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Judicial Efficiency and Entrepreneurs' Expectations on the Reliability of European Legal Systems¹

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Abstract: Many theories have tried to discover the determinants of entrepreneurship while at the same time defining a policy contour for its promotion. This study advances the extant discussion by focusing on the specific relationship between national judiciaries' performances and expectations about the reliability of the legal framework, which is an important component fostering entrepreneurial action. More precisely, by conducting an empirical investigation on a number of European countries, it assesses the role that judicial efficiency plays in reducing endogenous uncertainty in markets.

Jel Codes: K41, L26, C14

Keywords: judicial efficiency, courts performance, enforcing contract, entrepreneurship, clearance rate, DEA.

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1. Introduction

In the last fifteen years, a number of important studies have directed their attention towards the regulatory environment in which economic activity has to develop and has found a narrow link between the legal system and economic growth (La Porta et al., 1998; Djankov et al., 2002; Alesina et al., 2005; Acemoglu and Johnson, 2005; Peev, 2015). However, the effectiveness of the regulatory framework substantially depends on how laws are enforced: task essentially performed by the judiciary. Growing evidence maintains that efficient courts are necessary in order to facilitate economic activity (Chemin, 2009a).

This paper tries to further advance the understanding on this evidence by focusing on the specific relationship existing between judicial performance and a fertile legal environment for entrepreneurial action. Since contracts are the main legal tool for entrepreneurs, making possible transactions and access to credit, we will focus on the perception regarding the easiness in enforcing contracts, as measured in the 2010 World Bank's "Doing Business" Report (which positively relates to the general level of entrepreneurship) and we will test its relationship with judicial efficiency.

The investigation here is conducted on a sample of European countries and follows a two-stages empirical analysis, first calculating the efficiency of national judicial systems and then testing the enounced relationship. For the definition of judicial efficiency is itself not homogenous across literature, the paper adopts two different measures. On the one side, the clearance rate, more directly relating to the ability of the system to reply to the demand of justice. On the other, the technical efficiency score, estimated by means of Data Envelopment Analysis, characterized by the additional feature of considering at the same time both the demand of justice and the productive optimization.

An interesting additional contribution of the paper comes out specifically from this comparison. Actually the two measures produce equivalent estimates. Therefore, considering the greater information provided by technical efficiency, it follows that the latter should be preferred whenever there are policy implications affecting the organization of the judiciary.

The paper proceeds as follows: Section 2 sketches out the theoretical framework linking judicial performance, economic activity and more specifically entrepreneurship. Section 3 more precisely outlines the research structure and the subsequent hypothesis investigated. Section 4 describes the dataset and disentangles the technicalities used for assessing the judicial efficiency in the first stage and for conducting the estimates in the second stage. Section 5 presents and discusses the results. Finally conclusions are drawn in Section 6.

2. Judiciary, Economy and Entrepreneurship

An increasingly developing literature has underlined the important relationships between legal systems and the health of economic activities. Moreover this link seems to be causal to economic growth as it affects in many ways markets and their performance (Rajan & Zingales, 1995; La Porta et al., 1998). In this context, a number of studies have focused specifically on the role of the judiciary-institution in securing contract enforcement, which is the basic legal tool making exchanges possible. Johnson et al. (2002) concentrate their attention on the transition of Eastern European countries from a planned economy to market. In particular they are interested in the interaction between firms' "relational contracting" and courts. These two institutions are seen as complementary in the function of supporting transactions.

Moreover, judges have a crucial role when asked to perform qualitative verification of legal duties that would otherwise require prohibitive transaction costs among economic actors. The authors estimate that, despite informal relations remain the core of negotiating in a transition economy, as market players gain confidence in courts' efficiency, transaction costs related to contracting with new partners decrease and market activity increases.

Other studies have further tried to strengthen the evidence of a causal relationship between judicial systems and economic activities, especially for what concerns credit. Jappelli et al. (2005) investigate the influence of judicial efficiency on credit lending using data from Italy. Their estimates support the theory that a well-functioning judiciary positively affects credit availability. India further provides another fertile ground on which testing the previous hypothesis. Visaria (2009) argues that after the establishment of special "Debt Recovery Tribunals" in India it is possible to observe a significant increase in the loan repayment and a consequent reduction of interest rates charged on credits. Chemin (2009b) instead exploits data concerning Indian courts' delay and highlights a significant relationship between judges' slowness and farmers' access to credit markets.

Arellano et al. (2007) compare the financing patterns of firms in Ecuador and the United Kingdom and find that debt relative to assets is, on average, higher for UK firms than for Ecuadorian ones. Among others, they observe that a pivotal role is played by the effectiveness of contract enforcement, stronger in the UK and weaker in Ecuador. Weak contract enforcement works like a tax on borrowing, thus limiting loans for all firms especially for small ones, since their value relative to tax is smaller and, accordingly, the set of loans available relative to their asset is smaller. Strong contract enforcement acts like a subsidy on borrowing, which enables all firms to issue more debt and, likewise, expands the loans availability for small firms. The implication is that, where contract enforcement is weaker, newcomers (generally small firms) experience more difficulties. On the whole, financial constraints arising because of a limited enforceability of contracts are important for explaining firms' characteristics and markets' structures (Cooley et al. 2009).

All the mentioned studies focus on idiosyncratic cases in which no emphasis is given to the specific role of entrepreneurs. However, an established body of literature has unveiled that the leading engine in fostering economic growth is indeed entrepreneurship (Aghion and Howitt, 1997). Accordingly, in order to better grasp the dynamics of economic activity it becomes more relevant to properly understand the direct interplay between these two basic units, that is to say, the judiciary and entrepreneurship.

This perspective permits to zoom the analysis on the chief legal instrument available to entrepreneurs for operating into the market and how its enforcement affects their behavior. As well known, entrepreneurial action is the outcome of a complex of concurring factors, involving personal attitudes, economic opportunities and structural features (McMullen & Shepherd, 2006). The first two issues have been extensively investigated by economics, psychology and management sciences, while the latter must attract law and economics scholars since it mostly relies upon the institutional level (Audretsch et al., 2015), which is exactly where the judiciary operates.

More precisely, uncertainty is the conceptual cornerstone upon unveiling the main features of entrepreneurial action, as purported by an extensive literature (McMullen & Shepherd, 2006). Uncertainty depends on many structural and economic factors. While some of these are somewhat exogenous and connected to the asymmetric information or to the bounded rationality, a specific determinant of uncertainty must

be linked to the institutional system and its ability to provide the fertile ground for practicing economic activity. The legal system and its proper working, which of course ultimately relies upon the enforcement of contracts, thus becomes a pivotal element for influencing the creation of new firms and the expansion of existing ones. It can concern, for example, as previously discussed, the ability to attract external financing: the enforceability of financial arrangement plays a key role for investors and entrepreneurs (Monge-Naranjo, 2009). It can equally affect other relevant economic and operational variables. Chemin (2009a) explores the effect over time on entrepreneurship and economic activity of a specific “delay reduction” judicial reform in Pakistan. His analysis suggests that, as a consequence of a qualitatively improved workload management, more cases were disposed by judges and consequently the entry rate of new firms increased significantly. Lichard and Soares (2011) instead focus on the creation of special civil tribunals in the Brazilian judicial system, a reform aiming at increasing courts’ performances by establishing simplified procedures for small claims. From their results emerges that entrepreneurship, in terms of access to self-employment has benefitted from a more efficient justice.

2. The Research

The present work tries to advance the debate in three respects. First it tries to assess the relationship existing between courts performance and on of the main legal determinants of entrepreneurship – i.e., the perception about contract enforcement – as the institutional environment is concerned. Secondly, it attempts to conduct a cross-country analysis in the vein of a current movement championed by the European Commission for the Efficiency of Justice (CEPEJ) and trying to provide useful results for policy implications. This choice rests on the belief that in the framework of European markets a cross-country analysis might be a more appropriate tool to highlight best-practices and criticalities affecting different legal environments, ultimately influencing economic transactions on a broader continental perspective. Third, by considering courts as productive technologies and, accordingly, focusing on their performance in a more suitable way. In particular, it advances the debate concerning the proper indicator for assessing the judiciary performance by comparing two distinct indices.

The adoption of a twofold measure of judiciaries’ performances is aimed at providing a novel and more robust empirical evidence. Previous works refer to delay, which has several shortcomings when the concept of courts’ efficiency is at stake (Djankov et al., 2003). Judicial delay is a rough measure of the average time needed for a legal dispute to be solved and does not account for the market equilibrium and the effort necessary to reach it. The measures adopted here try to capture the productive side of the court system in a way compatible with what done in most productive sectors. The first measure employed here is the *Clearance Rate (CR)*, already used in a number of studies (including e.g. Buscaglia and Ulen, 1997) and adopted by the CPEPEJ itself. This index estimates the capacity of judicial systems to react to the demand of justice and is calculated as the ratio of resolved to incoming cases. However, such index has the shortcoming of not considering the resources employed, which are important for assessing the overall efficiency, especially in a productive perspective.

The second measure adopted here is estimated by means of Data Envelopment Analysis, extensively used in production theory and operational research for assessing the performance of different productive units, properly considering the employed inputs and the obtained outputs. The outcome is a *technical efficiency score (EFF)* which is an index comparing the relative performance of the productive units within

the sample (in our case, national judiciaries across Europe) with respect to an estimated efficient productive frontier.

Now, while these two measures are interchangeably mentioned in literature for assessing judicial efficiency, their outcome, as it will be shown, can be substantially different². This can have serious consequences if the results are then used for policy implications.

Stylized facts and research hypothesis

The starting point of the analysis is that the judiciary represents the main institutional technology available to entrepreneurs for enforcing contracts, while the other ways of dispute resolutions play a residual role³. Accordingly, a viable judicial system is the central way in lowering endogenous uncertainty in markets. Uncertainty itself, as previously seen, might be disaggregated into two components. On the one side we might think of an exogenous and unavoidable element that affects all economic transactions. For example, we can think of natural disasters that might be completely unrelated with economic actors' willingness, but that might at the same time determine the impossibility of complying to their previous contractual obligations. What mostly matters for the purposes of this work is the endogenous component of uncertainty that ultimately relies on economic actors' opportunistic behavior (Williamson, 1985). Since, contractual obligations will be breached whenever the benefits for economic actors deriving from a similar behavior exceed the expected costs, the court system plays a pivotal role also in setting up incentives and directing economic choices of entrepreneurs (Schwartz and Scott, 2003).

An example is provided by Jappelli et al. (2005) with respect to defaults in financial contracts. Legal enforcement of debt repayment might have crucial drawbacks in terms of credit lending and, consequently, investments. While of course there might be "accidental" defaults that are usually connected with general situations of insolvency usually depending on exogenous conditions with respect to the credit relationship, there is also the case of "strategic defaults", when borrowers, although potentially solvent, are unwilling to repay. Such strategic behaviors are relying upon the inability of the institutions governing credit markets, and more specifically the judicial system, to properly enforce repayment. In other words, a poor judicial enforcement of the law affects negatively the borrowers' future willingness to pay back their debts thus fostering opportunistic behaviors. As a consequence, creditors would strategically anticipate such risks and restrict credit availability, thus creating a vicious circle ultimately hindering entrepreneurs' investments (Monge-Naranjo, 2009).

Although solutions can be envisaged in order to mitigate the previous problem – e.g. by making more costly to deviate from original agreements – they ultimately have the downside of restricting economic actors' business opportunities and freedom to negotiate, hence impacting on entrepreneurs expectations that in turn affect the level of entrepreneurship (Chemin, 2009b).

In this vein, the thesis here proposed argues that an efficient judiciary will discourage ex-post opportunistic behaviors. *Ceteris paribus*, the possibility of contracts enforcement by formal institutions would lead to a business environment

² It is for example possible to envisage a downsized, although efficient, court unable to tackle all the filled lawsuits or vice versa.

³ Although alternative systems of dispute resolution exist, such instruments are at best complements of the judiciary. Hence, broadly speaking, the judiciary represents the main productive organization of legal adjudication (Falavigna et al., 2014).

characterized by a greater certainty with respect to property rights. We expect that in a similar situation, both the possibilities for entrepreneurs (in terms of entry in the markets and negotiating) and ultimately economic growth will be enhanced.

3. Data & Empirical Strategy

Data on judicial systems are extracted from the 4th CEPEJ Report (Council of Europe – European Commission for the Promotion of Judiciary Efficiency) that regards figures concerning first instance civil (and commercial) courts⁴ in 2010. According to data availability, 38 European countries have been considered in the analysis⁵. The CEPEJ dataset has the merit to provide real figures. At the same time it supplies comparable and homogeneous data among different countries and legal systems, thus allowing a transnational analysis as the present one.

The index employed for capturing entrepreneurs' expectations about institutional reliability (as said, ultimately affecting the overall level of entrepreneurship) is the one we believe better relates to courts' performance, that is to say, the value labelled as "Enforcing Contract - Distance to Frontier". Such measure has been extracted from the 2010 World Bank's "Doing Business" Report, which has been preferred to other existing and equally valuable dataset essentially for the better matching with the data on judicial systems. The index is the outcome of a survey measuring the subjective perceptions on the ease of contract enforcement in every country. It is worth noting that it does not relate to any objective measure of the judicial activity (Garcia-Posada and Mora-Sanguinetti, 2015); hence, also in line with Johnson et al. (2002), it is the perfect complement for testing whether the would-be entrepreneur's decisions, at least as far as the legal framework is concerned, are affected by the performance of courts. Compared to other figures of "Doing Business", it better encapsulates the impact of the legal setting in the entrepreneurial action. It is bounded in a [0,100] interval and it implies that for values close or equal to the upper bound, the level of entrepreneurship is maximal, since it represents the optimal perceived legal environment, while is decreasing for lower levels.

Other socio-economic variables employed in the empirical analysis have been extracted from the IMF's World Economic Outlook Database.

In order to further distinguish between legal systems belonging to either the Scandinavian, Socialist, German or French legal tradition we refer to La Porta et al. (1998) and Djankov et al. (2003).

As said above, the judicial performances' indices used here are the *Clearance Rate (CR)*, and the *Technical Efficiency Score (EFF)*.

The empirical investigation devoted to test our research hypothesis proceeds by using a two-stages procedure. In the first step, *CR* and *EFF* of national judiciaries are calculated. Then such figures are used as a covariate together with other control variables in various regression models where we use as dependent variable an index of entrepreneurship measuring the degree of uncertainty affecting economic transaction on markets.

⁴ We believe that these courts are actually the ones more interested in claims related to business transactions.

⁵ Although the member states participating to CEPEJ are 47, data availability allows so far to account only for 38 of them.

First Stage: CR and EFF

The *CR* is given by the ratio of cases disposed to incoming ones. This measure reflects the ability of the judiciary to manage the load of cases and provides accordingly a somewhat rough indicator of the market equilibrium. For $CR = 1$ we would have that the judiciary solves all the lawsuits filed. According to this metric, $CR > 1$ means that the judicial system is able to satisfy the current demand for justice plus some cases in the backlog, while $CR < 1$ implies the inability to handle the incoming cases, thus increasing the stock of pending lawsuits. However, though this measure might at first glance seem to provide an interesting snapshot of judicial efficiency, it is somewhat misleading because it does not consider the endowments employed to achieve similar results, and so can lead to incorrect conclusions about efficiency. In fact, the ability to handle the caseload and even reduce the backlog ($CR \geq 1$) can be the result of an extremely good performance with limited means, or simply of an oversized yet inefficient judiciary.

The *EFF* measure partially solves this problem by providing an index considering several inputs employed in the production of an output. It can be estimated by means of Data Envelopment Analysis (*DEA*), a non-parametric technique that permits to build a deterministic production frontier comparing the performances of several Decision Making Units (DMUs), which in this study are nationwide judicial systems. Efficiency scores are calculated on the basis of the radial distance of DMUs to the frontier.

It is worth noting that it will be here calculated according to the $[1, +\infty)$ interval, where $EFF = 1$ means that a given observation lies on the efficient frontier, whereas $EFF > 1$ implies inefficiency. Hence, because of the interval used the inefficiency increases in the value of the variable *EFF*. The output-oriented model is used here in accordance to Farrell (1957), and variable returns to scale (VRS) are equally implemented (Banker et al., 1984). The null hypothesis of constant returns to scale (CRS) is tested according to Simar and Wilson (2002) in order to reject the hypothesis that there is no relation between countries' size and their performances.

The output-oriented framework aims at maximizing the output levels keeping the inputs constant, assuming that the inputs used cannot be easily changed, at least in the short run. This orientation is also known as the 'output-augmenting' approach: it keeps the input bundle unchanged and expands the output level until the frontier is reached (Daraio and Simar, 2007).

According to Simar and Wilson (2007), the bootstrap procedure has been applied to the *DEA* approach in order to correct score values and their confidence intervals. In this way it is possible to obtain more robust results, even if the sample is composed by few observations. The basic idea of bootstrapping is that inference about a population from sample data can be modeled by *resampling* the sample data and performing inference on it. As the population is unknown, the true error in a sample statistic against its population value is unknowable. In bootstrap resamples, the 'population' is in fact the sample, and this is known; hence, the quality of inference from resample data is measurable. The application of the bootstrap procedure allows correcting score estimates with a bias, and this is particularly important because it ensures that estimates are robust.

The input variables introduced in the *DEA* are the factors that might affect the national productivity in this specific sector (professional judges and non-judge staff in courts) and the overall demand of justice (i.e., pending cases on 1 Jan 2010 and incoming cases). According to this approach we can imagine judicial systems'

efficiency as their ability to maximize the number of resolved cases taking the available human resources and the demand of justice into account.

The main idea behind the adoption of *DEA* for measuring the judicial efficiency is to expressly consider the factors affecting the production of decisions by the judiciary, thus providing a more appropriate proxy of judiciaries' performances with respect to other measures used in literature, like delay or clearance rate. Precisely, one of the added values with respect to the other aforementioned measures of performance is that *DEA* scores are able to account at the same time for both the caseload and the other productive inputs⁶.

Consistently with previous literature, this paper equally adopts the number of solved cases as a measure of output. Indeed this is simply an objective measure, and thus this strategy does not permit to infer anything on the qualitative aspects concerning the correctness of judges' decisions. However we cannot neglect that the main role of justice is to "state the law" – the Latin etymology *ius dicere* means exactly that – something done by courts precisely by solving cases. Hence, from this respect the standard measure of judicial systems' production unanimously adopted by previous literature well represents the output and makes possible an analysis likewise other productive sectors. Other controls will be adopted in the second stage of the empirical analysis in order to account for the qualitative aspects of legal enforcement.

Second Stage: Regression models

In the second stage of our empirical analysis we will employ the efficiency measures obtained together with other control variables as covariates in various regression models. The dependent variable (*ESHIP*) is the "Enforcing Contract - Distance to Frontier" index, bounded in a [0,100] interval, as previously explained. The index captures the variation of entrepreneurship as far as precisely when the legal framework is considered.

In order to account for country-specific conditions different from judicial efficiency that could affect our dependent variables, we introduce a set of controls for national factors regarding not only socio-economic and political conditions but also substantial and procedural aspects of legal systems. Table 1 summarizes the definitions and sources for all the variables employed in the second stage regression analysis.

We consider the *Civil Liberties* index (*CIV_LIB*), a proxy of the civil rights enjoyed by citizen in every country, extracted from the 2010 Democracy Index Report, elaborated by *the Economist Intelligence Unit*⁷. Such variable appears necessary so as to control for the potential problem arising in the case of an efficient judiciary operating in the framework of a scarcely democratic regime. In a similar context, an estimated good performance could in fact hide systematic violations of people's rights. In order to control for national specific socio-economic conditions we also include in the regression models several variables measuring respectively countries' population (*POP*), per capita Gross Domestic Product (*GDP*), life expectancy at birth (*LIFE*) and average years of schooling (*EDUC*). We introduce a covariate measuring per capita national budgets allocated to the Justice Sector (*BUDGET*)⁸: such variable

⁶ A flourishing body of literatures follows this approach. Within this journal see e.g. Schneider (2005) and Deyneli (2012) while for a broader survey see Falavigna et al. (2014).

⁷ For more information on the *CIV_LIB* variable, refer to: <http://www.eiu.com>

⁸ Both the *GDP* and the *BUDGET* variables have been normalized accounting for Purchasing Power Parity (PPP) indexes extracted from the International Monetary Fund (IMF) World Economic Outlook dataset.

might be considered as a proxy of the importance given by national Governments to Justice sectors.

Table 1
Description of variables used in Regression Models

Variable Name	Description
<i>ESHIP</i>	Enforcing Contract Distance to Frontier Source: World Bank's Doing Business (2010)
<i>EFF</i>	Technical efficiency scores Source: CEPEJ (2010)
<i>CR</i>	Clearance Rate estimated on first instance civil and commercial cases Source: CEPEJ (2010)
<i>CIV_LIB</i>	Civil Liberties index (logarithmic transformation) Source: The Economist Intelligence Unit Democracy Index (2010)
<i>BUDGET</i>	Per capita public expenditure allocated to judges' gross salaries (Purchase Power Parity adjusted) (logarithmic transformation) Source: CEPEJ (2010)
<i>GDP</i>	Per capita gross domestic product (Purchase Power Parity adjusted) (logarithmic transformation) Source: CEPEJ (2010)
<i>EDUC</i>	Mean Years of Schooling Source: IMF World Economic Outlook Database (2010)
<i>LIFE</i>	Life expectancy at birth Source: IMF World Economic Outlook Database (2010)
<i>POP</i>	Population (logarithmic transformation) Source: CEPEJ (2010)
<i>GERM_D</i>	Dummy = 1 if legal system belongs to German tradition. Source: Djankov et al., 2003
<i>SOCIAL_D</i>	Dummy = 1 if legal system belongs to Socialist tradition. Source: Djankov et al., 2003
<i>SCAND_D</i>	Dummy = 1 if legal system belongs to Scandinavian tradition. Source: Djankov et al., 2003

In order to account for the legal origin of judicial systems we introduce several dummies (*GERM_D*, *SCAND_D*, *SOCIAL_D*). We distinguish between legal systems belonging to either the Scandinavian, Socialist, German or French legal tradition, where the latter is used as reference category⁹. With respect to previous studies (La Porta et al., 1998; Djankov et al., 2003) we do not propose here ex ante hypotheses with respect to the impact of legal origins. The aim is instead to account for

⁹ Although Cyprus is generally acknowledged among Common Law countries because of its past British colonial occupation, for sakes of simplicity we have coded it as a nation belonging to the French Law tradition. This choice relies upon a legal and a statistical motivation. Since independence from the UK in 1960, several reforms have approached the Cypriot legal system to the other continental ones. Furthermore, given the relatively small sample size and the fact that Cyprus would be the only country belonging to the Common Law family, introducing another variable would end up to be an inconvenient loss of an additional degree of freedom in our regressions. However, in unreported models, results were unaffected by neither the exclusion of Cyprus from the sample or the introduction of a further variable.

unobserved characteristics of the legal systems affecting the dependent variable that are not captured by the proposed covariates and check, at the same time, if significant differences emerge from our estimates.

5. Results and Discussion

Table 2 reports the *CR* and the *EFF* obtained for the European countries listed by CEPEJ¹⁰.

Table 2
Countries ranking, according to efficiency scores
Civil (and commercial) cases at 1st instance courts (2010)

Ranking	Country	<i>EFF</i>	<i>CR</i>
1°	Czech Rep.	1.0303	1.0328
2°	Lithuania	1.0435	1.0190
3°	Hungary	1.0468	1.0167
4°	Austria	1.0548	1.0009
5°	Andorra	1.0585	0.9898
6°	Switzerland	1.0633	0.9953
7°	Denmark	1.0744	1.0194
8°	Armenia	1.0760	1.0100
9°	Azerbaijan	1.0795	0.9822
10°	Germany	1.0859	1.0031
11°	Spain	1.0873	0.9362
12°	Italy	1.0881	1.1814
13°	San Marino	1.0884	0.8317
14°	Russia	1.0887	0.9984
15°	Luxembourg	1.0904	1.3852
16°	Monaco	1.0909	0.7570
17°	Norway	1.0916	1.0052
18°	Sweden	1.0926	0.9790
19°	Moldova	1.1159	0.9483
20°	Poland	1.1249	0.9497
21°	Estonia	1.1295	0.9762
22°	Georgia	1.1328	0.9620
23°	Portugal	1.1386	1.0189
24°	Macedonia	1.1431	0.9515
25°	France	1.1447	0.9838
26°	Slovakia	1.1487	0.9771
27°	Croatia	1.1491	1.0183
28°	Albania	1.1739	0.9309
29°	Slovenia	1.1821	0.9779
30°	Serbia	1.1926	0.9161
31°	Montenegro	1.2116	0.9188
32°	Romania	1.2191	0.8976
33°	Finland	1.2220	0.9324
34°	Latvia	1.2748	0.8577
35°	Bosnia	1.3195	0.9408
36°	Malta	1.3297	0.8867
37°	Greece	1.3527	0.7889
38°	Cyprus	1.3588	0.8395

¹⁰ It is worth reminding that the *EFF* is calculated according to the $[1, +\infty)$ interval; this implies that efficiency decreases for values of *EFF* greater than 1.

As said, a $CR > 1$ means that the national system is able to fully satisfy the current demand of justice, i.e. incoming cases, whereas $CR < 1$ suggests the incapacity of the judicial system to face the number of filed cases. However, it totally neglects how this result is reached in terms of labour force employed, that is to say it does not consider the main inputs. Accordingly a $CR < 1$ could be the outcome of a very efficient but undersized judiciary and vice versa. For example, when considering two rather comparable countries like Austria and Germany (both in terms of legal tradition and economic and social development), we can observe how both are characterized by rather similar levels of CR : in fact, Germany enjoys a slightly better rate. However, once accounting for EFF , we see how Austria results more efficient than Germany. This means that, given the level of inputs, the Austrian judiciary is able to “produce” more solved cases than the German one.

This twofold level of measuring the performance is an added methodological value since it attempts to compare national judicial systems not only on the basis of decided cases but also considering the resources employed in the production process¹¹. If it is undeniable that entrepreneurial action will mostly rely on the overall performance of the judicial system, from a policy oriented perspective it appears desirable to uncover whether courts’ achievements are the outcome of an efficient organization or not.

Table 3

Descriptive statistics of dependent and independent variables adopted in regression analysis

Variable	Obs.	Mean	Std. Dev.	Min	Max
<i>ESHIP</i>	35	64.9257	11.0650	35.3	85
<i>EFF</i>	38	1.1420	.0884	1.0303	1.3588
<i>CR</i>	38	.9688	.1028	.7570	1.3852
<i>CIV_LIB</i>	35	2.1171	.1893	1.5497	2.3026
<i>BUDGET</i>	35	3.3775	.8110	1.2929	4.5919
<i>GDP</i>	35	9.8604	.7197	8.0384	11.2727
<i>EDUC</i>	36	10.3535	1.1373	8.0407	12.6313
<i>LIFE</i>	36	76.8414	3.9367	67.208	82.203
<i>POP</i>	38	15.2666	1.9149	10.4089	18.7778
<i>GERM_D</i>	38	.0789	.2733	0	1
<i>SOCIAL_D</i>	38	.5263	.5060	0	1
<i>SCAND_D</i>	38	.1053	.3110	0	1

Table 3 and Table 4 present respectively the descriptive statistics of the variables adopted in the second stage analysis and the correlation coefficients of independent variables.

Table 5 shows the results of the different regression models estimated in order to test our research hypothesis. More precisely, models (1) through (4) employ the EFF covariate as a measure of judicial performance, while models (5) through (8) use the CR .

¹¹ A similar reasoning can be made by other measures for assessing judiciary’s performances such as the ‘judicial delay’, i.e. the time to disposition (Christensen and Szmer, 2012) or the size of workload (Dakolias, 1999; Rosales, 2008). All this measure are not weighting the output with the inputs.

Table 4
Correlation of independent variables

	<i>CR</i>	<i>EFF</i>	<i>CIV LIB</i>	<i>BUDGET</i>	<i>GDP</i>	<i>EDUC</i>	<i>LIFE</i>	<i>POP</i>	<i>GERM D</i>	<i>SOCIAL D</i>	<i>SCAND D</i>
<i>CR</i>	1										
<i>EFF</i>	-0.4891*	1									
<i>CIV LIB</i>	0.0585	0.1102	1								
<i>BUDGET</i>	0.2164	0.0689	0.5405*	1							
<i>GDP</i>	0.3607*	-0.1357	0.6501*	0.7350*	1						
<i>EDUC</i>	0.0227	-0.2874	0.1769	-0.1747	0.1661	1					
<i>LIFE</i>	0.1577	0.0440	0.7003*	0.5885*	0.7620*	0.0700	1				
<i>POP</i>	0.2560	-0.1203	-0.1611	0.1092	0.1273	0.0367	-0.0421	1			
<i>GERM D</i>	0.0892	-0.2483	0.1704	0.3024	0.3134	0.1062	0.3182	0.2190	1		
<i>SOCIAL D</i>	-0.0494	0.0258	-0.5558*	-0.4207*	-0.7451*	-0.0362	-0.8394*	0.1215	-0.3086	1	
<i>SCAND D</i>	0.0512	-0.0857	0.3138	-0.0038	0.3693*	0.2701	0.3122	0.0649	-0.1004	-0.3616*	1

* Correlation coefficients significant at the 5% level or better.

We first adopted OLS regressions in models (1) and (5) in order to have a general idea of the effects of courts performance on our dependent variables. Then, in order to obtain more robust results, Truncated Regressions have been performed in the remaining models, applying, in this case, the maximum likelihood estimator. In order to better deal with outlier-observations and respond to criticisms with respect to a cross-country approach, we censor the dependent variable in a [40,100] interval. In this way we can obtain more accurate estimates with respect to a more homogeneous cluster of countries. Models (4) and (8) employ dummy variables accounting for the legal origin of the national judicial systems considered, while columns (3) and (7) try to catch the potential effect deriving from the exclusion of the *BUDGET* variable from the regressions.

As it can be easily seen, findings are consistent with the hypothesis previously raised. In models (1) through (4), the coefficient measuring the *EFF* is always significant and negative. Thus, in accordance with the proposed specification of *EFF*, we can say that judicial efficiency fosters economic activity by mitigating uncertainty connected on contract enforcement expectations that might ultimately affect economic transactions¹². In other terms, it contributes to create a more suitable institutional environment for entrepreneurship. Also when controlling for country-specific peculiarities regarding socio-economic conditions or the national legal system, judiciaries' *EFF* remains a significant predictor, thus confirming the claim that an efficient judicial system is pivotal for fostering entrepreneurship.

¹² Potential issues of reverse causality might be overcome by referring to the “ossification” of legal systems (McCubbins and Page, 1986; Burch, 2008). If it is undeniable that in the long run there might be a feedback between institutional change and socio-economic variables, in the short run the rigidities of legal dynamics impose to legislators costly deviations from the status quo of a given political equilibrium.

Table 5
Regression Models

	OLS	Truncreg	Truncreg	Truncreg	OLS	Truncreg	Truncreg	Truncreg
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>EFF</i>	-36.800 (17.174)**	-37.647 (15.482)**	-44.281 (17.15)***	-34.880 (15.070)**				
<i>CR</i>					49.127 (14.936)***	49.925 (13.470)***	52.007 (15.855)***	50.242 (11.009)***
<i>CIVL</i> ---	19.376 (10.815)*	19.915 (9.701)**	14.420 (10.521)	21.213 (8.597)**	23.820 (10.007)**	24.573 (9.009)***	18.236 (10.109)*	25.913 (7.355)***
<i>BUD</i> ---	-6.722 (2.718)**	-6.986 (2.491)***		-5.072 (2.788)*	-7.278 (2.451)***	-7.555 (2.257)***		-5.529 (2.268)**
<i>GDP</i>	12.307 (3.807)***	12.624 (3.447)***	6.854 (3.069)***	9.180 (3.912)**	9.514 (3.673)**	9.701 (3.286)***	3.630 (3.203)	5.976 (3.350)*
<i>EDU</i> ~	-1.239 (1.341)	-1.291 (1.205)	0.173 (1.203)	-0.791 (1.134)	-0.643 (1.197)	-0.724 (1.077)	1.032 (1.085)	-0.458 (0.957)
<i>LIFE</i>	-1.414 (0.593)**	-1.435 (0.528)***	-1.322 (0.588)**	-2.386 (0.597)***	-1.303 (0.540)**	-1.315 (0.478)***	-1.228 (0.555)**	-2.227 (0.503)***
<i>POP</i>	1.103 (1.067)	1.146 (0.964)	0.703 (1.048)	0.519 (0.873)	2.500 (0.947)**	2.591 (0.866)***	2.244 (0.986)**	1.807 (0.718)**
<i>GER</i> ---				8.253 (4.690)*				11.051 (3.660)***
<i>SOCI</i> ---				-8.429 (5.050)*				-7.026 (4.042)*
<i>SCA</i> ---				0.837 (4.121)				3.286 (3.424)
Const	72.449 (42.220)*	71.464 (37.928)*	101.100 (39.801)***	174.608 (62.234)***	-34.028 (33.994)	-37.053 (30.755)	-10.783 (34.053)	71.808 (45.214)
R²	0.55				0.62			
Mean VIF	2.44				2.49			
N	34	34	34	34	34	34	34	34

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Dependent Variable: Enforcing Contract Distance to Frontier (Source: World Bank Doing Business 2010 Report)

(1) & (5) Ordinary Least Square Regressions: Italy dropped as outlier observation

(2), (3), (4), (6), (7) & (8) Truncated Regressions: dependent variable censored in [40, 100] interval

Standard Errors in parenthesis

Moreover, we tested for the robustness of our results: estimations' residuals show a normal distribution (Shapiro-Wilk test for normality with a p-value = 0.005) and variance inflation factor for every covariate is far below 5 (mean value of 2.44), thus excluding also issues of multicollinearity.

In models (5) through (8), *CR* shows a significant and positive impact on the dependent variable. It is important to note that this is consistent with the results concerning *EFF*, thus implying that using either of the two measures of judicial

performance does not appear to change the estimates of the models. This homogeneity shows on the one hand the appropriateness of using either one of the two adopted measures to predict our dependent variable from a statistical point of view. However, the choice must expressly consider whether there are public policy implications at stake. In such case, *EFF* provides greater information also on the productive side and this should lean in favor of such measure.

Although we were not directly interested in the impact of the control variables employed in the regressions, it is nonetheless important to spend few words in order to comment the obtained results, where significant and homogeneous across different models.

With respect to the *CIV_LIB* variable, the positive coefficient is consistent with the idea that a more advanced legal system (in terms of a wider protection of civil rights) fosters an effective enforcement of economic transactions. Such result is in line with what previously found from La Porta et al. (2004) with respect to the determinants of economic freedom and with the strand of literature investigating the relationship between political and cultural development of societies and the effectiveness of legal enforcement (Djankov et al., 2003).

The results concerning the *BUDGET* variable are in line with previous studies that have shown how “money cannot buy justice” (Buscaglia and Ulen, 1997 and Dakolias, 1999). In particular, Buscaglia and Ulen (1997) have highlighted how developed countries (Norway, Netherlands, Japan, Germany and Denmark) tend to assign much less resources per-capita to their national judiciary systems than developing countries (Peru, Ecuador, Venezuela and Paraguay), although enjoying better performances in the form of shorter delays and smaller backlogs.

The positive impact of *GDP* on transaction enforcement is consistent with previous findings (Acemoglu and Johnson, 2005) that have shown how higher per capita gdp levels are positively correlated with a better protection of property rights. With respect to the negative impact of *AGE*, previous studies (Evans and Leighton, 1989) have estimated how life expectancy is negatively correlated with risk aversion and thus does not help to foster a good environment for entrepreneurship.

Finally, with respect to the dummy variables capturing the legal origin of the judicial systems investigated, findings are in line with what estimated by La Porta et al. (1998) and Djankov et al. (2003). The signs of *GERM_D* and *SOCIAL_D* are consistent with the idea that the judicial systems belonging to the German traditions are more effective than those deriving from French law in enforcing contracts. On the contrary, courts in post-socialist countries appear to be less able to mitigate uncertainty in economic transactions, with respect to those with a French legal tradition.

6. Conclusions

The aim of this paper was to empirically assess the relationship existing between the efficiency of the judicial system and the perceived reliability of the institutional framework, by means of the entrepreneurs’ expectations on contracts’ enforcement by the judiciary, for a pool of European countries. The literature on entrepreneurship has so far mainly focused on individual and economic determinants, mostly neglecting the role of institutions and namely of courts’ performances, which ultimately determine the consistency of legal systems. A fertile environment for economic activity does necessitate a reliable system enforcing contracts. Solving disputes resulting from economic transactions is a necessary condition for entrepreneurs to exploit their potential. The cross-country perspective provided by this paper constitutes a first step

in unveiling the pivotal role of an efficient judiciary in setting up a favorable ground for firms and entrepreneurial activity across Europe. From our estimates we are able to confirm the aforementioned theoretical premises on an empirical ground. Judicial efficiency is a significant factor for explaining a relevant institutional pillar of entrepreneurial action, this remains true also when accounting for a set of various country-specific characteristics regarding not only the judiciary, but also the law on the books, the political environment and socio-economic fundamentals. Moreover, by using two distinct measures of judicial efficiency, the clearance rate and the technical efficiency, alternatively used for assessing the performance of judicial systems, the work contributes to a methodological comparison, which tends to favor technical efficiency when policy is involved since it expressly considers also the productive side.

Of course this paper, by investigating a static perspective, is a first attempt to get a deeper insight on the inner connections between judicial activity and entrepreneurship. Given the relevance of the issue, even from an European political respect, we expect that the topic will attract further studies considering a dynamic dimension.

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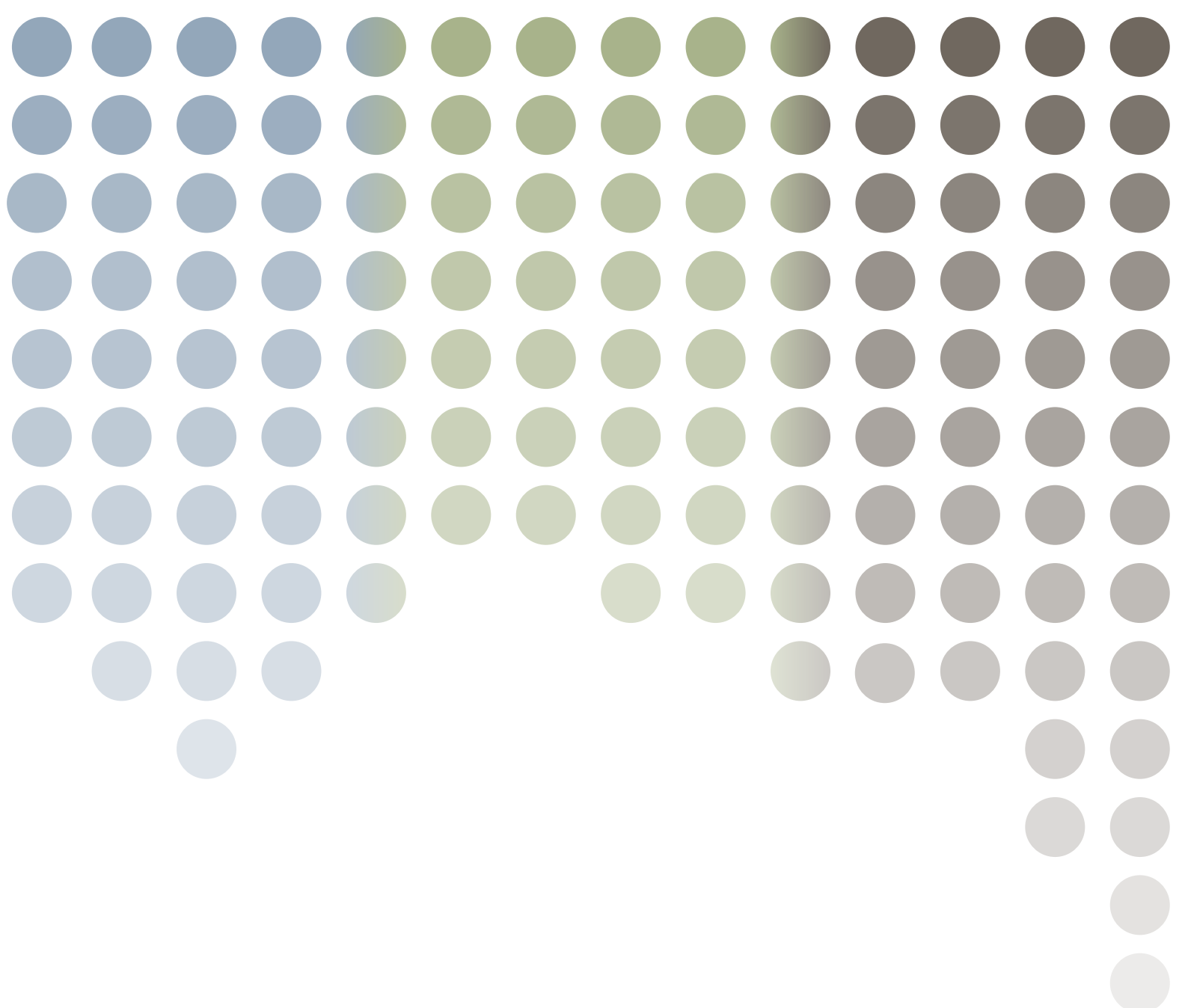
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