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Judicial Independence, Judges' Incentives and Efficiency

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Abstract

Although often assumed by economic theory, an efficient judicial system sounds an oxymoron. In this work we suggest an innovative approach investigating the determinants of court performance. Our focus is on the ideal institutional environment fostering the appropriate set of incentives for judges to operate efficiently. In this setting, we find evidence that greater independence enjoyed by the judiciary from politics induces more competition among judges to obtain professional upgrades. Such environment will incentivize ambitious individuals to be more efficient, thus positively affecting the aggregate performance of the judiciary.

JEL Codes: K41, K49, C14, C34

Keywords: Judicial Efficiency, Judicial Independence, Judicial Decision-Making, DEA, Clearance Rate

1. Introduction

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Since the very inception of economic thought, the enforcement of contracts and the certainty of property rights have been conceived as essential element in order to foster investments, trade and economic growth. In his seminal book Smith (1776, 1804 ed., p. 330) stress that "Commerce and manufactures can seldom flourish long in any state which does not enjoy a regular administration of justice, in which the people do not feel themselves secure in the possession of their property, in which the faith of contracts is not supported by law, and in which the authority of the state is not supposed to be regularly employed in enforcing the payment of debts from all those who are able to pay. Commerce and manufactures, in short, can seldom flourish in any state in which there is not a certain degree of confidence in the justice of government."

Nonetheless for longtime economic theory rested on the deliberate assumption that judicial systems operate efficiently: individuals were supposed to be able to contract in a frictionless way among each other and courts should perfectly enforce such agreements (Williamson, 1985).

Only recently a number of contributions started to challenge assumption on an empirical basis, highlighting how economic activity and growth are heavily affected not only by the legal system (La Porta et al., 1998; Acemoglu and Johnson, 2005) but also by the working of the main technology of legal enforcement, that is to say the court system (Chemin, 2009; Ippoliti et al., 2015).

Given the impact of courts' performances on the economic system, scholars have increasingly tried to understand how courts work and what the determinants of their inefficiency, which seems to be a widespread phenomenon characterizing many judiciaries across the world. Following up this body of literature, the present study attempts to frame a theoretical environment that might conciliate the measurement of judicial performance with a focus on the role of its main input, judges' labor. In particular, consistently with previous literature (Schneider, 2005), the paper relies on the idea that the institutional organization governing the judiciary affects the conduct of judges. Accordingly, we propose to investigate how this institutional framework might foster an appropriate set of incentives for judges to perform efficiently. In particular, the research tests whether judicial independence and the related career incentives for judges affect the performance of judicial systems.

For assessing the productivity of courts, the paper uses two distinct indices of judicial performance, Clearance Rates and Technical Efficiency Scores. This choice yields a twofold advantage: on the one side, by providing two different metrics, it gives a broader perspective on judicial performance. At the same time, it also an advancement from a methodological perspective, as it shows that although both measures produce comparable estimates, in general the latter is to be marginally preferred since it carries more information with regard to judiciaries' performances.

The focus on a heterogeneous group of countries, spanning from Western Europe to ormer Soviet Union, gives us a diversified cluster of observations in order to test how different institutional settings might influence the performance of courts. Data is supplied by the Council of Europe – European Commission for the Promotion of Judicial Efficiency (CEPEJ), which limit has the merit provid a complete overview on the judiciaries of a pool of countries gravitating around the European Council. This allows enlarg the focus from single countries to a wide European ontinental level, where the importance of judicial harmonization becomes critical in the perspective of economic and political integration.

The remainder of the paper proceeds as follows. In Section 2 we develop a theoretical framework that tries to reconcile the role of the judge with a consistent economic theory. In Section 3 we advance our hypothesis with respect to how the institutional environment in which judges work might affect their performance. In Section 4 we outline the empirical methodology adopted in order to test our research question while the results are presented and discussed in Section 5. Finally, in section 6 we draw our conclusions.

2. Incentives and Judicial Behavior

The seminal article of Posner (1993) has the great merit of having radically changed the way scholars approach judicial behavior. His model moves away from the orthodox idea of judges as individuals living in a sort of "legal empyrean" and only subject to the law's prescription, as purported by legal formalists. On the contrary, Judge Posner's view embraces the "homo oeconomicus" paradigm, according to which judges are rational and self-interested agents willing to maximize their personal utility. This apparently simple tenet corresponds to a Copernican revolution in the judicial behavior literature as it finally supplies a theory likening judges to any other economic agent. While this novelty per se already sheds light on the organization of

courts, it becomes even more relevant in order to understand courts' performance since adjudication is essentially labor-intensive production.

After Posner's contribution, a number of works have tried to supply insight with regard to the determinants of judges' utility functio [2] . Judges' individual characteristics and their behavior have thus been empirically investigated in different respects. Taha (2004) adopted the utility-maximizing model, by focusing on US federal judges and their publishing decision habits, with results that confirm the economic orientation of judicial choices. Landes et al. (1998) and Choi et al. (2010) for the US, Ramseyer (2012) for Japan and Schneider (2005) for Germany have stressed the role of judges' educational background (as a proxy for their intellectual ability) in explaining their performance. Christensen and Szmer (2012) show evidence that judicial delay, the most evident symptom of court' "pathology" (at least from ordinary people's perspective), is mitigated by judges' expertise.

Other studies targeting individual effort have discovered that judges generally respond to a heavier caseload by increasing productivity (e.g., Beenstock and Haitovsky, 2004 for Israel and Dimitrova-Grajzl et al., 2012 for Slovenia)[3]. At the same time, judges' behaviour may also be characterized by inertia in work habits that nullifies the effects of law amendments designed to promote efficiency (Eisenberg & Huang, 2012).

The present analysis takes the route of gaining further insight into how incentives affect judge's behavior by drawing from Posner's stylization. Accordingly, it identifies three main variables that might affect judge' utility: income (*i*), personal visibility (*v*) – for this study prestige in terms of reputation among peers and popularity the general public – and the impact on public policy (*p*) that might be accomplished by imposing personal preferences through decisions.

The considered determinants are assumed to be (strictly) positive, such that:

$$U(i, v, p) \text{ with } \frac{\partial U}{\partial i} > 0, \frac{\partial U}{\partial v} > 0, \frac{\partial U}{\partial p} > 0$$

[2] For a general view, see Smyth (2004).

3 This is also the motivation claimed for the recent bill submitted to the US congress (S. 699: Court Efficiency Act of 2013).

The most direct and concrete way available self-interested judges in many jurisdictions – includ those of our sample – maximiz utility is to enhance personal income (*i*). salary discrimination cannot be made among judges belonging to the same court levelremuneration varies only according to seniority and hierarchal position. Since the judiciary is a hierarchy that might be interpreted as an internal labor market (Schneider, 2005) career incentives are the strongest force influencing judicial behavior (Shapiro, 1981). Actually, climbing the career ladder equally enhances visibility (*v*) and personal impact (*p*).

egard judges' reputation and popularity (*v*), it is self-evident that higher-ranking positions will turn out to be the more prestigious ones. But it must also be considered that it is not uncommon for members of judiciar top ranks to be co-opted in political institutions (Parliament or Government), public administration or (where existing) judicial councils (Melcarne, 2015). Consequently, being promoted to the positions of the judiciary might be potential springboard toward further career advancements, most likely precluded to lower court judges. In general this process is accompanied by further increase in income.

Finally, with respect to the impact of judges' decisions on public policy (*p*), if it is rather intuitive how this might work for Common Law countries, it is not negligible that it might act as an incentive in Civil Law judiciaries: the ones actually considered in the present work. Although in these systems the *stare decisis* principle adopted, to a certain extent judges are engaged in law-making by interpreting statutes (Shapiro, 1981; Schneider, 2005) and establishing time-consistent decisional trends that lower courts adopt as a source of "Soft Law" (Fon and Parisi, 2006).

If all the previous holds and the mentioned variables are strictly increasing in the career, the judges' utility function collapses in the reduced form $U = U(c)$ where (c) represents the career/income incentive. Available data seems to support this claim. It is straightforward to show that everywhere in the considered region, the wage system does not reflect the marginal productivity of the individuals, but rather their rank within the hierarchy. Thus, monetary incentives coincide with career progression.

Empirical evidence suggests that monetary might be subject a three-fold increase depending on the hierarchical level of the court in which judge serve. As shown in Table 1, being promoted from a first instance tribunal to a court of last resort implies on average a twofold salary increase.

Table 1 Judges' Salary

Country	Salary Trial Court Judge	Salary Supreme Court Judge	Increase
Albania	17500	35001	2
Austria	55623	134821	2.42
Azerbaijan	26092	47878	1.83
Bosnia	55159	91646	1.66
Croatia	50948	109943	2.16
Cyprus	90785	161370	1.78
Czech Republic	44339	99134	2.24
Denmark	89100	147852	1.66
Estonia	55986	76987	1.38
Finland	58694	123962	2.11
France	46327	129295	2.79
Georgia	29896	57188	1.91
Germany	48670	87193	1.79
Greece	43849	116970	2.67
Hungary	35327	73523	2.08
Italy	58285	203980	3.49
Latvia	25875	49977	1.93
Lithuania	37415	50607	1.35
Luxembourg	75081	146178	1.94
Macedonia	50713	62500	1.23
Malta	43534	48584	1.12
Moldova	8109	11977	1.48
Montenegro	51107	68170	1.33
Norway	92605	147897	1.6
Poland	42012	116802	2.78
Portugal	51388	123537	2.4
Romania	54050	92075	1.7
Russia	32295	95474	2.96
Serbia	35811	59305	1.66
Slovakia	51580	74506	1.44
Slovenia	46452	92862	1.99
Spain	61169	144161	2.36
Sweden	51015	88862	1.74
Switzerland.	106379	222526	2.09
Average	50682	99787	1.97

Values have been adjusted in order to account for purchas power parity. All salaries are expressed in euros and are intended to be gross salaries. Source: Cepej Report (2012).

3. Judicial Independence and Efficiency

Once defined the theoretical cornerstone adopted in this paper underlying judicial behavior, we want then to investigate how the institutional framework might incentivize self-interested and promotion-seeking judges to be efficient. In the present work we advance the hypothesis that Judicial Independence (JI) might be a determinant factor affecting the career incentives of judges and, consequently, their performances.

The idea of an independent and autonomous judiciary finds its theoretical antecedents during the nlightenment and first practical application in the US Constitution. To date, the notion of JI has found several connotations. At the most basic level, JI might be interpreted as the existence of a third and neutral conflict resolution system (Shapiro, 1981) or, more precisely, as the quality of judges enforcing the law and resolving disputes regardless of the preferences of parties appearing before them (La Porta et al., 2004). However, a second and non-negligible trait of JI concerns "political insularity" (Fiss, 1993). According to this idea, judges should not be considered by political actors "instruments" to fulfill further political aims or be punished for preventing their realization: judges should not be removed for decisions that might contra exogenous political interests. The organizational structure of the judiciary should not be by political gains and judges should be shielded from threats that might compromise their impartiality (Larkins, 1996). Thus defined, insularity is the outcome of the establishment of a set of formal institutions safeguarding judges' conduct (Clark, 1975; Rosen, 1987).

In this vein it is worth noting that a fair and impartial system of professional career will contribute to the degree of independence of a judicial system. Political powers might interfere at various levels with the judiciary's organization, thus impacting the career incentives that a judge would be subject to. From this and by considering at the same time the lesson Posner (1993), we can hypothesize that the degree to which judges feel that their chances of future promotions will not depend on some politician's volatile will, but rather on their personal capacities, might ultimately affect their performances. To our knowledge no study so far has directly linked JI with the performance of a judicial system and this represents the main novelty of our research[4].

In a country characterized by a rather low level of JI, not only judges not be autonomous in their decisions and free to apply the law, but their career will be equally jeopardized by the influence of external political interests. In situation, the decision promot a judge will more likely depend on factors judge' work, the degree of loyalty toward the incumbent government. However, if promotion-seeking judges will not be evaluated with respect to their capacity and conduct, they will

[4] Other works have, for instance, focused their attention on how JI might be sought by rational politicians in order to guarantee long-term commitments (Landes and Posner, 1975; Salzberger, 1993; Maitra and Smyth, 2004) or on the impact of JI on economic growth (Feld and Voigt, 2003).

consequently incentivized not to focus on their performance, but they will rather wor to earn the political "protection" of their career' stakeholders (politicians, superiors, bureaucrats, lobbies). In this institutional setting we predict that, *ceteris paribus*, judges will not be subject to the right set of incentives to perform efficiently. As a consequence, we hypothesize that increasing levels of JI should entail better performances. A more autonomous judiciary will be characterized by a more transparent system of career upgrades, most likely organized by means of public selections, peerevaluation and elections. In institutional environment, promotions will be much more likely to reflect judges' personal capacities and conduct (Choi and Gulati, 2004). But if this is so, JI will foster competition among ambitious judges to work "more" and "better". The former aspect will result in better performances on the judges' side and is what we focus on[5]. Conversely, we are only indirectly interested in the qualitative aspects related to judges' work: given the extreme difficulty of observing the quality of judicial decisions without relying on survey data (Dakolias, 1999), we only control for this issue in our empirical analysis. The idea that ambitious judges will have to exhibit appropriate performances finds support in previous studies linking judges' productivity with higher chances of future promotions in countries like Japan (Ramseyer and Rasmussen, 1997), USA (Taha, 2004) Germany (Schneider, 2005). At the same time this insight seems to one of the top priorities in European political institutions' agenda, as the CEPEJ's work shows.

On the whole, we expect to observe better performances where judiciaries enjoy more independence from political interests. Such institutional framework will in fact be characterized by fewer constraints in terms of external interference in judges' work. Consequently we expect more competition to rise among rational judges willing to contend promotion higher ranks of the judiciary. Competition will thus push judges to work harder in order to be better qualified. If this is so, we expect that higher JI, by fostering more competition among judges and thus giving them the right set of incentives to work more, will determine better performance of the whole judicial system.

[5] A potential objection to our claim might stem from the fact that an independent and autonomous judiciary might avoid politic interference, at the same time also not held accountable its conduct. However, argument be overcome on two distinct levels. First, if JI implies less political influence, it does not exclude intra-judicia control over judges' conduct. Second, , given the theoretical assumptions adopted. At increasing levels of JI, a utility-maximiz judge will need to work hard in order to achieve his or her career goals.

4. Empirical Strategy

The empirical investigation here devoted to shed light on the aforementioned hypothesis, will be conducted in two stages. In a first step we will estimate two different measures of civil court performance, later be employed as dependent variables in several regression models in order to assess the impact of JI on court performance. The choice focus only on civil courts is consistent with previous literature[6]. We embrace perspective since civil courts have jurisdiction over share of litigation that ultimately has a direct impact on economic activity and growth. Moreover, while for civil litigation the demand justice is clearly identifiable with the of lawsuits, this is not the case for criminal justice, where it is not clear if one must account for the number of crimes, the number of cases autonomously filed by public prosecutors or by crime victims. In the framework of civil justice we will concentrate our attention on the first tier of this jurisdiction: first instance tribunals. This is due to the fact that such courts deal with the largest share of civil litigation and are, at the same time, the ones characterized by the symptoms of inefficiency. Furthermore, this choice allows to avoid potential problems connected higher court litigation deriving from biases in the appeal process that explained.

4.1. First Stage – Judicial Performance Estimation

As in Ippoliti et al. (2015), we propose a methodological comparison between two different measures of judicial efficiency. This choice rests on the fact that, when policy implications are at stake, it might be suitable to use the most appropriate index of public sector performance. For these purposes, we will estimate both Clearance Rate (CR) and Technical Efficiency Score (TE) of a number of European national Judiciaries[7]. Data on national judicial systems extracted from the 4th CEPEJ Report 2012 figures concerning first instance civil (and commercial) courts in 2010. completeness, 38 European countries have been considered in th analysis. The CEPEJ dataset has the merit provid real figures and, at the same time, suppl comparable and

[6] To our very best knowledge, with the exception of Gorman and Ruggiero (2009) deal with the efficiency of US prosecutors, all previous works have studied the performance of civil courts.

[7] According to available data, we were able to include in the first stage of our empirical analysis a set of 38 countries, namely: Albania, Andorra, Armenia, Austria, Azerbaijan, Bosnia, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Macedonia, Malta, Moldova, Monaco, Montenegro, Norway, Poland, Portugal, Romania, Russia, San Marino, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland.

homogeneous data among different countries and legal systems, thus allowing a transnational analysis as the present one.

Indeed, both indexes are objective measures, and thus the present strategy does not allow on 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 courts precisely by solving cases. Hence, this respect the two standard measures of judicial systems' production adopted by previous literature well represent the output and make possible a analysis 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.

4.1.1. Clearance Rate

The Clearance Rate (CR) is a proxy of the ability of a judicial system to promptly react to the current demand justice. It is obtained as a ratio between the of resolved to incoming cases. This measure has the advantage of being fairly easy to interpret and it is not the result of a comparison among countries' performances. Accordingly, if CR < 1 the courts are not able to keep pace with the current demand justice, thus increasing the backlog, while when CR > 1 the judicial system is able not only to fully satisfy the demand justice but also to the of pending cases. If on the one hand this index has the advantage of being simple and immediate to interpret, on the other it might not carry enough information with respect to how a performance is ultimately achieved, thus potentially leading to biased results. In fact a CR < 1 could reflect the outcome of a rather efficient but yet under-dimensioned judiciary, while a CR > 1 could in turn hide an over-dimensioned but inefficient court system. For this reason, we believe that considering another indicator might be appropriate.

4.1.2. Technical Efficiency

In order to overcome problem we introduce a second index, Technical Efficiency (TE): a methodology that allows consider multiple factors affecting the number of solved cases. In this respect we are going to be able to account not only for different components of the demand justice, but also for the workforce employed. TE reflects the ability of an ideal judicial "industry" to maximize its "production of justice" with

given endowments. Such measure is estimated by means of Data Envelopment Analysis (DEA), an established methodology adopted the last three decades by scholars to estimate courts' efficiency. This non-parametric technique builds a deterministic production frontier and then compares 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. TE will thus be bounded in a [0,1] interval, with TE = 1 representing the ideal frontier and with efficiency increasing in values of TE.

The output-oriented model is used here in accordance Farrell (1957), and variable returns to scale (VRS) are 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 while 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 model in order to correct score values and their confidence intervals. The basic idea of bootstrapping is that inference about a population from a sample can be modeled by resampling data. 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, which is known; hence, the quality of inference from resample data is measurable. The application of the bootstrap procedure allows correcting biased score estimates, and this is particularly important because it ensures greater robustness (Falavigna et al., 2015).

Consistent with previous literature, this paper adopts the number of solved cases as a measure of output. The input variables introduced in the *DEA* are the factors that might affect the national productivity in this specific sector. However, differently from the CR measure, we are able to account for multiple dimensions. Not only we consider as input the "flow" component of the demand justice (incoming cases), but also its "stock" component, represented by the number of pending cases at the beginning of the considered year. Furthermore, we are able to account for the

workforce employed in the justice sector (number of judges and administrative staff). 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 justice into account.

4.2. Second Stage – Regression Analysis

The two measures of (CR and TE) thus obtained become the dependent variables of the regression models estimated in the second stage of the empirical analysis in order to explore the impact of Judicial Independence on the performance of judicial systems.

4.2.1. Judicial Independence

The main variable of interest will be JI, our proxy for Judicial Independence. Among the various potential indexes available, our choice fell on the "*De Facto Judicial Independence*" Index designed by Voigt et al. (2015). The adoption of a substantive rather than a structural measure reflects the necessity of linking the performance of a judiciary with the actual institutional environment in which it operates (Maitra and Smyth, 2004). In the absence of a precise measure that accounts for the levels of political interference in judges' promotions we believe that this index is a good proxy (accounting, among others, for the government to limit judges' tenure or change their income) of the proposed aspect of Judicial Independence.

4.2.2. Control Variables

Since our main concern is to study the impact of JI on CR and TE, we must design our investigation strategy by trying to harmonize the necessit of controlling for other factors that might affect our measures of JE, at the same time limit the loss of degrees of freedom. Accordingly, we have chosen a number of covariates to include in the models in order to control for other factors[8].

As mentioned , being efficient does not necessarily mean fair. In fact, efficiency-oriented reforms of the judiciary often have to deal with the criticism that enhanced court efficiency would come at the cost of a lower quality law enforcement (Botero et al., 2003). If competition pushes judges to work "more" and "better", these two aspects not necessarily walk in the same direction. In other words, being efficient

[8] Table A1 in the Appendix presents a more detailed description of the considered variables.

from a quantitative point of view might not determine a qualitatively good system of law enforcement. In fact, a trade-off might arise between quantity and quality of judges' work (Rosales-Lopez, 2008). Given the fact that the quality of decisions is rather difficult to observe and assess, judges might be incentivized to solve as many cases as possible, but with the drawback of not investing the needed effort. Judges might be pushed to work more, but not better, because this is what is more easily observable on the part of those designated to appraise their conduct. For these reasons we include a specific variable, CIVLIB, to account for the effective enforcement of fundamental rights in the considered countries. This measure might be a better proxy of the quality of justice with respect to measures accounting for the rates of appeal against lower court decisions or repeal by higher courts. With regard to the former, such measure might be biased by differences in the litigation cultures existing in different countries. The choice of appealing a trial court's decision might completely disregard the quality of such judgment. Other reasons might emerge and push toward automatic appeals with the only aim of postponing final rulings. Also the rate which lower court decision are repealed by higher tribunals might hide some problems. A similar measure should rely on the assumption that higher-ranking courts are always more competent and loyal only to the principle of a fair application of the law. But in fact such idea might contrast with the fact that, because of their hierarchical position, judges in courts of appeal might be more sensitive to political interference than their lower court peers. Furthermore, given the pyramidal structure of judicial systems, higher judges enjoy a much greater concentration of power that could in fact bias the quality of their decisions to a even greater extent.

Another potential concern might stem from the different levels of social status linked to justiceship, as reflected by differences in salaries among the considered countries. In a nation where members of the judiciary enjoy a higher salary (relative to general wealth), they might be less incentivized to work harder in order to achieve better wage conditions. We thus include in the regressions the covariate BUDGET that controls for the (per capita) public expenditure allocated nationally to judges' salaries. A further issue might be related differences in "litigation culture". Both adopted measures of JE are sensitive to the levels of demand justice (number of filed cases

per capita)[9]. In fact, the very same judicial system will be characterized by a rather lower level of JE in a more litigious society. Accordingly, we introduce a variable, LITIGATION, to account for this circumstance. Finally, following a well-established literature on "legal origin" (among many, see La Porta et al., 1998 and Djankov et al., 2003), some models will account for differences in legal traditions. In our case, we cannot exclude *ex ante* that JI is ultimately correlated with legal origins. Accordingly, we will introduce three dummies (FRENCH, GERMAN, SCAND) in order to obtain more robust results with respect to the impact of JI on courts' efficiency[10].

5. Results and Discussion

Table 2

Type	Variable	Obs	Mean	Std. Dev.	Min	Max
Inputs	Professional judges	38	2977.316	6.133.879	14	32313
	Non-judge staff in courts	38	8830.605	18102.18	38	96128
	Pending cases on 1/1/2010	38	290914.3	737905.8	1352	4263961
	Incoming cases	38	696248.3	2240600	909	1.36e+07
Output	Resolved cases	38	696004.4	2245225	756	1.36e+07

Table 2 and 3 report respectively descriptive statistics the variables adopted to estimate both CR and TE and the covariates employed in the regression models[11].

Table 3

[9] This problem is partially dealt with DEA, since the number of judges is highly correlated with population

[10] Although Cyprus is generally acknowledged among Common Law countries because of its past British colonial occupation, for sake 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 the Cypriot legal system to the other continental ones. Furthermore, given 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 be an inconvenient loss of an additional degree of freedom in our regressions. However, in unreported models, results were unaffected by either the exclusion of Cyprus from the sample or the introduction of a further variable.

[11] Appendix A2 reports correlations among all independent variables.

Variable	Obs	Mean	Std. Dev.	Min	Max
CR	38	.968849	.1027849	.7569644	1.385164
TE	38	.8804215	.0633066	.7359229	.9705665
JI	33	.6607879	.1771791	.35	1
CIVLIB	35	8.437.714	1.367.551	4.71	10
BUDGET	35	3.377.483	.8110012	1.292871	4.591927
LITIGATION	38	.0264371	.0188071	.0020176	.0955095
GERMAN	38	.0789474	.2732763	0	1
FRENCH	38	.2631579	.4462583	0	1
SCANDINAVIAN	38	.1052632	.3110117	0	1

Table 4 shows results the regression models estimated in order to test our hypothesis regarding the impact of JI on JE. Several different specifications have been designed in order to account for different sets of controls and use both our measures of judicial performance. Respectively, models (1) through (3) use CR as dependent variable while models (4) through (9) adopt TE. We use OLS regressions in models (1) through (6), while truncated regressions are employed in columns (7) through (9) as suggested by Simar and Wilson (2007). No serious issues of multicollinearity are at stake: variance inflation factors for every variable are far below 2 across all models' specification.

Despite sample size and the various controls adopted, JI appears to be a highly statistically significant determinant of both proposed measures of judicial efficiency. Consistently with the aforementioned theoretical hypothesis, empirical evidence suggests that Judicial Independence is positively correlated with more efficient court systems. Judiciaries benefitting from higher degrees of autonomy from the political world perform significantly better, regardless of the adopted measure of efficiency[12]. This remains true when controlling for other different factors that could potentially bias such result. On the other hand, all proposed controls appear to have statistically significant impact on the performance of judicial systems, regardless of the measure used.

[12] The adopted regression models do not allow ruling out the possibility of reverse causality. However, we dealt with this problem in two ways. First, the "ossification" of legal institutions we can exclude that in the short run there might be a feedback between institutional change and socio-economic variables. The rigidities of legal dynamics impose legislat deviations from the status quo of a given political equilibrium. Second, in unreported models (available upon request) the inclusion of macro-economic controls (such as GDP per capita) did not alter sign and significance of any estimate.

Table 4

	OLS						***Truncreg***		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	CR	***CR***	***CR***	***TE***	***TE***	***TE***	***TE***	***TE***	***TE***
JI	0.209	0.222	0.246	0.216	0.221	0.200	0.247	0.250	0.221
	(0.073)***	(0.077)***	(0.099)**	(0.049)***	(0.049)***	(0.054)***	(0.062)***	(0.059)***	(0.056)***
CIVLIB		-0.001	-0.003		0.005	0.006		0.005	0.007
		(0.007)	(0.008)		(0.007)	(0.008)		(0.008)	(0.009)
BUDGET		0.013	0.020		-0.007	-0.008		-0.006	-0.009
		(0.014)	(0.018)		(0.012)	(0.014)		(0.013)	(0.014)
LITIG		0.190	0.207		0.291	0.570		0.331	0.651
		(0.406)	(0.366)		(0.445)	(0.434)		(0.501)	(0.471)
GERM			-0.035			0.020			0.028
			(0.044)			(0.034)			(0.035)
FREN			-0.006			-0.029			-0.031
			(0.045)			(0.034)			(0.032)
SCAND			0.018			0.016			0.016
			(0.029)			(0.029)			(0.029)
Constant	0.830	0.783	0.758	0.736	0.705	0.712	0.720	0.685	0.693
	(0.050)***	(0.079)***	(0.099)***	(0.038)***	(0.052)***	(0.068)***	(0.044)***	(0.061)***	(0.073)***
R2	0.30	0.33	0.35	0.38	0.39	0.44			
N	33	33	33	33	33	33	33	33	33

White's Heteroskedastic robust Standard Errors in parenthesis. Dependent variable in models (1) through (3) is CR, while models (4) through (9) employ TE. Models (1) through (6) use Ordinary Least Square estimation, while models (7) through (9) adopt Truncated regression. * p<0.1; ** p<0.05; *** p<0.01.

The estimates emerging from the empirical analysis suggest many interesting results both from a positive point of view and from a policy-oriented perspective. The independence enjoyed by judiciaries across European countries seems to be an important factor in explaining the performance of judges[13]. According to the proposed theoretical framework, evidence supports the claim that judiciaries' independence fosters an environment characterized by competition, pushing judges to work harder in order to compete for professional . If this is so, our estimates do not result biased by the omission of other relevant factors. In fact even the statistical insignificance of some of the adopted controls deserve a few words of comment. In accordance a well-established stream of literature supporting the idea that "money cannot buy justice" (Buscaglia and Ulen, 1997; Dakolias, 1996; Dakolias, 1999), budget allocated to judges' wages does not explain differences in their performances. At the same time we are able to exclude that career incentives induce judges to sacrifice the quality of their work on the altar of efficiency (Rosales-Lopez, 2008).

[13] In unreported models (available upon request) we tested the impact of the "De Jure" Judicial Independence Index, as extracted by Voigt et al. (2015). Either individually or interacted with the other variables, this covariate turned out to a insignificant impact on both our measures of JE.

This very last result has very important policy consequences, since it replies to the frequent criticism that would ascribe to efficiency-oriented reforms the potential downside of worsening the quality of justice. At the same time, according to our estimates, not just any reform appears to be suitable in order to enhance judges' performances. For example, we can conclude that attempts to uniform the levels of demand justice or judges' wages might be, at best, useless. On the other hand, that politicians should value positively the independence of judges as a necessary condition in order to the stability over time of their decisions (Landes and Posner, 1975; Ramseyer, 1994), efficiency-oriented reforms of the judiciary should not neglect the issue of judicial independence. Institutional changes mitigating the influence of the executive and legislative powers over the judiciary might determine greater competition among ambitious judges seeking promotions. If this is so, competition should push judges to work more and thus will foster the overall efficiency of judicial systems. Of course, because of the broad measure of JI adopted, we are not able to ascertain which specific institution might be more important in order to explain JE. For the moment, we leave to future research the development of more disaggregated index that might be useful for this purpose.

A further interesting result emerges from our analysis. As above, we were equally interested a methodological comparison between two different measures of judicial efficiency. When policy implications are at stake, we believe that TE might be a more suitable index than CR. Given the fact that no differences in the results emerge when adopting either one of the two measures, our propensity toward TE derives from the fact that such variable carries more information than CR.

6. Conclusions

In light of the centrality of judicial efficiency in European countries' political agenda, in this paper we aimed at giving a first insight at how a specific institutional structure in which the judiciary operates, namely its independence from politics, might influence career judges' incentives and, consequently, their performances. According to a well-established strand of literature dating back to Posner (1993), we embraced the idea that judges are rational and self-interested utility maximizers. Consistently, judges aim at obtaining promotion to higher ranks of the judiciary. In a similar struggle for career advancement, we found evidence that the degree to which judges are independent from political interference affects their performance. Greater

competitiveness for professional upgrades stems from a more autonomous judiciary, with judges evaluated according to their conduct and not their loyalty toward government. Such mechanism incentivize judges to work harder and consequently reflect in aggregate enhanced performance of the entire ustice sector. A similar result suggests interesting policy conclusions, building on the idea that politicians should positively value judicial independence as a warranty of the long-term stability of their policies. Accordingly, reforms supporting a more autonomous system of career advancement should entail positive consequences in terms of judicial efficiency. , we find further evidence that "money cannot buy justice", thus contradicting those ustice sector insiders impute the poor performance of judicial system to the scarcity of resources therein allocated.

Appendixes

A1
Variables Descriptions

Variable Name	Description
CIVLIB	Civil Liberties index[b]
BUDGET	Per capita public expenditure allocated to ustice sector workers' gross salaries (Purchase Power Parity adjusted & logarithmic transformation)[a]
LITIGATION	Litigation rate calculated as quantity of cases filed to courts for every 10000 citizens[a]
FRENCH	Dummy = 1 if legal system belongs to French tradition.[c]
GERMAN	Dummy = 1 if legal system belongs to German tradition.[c]
SCANDINAVIAN	Dummy = 1 if legal system belongs to Scandinavian tradition.[c]

Sources: a) 4th CEPEJ Report (2010); b) The Economist Intelligence Unit Democracy Index (2010); c) Djankov et al. (2003)

Appendix A2
Correlation Matrix

	JI	***CIVLIB***	***BUDGET***	***LITIGATION***	***GERMAN***	***FRENCH***	***SCANDINA***
JI	1						
CIVLIB	-0.1316	1					
BUDGET	-0.1800	0.5466*	1				
LITIGATION	-0.1486	-0.2480	0.1722	1			
GERMAN	0.3846*	0.1769	0.3024	-0.1304	1		
FRENCH	-0.0591	0.2992	0.2948	0.1304	-0.1750	1	
SCANDINAVIAN	0.0249	0.3577*	-0.0038	-0.3785*	-0.1004	-0.2050	1

* Correlation coefficient significant at the 5% level or better

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