree of proportionality (at least for the Senate elections) and the regional electoral reform in 1995 has changed the previous proportional system in a mixed one. The Regional electoral reform of 1995 (concerning the Regions with ordinary statute) has confirmed the proportional electoral rule of 1968 just for the 80% of the seats, while it has established that the remaining 20% of the seats was assigned looking at the regional lists introducing a sort of majoritarian premium. In this way the voter had the possibility to express a double willingness for the same committee: the first vote was for the preferred political party and it is assigned according to the proportional criterion; the second vote was for the regional coalition list

and it is assigned with majoritarian criterion. In this way electors cannot express any personal preference. Later in 1999 Constitutional Reform was complemented establishing the direct election of the Regional Governor by voters and introducing the principle of "simul stabunt simul cadent". Following this principle, in case the Governor loses the confidence of the Committee, both fall from office and new elections will take place. These reforms have modified significantly the electoral system promoting a most majoritarian approach to guaranty a better stability of regional government and introducing, firstly, the majoritarian premium and, secondly, a sort of correction mechanisms (as explained in footnote 2). The mentioned electoral reform is not about the Regions with special statute which have a particular legislative autonomy.

To analyse how electoral rules affect economic growth we construct an index which measures the degree of voters representation (by political parties) that is a very good proxy for the proportionality degree of an electoral system. Indeed, we explained that an electoral system which guarantees a greater representation of all political parties, is a more proportional one; while, inversely, that one which is less representative, is a more majoritarian. Looking at this, we can use a measure of the representativeness of political parties in a Committee (as a way in which votes are transformed into seats) as an index of the electoral system degree of proportionality, which we can call "proportionality index". It can take values from 0 to 1: 1 indicates perfect proportionality, 0 means that a candidate with no votes wins a seat.

The proportionality index[12] (which we call *Prop* in the estimated equation) is:

$$\Pr op = 1 - \sqrt{\frac{1}{2}\sum_i (v_i - s_i)^2}$$

where v_i and s_i are respectively the share of votes and of seats of a single political party (i=1,....,n political parties) for the regional elections from 1981 to 2005[13].

In appendix 1 and 2 we show the proportionality index respectively for Regions with ordinary and special statute. We can graphically note what we said about the reform of regional electoral system in 1995: in every Region with ordinary statute, in 1995 the value of the proportionality index decreases, meaning the transition to a more majoritarian electoral system. For Regions with special statute, the value of the proportionality index slightly changed across the elections but the direction is always toward a less proportional representation. Recalling that the proportionality index points out in which way each political party is represented within the regional

[12] Gallagher M. (1991).

[13] We calculate the proportionality index on the data of Regional election taken place in 1980, 1985, 1990, 1995, 2000 and 2005 for Regions with ordinary statute (but Molise only for 2001); for Valle d'Aosta, Trentino Alto Adige and Friuli Venezia Giulia the years have been 1978, 1983, 1988, 1993, 1998 and 2003; for Sicilia 1976, 1981, 1986, 1991, 1996 and 2001; for Sardegna 1979, 1984, 1989, 1994, 1999 and 2004.

committee (in the sense that the representation depends on the way in which the seats are distributed among political parties), it could change (in the same Region over the years) even under the same electoral rule. This is why figures in Appendix 1 and 2 show a variation of the index before and after 1995, respectively when the electoral system was totally proportional and mixed.

Looking at the Regional Committee and Governor in elections of 2000 and 2005 of Regions with ordinary statute the proportionality index is calculated by modifying the proportionality index in the following way:

$$\Pr op = 1 - \left[\sqrt{\frac{1}{2}\sum_i (vp_i - sp_i)^2} \cdot \frac{\sum_i sp_i}{\sum_i s_i} + \sqrt{\frac{1}{2}\sum_i (vm_i - sm_i)^2} \cdot \frac{\sum_i sm_i}{\sum_i s_i} \right]$$

where vp_i and sp_i are respectively the share of votes and the share of seats assigned to a single political party under the proportional system (i=1,....,n political parties) and vm_i and sm_i are respectively the share of votes and the share of seats assigned to a single coalition under the majoritarian system (i=1,....,n political parties), constrained to the condition that $sp_i + sm_{i=} s_i$.

The question we ask here is not only in which way the degree of proportionality affects economic growth (and, in the Italian regional scenario, moving from a totally proportional to a mixed electoral rule, we can expect a negative sign of the proportionality index – according to the literature which states a better performance of mixed electoral systems) but also if their relation is linear. The answer to the lest question should be negative because it (the linear relation) would imply that totally majoritarian system – that one whose degree of proportionality is almost zero – is the best for growth. But the more recent literature (mentioned in the introduction) wants that mixed rules are preferred. To test this statement and to give an answer to the previous question we introduce, in the econometric model to estimate, among the regressors, the square of the proportionality index: if the literature is right, we expect an inverted U-shaped relation between the electoral system degree of proportionality and the economic growth.

Italian socio-economic policies also have been affected by other fundamental episodes: ”Tangentopoli”, a campaign against corruption of public bureaucrats; the entry into force of the Euro in 2000; the Constitutional reform approved in 2001 which gives rise to a significant decentralization process (the *Fiscal Federalism*). See everyone in detail.

Government planners, administrators and economists have traditionally devoted little attention to the implicit assumption that bureaucrats and politician’s delegates would behave dishonestly giving rise to a large amounts of corruption, which plays a large role in increasing global amount of public budget[14]. In particular, corruption, more than the electoral system, alters the

[14] Baraldi (2008).

public budget structure towards social services and securities instead of education, health and general services straying government from efficient behavior and pushing each government to implement policies that are not always in the best interest of a nation (Powell 2004). In this way it distorts the market allocation of resources, negatively influences the investment of economic agents and finally it reduces the quality of the public infrastructure and services hindering economic growth[15] (McMullan (1961), Tanzi (1997) and Mauro (1995)). In addition, corruption affects both the total regional amount of public spending and its structure, addressing expenses towards those sectors in which it is easier to collect bribes: in this respect it could negatively influences regional economic growth.

In our analysis the variable which measures the number of crimes against public administration reported to the police for each of the 20 Italian Regions between 1981 and 2005, per capita, is called *Corr*; this number is based on Statutes no. 286 to 294 (ISTAT- Annals of Judicial Statistics). As summarised in the following figure 1 the level of corruption in Italy was very high before "Tangentopoli" period, when corruption crimes started to decrease[16]. In general we expect a negative effect of corruption on regional economic growth.

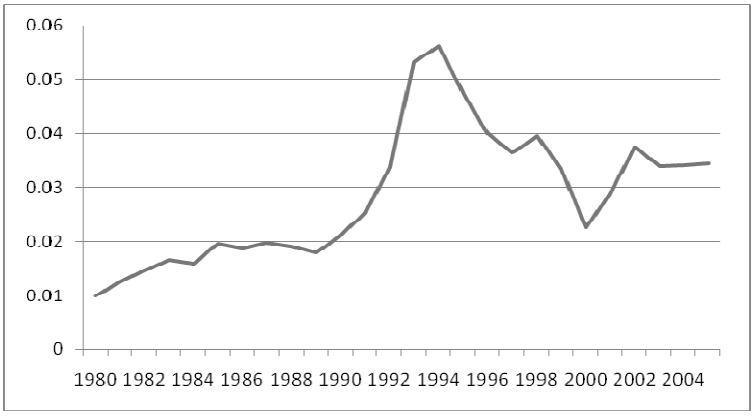


Fig. 1 Per capita corruption in Italy between 1980 – 2005

If we think of corruption as a sort of government inefficiency and following the literature emphasizing the link between electoral systems and corruption, we are also interesting in verifying if the impact of corruption on economic growth depends on the degree of proportionality of the electoral system; to do that, we introduce in the estimated equation an interaction term, called *Corr* Prop,* achieved by the product between per capita corruption and proportionality index.

[15] The basic theoretical framework for studying the impact of corruption on economic growth is outlined in Barro (1991) and Mauro (1995, 1997)

[16] Per capita corruption crimes recorded by the police at time t refer to those committed at least one year before; this explain why the increasing trend starts changing from 1994.

To take into account the entry of Italy the European Union, that is, the achievement of the convergence criteria, we introduce in the econometric model a dummy variable called EU. In November 2001 there was an important Constitutional reform in Italy, that of the "Title V" of the Constitution, rewriting the new principles of decentralization 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, assigning greater autonomy to the Regions with ordinary statute than the one which already benefits the Regions with special statute, should be applied to the Regions with special statute. To control for this important Constitutional reform, we specify in the econometric model a dummy variable called *Ref2001.*

As said above, the regional electoral reform had envisaged the direct election of the Governor by citizens. We use a variable, called *Prop* Gov*, obtained by multiplying the proportionality index by a dummy variable, *Gov,* which starts taking the value 1 in the year of the direct election of the Regional Council Governor. The variable *Prop* Gov* wants to give an answer to the question whether the direct election of the Regional Council Governor affected the effect of proportionality index on economic growth

To adequately consider the public budget management, we consider the level of regional public consumption spending over GDP. Italian regional public consumption spending, according to the ISTAT SEC95 classification, includes expenses in general services, defence, education, health, social services and securities, housing, culture, economic services, public order, environment. As we can observe in table 6 (Appendix 3), there is a quite significant differences in the level of public expenditure among the Italian Regions, especially compared Regions with ordinary statute with Regions with special statute, because of the typical autonomy of those latter. As said in section 2.3, the impact of government consumption spending on economic growth is not predictable: some expenses could have a positive effect (as expenses in education and health) and some other a negative effect.

Several microeconomic studies analyse the links between human resources, such as education, and labour market outcomes because investments in education and health directly contribute to the productivity of an individual, and then, to the growth. In this scenario, the regional human resources become an important determinant for the long-term viability of the investments and growth. Considering such framework we study the regional family expenditure in education, the regional private investment and the rate of schooling (which are widely different among Italian Regions)[17], to highlight the effect of physical and human capital on regional growth. Al these variables serve as a proxy for the effect of the quality of regional physical and human capital; of

[17] The tables of descriptive statistics of these variables are shown in Appendix 3.

course larger investment, expenditure in education and level of schooling, may increase economic activity; therefore their effects on GDP growth is expected to be positive. Another important input for growth is the productivity of labour which we measure by the ratio between the total added value and the unit of labour, always at regional level (Table 5, Appendix 3).

All these events allow us to say that such a very complex socio-economic situation, characterised by multiple and diversified socio-economic reality, made of each Region a particular context. Moreover, as stated above, there is a technical reason for choosing regional data within a country instead of cross-country data, linked to the difficulty of controlling for the different levels of corruption, for many aspects of economic life, for the importance of economic policies among countries.

We specify and estimate the following dynamic panel data equation:

$$\Delta GDP_{i,t} = \alpha + \beta_1 \Delta GDP_{i,t-1} + \beta_2 \Pr op_{i,t-1} + \beta_3 (\Pr op_{i,t-1})^2 + \beta_4 Corr_{i,t+1} + \beta_5 \Pr op_{i,t-1} * Corr_{i,t+1} + \beta_6 EU + \beta_7 \mathrm{Re}f2001 + \beta_8 \Pr op_{i,t-1} * D(Governoi) + \beta_9 \Delta Pop_{i,t} + \sum_{j=1}^{m} \gamma_j X_{i,t-j} + \varepsilon_{i,t} \quad (1)$$

where i=1….20 Regions, $\varepsilon_{i,t}$ are the general stochastic terms. $\Delta GDP_{i,t}$ is the growth rate of the per capita *GDP* of region *i* at time *t* (taken at constant price 1995)*;* $\Delta GDP_{i,t-1}$ is the lag of the dependent variable; $Prop_{i,t-1}$ is the proportionality index of the electoral system in region *i* at time *t-1* (we take the value of this variable at time *t-1* because the policy implemented by the winners of the elections gives its effects at least one year later); $(Prop_{i,t-1})^2$ is the square of the proportionality index; $Corr_{i,t+1}$ is per capita corruption crimes reported to the police of region *i* at time *t+1* (we take the value at *t+1* because the corruption crimes recorded by the police refer to those committed at least one year before); $Prop_{i,t-1}*Corr_{i,t+1}$ is the interaction term; *EU*, the dummy variable to take into account the convergence criteria of the European Union, takes the value 0 from 1981 to 1992 and 1 from 1993 to 2005; the dummy *Ref2001* takes the value 0 from 1981 to 2000 and the value 1 from 2001 to 2005; $Prop_{i,t-1}*Gov$ is obtained by multiplying the proportionality index by a dummy variable, *Gov* which starts taking the value 1 in the year of the direct election of the Regional Council Governor that, for the Regions with ordinary statute, was 2000, except for Molise, where the Governor was firstly elected in 2001, while, referring to the Regions with special statute, in Valle d'Aosta, Friuli Venezia Giulia and Trentino Alto Adige the year of the first Governor election was 2003, for Sicilia it was 2001 and for Sardegna it was 2004; $\Delta Pop_{i,t}$ is the population rate of growth of region *i* at time *t; X* is a vector of explanatory variables, such as the *ln(G)* which is the logarithm of public consumption spending/GDP in percentage (taken at constant price 1995); the

ln(Inv) which is the logarithm of the level of private investments/GDP in percentage (taken at constant price 1995); the *ln(Edu)* which is the logarithm of the family expenditure on education/GDP in percentage*;* the *ln(Prod)* which is a labor productivity index and it is constructed as the logarithm of the ratio total added value/unit of labor*;* the *Sch* which is a measure of the rate of schooling and is constructed by dividing the number of registered in high school over the population in age class 15-19.

We choose a dynamic specification to grasp the dynamicity of growth which is evident even using annual data. We use the Arellano-Bond and Blundell Bond techniques for the 20 Italian Regions over 25 years (1981 - 2005). Fixed and random effects estimators approaches to panel data analysis are inappropriate in a dynamic setting. Arellano & Bond (1991)[18] offer a solution to this problem by treating the model as a system of equations (viz. one for each time period) and developing a Generalized Method of Moments estimator that exploits the moment conditions for the equations in first differences. Specifically, the estimator is based on taking first differences of the model (to remove Countries-specific effects) and then instrumenting the lagged dependent variable in first differences with suitable lags of its own levels[19]. However, an important obstruction to using GMM is that the lagged values of the dependent variable may be only weak instruments in the differenced regression. This could lead to severe finite-sample bias, especially when the series is very persistent (see Blundell & Bond, 1998). Given this, we employ system GMM estimation (Arellano & Bover, 1995; Blundell & Bond, 1998). This method combines the moment conditions for the equations in first differences exploited in the difference GMM estimator with additional moment conditions for the equations in levels. The introduction of these additional moments increases the efficiency of the estimation.

---

[18] Linear dynamic panel-data models include *p* lags of the dependent variable as covariates and contain unobserved panel-level effects, fixed or random. By construction, the unobserved panel-level effects are correlated with the lagged dependent variables, making standard estimators inconsistent. Arellano and Bond (1991) derive a consistent generalized method of moments (GMM) estimator for the parameters of the model

$$y_{i,t} = \sum_{j=1}^{p} \alpha_j y_{i,t-j} + \beta_1 x_{i,t} + \beta_2 w_{i,t} + v_i + \varepsilon_{i,t}$$

i = 1,.....,N and t = 1,.....,T; α_j are p parameters to be estimated, $x_{i,t}$ is a vector of strictly exogenous variables, $w_{i,t}$ is a vector of predetermined variables, β_1 and β_2 are parameters to be estimated, v_i are the random effects that are i.i.d. over the panel with variance σ^2_v and $\varepsilon_{i,t}$ are i.i.d. over the whole sample with variance σ^2_ε. v_i and $\varepsilon_{i,t}$ are assumed to be independent for each i over all t. First differencing the previous equation removes v_i and produces an equation which can be estimated using IV. Arellano and Bond (1991) derive the GMM estimator using lagged levels of the dependent variable and the predetermined variables and differences of the strictly exogenous variables. This method assumes no second-order autocorrelation in the first-differenced idiosyncratic errors.

[19] The estimator developed by Arellano & Bond (1991) is generally called difference GMM (or GMM-DIF). It is ideal for short time series.

In the estimation we take into account of the endogeneity problem which may arise from the specified model; we refer to the corruption, the family expenses in education and private investments. We discuss about the endogeneity aspect of corruption in section 2.2. It is also well documented in the literature the reverse causality between family expenses in education and economic growth; we can consider such a reverse causality also between private investments and growth.

The data we used come from the ISTAT database and the Annals of Judicial Statistics for the 20 Italian Regions over 25 years (1981 - 2005) on an annual basis. We recall that Italy is divided into 15 Regions with ordinary statute and 5 with special status.

4. Results

The equation previously shown in (1) has been estimated twice, firstly by using the data concerning the 15 Italian regions with ordinary statute (whose results are reported in table 1) and later by adding the 5 Italian Regions with special statute (whose results are reported in table 2). This is due to the fact that, as above specified, the Regions with special statute manage expenses and taxes in total autonomy from the central government, while the financial system of the Regions with ordinary statute, at least until the 2001 reform, was almost totally "derivative", meaning that it was characterized by transfers from the central government. Moreover, the elections of the regional Committee in those 5 Regions took place on different dates with respect to the ordinary regional council elections. As we can see in both the tables presented, introducing the Regions with special statute in our dataset does not change the results of the estimations.

We estimate a dynamic panel data model using the Arellano-Bond and Blundell-Bond techniques. The dependent variable is the rate of growth of the per capita GDP for Region i at time t, called $\Delta GDP_{i,t}$ (taken at constant price 1995). Look at the results in Table 1 and 3. Equations (a) report the coefficients of the one-step estimation considering the homoskedastic case. Only in the case of homoskedastic error term the Sargan test have an asymptotic chi-squared distribution; the chi-squared of the one-step Sargan test in the tables reject the null hypothesis that the overidentification restrictions are valid, but it could be due to heteroskedasticity. For such reason, the estimated equations from (b) to (h) have robust standard errors (but the equation (b'') in table 2). In the robust case we can compute the Arellano-Bond test for first and second-order autocorrelation in the first-differenced residuals; the p-value of this test is reported in the last column of the tables: we always reject the null hypothesis of no first-order autocorrelation in the differenced residuals but we cannot reject the null hypothesis of no second-order autocorrelation. First-order autocorrelation in the differenced residuals does not imply that the estimates are

inconsistent but second-order autocorrelation implies that the estimates are inconsistent. Equation (b'') in table 2 has been estimated by using the Arellano-Bond two-steps estimator. Since the rejection of the null hypothesis of the Sargan test in the one-step estimation may indicate the presence of heteroskedasticity, we perform the Arellano-Bond two-step estimator to improve efficiency; the signs and the significance of the coefficients do not change but the two-step Sargan test says that we can no longer reject the null hypothesis that the overidentification restriction are valid[20].

Equations in column (a), (b), (b'), (c) and (d) in table 1 and equations (a), (b), (b'), (b''), (c), (d) and (e) in table 2 are estimated by using the Arellano-Bond dynamic panel data technique; equations (e), (f), (g) and (h) in table 1 and (f), (g) and (h) in table 2 by using the more efficient Blundell-Bond technique; the results do not change. In every equation the variable $Corr_{1,t+1}$ and $ln(Edu)_{i,t}$ are treated as endogenous variables; in equations (b') we add $ln(Inv)_{i,t}$ to the previous endogenous variables. Considering private investments both as strictly exogenous and endogenous variables does not change the results of the estimation (in every prove we made); for such a reason we present only equation (b') as an example of $ln(Inv)_{i,t}$ as endogenous.

Let us start, more in detail, the interpretation of the results.

The most important aim of this work is the analysis of the political determinants of growth. The sign of the variable $Prop_{i,t-1}$ in (a), (b), (b'), (b''), (d), (e), (g) and (h) of both tables is negative and highly significant. It measures the electoral system degree of proportionality. Its negative sign means that the lower the proportionality of the electoral systems the higher the regional rate of growth. It is, then, better for growth to choose a mixed electoral system instead of a pure proportional one. The theoretical explanation of this result is that a more proportional legislature could have a harder time agreeing on which policies to implement than a more majoritarian system, in which there is no need to create coalitions among political parties with different goals to pass the policies; this is the argument underlying the result that less proportional electoral systems produce governments that can better support economic growth. More in detail, majoritarian electoral system promotes the coalition formation of political parties with a common program to win the elections leading to a reduction of *government instability*[21]. Indeed, under a proportional electoral regime, political parties with different goals create coalitions both before and after the elections increasing government instability (due to political fragmentation). But, on the other side, majoritarian systems

[20] Arellano and Bond recommend using the one-step estimator for inference on the coefficients because the two-step standard errors tend to be biased downward in a small sample. For this reason , even if we have computed the two-steps estimator for every equation in both tables always no longer rejecting the null hypothesis that the overidentification restriction are valid, we have shown only one as an example.

[21] *Government instability* means governments with a short lifespan.

are also characterized by greater *political instability*[22] compared to proportional ones. In this light, one can argue that the choice of a mixed electoral system is justified by the intent of a reduction of both government and political instability.

To prove this last statement, we introduce in equations (c) and (f) (of both the tables) a quadratic term $(Prop_{i,t-1})^2$. The coefficient of $Prop_{i,t-1}$ is positive and that of $(Prop_{i,t-1})^2$ is negative (both highly significant) meaning that the shape of the relation between the degree of proportionality of the electoral system and economic growth is an inverted U. Graphically this relation is presented in figure 2; this graph has been constructed by calculating the rate of growth of the per capita GDP (ΔGDP) using the estimated coefficient of *Prop* and $(Prop)^2$ in column (c) of table 1. Precisely, started from the minimum value assumed by the proportionality index (among Regions with ordinary statute) and we increased it by 0,001 until the maximum value; then we calculate the per capita GDP rate of growth as

$\Delta GDP = 5.72*Prop - 3.18*(Prop)^2$.

It is evident from figure 2 that (inside the range of values assumed by the proportionality index inside the ordinary statute Italian Regions) the "best" mixed electoral rule may have a proportionality degree of almost 0.9.

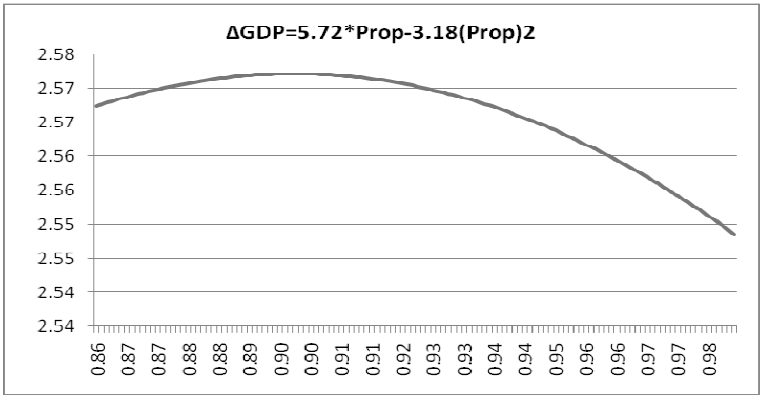


Fig. 2

In our knowledge this is the first paper which uses a measure of proportionality to test how the degree of proportionality of an electoral system affects economic growth. In this way, once showed that a mixed electoral rule better performs than a pure majoritarian or pure proportional rule, one can try to compute the "best" degree of proportionality of a mixed electoral system, that which maximizes economic growth.

[22] *Political instability* means that successive majorities which govern are expression of different political ideologies. Alesina, Ozler, Robini and Swagel (1992), point out that political instability could be defined "as the propensity of a change in the executive either by constitutional or unconstitutional means".

This methodology could be extended to an international context. Indeed the proportionality index we have calculated varies among Regions in the years of elections (see Appendix 1 and 2), which, firstly, allows us to assimilate the Italian Regions to individual countries with mixed electoral systems characterized by varying degrees of proportionality, and, secondly, to purify the econometrics analysis from the difficulties relating to the differences between countries, and consequently make it more precise. The Italian evidence would suggest to opt for a mixed electoral solution instead of pure proportional or pure majoritarian systems.

Look now at corruption. As stated by some literature, the relation between corruption and growth is negative: a more corrupt system is detrimental for growth, and this is what emerged from our analysis. The coefficient of the regressor *Corr* in equations (b), (b'), (c), (e), (f) and (h) of table 1 is negative but not significant; in equations (a), (b), (b'), (c), (e), (f) and (h) of table 2 it is negative and significant; this variable is treated as an endogenous one for the reverse causality problem specified in section 2.2. The variable *Corr* can be interpreted as a measure of government efficiency: corruption causes governments to stray from efficient behavior and adopt policies that are not always in the best interest of a nation, and this reduces economic growth.

One could ask if corruption influences policy implementation in electoral systems: proportional rules could be fertile environment for corruption because of the lesser accountability of politicians which could implement policies in their own interest.

To prove this prediction (as above said) we construct an interaction variable in equations (d) and (g) of both the tables given by the product between the per capita corruption and the proportionality index; this variable, called $Corr_{i,t+1} * Prop_{i,t-1}$, has a negative and significant coefficient. The interpretation (taking the values in column (d) of table 1, for example) is

$$\frac{\partial \Delta GDP}{\partial Corr} = 1.99 - 2.23 * \Pr op$$

an increase in the per capita corruption is as depressing for economic growth as proportional the electoral system is. This result could have important implications. Given that more majoritarian electoral systems are not fertile ground for the spreading of corruption, implementing a mixed rule characterized by a lower degree of proportionality will allows Regions (and probably, Countries) to obtain both a reduction of corruption and a push for economic growth.

As expected, the sign of the coefficient of the *EU* dummy variable is negative and highly significant everywhere. As stated before this variable wants to capture the effects of the economic

policies to enter *EU* on the size of regional rate of growth. The reduction of the debt/GDP ratio, the deficit/GDP ratio and the inflation rate weighed negatively upon growth.

The dummy variable *Ref2001* control for the reform of the Title V of the Constitution which gives greater autonomy of Regions; its coefficient is positive and highly significant but its magnitude is very low, so we can say that, by now, the constitutional reform has not affected economic growth yet.

The variable $Prop_{i,t-1}$* *Gov*, which wants test whether the direct election of the Regional Council Governor affected the effect of proportionality index on economic growth, has positive and significant sign but its magnitude is very low.

$\Delta Pop_{i,t}$ is negative and significant: the higher the regional population rate of growth, the lower the regional rate of growth; as the population grows, if all else is constant, the per capita rate of growth of the economy decreases.

$Ln(G)_{i,t}$ is the logarithm of the level of public consumption spending/GDP in percentage of region *i* at time *t*. The sum of both the significant coefficients of the $ln(G)_{i,t}$ and $ln(G)_{i,t-1}$ is negative meaning that public consumption spending negatively affects Italian regional economic growth. The interpretation of this (sum of the) coefficient is an absolute change in the regional rate of growth due to a relative change in the regional public consumption spending. The positive relation between the public expenses in education and health and the economic growth is well known in literature; but in general the impact of the other items on growth could be negative because they are non productive expenses which require to be financed with some taxes, which is detrimental for growth. The evidence for Italian Regions is of a general negative impact of government consumption spending on economic growth.

The total effect of the private investment (the sum of the sign of the variable $ln(Inv)_{i,t}$ and its lags) on regional growth is not significant in table 1 and positive (where significant) in table 2. This variable measures the absolute change in the regional rate of growth due to a relative change in the regional private investment. This result confirms the prediction of the literature about how private investments affect economic growth.

The effect of the variable $ln(Edu)_{i,t}$ on growth, where significant, is positive as expected. In every equation the family expenses on education is treated as an endogenous variable because of the reverse causality between growth and home expenditure. The variable is taken in natural logarithm therefore the coefficient measures the absolute change in the regional rate of growth due to a relative change in the regional family expenses on education.

The $Ln(Prod)_{i,t}$ variable is a measure of the labour productivity, indeed it is constructed, as explained above, as the ratio between the total added value (meaning the value added in agriculture,

in industry, in market services and in 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 so greater amount of income that can be distributed among the economy's population. With that rising of per capita income the regional economy can provide higher living standard and well-being of regional population.

The total effect of the *School* variable on regional growth is not relevant in table 1 and weakly positive in table 2. The rate of schooling is a measure of the human capital. We relate the annual economy rate of growth with the value of the rate of schooling of the two previous years (the two lags of the variable *School*). Regions with more developed labour force, in terms of better education, are likely to be able to produce more from a given resource base, than less-skilled workers. Moreover, following Romer (1990), we can state that Italian Regions with quality developed labour force, can generate new products or ideas that underlie technological progress. But, probably, these effects would appear in the long run.

In the last columns of tables 2 and 3 we introduce a dummy variable, *D2003*. It takes the value 0 from 1981 to 2002 and the value 1 from 2003 to 2005. In the construction of the dataset we used, we had to combine two different time series made available by ISTAT, one from 1980 to 2003 and the other from 2000 to 2005. Using statistical methods[23], we aligned the data and joint it in a single time series. Then the dummy variable *D2003* is to control for this aspect: its coefficient is not significant everywhere so we can consider the time series as uniform.

5. Conclusions

This work sought to investigate how the degree of proportionality of an electoral system affects the per capita GDP rate of growth. To enrich the poor empirical literature about this very new and interesting topic, we use the data of Italian Regional Council elections from 1981 to 2005. This choice is not limiting for the general analysis because the proportionality index of the electoral system which we construct varies across time over the same Region and across Regions. This is because the Italian electoral Law, both at national and regional levels, changed in the 1990's, characterizing the new electoral system by a lower degree of proportionality; moreover, Italian Regions are quite different in many other socio-political-economic aspects. This allowed us to analyze a changing electoral reality not only over time, but also over individuals (the Italian Regions) which legitimate us to extend the results to an international context.

[23] We calculate the rate of growth of each variable in 2003 using the "new" series 2000-2005 $g=[V(2004)_N-V(2003)_N]/V(2003)_N$; then we multiply this rate of growth to the value of the related variable in 2003 of the "old" series 1980-2003: $\Delta=g*V(2003)_O$; 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 2005.

Using the Arellano-Bond and Blundell-Bond dynamic panel data estimation techniques, we found that the degree of proportionality of the electoral system negatively affects economic growth; moreover, we show an inverted U shaped relation between the electoral system degree of proportionality and the per capita GDP regional growth: mixed rules better perform (in terms of growth) than pure proportional and pure majoritarian rules. Finally, we empirically verify that the way in which corruption affect regional growth, negatively depends on the proportionality of electoral system. This shape of the showed relation should allow to find the "best" degree of proportionality of the mixed electoral system and to write the electoral law in this way. Clearly, an analysis in this sense would perform better with international data, but, by now, there are some difficulties in researching such a data.

Table 1: Italian Regions with ordinary statute

ΔGDP	(a)	(b)	(b')	(c)	(d)	(e)	(f)	(g)	(h)
$(\Delta GDP)_{i,t-1}$	-0.013 (-0.48)	-0.013 (-0.38)	-0.015 (-0.4)	-0.019 (-0.5)	-0.015 (-0.4)	-0.014 (-0.34)	-0.019 (-0.4)	-0.016 (-0.4)	-0.015 (-0.4)
$Prop_{i,t-1}$	-0.13* (-5.86)	-0.13* (-6.18)	-0.14* (-6.4)	5.72* (3.39)	-0.04 (-0.9)	-0.15* (-5.7)	5.35* (3.07)	-0.01 (-0.24)	-0.18* (-7.1)
$(Prop_{i,t-1})^2$				-3.18* (-3.49)			-2.99* (-3.14)		
$Corr_{i,t+1}$	-0.05*** (-1.83)	-0.05 (-0.79)	-0.05 (-0.77)	-0.05 (-0.74)	1.99* (2.3)	-0.06 (-0.81)	-0.06 (-0.8)	2.6* (2.57)	-0.05 (-1.03)
$Corr_{i,t+1} * Prop_{i,t-1}$					-2.23* (-2.45)			-2.95* (-2.6)	
EU	-0.01* (-6.5)	-0.01* (-6.7)	-0.01* (-6.6)	-0.01* (-7.1)	-0.01* (-8.6)	-0.01* (-5.8)	-0.01* (-6.2)	-0.01* (-6.35)	-0.01* (-6.4)
$Ref2001$									0.01* (3.9)
$\Delta Pop_{i,t}$	-1.19* (-14.1)	-1.19* (-16.1)	-1.19* (-16.1)	-1.19* (-17.4)	-1.15* (-16.4)	-1.2* (-20.1)	-1.18* (-21.5)	-1.17* (-19.2)	-1.21* (-22.7)
$ln(G)_{i,t}$	-0.52* (-19.2)	-0.52* (-10.6)	-0.52* (-10.8)	-0.53* (-11.6)	-0.52* (-10.5)	-0.48* (-9.2)	-0.5* (-9.8)	-0.47* (-9.2)	-0.56* (-10.3)
$ln(G)_{i,t-1}$	0.51* (17.2)	0.51* (10.8)	0.51* (11.3)	0.52* (10.8)	0.50* (9.9)	0.49* (9.7)	0.50* (10.2)	0.48* (9.4)	0.58* (10.5)
$ln(Inv)_{i,t}$	0.01 (1.26)	0.01 (1.03)	0.01 (1.06)	0.01 (1.34)	0.01 (0.9)	0.01 (0.7)	0.01 (0.8)	0.01 (0.56)	0.01 (1.13)
$ln(Inv)_{i,t-1}$	0.004 (0.46)	0.004 (0.39)	0.004 (0.38)	-0.002 (-0.28)	-0.004 (-0.4)	-0.008 (-0.66)	-0.006 (-0.5)	-0.006 (-0.5)	-0.01 (-1.41)
$ln(Inv)_{i,t-2}$	-0.01 (-1.35)	-0.01 (-1.34)	-0.01 (-1.31)						
$ln(Edu)_{i,t}$	-0.01 (-0.5)	-0.01 (-0.45)	-0.01 (-0.47)	-0.03 (-1.36)	-0.04*** (-1.8)	-0.01 (-0.4)	-0.003 (-0.14)	-0.01 (-0.55)	0.02 (0.9)
$ln(Edu)_{i,t-1}$	0.03** (2.05)	0.03*** (1.68)	0.03*** (1.61)	0.02 (1.35)	0.036*** (1.76)	0.02 (0.8)	0.01 (0.14)	0.01 (0.6)	-0.02 (-1.05)
$ln(Prod)_{i,t}$	0.23* (5.6)	0.23* (3.4)	0.23* (3.4)	0.26* (3.7)	0.25* (3.7)	0.25* (3.8)	0.27* (4.3)	0.26* (4.2)	0.26* (4.3)
$ln(Prod)_{i,t-1}$	-0.21* (-4.9)	-0.21* (-3.2)	-0.21* (-3.2)	-0.24* (-3.3)	-0.23* (-3.4)	-0.21* (-3.25)	-0.22* (-3.4)	-0.24* (-3.5)	-0.22* (-3.3)
$School_{i,t-1}$	-0.001 (-1.5)	-0.001 (-1.24)	-0.001 (-1.29)	-0.002* (-3.1)	-0.002* (-2.8)	-0.002* (-2.98)	-0.002* (-3.6)	-0.002* (-3.6)	-0.002* (-3.4)
$School_{i,t-2}$	0.001** (2.2)	0.001** (2.02)	0.001** (2.05)	0.0016* (2.56)	0.0016* (3.05)	0.0018* (3.1)	0.0018* (3.3)	0.002* (3.5)	0.001* (2.8)
$D2003$	0.001 (0.5)	0.001 (0.9)	0.001 (0.9)	0.001 (0.3)		0.001 (0.5)	0.001 (0.07)	-0.001 (-0.1)	
$N.obs$	330	330	330	345	345	360	360	360	360
$Sargan\ test$	chi2(294)=396.7 (p-value=0.001)								
$p\text{-}value\ (2\text{-}order)$		0.47	0.47	0.35	0.37	0.61	0.5	0.5	0.4

In parentheses are standardized normal *z*-test values. * significant at 1% level; ** significant at 5% level; *** significant at 10% level.

Equation (a): Arellano-Bond one-step estimation; instruments for differenced equation: D.ΔPop D.ln(Inv) LD.ln(Inv) L2D.ln(Inv) D.ln(G) LD.ln(G) D.ln(Prod) LD.ln(Prod) D.Prop D.EU D.School(1) D.School(2) D.d2003; $Corr_{i,t+1}$ and $ln(Edu)_{i,t}$ are the endogenous variables; we include one lag of the dependent variable as instruments.

Equations (b), (c), (d): Arellano-Bond one-step robust estimation; instruments for differenced equation: D.Prop D.(Prop)^2 D.ΔPop D.EU D.ln(G) LD.ln(G) D.ln(Inv) LD.ln(Inv) L2D.ln(Inv) D.ln(Prod) LD.ln(Prod) D.School(1) D.School(2) D.d2003 D.Corr*Prop; we include one lag of the dependent variable as instruments; $Corr_{i,t+1}$ and $ln(Edu)_{i,t}$ are the endogenous variables.

Equation (b'): Arellano-Bond one-step robust estimation; instruments for differenced equation: D.ΔPop D.ln(G) LD.ln(G) D.ln(Prod) LD.ln(Prod) D.Prop D.EU D.School(1) D.School(2) D.d2003; we include two lags of the dependent variable as instruments; $Corr_{i,t+1}$, $ln(Inv)_{i,t}$ and $ln(Edu)_{i,t}$ are the endogenous variables.

Equations (e), (f), (g), (h): Blundell-Bond one-step robust estimation; instruments for differenced equation: D.ΔPop D.ln(Inv) LD.ln(Inv) D.ln(G) LD.ln(G) D.ln(Prod) LD.ln(Prod) D.Prop D.EU D.School(1) D.School(2) D.d2003 D.(Prop)^2 D.Corr*Prop D.Rif2001; instruments for level equation: LD.ΔGDP LD.Corr(1) L2D.ln(Edu); we include one lag of the dependent variable as instruments. $Corr_{i,t+1}$ and $ln(Edu)_{i,t}$ are the endogenous variables.

D = differences; LD = lagged differences.

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

Table 2: Italian Regions with ordinary plus Italian Regions with special statute

ΔGDP	(a)	(b)	(b')	(b'')	(c)	(d)	(e)	(f)	(g)	(h)
$(\Delta GDP)_{i,t-1}$	-0.016 (-0.6)	-0.01 (-0.5)	-0.01 (-0.5)	-0.007 (-0.06)	-0.03 (-0.9)	-0.03 (-0.9)	-0.013 (-0.4)	-0.02 (-0.5)	-0.02 (-0.5)	-0.01 (-0.36)
$Prop_{i,t-1}$	-0.13* (-6.4)	-0.13* (-6.5)	-0.13* (-7.08)	-0.12*** (-1.66)	3.35** (2.01)	-0.06 (-1.52)	-0.15* (-7.2)	3.59*** (1.65)	-0.04 (-1)	-0.17 (-7.1)
$(Prop_{i,t-1})^2$					-1.88** (-2.08)			-2.02*** (-1.72)		
$Corr_{i,t+1}$	-0.07* (-3.2)	-0.07*** (-1.72)	-0.07*** (-1.83)	-0.01 (-0.16)	-0.06*** (-1.7)	1.35*** (1.88)	-0.1* (-2.8)	-0.08** (-1.9)	2.09* (2.35)	-0.09* (-2.4)
$Corr_{i,t+1} * Prop_{i,t-1}$						-1.51** (-1.9)			-2.31* (-2.41)	
$Prop_{i,t-1} * Gov$							0.01* (5.6)			
$Ref(2001)$										0.01* (4.08)
EU	-0.01* (-7.9)	-0.01* (-7.2)	-0.01* (-6.8)	-0.02** (-2.0)	-0.01* (-7.3)	-0.01* (-8.2)	-0.01* (-5.2)	-0.01* (-6.1)	-0.01* (-6.8)	-0.01* (-5.7)
$\Delta Pop_{i,t}$	-1.24* (-16.3)	-1.24* (-18.3)	-1.24* (-19.7)	-1.32* (-10.2)	-1.22* (-17.6)	-1.15* (-16.4)	-1.2* (-20.2)	-1.21* (-18.2)	-1.17* (-16.7)	-1.24* (-19.7)
$ln(G)_{i,t}$	-0.50* (-20.3)	-0.5* (-11.2)	-0.5* (-11.4)	-0.4* (-5.6)	-0.5* (-11.09)	-0.5* (-10.8)	-0.50* (-11.3)	-0.44* (-9.7)	-0.43* (-9.5)	-0.50* (-10)
$ln(G)_{i,t-1}$	0.49* (19.8)	0.49* (12.2)	0.49* (12.6)	0.35* (3.5)	0.49* (11.5)	0.48* (11.3)	0.52* (11.4)	0.45* (10.2)	0.44* (9.9)	0.52* (10.2)
$ln(Inv)_{i,t}$	0.01*** (1.6)	0.01 (1.4)	0.01*** (1.75)	-0.05 (-0.5)	0.015*** (1.67)	0.01*** (1.65)	0.01 (1.45)	0.01 (1.07)	0.01 (1.01)	0.01 (1.2)
$ln(Inv)_{i,t-1}$	-0.006 (-0.8)	-0.005 (-0.6)	-0.006 (-0.8)	-0.005 (-0.09)	0.005 (064)	0.006 (0.7)	-0.01*** (-1.92)	-0.006 (-0.65)	-0.005 (-0.5)	-0.01*** (-1.7)
$ln(Inv)_{i,t-2}$					-0.01 (-1.44)	-0.01 (-1.5)				
$ln(Edu)_{i,t}$	-0.04** (-2.04)	-0.03*** (-1.7)	-0.03*** (-1.8)	0.008 (0.14)	-0.01 (-0.5)	-0.01 (-0.6)	-0.01 (-0.4)	-0.02 (-1.01)	-0.02 (-1.05)	0.006 (0.3)
$ln(Edu)_{i,t-1}$	0.04* (2.4)	0.03** (2.07)	0.03** (2.06)	0.02 (0.6)	0.03*** (1.4)	0.03*** (1.65)	0.01 (0.4)	0.02 (1.22)	0.02 (1.17)	-0.007 (-0.4)
$ln(Prod)_{i,t}$	0.25* (6.9)	0.24* (4.09)	0.24* (4.08)	0.48** (2.25)	0.26* (4.18)	0.25* (4.2)	0.26* (5.07)	0.29* (4.9)	0.29* (5.2)	0.28* (5)
$ln(Prod)_{i,t-1}$	-0.23* (-6.4)	-0.23* (-4.0)	-0.22* (-4.1)	-0.34** (-2.25)	-0.22* (-3.9)	-0.22* (-3.9)	-0.22* (-4.06)	-0.23* (-4.2)	-0.25* (-4.4)	-0.23* (-4.2)
$School_{i,t-1}$	-0.001* (-2.8)	-0.0013** (-2.07)	-0.0013** (-2.24)	-0.0013*** (-1.7)	-0.001*** (-1.65)	-0.001 (-1.47)	-0.001* (-2.9)	-0.002* (-3.2)	-0.002* (-3.4)	-0.002* (-3.6)
$School_{i,t-2}$	0.001* (3.1)	0.0014* (2.75)	0.0014* (2.79)	0.0013* (2.38)	0.0012** (2.26)	0.0016** (2.2)	0.001** (2.2)	0.0019* (3.6)	0.002* (3.8)	0.002* (3.1)
$D(2003)$	0.001 (0.07)	0.001 (0.08)	0.001 (0.08)	-0.001 (-0.03)	-0.001 (-0.17)	0.001 (0.16)				
$N.obs$	460	460	460	460	440	440	480	480	480	480
$Sargan\ test$	chi2(364)=537.8 (p-value=0.000)			chi2(364)=15.7 (p-value = 1.0)						
$p\text{-}value\ (2\text{-}order)$		0.7	0.7		0.73	0.74	0.88	0.64	0.63	0.6

In parentheses are standardized normal *z*-test values. * significant at 1% level; ** significant at 5% level; *** significant at 10% level.

Equations (a): Arellano-Bond one-step estimation; instruments for differenced equation: D.ΔPop D.ln(Inv) LD.ln(Inv) D.ln(G) LD.ln(G) D.ln(Prod) LD.ln(Prod) D.Prop D.EU D.School(1) D.School(2) D.d2003; $Corr_{i,t+1}$ and $ln(Edu)_{i,t}$ are the endogenous variables; we include one lag of the dependent variable as instruments.

Equations (b), (c), (d), (e): Arellano-Bond one-step robust estimation; instruments for differenced equation: D.ΔPop D.ln(Inv) LD.ln(Inv) L2D.ln(Inv) D.ln(G) LD.ln(G) D.ln(Prod) LD.ln(Prod) D.Prop $D.(Prop)^2$ D.EU D.School(1) D.School(2) D.d2003 D.Corr*Prop D.(Prop*Gov); $Corr_{i,t+1}$ and $ln(Edu)_{i,t}$ are the endogenous variables; we include one lag of the dependent variable as instruments.

Equations (b'): Arellano-Bond one-step robust estimation; instruments for differenced equation: D.ΔPop D.ln(G) LD.ln(G) D.ln(Prod) LD.ln(Prod) D.Prop D.EU D.School(1) D.School(2) D.d2003; $Corr_{i,t+1}$, $ln(Inv)_{i,t}$ and $ln(Edu)_{i,t}$ are the endogenous variables; we include one lag of the dependent variable as instruments.

Equations (b''): Arellano-Bond two-steps estimation; instruments for differenced equation: D.ΔPop D.ln(Inv) LD.ln(Inv) D.ln(G) LD.ln(G) D.ln(Prod) LD.ln(Prod) D.Prop D.EU D.School(1) D.School(2) D.d2003; $Corr_{i,t+1}$ and $ln(Edu)_{i,t}$ are the endogenous variables; we include one lag of the dependent variable as instruments.

Equations (f), (g), (h): Blundell-Bond one-step robust estimation; instruments for differenced equation: D.ΔPop D.ln(Inv) LD.ln(Inv) D.ln(G) LD.ln(G) D.ln(Prod) LD.ln(Prod) D.Prop D.EU D.School(1) D.School(2) $D.(Prop)^2$ D.Corr*Prop D.Rif2001; instruments for level equation: LD.ΔGDP LD.Corr L2D.ln(Edu); $Corr_{i,t+1}$ and $ln(Edu)_{i,t}$ are the endogenous variables; we include one lag of the dependent variable as instruments.

D = differences; LD = lagged differences.

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

Bibliography

Abelman E., Pesevento A.E. (2007) "A Regression Analysis of Electoral Systems and Economic Growth" working paper.

Abramovitz M. (1956), Resource and Output Trends in the United States Since 1870, American Economic Review, Vol. 46, May.

Acemoglu D., Johnson S. and Robison J., (2005), Handbook of Economic Growth (Philippe Aghion and Stephen Durlauf, eds., Elsevier, North Holland) pp. 386-472.

Aidt T., Dutta J., Sena V. (2008), "Governance regimes, corruption and growth: Theory and evidence", Journal of Comparative Economics,36 195–220.

Apergis, N., (2000), Public and Private Investments in Greece: Complementary or Substitute 'Goods'?, Bulletin of Economic Research, 2000, 52, (3), 225-34

Arellanno M., Bond S. (1991) "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equation" *The Review of Economic Studies*, 58: 277-297.

Arellano, M. & Bover, O. (1995), "Another look at the instrumental variable estimation of error components models", *Journal of Econometrics* 68, 29-51.

Arpaia A. and Turrini A., (2008), Government Expenditure and Economic Growth in the EU: Long-Run Tendencies and Short-Term Adjustment, European Economy Economic Papers No. 300

Aschauer D.A., (1989), Back of the G-7 pack: public investment and productivity growth in the Group of Seven," Working Paper Series, Macroeconomic Issues 89-13, Federal Reserve Bank of Chicago.

Baraldi A. L. (2008), "Effects of Electoral Rules, Political Competition and Corruption on the Size and Composition of Government Consumption Spending: an Italian Regional Analysis", The B.E. Journal of Economic Analysis & Policy, Vol. 8 : Iss. 1 (Topics), Article 24.

Barro, R. J, (1991), Economic Growth in a Cross Section of Countries, The Quarterly Journal of Economics, MIT Press, vol. 106(2), pages 407-43, May

Barro, R.J, (1990), Government Spending in a Simple Model of Endogenous Growth, Journal of Political Economy, University of Chicago Press, vol. 98(5), pages S103-26, October

Becker G.S.,. Murphy K. M and Tamura R. F., (1990), Human Capital, Fertility, and Economic Growth, NBER Working Papers 3414, National Bureau of Economic Research, Inc.

Black, D. (1948). On the rationale of group decision making. Reprinted in K.J. Arrow and T.Scitovsky (eds.) (1969) Readings in welfare economics, London: George Allen and Unwin.

Buchanan J.M. and G. Tullock (1962). The calculus of consent. Ann Arbor: University of Michigan Press.

Del Monte A., Papagni E. (2001), Public expenditure, corruption, and economic growth: the case of Italy, European Journal of Political Economy 17, 1-16.

Downs, A. (1957). An economic theory of democracy. New York: Harper and Row.

Easterly, W. and Rebelo, S., (1993), Fiscal policy and economic growth: An empirical investigation, Journal of Monetary Economics, Elsevier, vol. 32(3), pages 417-458, December.

Erden Lutfi and Holcombe R. G., (2006), The Linkage Between Public and Private Investment: A Co-integration Analysis of a Panel of Developing Countries, Eastern Economic Journal, Eastern Economic Association, vol. 32(3), pages 479-492, Summer.

Erenburg, S. J. and Wohar, M.E., (1995), Public and private investment: Are there causal linkages?, Journal of Macroeconomics, Elsevier, vol. 17(1), pages 1

Esteban K., F and Moses S.,(2007), Social Identity and Preferences over Redistribution, CEPR Discussion Papers 6406, C.E.P.R. Discussion Papers

Fabricant, S. (1954), Economic Progress and Economic Change, 34th Annual Report. New York: National Bureau of Economic Research.

Gallagher, M. (1991), Proportionality, Disproportionality and Electoral Systems, Electoral Studies 10, 33-51.

Gallup J. L., Sachs J. D. and Mellinger A. D., (1998), Geography and Economic Development," NBER Working Papers 6849, National Bureau of Economic Research

Ghali, K. H. (1998). "Government size and economic growth: Evidence from a multivariate cointegration analysis". Applied Economics (31), 975-987.

Glaeser, E., La Porta R., Lopez-de-Silanes F., and Shleifer A., (2004), Do Institutions Cause Growth?, Journal of Economic Growth, Vol 9. pp. 271-303

Hall R. E. and Jones Charles I., (1999), Why Do Some Countries Produce So Much More Output Per Worker Than Others?, The Quarterly Journal of Economics, MIT Press, vol. 114(1), pages 83-116

Huntington, S (1968), Political order in changing societies. London: Yale University Press.

Jones, C.I. (1997) "Convergence Revisited" Journal of Economic Growth, 2(2), 131-153

Jorgenson, D.W and Griliches, Z. (1967), The Explanation of Productivity Change, Review of Economic Studies, 34, 249-283.

Kendrick, J.W. (1956), Productivity Trends: Capital and Labor, Review of Economics and Statistics, Vol. 38, No. 3, August, pp. 248-257.

Khan, M. S. and Reinhart, C.M., (1990), "Private investment and economic growth in developing countries," World Development, Elsevier, vol. 18(1), pages 19-27, January

Kolluri, B. R., Panik, M. J and Wahab, Mahmoud S, (2000), Government Expenditure and Economic Growth: Evidence from G7 Countries, Applied Economics, Taylor and Francis Journals, vol. 32(8), pages 1059-68, June

Leduc, L., R. Niemi, and P. Norris, (1996), Comparing Democracies: Elections and Voting in Global Perspective. Thousand Oaks, CA: Sage.

Leff N. H., (1964), Economic Development through Bureaucratic Corruption, The American Behavioral Scientist; 8(3); 8-14.

Levine, R and Zervos, S. (1993), Looking at the facts : what we know about policy and growth from cross-country analysis, Policy Research Working Paper Series 1115, The World Bank

Lijphart A. (1999) "Patterns of Democracy: Government Forms and Performance in Thirty-Six Countries" New Haven & London: Yale UP.

Lijphart A. (1984), "Democracies: Patterns of Majoritarian and Consensus Government in Twenty-one Countries", New Haven: Yale University Press.

Lijphart, A. (1994) "Electoral Systems and Party Systems" Oxford: Oxford UP.

Lucas, R.E. (1988): On the Mechanics of Economic Development, Journal of Monetary Economics, 22:3-42.

Lui, F.T.(1985), An Equilibrium Queing Model of Bribery, Journal of Political Economy; 93; 760-781.

Maddison, A. (1995): Monitoring the World Economy, 1820-1992, OECD Development Centre, Paris

Mauro P. (1995), "Corruption and Growth" Quarterly Journal of Economics, Vol. 110, No. 3 (Aug., 1995), pp. 681-712.

Mauro P. (1998a), "Corruption and the Composition of Government Expenditure", Journal of Public Economics 69, 263-279.

Mauro P. (1998b) "Corruption: Causes, Consequences and Agenda for Further Research" Finance & Development, World Bank, Washington, DC.

Mauro, P. (1997), "The Effects of Corruption on Growth, Investment and Government Expenditure" Elliot, K. (ed.), Corruption and the Global Economy: 83-108

Mendoza C. and Martínez-Vázquez (2000), Assignment of Spending Responsibilities and Service Delivery in Giungale and Webb. (Eds.) Achievements and Challenges of Fiscal Decentralization – Lessons from Mexico, World Bank, Washington D.C

Milesi-Ferretti G.M., Perotti R., Rostagno M., (2002) "Electoral Systems and the Composition of Public Spending", Quarterly Journal of Economics 11, 609-657.

Mueller, D.C. (1989). Public Choice II. New York: Cambridge University Press.

Munnell A. H., (1991), Is there a shortfall in public capital investment? An overview," New England Economic Review, Federal Reserve Bank of Boston, issue May, pages 23-35.

Murphy, K. M., Shleifer, A. and Vishny, R. W, (1991), The Allocation of Talent: Implications for Growth, The Quarterly Journal of Economics, MIT Press, vol. 106(2), pages 503-30, May

Persson T. (2005), Forms of Democracy, Policy, and Economic Development. Centre for Economic Policy Research. 2005. 1-27. 14 Nov. 2006 www.cepr.org/pubs/dps/DP4938.asp

Persson T, Roland G, and Tabellini G., (2006), Electoral Rules and Government Spending in Parliamentary Democracies, Levine's Working Paper Archive with number 784828000000000024, UCLA Department of Economics.

Persson T., Tabellini G. (1999a) "The Size and Scope of Government: Comparative Politics with Rational Politicians" European Economic Review 43, 699-735.

Persson T., Tabellini G. (1999b) "Political Economics and Public Finance" in Auerbach A., FeldsteinM. eds Handbook of Public Economics North Holland.

Persson T., Tabellini G. (2000) "Political Economics: Explaining Economic Policy" MIT Pres, Cambridge and London.

Persson T., Tabellini G. (2003) "The Economic Effects of Constitutions." Cambridge, Massachusetts: The MIT P.

Persson T., Tabellini G., F. Trebbi (2002), Electoral Rules and Corruption, mimeo IGIER Bocconi University.

Powell Jr., G. Bingham, . (2004), The Chain of Responsivness, Journal of Democracy 15.4, 91-105.

Przeworski A. (2004). "The Last Instance: Are Institutions the Primary Cause of Economic Development?" European Journal of Sociology 45(2): 165-188.

Ramirez M. D. and Nazmi N., (1997), Public Investment and Productivity Growth in Mexico," Contemporary Economic Policy, Volume XV, No. 1, January, pp. 65-75.

Rodrik D., Subramanian A.,Trebbi F., (2004), Institutions Rule: The Primacy of Institutions Over Geography and Integration in Economic Development, Journal of Economic Growth, Springer, vol. 9(2), pages 131-165, 06.

Romer, P. (1990), Endogenous Technological Change. Journal of Political Economy, XCVIII, S71-S102. 04): 91-105.

Romer, Paul M, (1986), Increasing Returns and Long-run Growth, Journal of Political Economy, University of Chicago Press, vol. 94(5), pages 1002-37.

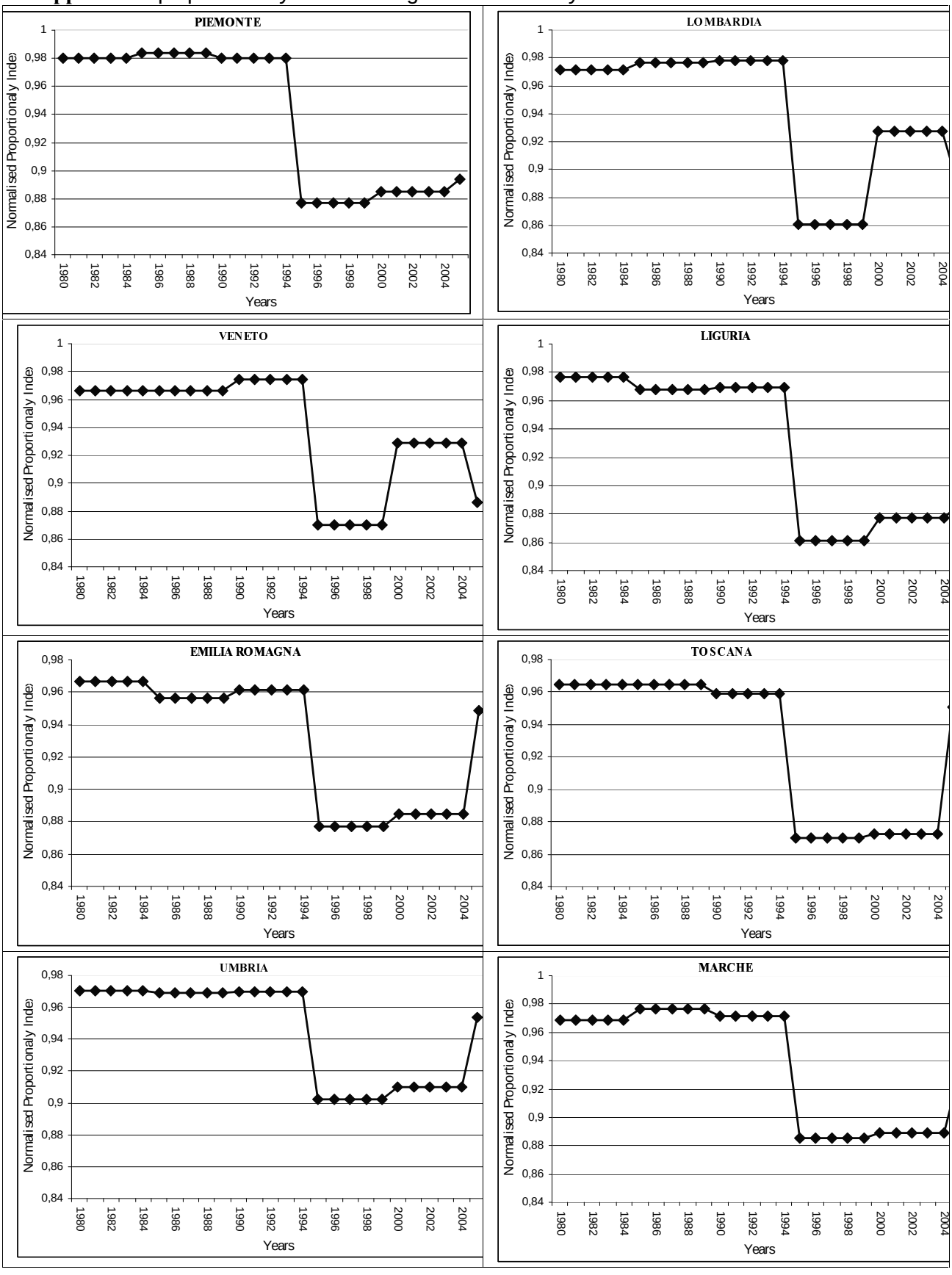
Sala-I-Martin, Xavier. (1997) I Just Ran Four Million Regressions, NBER Working Paper No. 6252, November.

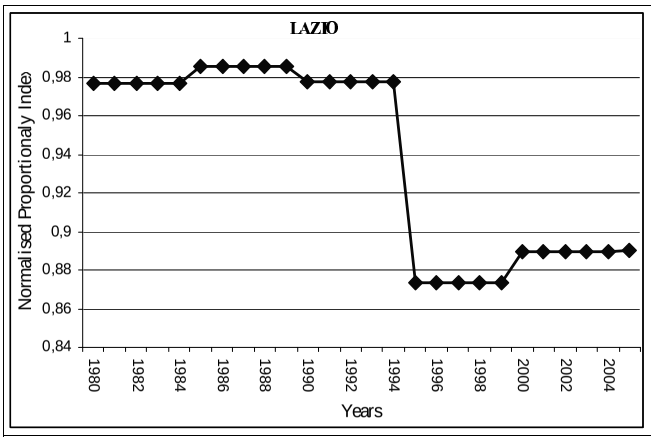
Scartascini, C. and Crain W. M. (2001), The Size and Composition of Government Spending in Multi-Party Systems. Working Papers in Economics 01.05. George Mason University.

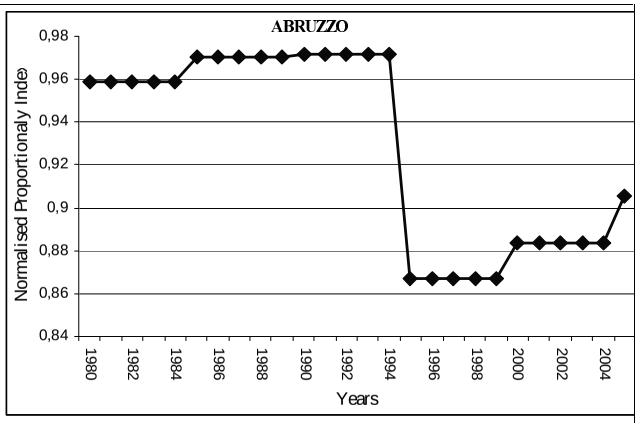
Solow, R., (1956), A Contribution to the Theory of Economic Growth," Quarterly Journal of Economics, February.

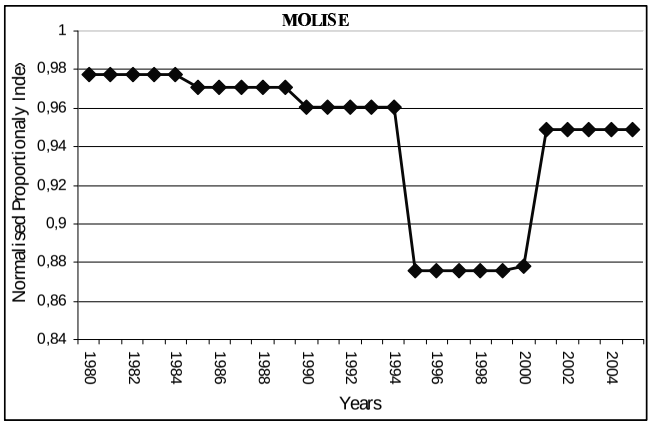
Solow, R., (1957), Technical Change and the Aggregate Production Function, Review of Economics and Statistics, August.

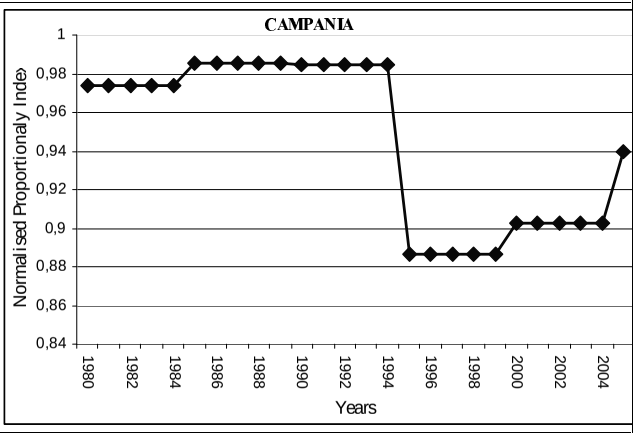
Appendix 1: proportionality index for Regions with ordinary statute

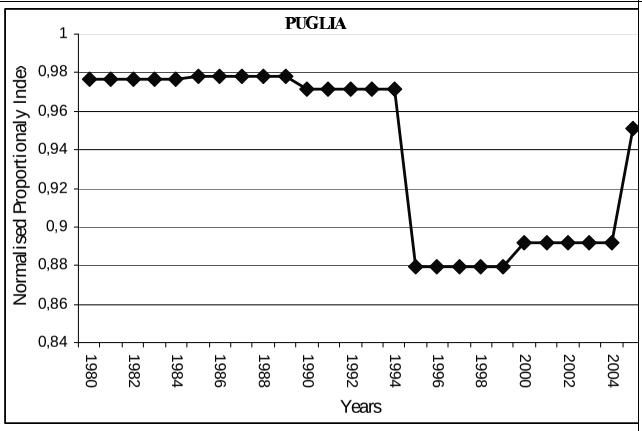


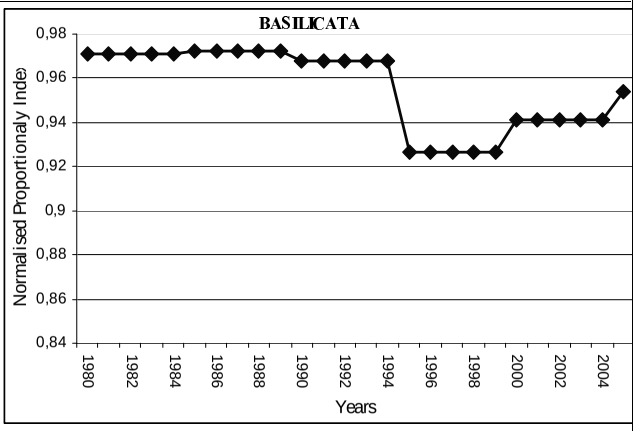

LAZIO
Normalised Proportionaly Index
Years

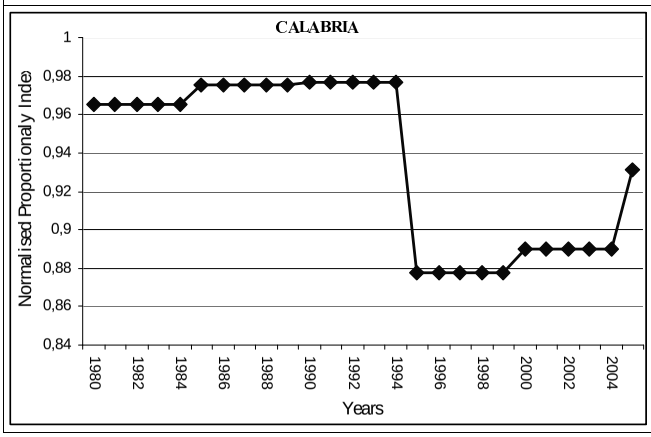

ABRUZZO
Normalised Proportionaly Index
Years


MOLISE
Normalised Proportionaly Index
Years

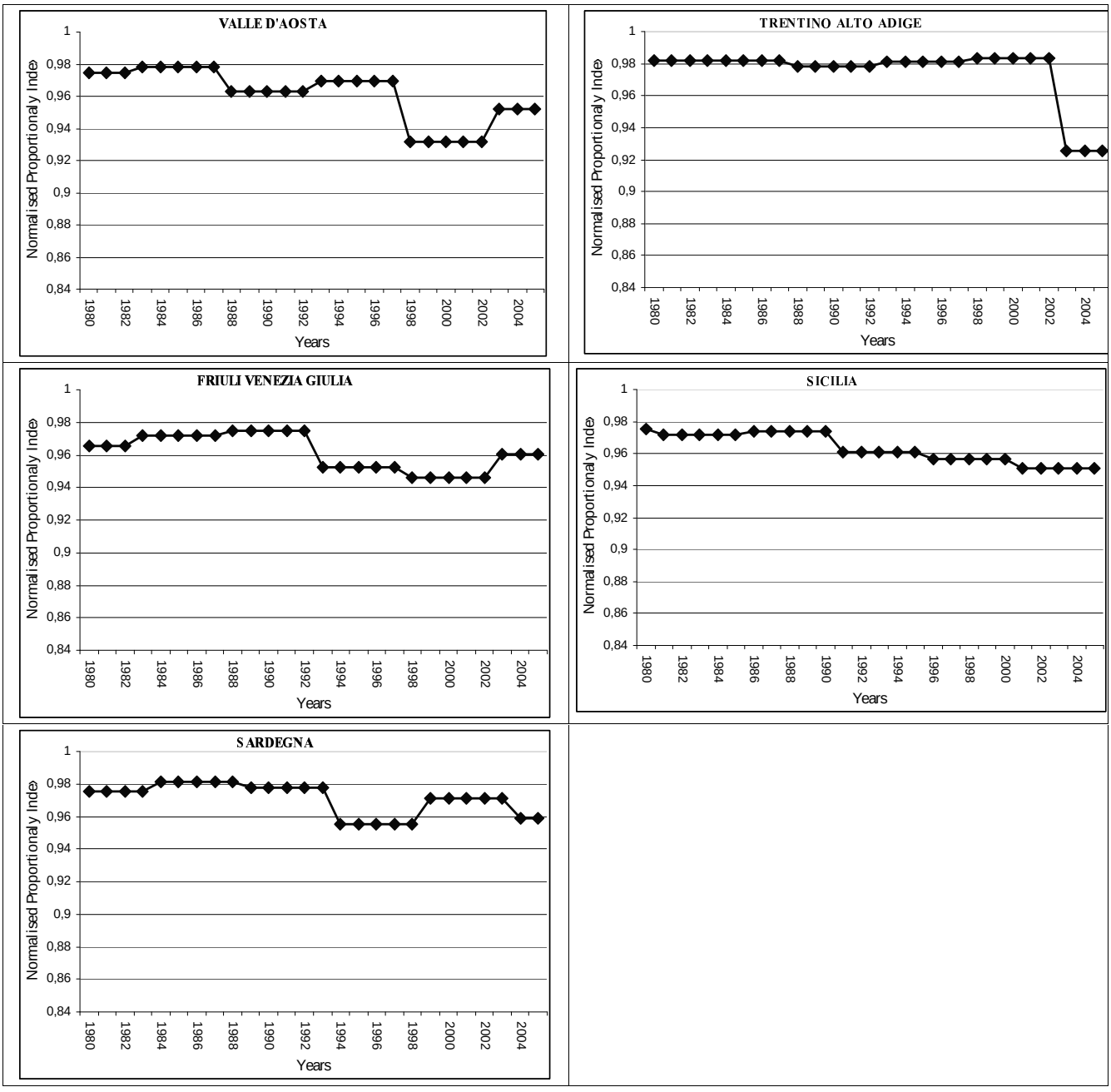

CAMPANIA
Normalised Proportionaly Index
Years


PUGLIA
Normalised Proportionaly Index
Years


BASILICATA
Normalised Proportionaly Index
Years


CALABRIA
Normalised Proportionaly Index
Years

Appendix 2: proportionality index for Regions with special statute



Appendix 3: descriptive statistics of the variables

Table 3: descriptive statistics of the per capita GDP rate of growth

	Mean	Val min	Val max	Stand Dev
Piemonte	0.01	-0.02	0.05	0.02
Valle D'Aosta	0.01	-0.02	0.04	0.02
Lombardia	0.02	-0.02	0.05	0.02
Trentino A. A.	0.01	-0.01	0.06	0.02
Veneto	0.02	-0.02	0.05	0.02
Friuli V. G.	0.02	-0.02	0.07	0.02
Liguria	0.02	-0.02	0.06	0.02
Emilia Romagna	0.01	-0.02	0.05	0.02
Toscana	0.02	-0.02	0.04	0.02
Umbria	0.01	-0.03	0.05	0.02
Marche	0.02	-0.01	0.05	0.02
Lazio	0.02	-0.02	0.06	0.02
Abruzzo	0.01	-0.04	0.05	0.02
Molise	0.02	-0.02	0.07	0.02
Campania	0.01	-0.02	0.04	0.02
Puglia	0.01	-0.03	0.05	0.02
Basilicata	0.02	-0.04	0.09	0.03
Calabria	0.02	-0.03	0.09	0.03
Sicilia	0.01	-0.02	0.07	0.02
Sardegna	0.01	-0.01	0.05	0.02

Table 4: descriptive statistics of private investments/GDP

	Mean	Val min	Val max	Stand Dev
Piemonte	20.47	18.36	23.53	1.48
Valle D'Aosta	22.95	19.26	27.24	2.13
Lombardia	17.80	15.25	21.40	1.70
Trentino A. A.	25.54	22.35	30.04	2.75
Veneto	20.13	17.75	23.12	1.64
Friuli V. G.	20.76	17.04	26.39	2.17
Liguria	14.96	12.14	18.85	1.33
Emilia Romagna	19.74	16.77	22.57	1.59
Toscana	17.04	14.38	19.14	1.49
Umbria	20.25	17.38	22.23	1.14
Marche	19.69	16.18	23.03	1.59
Lazio	17.10	14.74	18.82	1.13
Abruzzo	22.12	18.82	26.03	1.84
Molise	24.59	19.53	32.02	3.56
Campania	24.12	19.15	30.68	4.57
Puglia	19.92	15.97	24.53	1.97
Basilicata	28.35	22.51	39.80	5.20
Calabria	25.22	20.45	28.96	2.36
Sicilia	22.32	18.64	26.83	2.78
Sardegna	25.27	21.28	30.98	2.47

Table 5: descriptive statistics of family expenditure in education/GDP

	Mean	Val min	Val max	Stand Dev
Piemonte	18.16	11.54	37.14	7.03
Valle D'Aosta	25.52	15.40	57.85	11.31
Lombardia	16.78	10.77	32.70	5.88
Trentino A. A.	30.93	18.29	67.63	13.68
Veneto	20.41	13.98	41.83	7.72
Friuli V. G.	20.17	11.49	44.05	8.87
Liguria	22.90	13.24	51.13	10.02
Emilia Romagna	20.23	13.62	40.89	7.55
Toscana	20.21	13.49	39.94	7.08
Umbria	17.35	11.97	31.60	4.99
Marche	20.06	13.24	39.91	7.08
Lazio	17.53	10.82	36.88	6.81
Abruzzo	17.92	11.14	36.67	6.74
Molise	15.75	10.71	32.37	5.77
Campania	18.12	10.87	37.11	6.79
Puglia	19.01	12.06	38.05	7.02
Basilicata	17.80	11.61	36.28	6.80
Calabria	19.69	11.84	37.30	6.99
Sicilia	17.65	11.82	36.87	6.21
Sardegna	18.04	12.17	33.62	5.84

Table 6: descriptive statistics of public consumption expenditure/GDP

	Mean	Val min	Val max	Stand Dev
Piemonte	14.70	13.47	15.61	0.76
Valle D'Aosta	21.98	18.61	26.23	2.14
Lombardia	13.34	11.97	14.70	0.89
Trentino A. A.	18.94	17.77	20.19	0.63
Veneto	15.03	13.07	16.60	1.21
Friuli V. G.	18.27	15.64	21.03	2.08
Liguria	19.00	17.99	20.05	0.60
Emilia Romagna	15.30	13.51	16.89	1.22
Toscana	17.27	15.08	19.22	1.35
Umbria	21.06	18.46	23.52	1.48
Marche	19.27	16.60	21.58	1.65
Lazio	18.65	17.56	19.70	0.63
Abruzzo	21.20	19.50	22.57	0.95
Molise	25.25	23.20	27.44	1.28
Campania	26.20	24.83	27.89	0.89
Puglia	25.19	22.80	26.94	1.36
Basilicata	28.27	23.51	32.39	3.03
Calabria	30.18	26.94	33.52	2.04
Sicilia	27.89	24.40	29.98	1.62
Sardegna	26.92	25.46	28.35	1.02

Table 7: descriptive statistics of pruductivity

	Mean	Val min	Val max	Stand Dev
Piemonte	38.38	30.53	42.84	4.13
Valle D'Aosta	39.59	34.02	43.34	3.03
Lombardia	40.85	32.95	46.01	4.49
Trentino A. A.	37.80	31.54	43.35	4.05
Veneto	35.98	29.21	41.61	4.34
Friuli V. G.	35.60	26.48	43.66	6.03
Liguria	38.39	32.07	43.85	4.14
Emilia Romagna	37.11	30.75	42.95	4.43
Toscana	35.37	29.53	40.19	3.86
Umbria	34.08	27.95	38.65	4.20
Marche	32.11	24.85	37.97	4.89
Lazio	39.90	33.52	44.14	3.77
Abruzzo	32.95	26.77	38.86	3.74
Molise	31.84	23.76	38.43	5.01
Campania	31.49	24.87	36.32	3.76
Puglia	29.66	23.88	34.78	3.64
Basilicata	30.49	22.19	37.10	5.59
Calabria	28.29	21.88	33.87	4.18
Sicilia	33.66	28.76	38.55	3.01
Sardegna	32.27	28.77	36.12	2.76

Table 8: descriptive statistics of rate of schooling

	Mean	Val min	Val max	Stand Dev
Piemonte	71.91	50.63	91.08	13.93
Valle D'Aosta	0.69	0.46	0.91	0.17
Lombardia	69.59	49.20	88.07	13.48
Trentino A. A.	0.60	0.39	0.78	0.12
Veneto	69.78	45.52	89.25	15.49
Friuli V. G.	0.79	0.55	0.97	0.15
Liguria	82.06	62.17	98.14	13.25
Emilia Romagna	78.33	56.62	97.49	14.21
Toscana	78.64	57.42	96.57	14.64
Umbria	84.62	64.25	100.11	13.01
Marche	80.60	57.75	99.38	15.13
Lazio	81.46	61.47	101.02	14.36
Abruzzo	78.40	56.63	97.50	15.56
Molise	75.77	52.67	99.51	16.85
Campania	66.62	47.91	90.63	14.79
Puglia	66.20	44.84	91.81	15.90
Basilicata	76.94	50.48	102.77	17.83
Calabria	70.11	49.91	94.75	15.33
Sicilia	0.66	0.46	0.91	0.16
Sardegna	0.74	0.46	0.97	0.18