INSTITUTIONAL QUALITY AND THE GROWTH RATES OF THE ITALIAN REGIONS: THE COSTS OF REGULATORY COMPLEXITY.

by

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Abstract. In this paper we study the impact of the regulatory complexity, a measure of institutional quality, on the GDP, on per capita income and on the growth rate of the Italian regions. Using the Random Effects and quantile regressions models we are able to quantify the effect on GDP and growth rate of an improvement in two different indicators of institutional quality, making a comparison between the results of regressions using two different indicators of institutional quality. The main finding is that a reduction in regulatory complexity would increase, on average, the growth rate of GDP per capita of around 2.39% per year.

JEL classification: O17, R11.

Keywords: Coordination Externality; Institutional quality; Multi-level governance; Quantile regression; Regional growth rate; Regulatory Complexity.

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1. INTRODUCTION. Since the time of the Roman Emperors, the regulatory complexity has been viewed as a source of corruption and an indicator of the poor quality of public institutions. This ancient point of view is summarized in a statement of Tacitus " ... *Corruptissima re publica plurimae leges* ... "[1] (Tacitus, 110). Recently, the regulatory complexity has increasingly been considered as an indicator of poor quality of institutions and an obstacle to growth in many economies, such as, for example, Australia, European Countries, OECD, United Kingdom (Australian Government, 2011, European Union, 2012, OECD, 2012, 2014, United Kingdom, 2012).

Quandt (1983) in his pioneering theoretical research found that regulatory complexity " ... will tend to be set at socially excessive levels is analogous to market failure in presence of public goods ... ".[2]

Hall and Jones (1999) were among the first to emphasize the determinant role of institutional quality in explaining the differences in the growth rate of countries; following them, many other scholars have investigated this issue. Their main findings are that differences in capital accruement and in total and per worker productivity, may be explained by differences in economic policies and the quality of institutions (Acemoglu *et al*., 2001, Djankov *et al*., 2003, 2006). Institutional quality is the result, among other things, of social infrastructures, like the regulation of all aspects of social life.

The quality of the institutions has been measured in several ways, for example referring to the level of corruption (Barro, 1991), the quality of business regulation (Djankov *et al*., 2006), but no scholars, with the remarkable exception of Kirchner (2012), have attempted to adopt the complexity of regulation as an indicator of

[1] Translated into English: "Too many are the laws when the State is corrupt".
[2] See also Epstein (1995) and Spatt (2012) about the consequences of regulatory complexity.

institutional quality. Kirchner (2012), at a national level (Australia), found a short run negative relationship between per capita income growth rate and regulatory complexity, while in the long run the relationship is positive.

Kirchner uses the length of laws as an indicator of regulatory complexity. We approximate the quality of institutions through two indicators: the regulatory complexity and the duration of civil disputes. Here the regulatory complexity is addressed quantitatively, using the approach of coordination externalities (Ellingsen, 1998) among the different sources of law production, that render it difficult for consumers and firms to understand which is the correct rule to be observed. This is especially true in countries with a multi-level government system, where there are many sources of law: international institutions (for example, the European Union, EU for short), central state, regions[3] and constitutional court, may all produce regulation, without any coordination among them.

The length of civil disputes is another indicator of institutional quality that measures the capability of the public sector of the economy in managing the enforcement of private law efficiently (Silbey and Sarat, 1989, Djankov *et al*., 2003). Both indicators of institutional quality are considered in the empirical analysis for purposes of comparison of results and for their implications for economic policy.

In this paper we refer to Italy, a member country of the EU, divided in twenty regions,[4] with a Constitutional Court that pronounces sentences with the value of laws (for citizens and judges). Italy may be considered a good example of a country with a multi-level governance system, such that the approach developed here could be applied to many other economies.

[3] Regions possess a legislative power, effectively limited within their borders. Unlike Djankov *et al*. (2006) we do not have data on the quality of regulation regarding business, but we use data regarding the regulation of social life .

[4] Among the twenty Italian regions, five of them possess a special statute and, comparable with the remaining fifteen regions, have a stronger authority to legislate within their borders, with the limit of respecting EU regulation and Constitutional norms.

In the data set we consider, among other variables, an indicator of regulatory complexity that never been used before in macroeconomic analysis to study quantitatively the costs of regulatory complexity.

In the economic literature there are not previous attempts to give a measure of the costs of regulatory complexity due to the negative externality of coordination among different sources of law production. This research try to fill this gap in economic literature to shed light on this issue and suggest suitable measures of economic policy

We estimate the costs of regulatory complexity on the regional GDP, per capita income and its growth rate, using, alternatively, the two indicators of institutional quality considered in this research (i.e. indicator of regulatory complexity and civil disputes duration).

The rest of the paper is organized like follows. After this short introduction, in Section two we survey the economic literature on regional growth and the costs of regulatory complexity. Section three is devoted to describe the variables enclosed in our data set and performing preliminary analysis of data. In Section four we perform the econometric analysis and estimate the costs of regulatory complexity. Section five conclude the paper with final remarks.

2. LITERATURE SURVEY. Since the seminal studies by Hoover and Fisher (1949) and Kaldor (1970) that applied the paradigms of macroeconomics to the regional growth, there has been a flourishing studies in this field (for a detailed literature review see Alesina and Perotti. 1994, Roberts and Setterfield, 2007). In general the economic theory of the growth has evolved over the years putting emphasis on the accumulation of physical capital (Harrod, 1939 and Domar, 1946), and on technological development (Solow, 1965), and on accruing of human capital (Lucas, 1988, Romer, 1990). The last strand of research to explain the determinants of economic growth is the so-called “new

institutionalism approach" that put emphasis on institutional quality driving the growth (North and Thomas, 1973, North, 1990, Williamson, 1985). Despite the great effort to address the issue of the impact of institutional quality on the growth rate and welfare at a national level (see, for an updated survey, Valeriani and Peluso. 2011), there are few analyses performed at a regional level, as argued by Charron and Lapuente (2013). Within this tiny stream of the economic literature we may refer to the paper of Bruns *et al*. (2015) who attempts to shed lights on the relationship between the institutional quality and regional economic growth. In their analysis they depart from the assumption that institutional quality cannot be measured directly, so they use like indirect proxy of institutional quality the residual variation in regional growth, that includes the effect of the fundamentally latent variable that is the institutional quality. Bartlett *et al*. (2013) have investigated the relationship between institutional reform and economic growth in the former socialist countries, showing that the simple inclusion of these nations in the European Union and the implementation of Continental laws, didn't warranty an improvement in economic conditions. Their most important result is that country level institutional quality is of greater important to entrepreneurial activity and to explain the growth

Within this field of research there are many scholar that have investigated the determinants of growth in the regions of Italy. For example, Dotti *et al*. (2014) have studied the negative impact on regional growth of brain drain from the Southern Italian regions to the northern. Coccorese and Silipo (2014) put emphasis on the financial development like a determinant of the growth process. They found that it has not been relevant, in the period since 1960 to 1980, while the opposite was happened in the twenty subsequent years. Corsatea (2014) investigate the impact of renewable energy technologies adoption on region GDP. He conclude his research highlighting the role of local resources and local policies to support the diffusion of more environmental

friendly sources of energy, for economies that wish to strive to become more self-reliant and less import intensive in the knowledge sector. Aiello and Cardamone (2012) attempt to estimate the effects of technological spill-over among the Italian regions. Their most important results are that the domestic and imported innovations have a greater impact in the North of Italy than in the rest of the country, and these two channels of R&D diffusion are weak substitutes, without significant territorial differences.

Padovano (2012, 2014) in two recent studies has proved the relevance of most political determinants and of standard economic and socio-demographic determinants of interregional redistribution, he also underline the effects of differences in type of expenditures and intergovernmental relations. In the most recent research the strategic interactions between central and regional governments, under the assumption of incomplete information forces, the regional government to form expectations about the amount of transfers that each region will receive from the central State. The empirical analysis performed, in the time span since 1995 to 2009, support the hypothesis of soft-budget constraint in the regions.

Marra (2014) address an extremely narrow aspect of the regional growth in Italy, like the negative coordination externalities emerging in the management of European Structural Fund programmes, that are more and more delegated to the local authorities, in consideration of the assumed their best knowledge of socio-economic conditions. Despite this advisable assumption, she found that the lack of coordination between central and local policy makers, which make useful an improvement in coordination mechanism to fight the corruption and the waste of public money.

In a multi-level government country like Italy, where there are at least four sources of regulation, like European Uninon, national parliament, regional councils and the sentences of Constitutional Court, working without coordination (formal or informal). The conflicts (actual and potential) between national laws and European

legislation are solved *ex post* by the European court, while the conflict between domestic law and the constitutional Charter are decided by the Italian Constitutional court. Italy has suffered from an internal conflict caused by two contrasting factors. After the II World War an attempt was made to promote the decentralization of laws and regulations, and this process has been amplified since 1990 and 2001 by the moves towards federalism (Lippi, 2011, OECD, 2012). On the other hand, affiliation of Italy to the European Union and the creation of the Euro (the European common currency) has led to the need for a more centralized legislation and regulation, to avoid any opportunistic behaviour of the countries belonging to the EU. Thus in Italy two opposite forces have been simultaneously at work since the late fifties, in the process of centralization and decentralization of non-budgetary policies such as regional laws. This overlapping of laws maybe a source of confusion and uncertainty like suggested by Bardhan (2002) in a theoretical framework, among regulations with the same effectiveness (for example national laws, sentences of constitutional courts, regional laws) creating horizontal negative externalities of coordination, and among regulations with different effectiveness (for example between national laws and sentences of constitutional courts, etc.) sources of vertical negative coordination externality (Büchs, 2009, introduce a similar concept referring to the state structure).

[**Figure 1, about here**]

European regulation always prevail on the other three sources of regulation, so this kind of nevative coordination externality can not be traced to either category. In a more general framework Bardhan (2002) bring argument to be skeptic about the positive effects of decentralization of legislative power from central State to regions.

In consideration of the non-linear relationship between the indicator of regulatory complexity and the negative coordination externalities (like shown in Figure 1) we may represent it like in the Figure 2, reported below

[**Figure 2, about here**]

This means that the relationship between the indicator of regulatory complexity and the Gross Domestic Product may be represented like a curve that for low levels of negative coordination externality show a positive relationship, because the benefits of additional regulation are greater than their external costs, thus helping to increase the GDP. This positive relationship between GDP and aci correspond graphically at the increasing branch of the curve represented in Figure 3.

[**Figure 3, about here**]

Reached the optimal level of regulatory complexity aci* (corresponding with the maximum level of GDP*), additional laws will reduce the GDP because the marginal cost of regulatory complexity negative coordination externality becomes greater than the marginal benefit.

3. DATA AND METHODOLOGY. We used data published in the official website of the Italian National Institute of Statistics (ISTAT). The data regarding the different kinds of regulations were drawn from the Official Gazette of Italy, the European Community and the Italian Regions. The data set covers seventeen years, from 1995 to 2011. A full description of the variables is provided in Table 1, reported below

[**Table 1, around here**]

In this research we considered four types of data.

3.1 DEPENDENT VARIABLES: The dependent variables, expressed at a regional level, are Gross Domestic Product (reggdp), per capita income (pcreggdp) (given by GDP divided by the regional population regpop) and growth rate of per capita income (reggrowth).

3.2 INDEPENDENT VARIABLES: Following the approach of Djankov *et al*. (2006), that assumes a strong correlation between the GDP and its initial level, we included

among the covariates, in each regression, the dependent variable defined at the 1995 level. In the case of growth rate of pcreggdp, we considered as regressors its natural logs defined at 1995.

The first measure of institutional quality is an aggregate indicator of the complexity of regulation (aci), given by the unweighted sum of the annual flows of four sources of regulation: EU, national parliament, regional councils and Italian Constitutional Court, for each of the Italian regions and for all the period considered (Di Vita, 2010, 2012).

These four sources of law production often (or always) work without any coordination. This is a source of confusion about the rules that govern a specific aspect of social and economic life, that generates uncertainty among the agents of our economy and makes the work of judges very hard, because they must determine the right law to enforce. On the grounds that the coordination externality, among the different sources of the law, increases with the number of regulations, we seek to test if a great number of regulations is harmful for the economy.[5] It is worthwhile to say that we refer to the national flows of laws, because the stock of regulations still in force is unknown even to the government. We are not able to measure the extension of each law, so their number is assumed like a proxy.

3.3 CONTROL VARIABLES: Among the potential control and instrumental variables we considered, at the regional level, the ratio between public expenditure and GDP (reggov), the frequency of religion cult places (religion), the surface area (surface), the number of provinces (prov) and municipalities (mun), and finally the population (rpop). In the analysis we consider the ratio between public expenditure and GDP, that is a measure of the State intervention at regional level. The other variables

[5] On another hand we can assume that more detailed regulation makes it easier to understand the rule to be applied. In other words, a trade-off may emerge between the negative coordination externality among the different sources of regulation and the extension of rules that may regulate social life in a more precise way (rules v/ standards).

listed previously were enclosed in the analysis because are considered a good instrumental variable, useful to address the problem of possible bias in the regressions results due to potential endogeneity.

3.4 DUMMY VARIABLES: Due to the hypothesis made about the coordination externality among the different sources of regulation, we created four dummies accounting for four quartiles (dum1aci, dum2aci, dum3aci, dum4aci), of aggregate indicator of the complexity of regulation (aic). The binary variables assume the value of one if the observation falls in the quartile considered and zero otherwise, considering the different kinds of coordination externality. The dummy of the first quartile accounts for the low level of negative coordination externality, and so on for the second and third. The fourth quartile dummy considers the highest negative coordination externality among the sources of regulation.

In a similar way we created four more dummy variables to account for differences in the duration of civil disputes (dur). Also in this case we created four dummies (dum1dur, dum2dur, dum3dur, dum4dur), that take the value of one if the observation falls in the quartile considered and zero otherwise. The dummy of the first quartile considers the disputes with the shortest duration, and so on for the second and third. The worst quartile (the fourth) considers the disputes with the longest duration.

The analysis moves from the observation that among the explanatory variables, there are major differences among the twenty Italian regions as we may see from the summary of statistics reported below in Table 2

[**Table 2, about here**]

Thus it is possible for the effects on regional growth rates of quality regulation and civil disputes duration to differ among the quantiles in the conditional distribution of test score changes. Thus we may give a quantitative dimension to the impact of each

covariate on the explanatory variable and compare the effects of different economic policies.

3.5 OMITTED VARIABLES: Although there may be a problem of omitted variables, because there are many possible factors that could have influenced the levels of GDP in the seventeen years considered, we may affirm that are not verified events that systematically differences among the twenty Italian regions within the time span considered. To address this statement in a more scientific way we perform the Hausmann test for omitted variables, make a comparison between the results of regressions using the econometric models of random effects and fixed effects. The Hausman test statistic is 1.02 and differences in coefficients are not systematic. Based on these results we may skip the problem of potential omitted variables.

Preliminary information about the variable reported in our data set could be drawn from the correlation matrix reported below

[**Table 3, about here**]

Note that the two indicators of institutional quality are positively partially correlated, this means that they are complements and their semi-elasticity is positive. This may be explained considering that regulatory complexity has been considered one of the reasons of the slowness of civil justice around the world (Kaplow, 1995).

Our approach is based on quantile regressions, which estimate the impact of covariates on the dependent variable, at different points of its (dependent variable) conditional distribution (Eide and Showalter, 1998). Here the condition to apply the quantile regression (Koenker and Portnoy, 2001) is satisfied because the covariates considered show a high variability, as documented in Table 2.

After performing the Hausman test we found evidence that random effect (RE) econometric model is better than OLS and fixed effect (FE) model, because the null

hypothesis is rejected for OLS (Prob>chi2 = 0.7796) and FE (Prob>chi2 = 0.7378), in favour of RE.

The rationale behind of the use of a random effects model is that, unlike the fixed effects model, the variation across entities (in our case the Italian regions) is assumed to be random and uncorrelated with the predictor or independent variables included in the econometric model.. Moreover, the RE econometric model seems to fit better to our problem because the preliminary analysis of data support the hypotesis that the differences among regions may have some influence on our dependent variables.

4. ECONOMETRIC ANALYSIS AND ESTIMATION OF THE COSTS OF REGULATORY COMPLEXITY. The analysis departs from a simple RE econometric model to consider the longitudinal aspect of the unbalanced panel data set. Like dependent variables we consider different measures of growth and welfare. In particular we regressed the GDP, the per capita income level and the per capita regional growth with respect to their levels in 1995. Subsequently, the first indicator of institutional quality (aci) was included among the covariates.

The results of these regressions are reported, respectively, in Table 4, columns A1-A2, B1-B2 and C1-C2, below

[**Table 4, around here**]

To address the issue of the potential effects of an improvement in institutional quality through a reduction of the complexity of regulation, we also ran regressions using as covariates three of the four dummies of quartiles accounting for coordination externalities, to avoid the so-called “dummy trap”, including the dummies for the first (the best) and the fourth (the worst) quartiles for purposes of comparison (see Table 4, columns A3, B3 and C3). Finally, to address the problem of potential endogeneity we

also performed RE EC2SLS using Baltagi Estimator, and like instrument the frequency of cult places (again Table 4, columns C4 and C5).

4.1 COMMENTS ON REGRESSIONS RESULTS.

The regional GDP and the per capita income are essentially explained by their values at the beginning of the period. As in Barro (1991) and Djankov *et al.* (2006) we found that there is an inverse correlation between the per capita income growth rate and its value at the beginning of the period, although it is not usually statistically significant.

From the results of the regression reported in Table 4 we may affirm that the indicator of the complexity of regulation negatively effects the level of regional GDP, per capita regional income and its growth rate. In particular we may observe that it possesses a negative algebraic sign with regard to the GDP and pcreggdp and is always statistically significant at the 1% level.[6]

REGIONAL GDP

When we consider the GDP as dependent variable, the R-squared increases when the indicator of complexity of regulation is included among the regressors. Using the dummies for quartiles of the complexity of regulation we can see from Table 4, column A3, that the regional GDP increases by of 24.051,77 (expressed at market prices in millions of current €), when we move from the worst to the best quartile of complexity of regulation.

Coherently with our hypothesis we find that the dummy variable accounting for the best quartile (first) to the worst (fourth) changes its algebraic sign, remaining statistically significant at the 1‰ level. This result confirms that complexity of regulation reduces the GDP, in other words few numbers of laws have a positive impact for regional GDP, while excessive regulation production have a negative effects because

[6] We also run regressions using the indicator of complexity of regulation weighted by the regional population instead of aci, but the results remain substantially the same.

the negative coordination externalities due to regulatory complexity outweigh the benefits of additional regulations (like graphically described in Figure 3).

PER CAPITA REGIONAL GDP

The results did not change when per capita income was used as dependent variable. Also in this case R-squared increases significantly when aci is included among the covariates. In this hypothesis, when we move from the worst to the best dummy accounting for the quartile of coordination externality among different sources of regulation, the pcreggdp increases on average, during the time span considered, by € 6.888,51 per capita.

GROWTH RATE OF PER CAPITA GDP

To address the dynamics of the relationship between the per capita income and the indicator of regulatory complexity, we used as dependent variable the growth rate of per capita regional income, and took the natural logs of aci. We found, as in Djankov *et al*. (2006), a negative relationship with respect to the per capita income at the beginning of the period, and that by adding the index of regulatory complexity among the covariates the value of R-squared jumps from 0.0017 to 0.2631. This means that the regulatory complexity may alone explain more than one quarter of the growth rate of the per capita income! Surprisingly, the coefficient of this covariates possesses a positive algebraic sign, and is strongly statistically significant. Despite this, the dummies of first and second quartile show a negative algebraic sign and are both statistically significant. We cannot perform any comparison between the best and the worst quartile, because the fourth dummy is not statistically relevant.

To exclude the possibility that these results are due to endogeneity between the growth rate of per capita income and the natural log of pcreggdp at the beginning of the period, we performed the regression again using the model of RE instrumental variable

(EC2SLS), enclosing as instrument the average, from 1995 to 2011, of the frequency of places of religious worship of the citizens (Altonji *et al*., 2005).

Even when we use the two stage instrumental approach (EC2SLS) to address the issue of potential endogeneity, we get the same value of R-squared as when using the RE model, and the index of regulatory complexity remains positive algebraic sign and it is also strongly statistically significant.[7]

Due to the high variability of aci, especially for the observations above the mean, as it is possible to see from Table 2 (Summary statistics), we decided to perform the regressions using the quantile approach. The outcome of these regressions is listed in Table 5, below

[**Table 5**]

Once again we found that regulatory complexity diminishes the growth rate of per capita income. Making a comparison between the second quantile and the fourth quantile, we may observe that the per capita income growth rate increases by 2.39% when we move from the fourth to the second quantile. A similar result is obtained when we refer to the estimate coefficients of the four dummies for regulatory complexity, reported in Table 4. In fact when we switch from the second quartile to the first quartile, the growth rate of per capita income increases by 2.84% (note that the dummy accounting fourth quartile, the worst, is not statistically significant). This confirms our previous results.

For the purpose of comparison we already performed regressions using as indicator of institutional quality the duration of civil disputes instead of the indicator of regulatory complexity, leaving the dependent variables unaltered. The results are reported in Table 6, below

[7] Even using as instrument variable the regional surface area and the number of the municipalities, the indicator of complexity of regulation still remains with a positive algebraic sign and is strongly statistically significant. The results of these regressions are available from the author.

[**Table 6**]

The duration of civil disputes strongly affects the GDP. This variable possesses a positive algebraic sign and is strongly statistically significant. The dummy accounting for the first quartile (the best) with the shortest duration of disputes has a positive impact on the GDP, while the fourth dummy, considering the longest duration of civil disputes, negatively affects the gross domestic product. In this hypothesis the loss in terms of GDP incurred by having a long duration of disputes is about 10.487,55 million euros at the current market price, lower than the loss in the case of complexity of regulation! This result is surprising because the slowness of justice has been considered one of the constraint to the growth in developed countries, while we show that regulatory complexity have a negative and stronger, than disputes duration, impact on several important economic variables.

Even considering the results of regression using the per capita GDP, reported in columns B of Table 6, we may observe that the duration of civil disputes is a constraint on the pcreggdp, and that moving from the fourth (the worst) to the first (the best) quartile the per capita income may increase by 3.623,81 € at current prices, on average during the period considered. This loss of per capita income is lower than that which occurs as a result of the complexity of regulations. Finally, the impact on the growth rate of per capita income of the time required to decide civil disputes is rather quantitatively irrelevant, but the negative impact of this independent variable is confirmed, although the dummy accounting for the first quartile shows a positive algebraic sign.

Making a comparison between the results obtained using as indicator of institutional quality the indicator of complexity of regulation and the length of civil disputes, we find that the effects of the per capita growth rate are greater in the first case. This means that from the policy maker's point of view it is more efficient to

reduce the burden of regulatory complexity and gain, as an advisable by product, a reduction in the duration of civil disputes due to a simpler application of the law and its enforcement.[8]

Finally, to check for non linearity of relationship between the GDP, the per capita income, the growth rate of per capita income and the indicator of regulatory complexity, we run the regressions again enclosing among covariate the square of aci. This explanatory variable always possess a negative algebraic sign and was statistically significant at 1‰.[9] Note that the square of regulatory complexity indicator capture in full the social cost due to the negative coordination externality.

5. FINAL REMARKS.

Our outcome confirms different effects of the quality of legislation in the short run (absolute values) and long-run (rate of growth). In the short run, our measure of complexity of legislation has a negative impact on the regional GDP level and per capita GDP.

As in Djankov *et al*. (2006) we find a negative relationship between the per capita GDP regional rate and the indicator of complexity of legislation calculated at a regional level.

The indicator of quality of legislation shows, as in Kirchner (2012), a different algebraic sign in the short-run and in the long-run analyses. In particular, the negative impact of complexity of legislation is confirmed by the quantile regression for which we found that only the dummy variable accounting for the first quantile (the best) is

[8] The elasticity of civil disputes duration with respect to the indicator of regulation complexity is positive and equal to $\varepsilon = 1.0161$ (the natural log of the two variables are positively correlated at 0.1917, with a statistically significance at 1%). This means that a reduction of regulation complexity of 10% determine a reduction of a greater amount of the length of civil disputes.

[9] The results of these regressions are available, upon request, from author.

negatively and strongly statistically significant (at the 1% level in the natural log) with respect to the growth rate of per capita income.

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FIGURE 1
NEGATIVE COORDINATION EXTERNALITIES AND DIFFERENT SOURCES OF LAW

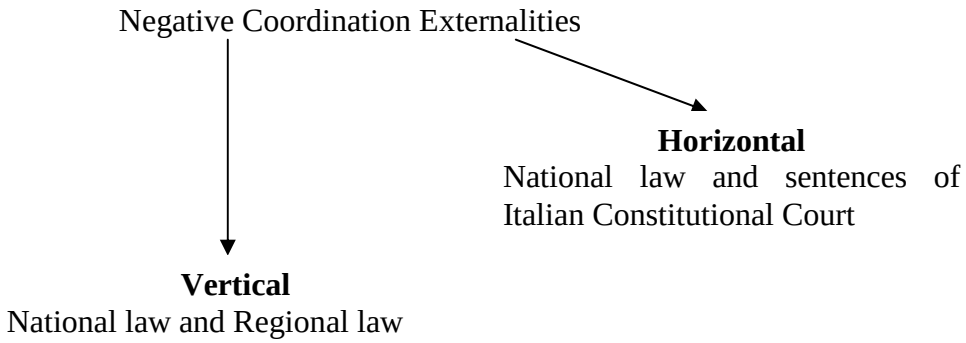

FIGURE 2
INDICATOR OF REGULATORY COMPLEXITY AND NEGATIVE COORDINATION EXTERNALITIES

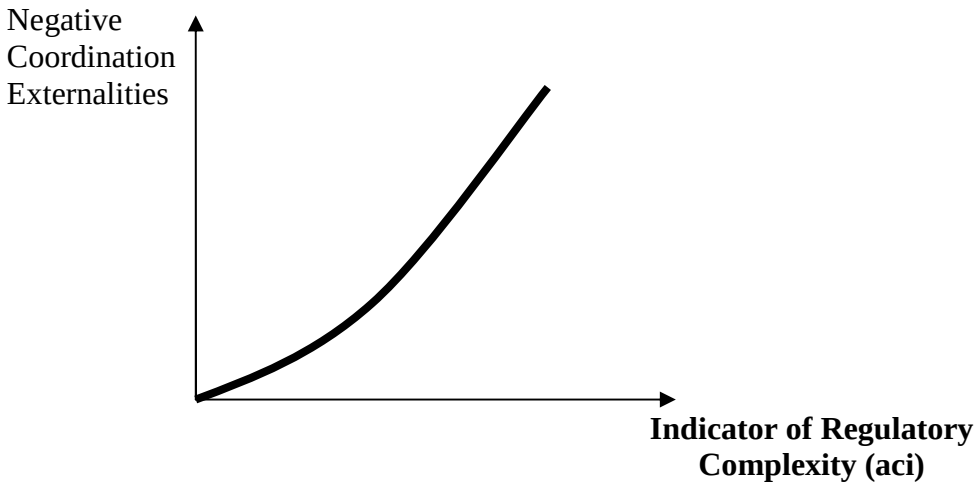

FIGURE 3
THE RELATIONSHIP BETWEEN THE GDP AND THE INDICATOR OF REGULATORY COMPLEXITY

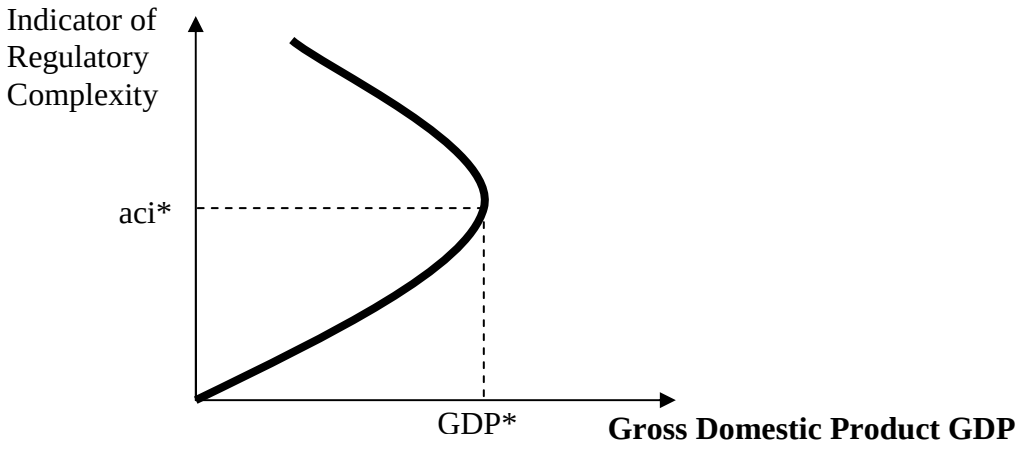

TABLE 2
SUMMARY STATISTICS

Variables	Obs.	Mean	S.D.	Min.	Max
(1) Regional Gross Domestic Product (GDP) (reggdp)	340	66698.36	64303.71	2813	333475
(2) Regional GDP at 1995 level (reggdp95)	340	22802.36	7881.186	9946	51475
(3)) Aggregate complexity indicator of regulation (aci)	340	971.7	164.8088	681	1373
(4) Regional GDP per capita (pcreggdp)	340	22802.36	7881.186	9946	51475
(5) Regional GDP per capita 1995 (pcreggdp95)	340	17000	5794.104	9947	34292
(6) Growth rate of per capita income (reggrowth)	340	.02853	.0309	-.29313	.0858
(7) Time to decide a civil dispute (dur)	248	1229.87	483.1628	464	3128
(8) Regional frequency of religion cult places (religion)	340	34.48971	7.497707	20.5	53.2
(9) Ratio regional public expenditure/regional GDP (reggov)	340	-155.1019	2054.871	-.31143	.59943
(10) Regional surface (surface)	340	14838.84	7156.718	13.606	25832
(11) Regional provences (prov)	340	5.5	2.996064	1	12
(12) Regional municipalities (mun)	340	326.3766	249.1865	1.531	1206
(13) Regional Population (rpop)	340	2877.594	2338.125	116	9959

TABLE 1

DESCRIPTION OF THE VARIABLES AND DATA SOURCES

VARIABLES NAME	DESCRIPTION
(1) Regional GDP at market prices (reggdp)	Regional Gross Domestic Product expressed in millions of current euro. ♣
(2) Regional GDP at 1995 (reggdp95)	Regional Gross Domestic Product expressed in millions of current euro at 1995 levels. ♣
(3) Aggregate complexity indicator of regulation (aci)	This is an aggregate complexity indicator of regulation. It is given by the unweighted sum of European directives, national and regional laws, and Italian Constitutional sentences Sources: Official Gazette and our elaboration.
(4) Per capita regional GDP at market prices (pcreggdp)	Per capita regional gross domestic product expressed in current euro. ♣
(5) Per capita regional GDP at 1995 (pcreggdp95)	Per capita regional gross domestic product expressed in millions of current euro at 1995 levels. ♣
(6) Growth rate of reg.per capita GDP (pcreggrowth)	This is the growth rate of regional per capita GDP. ♣
(7) Time to decide a dispute (dur)	It is given in days from the date of public session until the decision is deposited with the clerk of the court. ♣
(8) Regional frequency of cult places (religion)	Is the percentage of regional residents in respect of population that frequent the cult places. ♣
(9) Ratio regional public expenditure/regional GDP (reggov)	Is the ration between the regional public expenditure and the regional GDP in percentage.. ♣
(10) Regional surface (surface)	Regional surfaces measured in kilometers squared. ♣
(11) Regional provinces (prov)	Number of provinces for each regions. ♣
(12) Regional municipalities (mun)	Number of municipalities for each regions. ♣
(13) Regional Population (rpop)	Regional population (annual average) expressed in thousands. Source: ISTAT.

Legenda: ISTAT is the Italian Institute of Statistics. ♣ Source ISTAT.

TABLE 3
CORRELATION MATRIX

	VARIABLES												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) reggdp	1												
(2) reggdp95	0.976	1											
(3) aci	-0.147	-0.001	1										
(4) pcreggdp	0.381	0.322	-0.361	1									
(5) pcreggdp95	0.342	0.351	-0.022	0.919	1								
(6) pcreggrowth	-0.0779	-0.0403	0.2625	-0.1256	-0.0569	1							
(7) dur	-0.3614	-0.3166	0.3571	-0.5852	-0.4826	0.0241	1						
(8) religion	-0.4263	-0.3884	0.2280	-0.4229	-0.3222	0.1121	0.3487	1					
(9) reggov	0.0385	0.0255	-0.0476	0.0663	0.0535	-0.0074	-0.0257	-0.1221	1				
(10) surface	0.5865	0.5979	-0.0205	-0.0117	-0.0308	-0.1233	-0.2707	-0.1236	-0.0396	1			
(11) prov	0.7245	0.7432	0.0204	0.0364	0.0393	-0.0922	-0.3862	-0.2058	-0.0121	0.8686	1		
(12) mun	0.1068	0.1096	0.0029	0.0278	0.0306	-0.0272	0.1231	-0.1488	0.0258	0.4165	0.2139	1	
(13) rpop	0.9089	0.9235	-0.0234	0.0892	0.0921	-0.0127	-0.1864	-0.1964	-0.0124	0.6503	0.7443	0.1943	1

Table 4

REGRESSION RESULTS 1995 – 2011

INDEPENDENT VARIABLES	**Dependent variable: Regional GDP**			**Dependent variable: per capita regional GDP**			**Dependent variable: growth rate of regional per capita GDP**				
	RE			**Regulatory complexity**						**EC2SLS**	
	(A1)	(A2)	(A3)	(B1)	(B2)	(B3)	(C1)	(C2)	(C3)	(C4)	(C5)
Constant	141.04 (1162.34)	57766.39 (3611.87)***	-5703.96 (1371.52)***	1705.71 (543.9548)***	18440.25 (576.0182)***	300.76 (370.29)	.0664162 (.0504844)	-.0294752 (.0443139)	.0743224 (.0427089)*	-.0547041 (.0819018)	-.2383239 (.7464)
Regional GDP 1995 (GDPreg1995)	1.3838 (.0176)***	1.3837 (.0131)***	1.3834 (.013001)***								
Complexity Index (**aci**)		-59.3012 (3.6082)*			-17.15641 (.5028448)***			.000096 (8.78e-06)***		.0000961 (8.79e-06)*	
Per capita regional GDP1995 (pcregionalGD1995)				1.24098 (.0303)*	1.233358 (.0223279)***	1.2343 (.0186)***	-.0039116 (.0052083)	-.003645 (0044813)	-.0036241 (.0043968)	-.0010437 (.0083978)	.0286476 (.0770382)
First quartile of Complexity Index			17721.76 (1711.57)***			4702.49 (255.63)***			-.0382048 (.0040103)***		-.0381963 (.0040231)*
Second quartile Complexity Index			12336.68 (1711.65)***			3563.58 (256.14)***			-.0096244 (.0040103)**		-.0098483 (.004047)***
Fourth quartile Complexity Index			-6330.51 (1711.61)***			-2192.16 (255.55)***			.0090625 (.0040105)		.0093006 (.0040168)
R-squared (overall) Within Between	.9481 .0725 .9994	.9712 .4910 .9993	.9702 .4755 .9992	.8324 .0006 .9943	.9599 .7850 .9938	.9543 .7523 .9935	.0017 .1040 .0540	.2631 .2704 .0224	.2950 .0992 .2994	.2624 .2698 .0052	.2986 .0362 .2928
Observations	340	340	340	340	340	340	340	340	340	340	340

t statistics in parentheses. * ρ<0.05, ** ρ<0.01, *** ρ<0.001.

Table 5

RE AND QUANTILE REGRESSIONS RESULTS USING LIKE DEPENDENT VARIABLE THE GROWTH RATE OF PER CAPITA GDP

	RE	Quantile				
		0.05	0.25	0.50	0.75	0.95
Constant	-.0294752	-.8239624	-.6318459	-.5497429	-.4632889	-.4750306
	(.0443139)	(1.964594)	(.0714961)***	(.0496719)***	(.0549428)***	(.1177623)***
Per capita regional GDP 1995	-.0036451	-.0162106	-.0082368	-.0051943	-.0065702	-.0043329
(pcreggdp1995)	(.0044813)	(.1047944)	(.00403)	(.0030259)*	(.0036596)*	(.0069694
Complexity Index (aci)	.000096	.1420321	.1066743	.0920868	.0827888	.0831569
Natural log	(8.78e-06)***	(.3139899)	(.0084826)***	(.00579)***	(.0065123)***	(.0155098)***
R-squared	.2631	.2835	.2406	.2733	0.2826	0.2499
Observations	340	340	340	340	340	340

t statistics in parentheses. * ρ<0.05, ** ρ<0.01, *** ρ<0.001

Table 6

REGRESSION RESULTS USING DURATION OF CIVIL DISPUTES AMONG COVARIATES

INDEPENDENT VARIABLES	Dependent variable: Regional GDP		Dependent variable: per capita regional GDP		Dependent variable: growth rate of per capita GDP			
	RE		Disputes duration				2SLS	
	(A1)	(A2)	(B1)	(B2)	(C1)	(C2)	(C3)	(C4)
Constant	10582.01 (2766.86)***	574.31 (5261.81)***	6785.724 (943.92)***	3162.688 (649.8349)***	.1083735 (.085727)	.1049519 (.0886292)	.0904901 (.1146116)	.0495292 (.0695014)
Regional GDP 1995 (regGDP1995)	1.27807 (.018959)***	1.275986 (1824.38)***	1.094529 (.0345632)***					
Disputes duration (dur)	-7.271305 (1.773798)***		-2.874837 (.4084248)***		-.0071693 (.0086496)		-.0053275 (.0116417)	
Per capita regional GDP 1995 (regGDP1995)				1.104861 (.0352891)***	-7.74e-07 (4.18e-06)	-.0070893 (.0091839)	-7.01e-07 (4.27e-06)	-.0013065 (-.0013065)
First quartile of Disputes duration		6538.351 (2330.85)***		1504.194 (519.0732)***		.0063079 (.0050686)		.00453 (.0050849)
Second quartile of Disputes duration		1610.237 (2296.019)		243.8992 (503.8608)		-.0030868 (.0049182)		-.0037795 (.004915)
Fourth quartile of Disputes duration		-3949.199 (2308.713)*		-2118.625 (506.7993)***		.0036162 (.0049713)		.0039657 (.00501)
R-squared (overall)	.9557	.9562	.8713	.8685	.00290	.0175	.0029	.0173
Whutin	.1354	.1514	.1945	.1670	.0179	.0227	.0125	.0196
Between	.9986	.9984	.9929	.9941	.0260	.0141	.0254	.0066
Observations	248	248	248	248	248	248	248	248

t statistics in parentheses. * ρ<0.05, ** ρ<0.01, *** ρ<0.001