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FINANCIAL AND LEGAL CONSTRAINTS TO FIRM GROWTH: THA CASE OF ITALY

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FINANCIAL AND LEGAL CONSTRAINTS TO FIRM GROWTH: THE CASE OF ITALY

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ABSTRACT

The aim of this study is to confirm empirically the implications of the theory about the law-finance-growth nexus. In order to verify the predictions of the theory, a panel data including three different types of data is used. All the data are referred to Italian provinces. The empirical analysis shows that between firms' growth and financial development there is a first-order relationship, while between firms' growth and legal enforcement as measured by the efficiency of the judicial system there is a second-order relationship.

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1. INTRODUCTION

Differences between long-run growth rates are theoretically explained with the degree of the development of financial markets and institutions. Although there is not agreement about the causal direction exiting between the financial development and the economic growth, there is a massive body of theoretical and empirical studies showing that the growth is strongly connected with the financial development through a first order relationship. Particularly, both the ideas that financial development accelerates economic growth and that the degree of maturity of financial markets represents a good predictor of the potential of economic growth are largely accepted. This is because the financial institutions gathering the information mitigate the problems that arise from the information asymmetries and reduce the transaction costs, mobilize the private savings and improve the allocation efficiency (King, Levine, 1993; Levine, 1997).

An related field of analysis has been growing recently; it aims to identify the causes of the differences between national financial structures. Within this approach differences between national legal systems are explained with reference of the major legal traditions: the British Common Law and the French Civil Law (La Porta et al., 1997,1998; Demirgüç-Kunt, Maksimovic, 1998, 1999). According to this theory, the countries have developed over the years legal systems insuring the protection of the private rights in different degrees. This protection is higher in the Common Law tradition compared to the Civil Law tradition. "*The British Common law evolved to protect private property owners against the crown. This facilitated the ability of private property owners to transact confidently, with positive repercussions on financial development. In contrast, the French Civil law was constructed to eliminate the role of a corrupt judiciary, solidify state power, and restrain the courts from interfering with state policy. Over time, state dominance produced a legal tradition that focuses more on the rights of the state and less on the rights of individual investors than the British Common law.*" (Beck et al., 2003, pp.138-139).

However, beyond differences in origin, the protection of the investor rights also depends on law enforcement. The level of the enforcement can vary within the same legal systems. It is determined by the efficiency of the judicial system and its performance can significantly differ within the same national legal

system because of the misallocation of resources or local imbalances between the judicial demand and supply.

The rules protecting creditor interests and contractual enforcement affect more directly the efficiency of the financial markets and thus have repercussion on the growth. The finance theory helps us to explain the microeconomics of this process more precisely. The default probability is reflected by agency costs; the larger the degree of opacity in the relationship between the firm and the financial markets, the higher the agency costs. Those costs rise more if there is a lack of enforcement; as a consequence the access to external financing sources becomes more difficult and credit rationing and request for collaterals are increasing. Therefore, the firm will be able to take market opportunities to grow only if it can produce internal resource flows devoted to finance it. That makes financial constraints more likely; economic growth, therefore, becomes more volatile due to this higher dependence of firm growth on internal finance.

In this work I propose a preliminary analysis of this theoretical field through a intra-country analysis utilising a microeconomic data set. More precisely, the paper aims to verify empirically the existence of a first-order relationship between firm growth and financial development and of a second order relationship between firm growth and judicial efficiency. The data set consists of a closed sample of Italian SMEs and a number of variables measuring financial development and judicial efficiency in Italian provinces.

The paper is organised as follows. In the next section I discuss the theoretical foundations of the law-finance-growth relationship. Section 3 presents the characteristics of the data set. In section 4 an preliminary, graphical analysis is proposed, while in section 5 I illustrate the empirical model and the estimates obtained. Some concluding remarks are reported in the last section.

2. FINANCIAL DEVELOPMENT, LEGAL SYSTEM AND FIRM GROWTH: A BRIEF REVIEW

The finance theory allows us to understand how market imperfections restrict the possibility for the firm to use the external resources in order to finance its investment projects. According to this theory, market imperfections feed the conflict between the firm's insiders and the outsider investors; this conflict originates from, on the one hand, information asymmetries and, on the other hand, the lack of the contractual enforcement.

Information asymmetries make it impossible or too costly to sign complete contracts between lenders and borrowers; inefficient enforcement makes default profitable. The size of this negative effects is determined by the degree of the development of the financial and legal systems: they are the less extensive the more developed are financial and legal institutions [Beck et al. 2005; Demirgüç-Kunt, Maksimovic, 1998, 1999; La Porta et al., 1997, 1998, 2000; Levine, 1998, 1999].

Growth theory has definitively rejected the idea that the financial systems adjust to real growth passively; instead, the financial systems are seen as determinant to the process of economic growth. The main function of financial

institutions and markets is to mitigate the problems arising from information imperfections. Particularly, the financial institutions are dedicated to gathering information; this makes the *ex-ante* acquisition of information cheaper and makes the *ex post* monitoring of the firm's behaviour more efficient. The delegated monitoring function minimizes transaction costs and improves resource allocation; moreover, it affects capital accumulation, technological innovation and long-run growth dynamic [Diamond, 1984; Bernanke, Gertler, 1990; Levine 1997][1].

Financial institutions play an important role in reducing the opacity in the relationship between firms and financial markets and in facilitating firms' access to external finance. Of course, it is not easy to empirically verify how much well behaved financial institutions resolve the problems deriving from the information imperfections; nevertheless, the analysis using microeconomic data set help us to evaluate their importance. On this regard the theory suggests that, if the costs related to acquisition of the information by the outsider investors increase, the difficulties for the firm to get access of external resources increase as well. Empirical works show that the firms receive more external funding where financial markets are more developed [for example, Beck et al., 2005].

Information imperfections increase the wedge between the external and the internal finance; this makes internal resources cheaper as primary financial source of funding. As a consequence, the growth of the firm is more strictly dependent on the internal resources that the firm can produce and can devote to finance itself[2,3].

The literature on the financial constraints to the growth of the firm draws on these theoretical discussions. There is now a wide body of research in this field, producing many important but controversial results. This literature is heavily focused on the problem of the relationship between capital structure and the growth of the firm. The theoretical basis are the Modigliani-Miller propositions that establish the independence of the growth of the firm from capital structure and, on the opposite side, the pecking order hypothesis affirming that external finance is not a perfect substitute for internal funding and, consequently, the growth is not independent from the internal finance[4].

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[1] The large literature on the finance-growth nexus dates back to the paper by Gurley-Show, Goldsmith and McKinnon. The recent research is reviewed by Levine (1997).

[2] Information imperfections cause the credit rationing. Collaterals exist to reduce the effects of the credit rationing. On the one hand, this permits to supply credit to small opaque firms; on the other hand, it is a device that allows to control managers' behaviour.

[3] It is believed that the relationship banking can reduce the negative impact of information imperfections. Close relationships between firms and banks facilitate the information transfer and improve the relationship of the firms with the financial markets. Nevertheless, the empirical results are contrasted. On the one hand, relationship banking gives benefits with regard to the decreasing interest rate and increasing credit availability. On the other hand, it may carry high private and social costs arise as banks exploit market power deriving from its information advantage.

[4] The two propositions of MM are contained in the 1958' and 1961' articles [Modigliani, Miller, 1958, 1961] and have been subsequently extended by Miller [Miller, 1977]; the pecking order hypothesis dates back to the works of Myers and Majluf [Myers, Majluf, 1984; Myers, 1984].

Empirical studies have tried to identify a positive relationship between firm's growth and internal finance. In particular, there have been questions as to whether the sensitivity of investments to cash flow is a good indicator of the presence of financial constraints to growth [Fazzari et al., 1988; Bond, Meghir, 1994; Hubbard, 1998][5,6].

The sources of agency conflicts lie in the capital structure of the firm. The property right theory helps us to identify this sources. According to this theory, different funding sources are associated with different kinds of contracts defining the allocation of property rights. Those contracts minimize the transaction costs and simultaneously act in protection of investor's interests. For example, an equity issuance causes an *ex ante* reallocation of shares of the property rights within the firm; here investor's protection lies in the owners' behaviour. By contrast, in the case of debt issuance this protection is ensured through an *ex post* transfer of property rights to the firm's assets; the creditor can recover totally or partially his credit if the firm defaults [Williamson, 1985, 1988; Aghion, Bolton, 1992; Hart, 1995].

Within this framework the problems arise when the mechanism of the transfer of the property rights on firm's assets cannot adequately protect creditor's interests when the firm acts to reduce the value of the transferred assets[7].

Therefore, the function of the judicial system in the lender/borrower relationship is to force the repayment of debt upon the borrower who would not do it spontaneously. Indeed, the borrower could find non-repayment profitable when the benefits of the default exceeds the perceived costs of the penalty. Since the weakness of the enforcement reduces the credibility of the threat and the costs related to it, the inefficiency of the judicial system tends to increase the opportunistic behaviour of the borrowers. As a consequence, lenders discount the probability of such event by reducing credit supply and making firm's access to the external finance more difficult.

This argument is proposed by Jappelli et al. (2005). In this work trough a theoretical model the authors show that judicial inefficiency increases incentives for borrowers to behave in an opportunistic way with no relation whatsoever to the probability of a successful outcome for investment projects. This happens because the borrower can always deny the repayment of its debt to the lender leading it to a trial. The advantages of default for the borrower increase if: a) the borrower can appropriate of a part of the income arising from the investment or can consume part of the collateral; b) the cost of the

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[5] The references cited in the text are representative of a massive body of theoretical and empirical studies analysing the problems related to the relationship between the capital structure and the growth of the firm and about to investment financing; the cited work of Hubbard (1997) contains a broad review of this literature.

[6] The thesis that the sensitivity of investment on cash flow can be interpreted as financial constraints has been famously put into question by Kaplan and Zingales [Kaplan, Zingales, 1997, 2000]. They believe that the sensitivity of investment to cash flow indicates profitable opportunities by the firm.

[7] In the finance theory those strategies are seen as costly because they decrease the firm value.

trial is sustained entirely by the lender. Within the model the hypothesis about agents' behaviour is developed assuming that the credit markets are competitive or, alternatively, imperfect; the conclusions of this research suggest that the improvement of the enforcement reducing the opportunistic behaviour leads to an increase of the credit supply (or a decrease of credit rationing) and a decrease of the collaterals[8].

3. CHARACTERISTICS OF THE DATA SET

The analysis covers the 103 Italian provinces and the years from 1995 to 2003 years. The data set collects three different types of data: microeconomic data on firms, data related both to financial development and to the efficiency of the judicial system.

The microeconomic data on firms comes from a closed sample of Italian manufacturing SMEs. This sample has been extracted from the last three surveys on the Italian Manufacturing Sector performed by Capitalia, and previously by Mediocredito Centrale, for the three three-years 1995-1997, 1998-2000 and 2001-2003[9]. It is composed of 533 small and medium sized firms (<250 employees); the small firms (<50 employees) represent 89,1% of the sample (475 firms). A size variables is determined on sample's data: 1) total assets (ASSET) of the firms.

The data on the financial system come from Bank of Italy statistics. They consist of: a) the number of the bank branches by province; b) the distribution of the loans granted to residents by province. In order to define the variables used for the estimate data from ISTAT source on population and GDP by province are in addition utilised. The model then uses two proxies for financial development : (2) the number of bank branches for 100,000 inhabitants (BRANCHS_POP) and (3) the loans/GDP ratio (LOANS_GDP) by province.

The data related to judicial system are obtained from the ISTAT statistics of the civil justice. Those statistics include the annual flow of trials and the stock of pending trials; moreover the statistics contain several measures of efficiency of the legal system. Since 2000 this data is broken down at the court district level, corresponding to provinces or below; for previous years the data are available at the level of appeal's court districts, which encompass one or more provinces[10]. The data by province are obtained by matching of the court data and appeal's court data and provinces. Two proxies of the efficiency of civil judicial system are defined: 4) the ratio of closed trials on total trials

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[8] The effects on the interest rates are ambiguous because they are affected by the market structure. In a monopolistic market the lender can appropriate of the borrower surplus entirely; therefore, an improvement in the judicial efficiency causes an increase in interest rates. In competitive markets, the rate rises if there is inside collateral, while if there is outside collateral the effect on the rates is ambiguous.

[9] The "Survey of Italian manufacturing firms" draws on a representative sample of the population of manufacturing firms; it is based on questionnaires filled by the sampled firms and of the data sheet for the most of them.

[10] There are 164 court districts and 26 appeals court districts.

(CLOSEDTRIALS) and 5) the mean length of trials (LENGHTRIALS); the first one is an efficiency index, the second one an inefficiency measure.

Finally, the data set used for the estimate has been obtained by matching of the firm-level data and the values of financial and judicial variables of the province where the firm has its headquarters [11].

4. THE EFFICIENCY OF THE ITALIAN JUDICIAL SYSTEM AND THE RELATIONSHIP WITH THE FINANCIAL SYSTEM

With regard to the empirical analysis it is decisive to consider the efficiency of the judicial system. There is much empirical work devoted to this issues (Marchesi, 1998, 2001, 2003; ISTAT-MIPA, 2006). The national judicial statistics contains standard efficiency indicators related to the trials at various judiciary levels. However the subject is very complex.

Generally civil contentious can be classified into four classes: property and obligations, succession, work and family. The procedures are divided into three classes of trials: cognitive, precautionary and executive. The cognitive trial is finalised to the assessment of the judicial controversy while the other two classes of trials precede or following to it[12]. The efficiency analysis can be restricted to the cognitive trials. They concern all the different degrees of justice and they are concentrated in the courts[13]. Statistics are available for all the various degrees; they relate to the ingoing and outgoing trials and the stock of pending trials; moreover there are several indicators scaled to population and efficiency indexes[14,15].

The trend of two efficiency indexes is taken here as an example. The graphs in the FIGURE 1 depicts the trend in the years 1996-2006 of 1a) the number of the I° and II° degree trials pending both at first-degree courts and at the courts of the appeals scaled for the population (100,000 inhabitants) and 1b)

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[11] The sample contains firms belonging to 92 of the 103 Italian provinces.

[12] More precisely, the precautionary trial precedes and complements the cognitive trial because it should guarantee the successful of the cognitive and executive trials. By contrast, the executive trial makes the execution of the sentence and therefore follows the cognitive trial.

[13] Since 1998 a significant reorganization of the Italian judicial system has been implemented. The court has become the only one judicial office for the I° degree trials. The less important trials in civil law are delegated to "peace officer". Therefore the three different degree of the civil justice are: the peace officer or the court, the court of appeals and, finally, the Cassation court.

[14] The efficiency indexes available from national statistics are: the turnover ratio, the closed trials ratio, the index of controversial settlement and the mean length of the trials. A more exhaustive definition of the indexes used in this work is provided in APPENDIX 1.

[15] Cognitive trial concern the general contentious of the civil justice. Marchesi (2003) finds that in years 1975-1998 about the 60% of annual cognitive trials involved economic controversies.

the mean length of the trials[16]. The trend of the pending trials shows a weak improvement of the efficiency, in particular since 1999. The mean length of trials is significantly decreasing. In both of the cases, the improvement have almost exclusively concerned I° degree trials.

FIGURE 2 reports the territorial differences in the two previous efficiency indexes of the judicial system. The graphs show the distribution of the residuals with regard to the national mean of 2a) the pending trials and 2b) the length of the trials of the judicial district and of appeal's courts[17]. Since the graphs reflects the regional distribution of the judicial districts from the Northern to Southern Italian regions moving towards right, it appears clearly that the judicial activities in the northern judicial districts are more efficient than in Southern judicial districts.

Before presenting the estimates, it can be useful at this stage of the analysis to verify through an descriptive, graphical analysis the relationship between the development of the financial system and the efficiency of the judicial system.

In FIGURE 3 the two pairs of graph represent the relationships between the two proxies of the financial development by province and the two proxies of the judicial efficiency by province. The data express the mean of the period and then are transformed into index numbers around a national mean value (=100). The graphs include trend lines as well.

The pair of graphs 3a) and 3b) shows an increasing relationship between the two financial indicators and the rate of closed trials; the other pair, 3c) and 3d), shows an decreasing relationship between the two financial variables and the mean length of trials.

In all cases, it appears clearly that there is a relevant positive relationship between enforcement as measured by the efficiency of the judicial system and the development of the financial markets.

5. FINANCIAL AND LEGAL CONSTRAINTS TO FIRM GROWTH: THE ECONOMETRIC ANALYSIS

The previous model can be represented by two equations: in the first, the growth of the firm is dependent by the financial development; in the next, the financial development is dependent by the judicial efficiency.

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[16]Both our indicators may suffer from measurement error: the indexes are based on the data regarding cognitive trials, which include many disputes on matter other than credit. Jappelli et al. (2005) shows high correlation between the ISTAT data and Bank of Italy data, in a survey on credit recovery costs and procedures (both judicial and non judicial) in the presence of insolvent borrowers. The survey includes 269 banks, representing 90 per cent of total loans. The characteristics and the main findings of this survey are presented in Generale and Gobbi (1996).

[17] As we have mentioned above, there are 26 court of appeal's districts; moreover, there are 3 judicial sections that are not included in the graphs. The districts are in accordance with the judicial demand: they are fewer in the Northern and Central regions of Italy, while they are more numerous in the South and in the Islands.

Therefore, the panel representing the reduced form of the model can be represented as

$$log\ Y_{i,t} = \beta_1\ log\ Y_{i,t-1} + \beta_2\ F_{it} + \beta_3\ G_{it} + a_{i,t} + \eta_i + \varepsilon_{it}$$

where firm growth is $log\ Y_t - log\ Y_{t-1}$ and Y the size variable of the firms [assets (ASSET)], F represents the two variables measuring financial development [branch banks/population ratio (BRANCHS_POP) and loans/GDP ratio (LOANS_GDP)] and, finally, with G as the two proxies of the judicial efficiency [closed trials/total trials ratio (CLOSEDTRIALS) and mean length of the trials (LENGHTRIALS)]; a and η are the specific and temporal effects, ε the error term.

All the variables are expressed as natural logarithm; the statistics and the correlation matrix of those variables are presented in TABLE 1.

The estimates are obtained through the DPD methodology proposed by Arellano-Bond (1994). It is known that in the Arellano-Bond estimate the first differences of the variables are used to eliminate the fixed effects; subsequent GMM estimates are performed using the independent lagged variables as instruments. The choice of the instruments is a crucial issue; it can be seen that, due to the correlation between the lagged dependent variable and the error term, the more suitable instruments are the two lag independent variables[18].

The estimates are in TABLE 2[19]. The Sargan tests reject the null hypothesis about the restrictions of over-identification, while the AR tests confirm the presence of the first-order correlation and reject the presence of second-order autocorrelation between the residuals; the test F is always significant.

The estimates are coherent with the theory. The coefficient related to the lagged independent variable are about 0.50/0.60 values. The positive relationship between firm growth and the proxies of the financial development are confirmed: the BRANCHS_POP coefficients are higher (0.17/0.18) compared to the LOANS_GDP coefficients (0.05/0.07). The sign of the coefficients related to the judicial system are positive for the efficiency index (CLOSEDTRIALS) and negative for the inefficiency index (LENGHTRIALS); all the coefficient values are in the range 0.20/0.24.

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[18] The instruments are obtained using the orthogonal condition between the lagged dependent variable and the errors. In order to illustrate this approach a model AR(1) can be considered

$$y_{it} = \rho\ y_{it-1} + v_{it} \quad where \quad v_{it} = \mu_i + \varepsilon_{it}$$

where both μ_i and ε_{it} are normally distributed with zero mean and constant variance. In order to obtain an consistent estimator by ρ for fixed T (small) and N→∞ the first order differences are calculated and the fixed effects μ_i are eliminated. The result is

$$\Delta y_i = \rho \Delta y_{it-1} + \Delta \varepsilon_{it}$$

where y_{it-1} is correlated with ε_{t-1}. This means that if the observations begin in year t = 1, the first year where the previous relationship can be observed is t=3.

[19] We have produced estimates using the employees as dependent variable. This estimates confirms the casual relationship, but they show serial correlation between instrument with two, three and four lags and error terms. This violates the conditions imposed in the PDD approach.

6. CONCLUSIONS

The results of the previous analysis confirm the implications of the theory about law-finance-growth nexus. This study differs with existing works on the same subject in two ways. First, the analysis presented here is not cross-country but is, instead, performed within the same national context and focuses on cross-regional (provincial) differences in the contractual enforcement as measured by the efficiency variables of the civil justice. Secondly, microeconomic data, not macroeconomic data, is used for the empirical test.

The econometric test has confirmed that there is a first order relationship between the degree of financial development and economic growth; at the same time, the test has shown that there is a positive relationship between the growth of the firm and the efficiency of the civil judicial system.

This conclusions are in line with the basic tenets of the theory exposed above. The potential growth of firms is affected by financial development in that more developed financial markets improve the firm's access to external funding sources. This enables firms to finance their investment projects using external finance, thus mitigating the financial constraints arising when economic growth is excessively sensitive to internal finance. Financial development is enhanced if the rule system devoted to protect the investor well-behaves. The lender/borrower contract is typically incomplete because it occurs in a environment where there are information imperfections; which frequently lead to opportunistic behaviours and defaults. The improvement of the enforcement can reduce the opportunistic behaviours if the legal system efficiently enforces the rules protecting the creditors' interests and makes penalty credible in case of default.

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APPENDIX 1 – DATA BY PROVINCE

The data are referred to the 103 Italian provinces for the period 1995-2003. They are classified for three types: microeconomic data of the firms, data related to the financial system and data related to the judicial system (civil justice).

FIRM'S MICROECONOMIC DATA – The data are available from a closed sample formed by 533 manufacturing firms. The sample is extracted from the last three surveys of the Italian manufacturing firms on three three-years periods: 1995-1997, 1998-2000, 2001-2003. Source: Capitalia, Medio Credito Centrale

FINANCIAL SYSTEM DATA – The data cover the distribution of the bank branches by province and the distribution of the loans to the residents by province. Source: Bank of Italy

JUDICIAL SYSTEM DATA – The data refer to the trials requiring adjudication of substantive rights (cognitive trials). They concern a broad aggregate of all cases on civil matters, among which credit and commercial matters, which represents about 60% of the total trials. This data are available for court district since year 2000 and for appeal's court district in previous years. Source: Italian National Institute of Statistics (ISTAT).

In order to determine the set of variables utilized for the estimates, the data of the GDP and of the Populations by province for the period 1995-2003 are considered.
Source: Italian National Institute of Statistics (ISTAT).

The variables are:

1) ASSET – Total assets extracted from the data sheet of the firms of the closed sample,
2) BRANCHS_POP – Branch banks / Population ratio (100,000 inhabitants) by provinces
3) LOANS_GDP – Loans / GDP ratio by provinces
4) CLOSEDTRIALS – Closed trials / Total Trials ratio.
   The index is calculated as:
        Closed Trials / (Initial Pending Trials + Occurring trials)

5) LENGHTRIALS – Mean length of the trial (days).
   The index is calculated as:
 (Initial Pending Trials + Final Pending Trials) / (Occurring Trial + Closed Trials) x 365
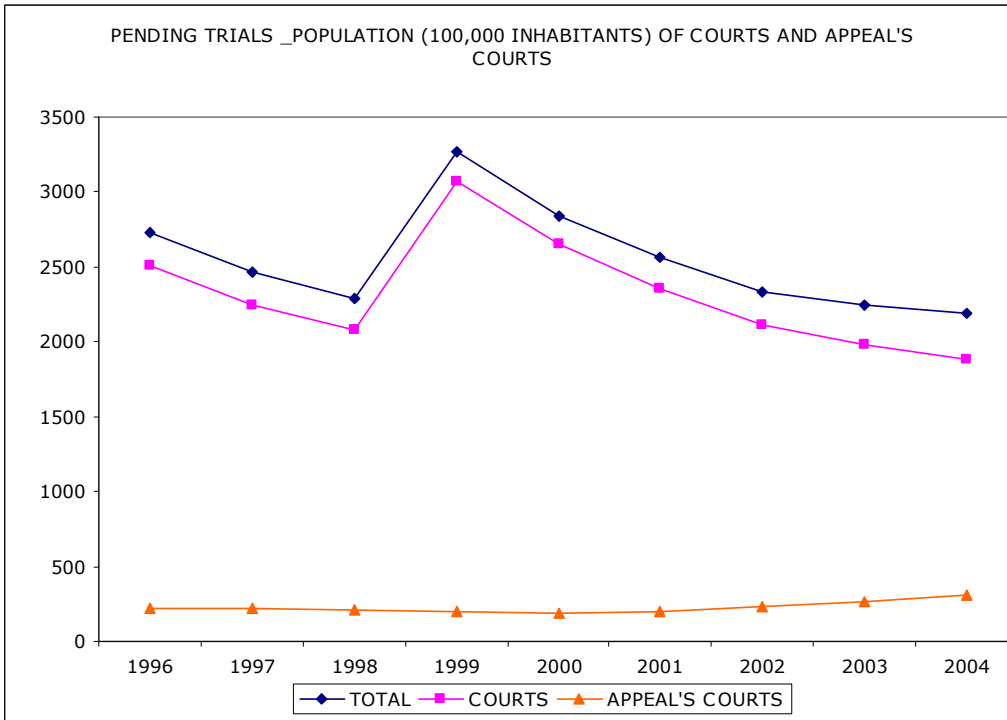
LEGENDA OF JUDICIAL DISTRICTS

1. TO   Torino
2. MI   Milano
3. BS   Brescia
4. TN   Trento
5. VE   Venezia
6. TS   Trieste
7. GE   Genova
8. BO   Bologna
9. FI   Firenze
10. PG   Perugia
11. AN   Ancona
12. RO   Roma
13. AQ   L'Aquila
14. AB   Campobasso
15. NA   Napoli
16. SA   Salerno
17. BA   Bari
18. LE   Lecce
19. PZ   Potenza
20. CZ   Catanzaro
21. RC   Reggio di Calabria
22. PA   Palermo
23. ME   Messina
24. CL   Caltanissetta
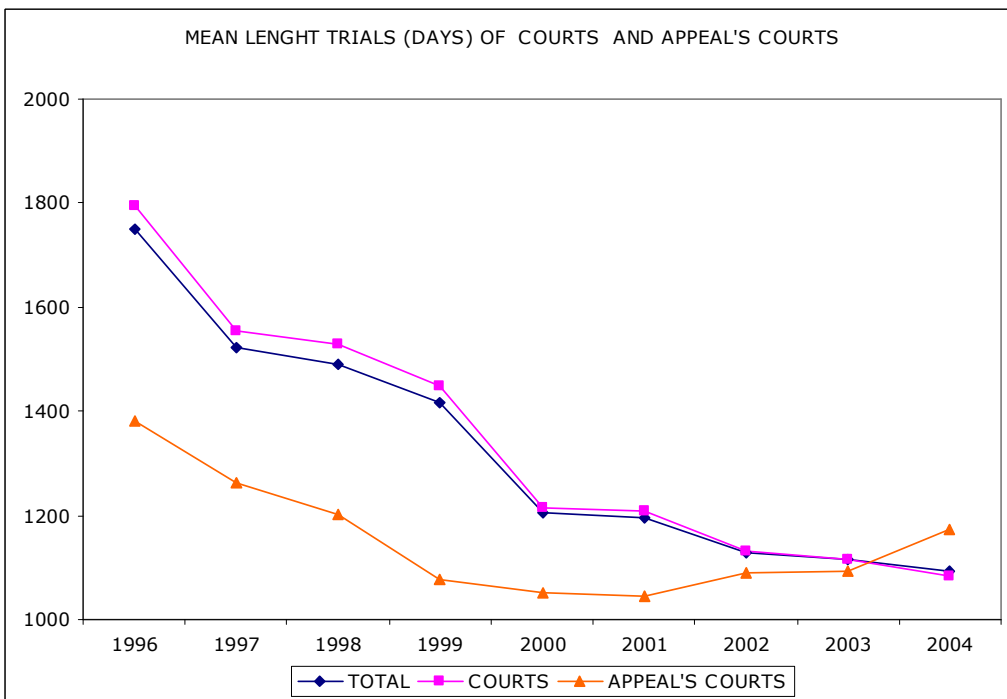25. CT   Catania
26. CA   Cagliari

FIGURE 1 - STOCK OF PENDING TRIALS AND MEAN LENGHT OF TRIALS – ITALY

The graphs depict a) PENDING TRIALS scaled for the population (100,000 inhabitants) opened in the courts and the appeal's courts and b) MEAN LENGTH OF TRIALS (days) in the 1996-2004 years. Data are absolute value.
Source: Processing on Italian National Institute of Statistics (ISTAT)


a)

b)

FIGURE 2 – STOCK OF PENDING TRIALS AND MEAN LENGHT OF TRIALS BY JUDICIAL DISTRICTS

The graphs depict a) PENDING TRIALS scaled fOR the population (100,000 inhabitants) opened in the courts and the appeal's courts and b) MEAN LENGTH OF TRIALS (days) in the 1996-2004 years by judicial districts. Data are expressed as residuals on the mean value. The list of the judicial districts is in APPENDIX 1.
Source: Processing on Italian National Institute of Statistics (ISTAT)
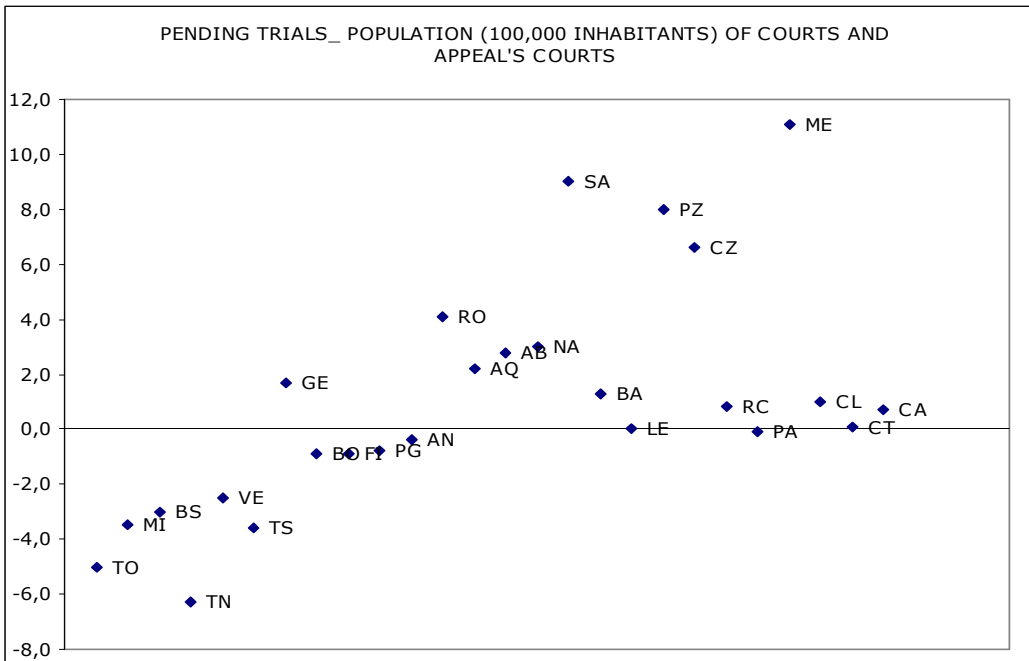

a)
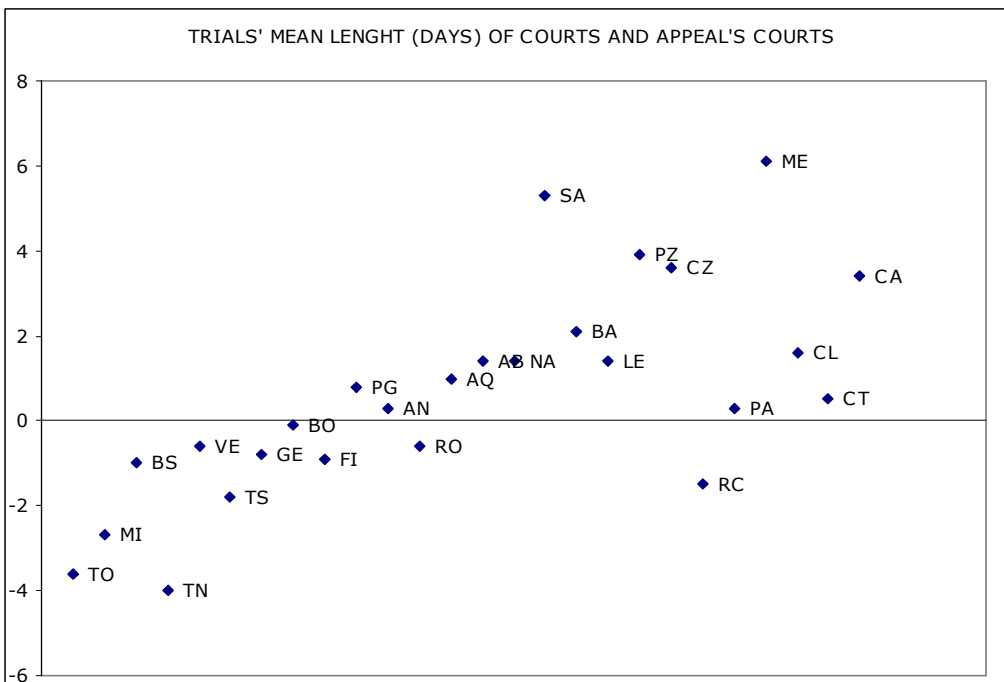
b)

FIGURA 4 – FINANCIAL DEVELOPMENT AND JUDICIAL EFFICIENCY RELATIONSHIP

The graphs contain the provincial number index (Italy=100). On the y-axis there are the provincial number index of the financial development variables (BRANCHS_POP) (100,000 inhabitants) and the LOANS / GDP ratio); on the x-axis there are the provincial number index of the judicial efficiency variables (CLOSEDTRIALS and LENGTH OF TRIALS).
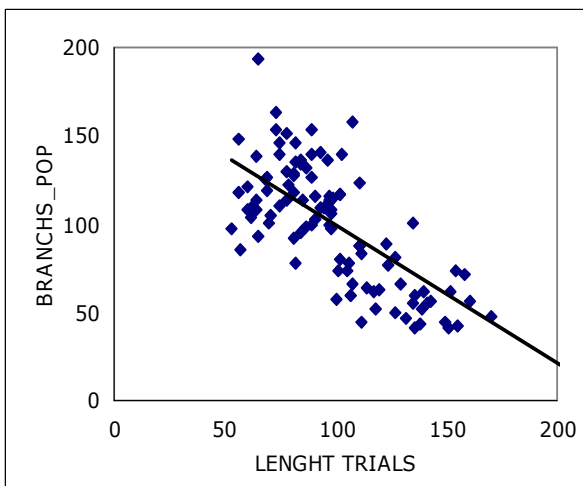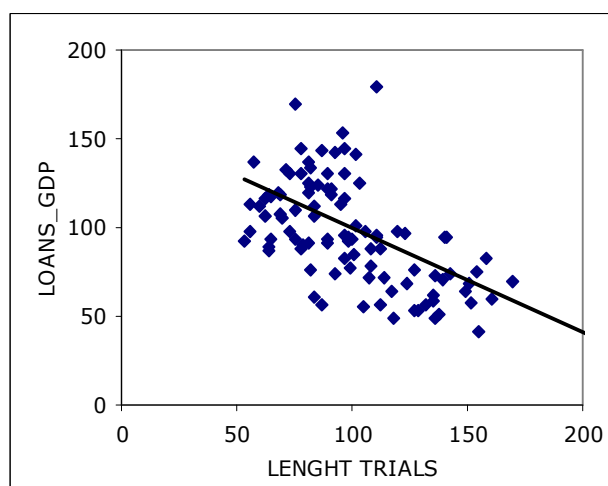Source: processing on Bank of Italy and ISTAT data.
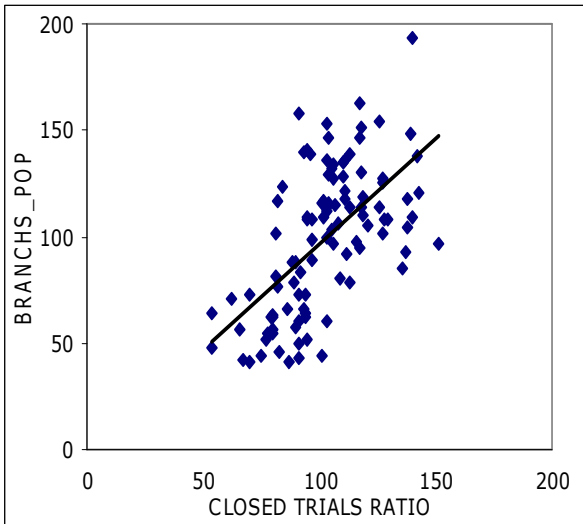
a)
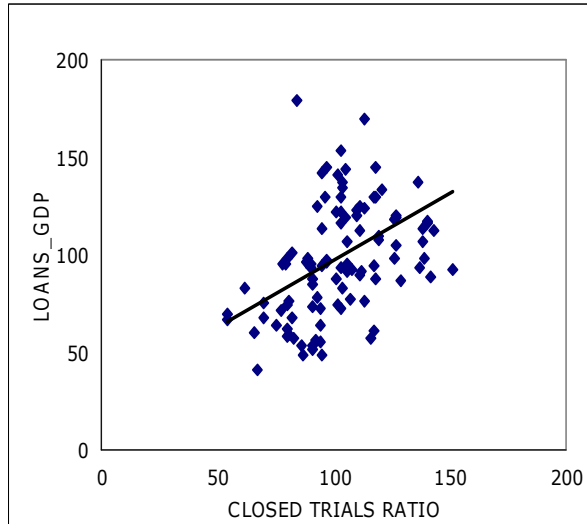
b)

c)

d)

TABLE 1 – STATISTICS AND CORRELATION MATRIX

In the table are reported the statistics and the correlation matrix of the variables used for the estimates.
ASSET = Total assets at year t; ASSETS$_{-1}$= Total asset at year t-1; BRANCHS_POP = Branch banks /
population ratio by provinces (100,000 inhabitants); LOANS_GDP = Loans / GDP ratio by provinces;
CLOSEDTRIALS = Closed trials / Total Trials ratio; LENGHTRIALS = Length of trials (days).

ABSOLUTE VALUES

Variable	Mean	Std.Dev.	Minimum	Maximum
ASSET	33535	138924	366	2778020
ASSET$_{-1}$	31756	132775	328	2676513
BRANCHS_POP	56,3	12,8	16	103
LOANS_GDP	76,4	30,5	10	169
CLOSEDTRIALS	31,2	6,6	13	58
LENGHTRIALS	991,9	301,2	348	2492

LOGARITHMIC VALUES

Variable	Mean	Std.Dev.	Minimum	Maximum
ASSET	9,165	1,291	5,904	14,837
ASSET$_{-1}$	9,114	1,284	5,793	14,801
BRANCHS_POP	3,998	0,265	2,773	4,634
LOANS_GDP	4,246	0,457	2,302	5,129
CLOSEDTRIALS	3,416	0,217	2,565	4,061
LENGHTRIALS	6,855	0,299	5,852	7,822

CORRELATION MATRIX

	ASSET	ASSET$_{-1}$	BRANCHS_POP	LOANS_GDP	CLOSEDTRIALS	LENGHTRIALS
ASSET	1,000	0,992	0,052	0,104	0,049	-0,072
ASSET$_{-1}$	0,992	1,000	0,048	0,113	0,058	-0,082
BRANCHS_POP	0,052	0,048	1,000	0,234	0,282	-0,368
LOANS_GDP	0,104	0,113	0,234	1,000	0,237	-0,410
CLOSEDTRIALS	0,049	0,058	0,282	0,237	1,000	-0,892
LENGHTRIALS	-0,072	-0,082	-0,368	-0,410	-0,892	1,000

TABLE 2 - LAW-FINANCE-GROWTH ESTIMATES

This table contains the estimates of the relationship between the firm growth, the financial development and the judicial efficiency. The variables are expressed in natural logarithm. The dependent variables are: ASSET (Total asset); the dependent variables are ASSET$_{-1}$ and BRANCHS_POP (branch / population ratio), LOANS_GDP (Loans on GDP ratio), CLOSEDTRIALS (Closed trials / Total trials ratio) and LENGHTRIALS (length of trials in days).
Estimates: Arellano-Bond estimates (GMM estimates on the first order differences and instruments y_{t-2} e y_{t-3}); years 1995-2003. The standard deviation are in quadratic brackets; *, **, *** significance levels at 1, 5 and 10%.
SARGAN = test of sovra-identification (critical value at 1% = 25.2); AR(1) and AR(2) – Arellano-Bond test (H0 = absence of autocorrelations of first order residuals and of second order residuals, respectively).

DEPENDENT VARAIBLE: ASSET

ASSET$_{-1}$	.581	.536	.580	.514
	[.031]***	[.033]***	[.031]***	[.036]***
BRANCHS_POP	.187	.174		
	[.072]***	[.067]***		
LOAN_GDP			.074	.053
			[.011]***	[.010]***
CLOSEDTRIALS	.202		.245	
	[.040]***		[.033]***	
LENGHTRIALS		-.209		-.219
		[.031]***		[.027]***
F TEST	952.4***	1074.5***	1001.4***	1095.2***
SARGAN	300.6***	300.4***	324.9***	350.4***
AR(1)	-15.4***	-12.5***	-14.6***	-12.1***
AR(2)	-0.4	-0.3	-0.4	-0.3
N° INSTRUMENTS	84	84	84	84
N° OBSERVATIONS	3720	3720	3730	3730