Judicial Efficiency and Economic Growth: Evidence based on EU data

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May 2021

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This Draft: May 20, 2021

Abstract: The growth-enhancing property of a well-functioned judicial system is documented on the back of the safeguarding of property rights and legal investor protection, the well-functioning of financial markets, the support to entrepreneurship and the upholding of the firm growth. We investigate the effects of judicial efficiency on economic growth, using a new dataset over the period 2010-2018 drawn by the EU Justice Scoreboard study. More specifically, we estimate a static growth equation controlling for alternative judicial efficiency measures. Our findings corroborate that the inefficiencies in the operation of judicial systems pose obstacles to economic growth, and consequently, positive developments in judicial efficiency can be growth enhancing. Specifically, inefficiencies in the operation of judicial systems, measured alternatively as (a) lengthier court proceedings, (b) lower rates of clearance of accumulated unresolved cases, (c) increasing burden of pending cases and (d) a high inflow of new cases, all undermine economic growth. Our results justify the further adoption of judicial reforms in European Union members, that strengthen the enforcement of private contracts, incentivizing the domestic and external investment decisions and supporting the European economies to achieve and sustain robust growth rates. Finally, we find that civil origin legal systems, which are characterized by a higher degree of formalism in judicial procedures relative to common law origin systems, hinder economic growth.

Keywords: judicial efficiency, economic growth, disposition time, clearance rate, caseload

JEL classification: K40, O43, C23, C26

Disclaimer: The views expressed herein are those of the authors and do not necessarily reflect those of Alpha Bank.

Declarations of interest: none.

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1. Introduction

Cross-country variations in economic growth rates can be explained by economic as well as institutional factors. Nowadays, there is a resurgence of interest for the link between economic performance and the efficiency of institutions. Differences in institutional efficiency may serve as a key explanation of the dispersion of growth rates and per capita income among countries (see, e.g., Acemoglu *et al.* (2005) and Acemoglu and Robinson (2012)). Empirical literature indicates a significant relationship between prosperity and low levels of corruption, economic and political independence and protection of civil and property rights. Thus, countries with advanced institutions tend to exhibit higher growth rates compared to those that are characterized by institutional inefficiencies.

Among the several institutional factors that determine economic growth (e.g., corruption, economic freedom, political stability, regulatory quality, government effectiveness), judicial efficiency seems to play a crucial role on economic performance, shaping the incentives of economic agents to take the ownership of significant investment projects and, thus, boosting economic growth dynamics. The growth-enhancing property of a well-functioned judicial system is established through the safeguarding of property rights and the enforcement of private contracts. Inefficiencies in the operation of judicial systems can hinder saving and investment decisions, failing to ensure the protection of their returns as they are exhausting the necessary funds used for financing investment plans. As a consequence, judicial system inefficiencies pose obstacles to the foreign direct investment inflows and/or increase capital flight towards safer and more stable legal environments. Moreover, judicial systems that are characterized by weak contract enforcement could increase transaction costs and have adverse effects on firms' size and loan provision.

Relying on the received literature of economics and law, we can propose that judicial efficiency not only endorse social values but also promote growth through the well-functioning of financial markets (Bae & Goyal, 2009; Jappelli *et al*., 2002; Fabbri, 2010), the support to entrepreneurship (Ippoliti *et al*., 2015) and investment (Lorenzani and Lucidi, 2014), and the upholding of the firm growth (Beck *et al*., 2006; Laeven and Woodruff, 2007). In light of the aforementioned growth-enhancing factors, we study

whether judicial efficiency has a direct impact on economic growth. More specifically, we examine whether different levels of judicial efficiency in European union can explain the cross-country differences in per capita GDP growth.

Measurement of judicial efficiency and productivity is not an easy task. Several methods have been proposed, relying either on the time needed to settle a case (e.g., Christensen and Szmer, 2012; Di Vita, 2010) or the number of cases completed by a court (e.g., Beenstock and Haitovsky, 2004; Ramseyer, 2012) or clearance rates (e.g., Buscaglia and Ulen, 1997). In this paper, we investigate the direct impact of judicial efficiency on economic growth, using a new dataset drawn by the EU Justice Scoreboard, which provides, among others, data about the judicial efficiency for the member states of the European Union. To the best of our knowledge, the empirical literature has not studied the direct impact of judicial efficiency indicators on economic growth, especially for the European Union economies[3]. Thus, our paper tries to fill this gap by examining the impact of four different indicators of judicial efficiency on economic growth, using a new panel dataset for the European Union countries. Our aim is to highlight the growth-enhancing implications of the efficient judicial systems and to provide significant policy implications.

In the aftermath of the financial crisis, the EU member states proceeded to significant structural reforms, aiming to mitigate the output losses and strengthening their economic fundamentals. Among the various structural reforms, European Union countries adopted significant justice reforms, aiming to increase the efficiency of their judicial systems by reducing the length of court proceedings as well as by restricting the excess caseload burden (either in terms of pending cases and/or incoming cases). Thus, our results justify the further implementation of reforms that boost judicial efficiency in the European Union countries, as a means of achieving higher growth rates.

To evaluate the effects of judicial efficiency on economic growth in European Union' countries, we estimate a static growth equation, controlling also for some standard growth determinants, that are widely used by the relevant empirical literature. We estimate alternative versions of our growth equation with OLS, using four different

[3] The related empirical literature examines the impact of judicial efficiency on several economic outcomes, including, among others, the firms' size, foreign direct investments and credit supply (see Section 2 for a detailed discussion about the related literature).

indices of judicial efficiency, namely the clearance ratio, the disposition time, the incoming caseload and the pending caseload. Furthermore, in order to take into account, the potential endogeneity in our independent variables that arises in panel data estimations, we use instrumental variables (IV) estimation methods (in particular, two-stage least squares (2SLS) estimation). Thus, our estimation controls for the potential endogeneity of all explanatory variables, using their lagged values as instruments. Finally, we construct two distinct composite indices of judicial inefficiency, using the four above-mentioned judicial efficiency indicators. This analysis helps us to identify an overall impact of the effectiveness of justice systems on economic growth.

Our main findings can be summarized as follows. Higher levels of judicial efficiency can actually promote growth. In other words, inefficiencies in the operation of judicial systems, measured alternatively as (a) lengthier court proceedings, (b) lower rates of clearance of accumulated unresolved cases, (c) increasing burden of pending cases and (d) a high inflow of new cases, that could be otherwise resort to alternative out-of-court resolution mechanisms, all undermine economic growth. Distortions in the operation of justice systems increase institutional uncertainty and compress business confidence, hampering several aspects of economic performance, hurting investment and creating productivity losses and, thus, hindering economic growth. Our results justify the continuation of judicial reforms in European Union members, aiming to safeguard the enforcement of private contracts and the security of property rights, facilitating the investment decisions, improving business confidence, raising productivity and supporting the European economies to achieve and sustain robust growth rates. Finally, we examine whether civil origin legal systems are relatively less growth enhancing than common law origin systems and find that civil origin systems do not underpin economic growth.

The rest of the paper is structured as follows. Section 2 discusses briefly the related literature. In section 3 we present our data and the empirical strategy we employ. Section 4 presents and discusses our baseline results. Section 5 presents robustness checks. Lastly, the Section 6 concludes.

2. Literature review and theoretical background

A significant part of the received literature focuses on the study of the effects of well-functioning judicial systems in economic outcomes, through the protection of property rights and the enforcement of contracts, providing empirical evidence of a strong positive relationship between efficient justice systems and various aspects of economic performance, such as firm size, foreign direct investments and credit supply[4].

A large part of the related literature examines the relationship between the efficiency and quality of judicial systems with the firms' size. In general, an increase in the average size of firms implies productivity gains for the economy, fostering growth dynamics through the enhancement of scale economies. According to Lorizio and Gurrieri (2014), an inefficient judicial system may have adverse effects on several areas of businesses' performance, hampering employment decisions (through failures in the enforcement of the employment legislation) and investment plans (through failures in the contract enforcement) and, thus, having a negative impact on firm size. Kumar *et al.* (2001), using firm-level data from 15 European economies, corroborate a positive relationship between the efficiency of judicial system and the average firm size, especially for the lower capital-intensive firms. In the same line, Beck *et al.* (2006), using data from 44 developed economies, provide evidence of a positive relationship between the efficiency of the legal system and property rights protection with the firms' size. Moreover, several country-specific studies confirm the positive implications of a well-functional justice system to the firm size. For instance, Laeven and Woodruf (2007) find that the Mexican states with more efficient legal systems exhibit larger firms, mainly through a lower idiosyncratic risk faced by entrepreneurs which facilitates the smooth completion of their investment plans. Also, Garcia-Posada and Mora-Sanguinetti (2013) confirm this positive relationship between firm size and judicial efficiency in Spain, while Giacomelli and Menon (2013) show that a reduction in trial length in Italy leads to an increase in the average Italian firm size.

[4] A large strand of the literature investigates the demand and supply determinants of judicial efficiency. For example, see Carmignani and Giacomelli (2010), and Buonanno and Galizzi (2010) for studies on the demand-side determinants, while for supply-side drivers of judicial efficiency see, indicatively, Buscaglia and Dakolias (1999), Garoupa *et al.* (2010) and Voigt and El Bialy (2012), which examine several factors (including, among others, the size and specialization of courts, salaries of judicial personnel and presence of judicial councils and judges' incentives). See also Palumbo *et al.* (2013) for a cross-country comparison across OECD economies, regarding the length of court proceedings, the accessibility to justice and the predictability of court decisions.

A second pillar of the related literature focuses on the effect of well-performed judicial systems on foreign direct investment (FDI). Foreign equity financing *via* FDI inflows is considered one of the major sources of capital inflows, fostering growth perspectives through the acceleration of technological progress and the adoption of innovative production techniques. Benassy-Quere *et al*. (2007) examine the role of institutions in the host and in the source country of FDI flows for OECD countries, providing evidence that a more efficient protection of civil and property rights, among others, tend to increase FDI inflows. Bellani (2014) finds also that countries with efficient justice systems attract more investment plans that are characterized by a higher degree of firm-specific assets. Lorenzani and Lucidi (2014) examine the impact of several judicial reforms that enhance judicial efficiency on FDI for the European Union members, suggesting that judicial efficiency gains may have profound effects on business activity and FDI.

The third pillar of the related empirical literature is oriented towards the effects of inefficient justice systems on the smooth provision of credit as well as the level of interest rates. Borrowing restrictions and increases in the cost of lending due to inefficiencies of justice undermine growth perspectives. As Djankov *et al.* (2008) point out, debt financing is a crucial factor that determines the economic performance, allowing for the businesses to finance their investment plans and households to underpin their consumption expenditure. La Porta *et al.* (1997) find that the legal environment has positive effects on the size of capital markets across countries. Levine (1998) provides evidence that countries with legal codes that protect creditors' rights, which are highly dependent on the legal origin, are characterized by more developed banking systems. Djankov *et al.* (2008) show that more efficient debt enforcement of contracts is associated with improvements in debt markets, as measured by the ratio of private credit to GDP, as well as that the legal origin plays a crucial role on the efficiency level of debt enforcement. Bae and Goyal (2009) study the effects of variations across countries in legal protection of property and creditor rights on credit market, providing evidence that weak contract enforcement is related to compressed loan provision and elevated interest rates. Furthermore, several studies confirm the negative consequences of inefficient judicial systems on debt financing at a country level (e.g., Japelli *et al.* (2005) for Italy and Fabbri (2010) for Spain).

Although the empirical literature has studied extensively the role of judicial efficiency on different aspects of economic performance, the direct effect of judicial performance on growth dynamics has not been studied extensively, with an exception of Feld and Voigt (2003) and Hayo and Voigt (2008). However, the former investigates the impact of judicial independence on growth dynamics, distinguishing between *de iure* and *de facto* indicators of judicial independence. The latter examines the role of procedural formalism on growth dynamics, contradicting the previous literature (e.g., Djankov *et al*. (2003)) that a high degree of formalism in judicial procedure is associated with lower economic growth rates, taking also into account the legal origin (for example, procedural formalism is higher in civil than in common law countries[5]). They find that several judicial procedures that safeguard the independence of the courts from external interventions and the fairness of legal proceedings (including, among others, the right to legal counsel and the right to appeal) are growth-enhancing, through the facilitation of transactions and the acceleration of investments.

3. Data and Empirical Methodology

In this section, we provide a description of our empirical methodology as well as the variables used in our regressions, focusing mainly on the variables of interest, i.e. the judicial efficiency indicators.

3.1 Data Description: A Statistical Portrait of European judicial systems

The dataset used in our analysis consists of an unbalanced panel of 27 European Union countries (see Table A1 in the Appendix). Our sample covers the period 2010 to 2018. Judicial efficiency indicators are drawn from the European Union (EU) Justice Scoreboard. The data sources for the rest of our control variables include the Eurostat, the World Bank and the Penn World Table (see Table A.3 in the Appendix).

[5] See, for example, La Porta *et al*. (1997, 1998), Beck *et al.* (2003) and Levine (2005) for a discussion about the ways in which the law origin and legal traditions shaped the legal framework for the protection of property rights across countries. For instance, the countries adopted the French Civil Law exhibit weaker protection of property rights as they give priority to the power of state and government operation, while the countries that embraced the British Common Law are characterized by flexible legal systems that facilitate private contracting.

The EU Justice Scoreboard aims to provide useful insights and data for researchers and policymakers, facilitating the evaluation of quality and efficiency of judicial systems within the European Union.[6]. The Scoreboard is published on an annual basis, from 2013 onwards, providing data from 2010 onwards, with an exception for 2011. The EU Justice Scoreboard uses various sources of information, with the largest part of the quantitative data to be derived from the Council of Europe Commission for the Evaluation of the Efficiency of Justice (CEPEJ)[7]. The Scoreboard focuses on a number of indicators that measure the efficiency, quality and independence of justice in each EU country, focusing on non-criminal litigious cases (civil, commercial and administrative disputes).

To estimate the effects of the efficient justice systems on economic growth, we consider four different indicators that gauge the degree of judicial efficiency, namely the clearance ratio, the disposition time, the incoming caseload and the pending caseload. All indices refer to first instance civil and commercial cases.[8]

More specifically, the clearance rate is the ratio of the number of resolved cases over the number of incoming cases within a year. It measures the degree of performance of the judicial system regarding its incoming caseload. If the clearance rate is larger than 100%, the courts are able to handle more cases than they received, thus, part of past accumulated cases is resolved. On the contrary, a clearance rate lower than 100%, implies that the judicial system resolves less cases than it receives, increasing the accumulated unresolved cases for the next year. The clearance rate is given by the following formula:

$$Clearance\ rate\ (\%) = \frac{Resolved\ cases\ in\ a\ period}{Incoming\ cases\ in\ a\ period} \times 100$$

The disposition time measures the time necessary for a pending case to be solved in a court, taking into account the current pace of caseload of the courts in each country. In other words, it measures the length of judicial proceedings, i.e. the estimated time (in days) needed to resolve a case in court, meaning the time taken by the court to reach a

[6] See Dori (2015) for a detailed description of the scope and methodology of the EU Justice Scoreboard.
[7] CEPEJ provides data about the quality and efficiency of judicial systems in EU countries, using available information from the member states. Data are distinguished between supply-side and demand-side determinants of judicial efficiency (e.g., number of lawyers and judges, judicial budget, use of ICT applications, etc.)
[8] See, also, EU Justice Scoreboard 2020 for more details about the construction of the indices.

decision at first instance. It equals to the total number of pending cases at the end of the reference period over the number of resolved cases during the same period, transforming the ratio to a number of days by multiplying with 365. Thus, disposition time is obtained by the following formula:

$$Disposition\ Time\ = \frac{Number\ of\ pending\ cases\ at\ the\ end\ of\ a\ period}{Number\ of\ resolved\ cases\ in\ a\ period} \times 365$$

Furthermore, we rely on two additional judicial efficiency indicators, namely the incoming and pending caseload. The former measures the number of incoming cases within a year per 100 inhabitants. In other words, it captures the inflow of new cases within the reference year, which is expected to be negatively correlated with the level of judicial efficiency. The incoming caseload is computed using the following formula:

$$Incoming\ caseload\ = \frac{Number\ of\ incoming\ cases\ in\ a\ year}{100\ inhabitants}$$

The pending caseload measures the number of pending (unresolved) cases on 31 December of the reference year per 100 inhabitants. It is a measure of the accumulated caseload of unresolved cases at the end of each year, which raises obstacles to the enforcement of contracts and the timely and efficient operation of courts and resolution of disputes. The pending caseload is determined as:

$$Pending\ caseload\ = \frac{Number\ of\ pending\ cases\ on\ 31\ December\ of\ a\ year}{100\ inhabitants}$$

To investigate the relationship between the different indices of judicial efficiency and economic growth, we control for other growth determinants, that are widely used by the relevant empirical literature. The empirical literature on economic growth determinants (see e.g., Barro (2003)) has identified several drives of economic performance. We use per capita real GDP growth as our dependent variable.

As explanatory variables in the growth equation, we use the government consumption as a share of GDP, used as a proxy to the government size, which usually has adverse effects on growth dynamics. Also, we include trade openness over GDP, computed as the sum of total exports and imports; a higher trade openness usually boosts economic growth. Furthermore, we employ the inflation rate, measured as the growth rate of the harmonized index of consumer prices (HICP), which usually hinder economic growth. Moreover, following the findings from the neoclassical growth theory that human capital promotes output growth dynamics, we use as an additional determinant the

human capital index, drawn from Penn World Table, which is constructed based on years of schooling and returns to education. We use also population growth in percent; the literature usually suggests a negative relationship between per capita GDP growth and population growth.

Finally, following Djankov *et al.* (2003) that procedural formalism has a significant impact on judicial efficiency and, thus, on the decisions of economic agents, we include in our specification time invariant legal origin dummies. To distinguish our sample of countries between the various origins of legal systems, we follow the categorization by Djankov *et al.* (2003), i.e. in Common law (British-law origin), Civil law (French-law origin), German law, Nordic law and former-socialist law countries (see Table A.2 in the appendix). As Levine (2005) points out, differences in law origin, shaped by historical factors (i.e. colonization, conquest and imitation), can explain the cross-country differences in the protection of property rights and the enforcement of private contracts. For instance, the French civil law prioritizes the operation and the enhancement of the state and exhibits higher procedural formalism, putting less emphasis on the safeguarding of private property rights. On the contrary, common law (English legal origin) countries are characterized by a higher flexibility (and less formalism) and stronger support of private contracts.[9]

Descriptive statistics of the variables used in our estimations are presented in Table A.3 in the appendix. A comparison of our data reveals a considerable cross-country variation. For instance, the mean per capita real GDP growth is 2%, with a standard deviation of 2.9%. The values of our dependent variable range between -9%, suffered by Greece, and 24%, enjoyed by Ireland. Regarding the standard control variables, it is evident also a cross-country variation (see Table A.3 in the appendix). Regarding the judicial efficiency indicators, the average clearance rate is 102.1%, ranging between the minimum vale of 55.6%, in Ireland and the maximum value of 181.6%, enjoyed by Luxembourg. The mean disposition time is 261.3 days. Malta has the maximum disposition time (849 days), while Luxembourg enjoys the lowest (53 days). Regarding the caseload, the mean value of the incoming caseload is 2.52 and that of the pending caseload is 1.74 per 100 inhabitants. Romania exhibits the highest incoming caseload (6.9 incoming cases per 100 inhabitants) and Finland the lowest (0.1 incoming cases

[9] See Levine (2005) for a detailed review of the related literature that studies the factors that shaped the cross-country variations in legal systems.

per 100 inhabitants). Italy has the highest pending caseload (6.3 pending cases per 100 inhabitants), while Finland enjoys the lowest value (0.1 pending cases per 100 inhabitants).

Table A.4 in the appendix presents the correlation matrix, suggesting a simple statistical positive relationship between growth and clearance rate and a respective negative relationship of economic growth versus disposition time and caseload of pending cases. Although there is a positive correlation between growth and caseload of income cases, the majority of our growth specifications result in negative coefficients.

3.2 Empirical Methodology

We aim at empirically assessing the effects of different judicial indicators on economic growth in European Union countries by estimating variations of a static parsimonious growth equation, given by the following general specification:

$$GDP_{i,t} = \beta_0 + \beta_1 JUD_{i,t} + \beta_2 X_{i,t} + \beta_3 LEGAL_i + c_i + \tau_t + \varepsilon_{i,t} \qquad (1)$$

where the dependent variable $GDP_{i,t}$ is real per capita GDP growth in country i at time t and the $JUD_{i,t}$ represents different indicators of judicial efficiency (clearance rate, disposition time, incoming caseload or pending caseload). The vector $X_{i,t}$ includes the rest control variables and $\varepsilon_{i,t}$ is a zero-mean error term. The general specification (1) also includes the time-invariant dummy $LEGAL_i$ to capture the effects of legal origin on economic performance.[10] Moreover, equation (1) includes country fixed effects c_i and time effects τ_t. Alternative specifications of (1) are examined, taking into account variations in country fixed effects and time effects as well as the incorporation of the legal origin dummies.

We estimate alternative versions of equation (1) with OLS. Furthermore, in order to take into account, the potential endogeneity in our independent variables that arises in panel data estimations, we use IV estimation methods (in particular, two-stage least

[10] Notice that the legal origin dummies are constant and do not change over time. Therefore, we do not include them in fixed-effect estimations, as their effects are captured by country fixed effects. We include legal origin dummies only in random effects estimations. This dummy takes the value of 1 when a country belongs to the respective group of countries that are originated from the specific legal origin. For more details regarding the distribution of countries across their law origin, see Djankov *et al.* (2003).

squares (2SLS) estimation). Thus, our estimation controls for the potential endogeneity of all explanatory variables, using their lagged values as instruments.

4. Empirical Findings and Discussion

This paper examines the effects of four different indices of judicial efficiency on economic growth, using a standard growth model and controlling also for some widely-used growth determinants. To do so, we estimate variations of equation (1) using OLS estimation methods. Moreover, we use an instrumental variable approach (2SLS) to control for potential endogeneity of all explanatory variables. Variations of (1) are estimated either with (a) country and time fixed effects (and without legal origin dummies, i.e., setting $\beta_3 = 0$), (b) with country fixed effects and no time effects (again, without legal origin dummies, i.e., setting $\beta_3 = 0$) and (c) with random effects, considering also the legal origin dummies (i.e., setting $\beta_3 \neq 0$). First, we present and discuss briefly the impact of the control variables on economic growth. Then, we focus on the growth effects of judicial efficiency indicators. Tables 1 and 2 summarize our empirical results from the OLS and IV estimations.

[Insert Table 1 about here]

Our results regarding the effects of the control variables on economic growth are broadly in line with the related empirical literature (see, for instance, Barro (2003)). More specifically, our results (in OLS as well as in IV estimations) corroborate a strong negative and statistically significant relationship between government consumption (as % of GDP) and per capita growth, signifying that a higher government size (proxied by the government consumption ratio) hamper growth dynamics. Furthermore, we get positive and statistically significant coefficients for the trade openness (as a percent of GDP). Also, we confirm a negative statistically significant relationship between per capita GDP growth and inflation rate; the latter serves as an indicator of macroeconomic stability considering that inflationary pressures hinder economic outlook. We get also significant positive coefficients for human capital, confirming the theoretical predictions of the neoclassical growth models. Finally, our estimations provide evidence of a negative relationship between population growth and per capita GDP growth.

Moving to our main variables of interest, our empirical findings suggest, in general, that inefficiencies in the operation of judicial systems, measured alternatively as (a) lengthier court proceedings, (b) lower rates of clearance of accumulated unresolved cases, (c) increasing burden of pending cases and (d) a high inflow of new cases, that could be otherwise resort to alternative out-of-court resolution mechanisms, all pose obstacles to economic growth. In other words, positive developments in judicial efficiency can promote the potential for a strong economic growth. There are also significant policy implications that indicate the increasing importance of structural reforms as a means of boosting investment and growth dynamics. Our results provide grounds for the justification of the implementation of further reforms in European Union members, aiming to enhance the efficiency of justice systems. Especially in the aftermath of the economic crisis, more efficient judicial systems, that safeguard the enforcement of private contracts and the security of property rights, can be growth-enhancing, facilitating and incentivizing the domestic and external investment decisions and supporting the European economies to achieve and sustain robust growth rates.

[Insert Table 2 about here]

More specifically, in both OLS and IV estimations, we uncover a strong significant positive relationship between the clearance rate and per capita economic growth (across all specifications). A higher clearance rate means that the judicial system is characterized by increased capability to address more cases compared to incoming cases, which, in turn, leads to an acceleration of the resolution of past accumulated unresolved cases. The swift decrease of the accumulated burden of unresolved cases promotes the investment decisions, facilitates the ownership of investment plans and sends a signal to economic agents of a bold policy intention to confront past inefficiencies, easing the attraction of fresh investments.

Regarding the impact of disposition time on economic growth, we get a negative statistically significant coefficient only in our IV estimation that includes random effects and legal origin dummies. Length trial proceedings are related to delayed resolution of commercial disputes, raising disincentives especially for foreign investors to choose the respective country among alternative investment destinations.

Moreover, our results indicate a negative relationship between the caseload of incoming cases per 100 inhabitants and per capita GDP growth. An increased inflow of incoming cases in courts, instead of, for example, resort to out-of-court dispute resolution mechanisms, could trigger significant delays in court proceedings as well as in dispute resolution of civil and commercial cases, establishing a business-hostile environment and, thus, hindering economic growth.

Finally, our results provide evidence of a negative impact of the caseload of pending cases per 100 inhabitants on economic growth (in both OLS and IV estimations). An increasing burden of accumulated unresolved cases within a year implies delays in the resolution of civil and commercial disputes, raising significant disincentives for new investment and, thus, posing obstacles to the achievement of robust economic growth rates.

Finally, we test for the economic outcomes of a hypothesized basic historical difference between the styles of legal traditions, i.e., the policy-implementing focus of civil law versus the market-supporting focus of common law as documented by La Porta *et al.* (2008). Our results regarding the economic growth effects of legal origin dummies provide evidence for the existence of a strong negative relationship between economic growth and the civil (French) law origin (see columns 6, 9 and 12 in Table 1 and column 9 in Table 2). This could be mainly attributed to the fact that the countries adopted civil law as their legal system tend to exhibit a weaker performance in the protection of private property rights, placing greater emphasis to the concentration of power by the state (see, e.g., Levine (2005)). Thus, civil law countries - which are characterized by a higher degree of formalism in judicial procedures - relegate the security of private property rights and the private enforcement of contracts to second place, hindering private investment and savings and, in turn, undermining the economic performance. Furthermore, we get significant negative coefficients for German legal origin and Nordic (Scandinavian) legal origin (see columns 6, 9 and 12 in Tables 1 and 2). Although the German and Scandinavian law embrace jurisprudence and are characterized by more independent judicial systems, commercial and civil dispute

resolution in these countries tend to be more formalized than in common law countries.[11]

5. Robustness checks

5.1 Composite Indices of Judicial Inefficiency

In this section, we examine the robustness of our findings, using two different composite indices of judicial inefficiency. We construct these two different composite indicators, using two alternative techniques and based on the four aforementioned indices of judicial efficiency. This analysis helps us to identify an overall impact of the effectiveness of justice systems on economic growth.

The former indicator of judicial inefficiency is constructed using the Principal Component Analysis (hereafter referred as *PCA index*). PCA has the advantage that concentrates closely related variables together, creating a new variable (which is called *component*). This kind of analysis allows us to create a new index of judicial efficiency, combining the four abovementioned indicators. The second composite index (hereafter referred as *Composite Index*) is constructed again using the four indices used in the previous sections. More specifically, we standardize the four indices so as to obtain a zero mean and a unit standard deviation. Then, the composite index is generated as the average of the standardized series.[12] As depicted in Graphs 1 and 2, both composite indices seem to track the overall trend of per capita real GDP growth relatively well.

[Insert Graphs 1 and 2 about here]

[Insert Table 3 about here]

Our results suggest a negative impact of judicial inefficiency on economic growth. In particular, as depicted in Table 3, we get negative significant coefficients of both indices of judicial inefficiency for both OLS and IV estimations. Thus, our findings

[11] According to Djankov *et al.* (2003) and Levine (2005) the common law countries put larger emphasis on the protection of private property rights and are more flexible regarding the adherence to formal procedures. Thus, we expected that common law origin could imply potential output gains. However, although the majority of the coefficients for the common law origin dummy are positive, we do not get statistically significant results.

[12] All indices of judicial efficiency used in this paper, except from the clearance rate, indicate that a rise in the index reflects a deterioration in judicial performance. Thus, in both cases, we first transpose the clearance rate in order to be compatible with the remaining three indices and, then, we proceed to the generation of the composite index.

corroborate the widespread view that dysfunctional judicial systems, that fail to safeguard the security of property rights and the enforcement of contracts, raise significant obstacles to economic growth dynamics and have detrimental effects on productivity. Distortions in the operation of justice systems (for example, lengthy trial proceedings, a high degree of procedural formalism that undermines the productivity of courts, organizational issues, inadequacies in the training of the judicial personnel as well as the lack of innovative ICT mechanisms) increase the institutional uncertainty and compress business confidence, hampering several aspects of economic performance.

More specifically, a failure to safeguard property rights can undermine saving and investment through a weak protection of their returns, raise impediments to the attraction of foreign direct investment and create capital outflows, deteriorating the business climate and eliminating the necessary funds used for financing investment plans. Furthermore, a weak private contract enforcement could heighten transaction costs, creating disincentives for the private agents to participate in financial transactions, pose obstacles to the enhancement of scale economies and the enlargement of firms' size and raise liquidity constraints, compressing loan provision and increasing interest rates.

5.2 Dynamic specification

In this section, we examine the robustness of our baseline results, studying an alternative dynamic specification of equation (1). More specifically, we use a dynamic version of our initial specification, adding a lagged term of our dependent variable (i.e., per capita real GDP growth) in the set of our explanatory variables. Thus, our specification in transformed to:

$$GDP_{i,t} = \beta_0 + \beta_1 GDP_{i,t-1} + \beta_2 JUD_{i,t} + \beta_3 X_{i,t} + \beta_4 LEGAL_i + c_i + \tau_t + \varepsilon_{i,t} \qquad (2)$$

Estimating equation (2) by least squares will provide biased estimates due to the endogeneity of our control variables as well as the presence of the lagged dependent variable as a regressor (Nickel (1981)). Thus, we employ the Generalized Method of Moments (GMM) estimation developed for dynamic panel data, as introduced by Arellano and Bond (1991) and Arellano and Bover (1995). We use as instruments the

lagged values of our explanatory variables, so as to control for the potential endogeneity of all explanatory variables.

[Insert Table 4 about here]

Our results from the GMM estimations confirm our previous findings that efficient judicial systems are growth enhancing. More specifically, as depicted in Table 4, we get a significant positive coefficient for the clearance rate and significant negative coefficients for the disposition time, the caseload of incoming cases and the caseload of pending cases per 100 inhabitants.

6. Concluding Remarks

Cross-country differences in economic growth rates can be attributed to both economic and institutional factors. In the aftermath of the financial crisis, the EU member states adopted significant structural reform agendas, directing their reform effort to policies that offset the output losses occurred during the previous decade and enhance their economic fundamentals and their resilience to future shocks. Among the various structural reforms adopted, European Union economies proceeded to judicial reforms, through various ways (e.g., by reducing the length of court proceedings and/or by restricting the excess caseload burden, either in terms of pending cases and/or incoming cases), aiming to increase the efficiency of their justice systems.

The empirical literature has studied the role of judicial efficiency on different aspects of economic performance, including, among others, the firm size, foreign direct investments and credit supply. However, to the best of our knowledge, the direct effect of judicial performance on growth, especially for the European Union economies, has not been studied extensively. Thus, our paper tries to fill this gap by examining the impact of four different indicators of judicial efficiency provided by European Commission (through the EU Justice Scoreboard) on economic growth, using a new panel dataset for the European Union countries. Moreover, we construct two alternative composite indices of judicial inefficiency, based on the available information and data provided by European Commission, and examine their impact on economic growth.

Our results corroborate that inefficiencies in the operation of judicial systems, measured alternatively as (a) lengthier court proceedings, (b) lower rates of clearance of

accumulated unresolved cases, (c) increasing burden of pending cases and (d) a high inflow of new cases, all pose obstacles to economic growth. In other words, improvements in judicial efficiency can be growth enhancing; this supports the further adoption of judicial reforms in European Union members, aiming to safeguard the enforcement of private contracts and the security of property rights, facilitating the investment decisions, improving business confidence, raising productivity and supporting the European economies to achieve and sustain robust growth rates. Additionally, our empirical evidence showed that legal origin, civil versus common law, matter for economic growth as it is associated with a higher degree of procedural formalism that hinders economic growth.

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Tables

Table 1: Dependent variable: Real Per Capita GDP Growth (OLS Estimations)												
Efficiency Indicators:	**Clearance rate**			**Disposition time**			**Caseload (incoming cases)**			**Caseload (pending cases)**		
Dependent variabe: Real Per Capita GDP Growth	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Control Variables												
Constant	-0.188**	-0.263	0.055	0.129	-0.238	0.075**	0.079	-0.029	0.127***	0.171	-0.138	0.131**
	(0.094)	(0.217)	(0.051)	(0.093)	(0.173)	(0.037)	(0.121)	(0.245)	(0.051)	(0.114)	(0.156)	(0.052)
Government expenditure (% GDP)	-0.571*	-0.427*	-0.406***	-0.533***	-0.415***	-0.290***	-0.708	-0.673*	-0.446***	-0.463**	-0.355***	-0.335***
	(0.299)	(0.217)	(0.144)	(0.199)	(0.108)	(0.071)	(0.451)	(0.397)	(0.164)	(0.198)	(0.111)	(0.076)
Trade openness (% GDP)	0.024	-0.002	0.008**	0.028**	-0.003	0.007*	0.022	0.004	0.005	0.028**	0.002	-0.003
	(0.019)	(0.019)	(0.003)	(0.013)	(0.017)	(0.004)	(0.022)	(0.022)	(0.003)	(0.013)	(0.016)	(0.006)
Inflation	-0.016	-0.029*	-0.041*	-0.027	-0.029*	-0.041*	-0.019	-0.035**	-0.043**	-0.037*	-0.035**	-0.045**
	(0.027)	(0.016)	(0.022)	(0.019)	(0.015)	(0.021)	(0.031)	(0.016)	(0.021)	(0.021)	(0.015)	(0.017)
Human capital	0.075**	0.103	0.007	-0.011	0.108**	0.003	0.021	0.062	-0.001	-0.023	-0.077*	-0.032
	(0.036)	(0.064)	(0.009)	(0.023)	(0.053)	(0.011)	(0.025)	(0.064)	(0.010)	(0.027)	(0.046)	(0.010)
Population growth	-0.073	-0.055	-0.073**	-0.066	-0.057	-0.063*	-0.066	-0.032	-0.051	-0.065	-0.057*	-0.041
	(0.053)	(0.048)	(0.033)	(0.048)	(0.041)	(0.037)	(0.052)	(0.049)	(0.032)	(0.042)	(0.031)	(0.032)
Common (dummy)			0.011			0.001			-0.002			0.008
			(0.027)			(0.021)			(0.025)			(0.013)
Civil (dummy)			-0.010			-0.011***			-0.011*			-0.012***
			(0.006)			(0.003)			(0.006)			(0.003)
German (dummy)			-0.044			-0.009			-0.014*			-0.025**
			(0.006)			(0.008)			(0.008)			(0.012)

Nordic (dummy)			0.016 (0.011)			0.008 (0.006)			0.006 (0.013)			-0.011 (0.012)
Judicial Efficiency Indicators												
Clearance rate	0.049*** (0.014)	0.038*** (0.006)	0.021* (0.011)									
Disposition time				0.003 (0.017)	-0.007 (0.021)	-0.032 (0.021)						
Caseload (incoming cases)							-0.004* (0.002)	-0.007*** (0.002)	-0.004** (0.002)			
Caseload (pending cases)										-0.007** (0.003)	-0.011*** (0.003)	-0.011** (0.005)
Country dummies	YES	YES	NO	YES	YES	NO	YES	YES	NO	YES	YES	NO
Time dummies	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO
Number of obs	189	189	189	180	180	180	194	194	194	180	180	180
Adj. R^2	0.54	0.45	0.17	0.57	0.44	0.18	0.50	0.42	0.19	0.58	0.49	0.28

Note for Table 1: The table reports estimations of equation (1) for the four different measures of judicial efficiency and for different specifications of deterministic controls and estimation methods. Columns (1), (4), (7) and (10) report results from OLS models that include country and time fixed effects and no legal origin dummies. Columns (2), (5), (8) and (11) report results from OLS models that include country-fixed effects only and no legal origin dummies. Columns (3), (6), (9) and (12) report results from OLS models that include random effects and legal origin dummies. Robust standard errors in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% level.

Table 2: Dependent variable: Real Per Capita GDP Growth (IV Estimations)												
Efficiency Indicators:	**Clearance rate**			**Disposition time**			**Caseload (incoming cases)**			**Caseload (pending cases)**		
Dependent variabe: Real Per Capita GDP Growth	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Control Variables												
Constant	-0.335	-1.290***	-1.067	0.355**	-0.621**	-0.387	0.238	-0.684**	0.169	0.422**	-0.506**	-0.182
	(0.410)	(0.454)	(0.892)	(0.154)	(0.238)	(0.372)	(0.313)	(0.270)	(0.164)	(0.188)	(0.222)	(0.362)
Government expenditure (% of GDP)	1.234	1.782	1.561	0.025	0.113	2.315*	-0.035	0.564	-0.375	-0.196	0.343	1.048
	(1.475)	(1.611)	(1.802)	(0.332)	(0.324)	(1.192)	(0.862)	(0.645)	(0.789)	(0.295)	(0.293)	(0.786)
Trade openness (% of GDP)	-0.032	-0.115	-0.127	-0.044	-0.108	-0.028	-0.068	-0.110	-0.019	-0.031	-0.084	-0.022
	(0.057)	(0.119)	(0.120)	(0.039)	(0.091)	(0.075)	(0.051)	(0.085)	(0.015)	(0.032)	(0.082)	(0.036)
Inflation	0.051	-0.044	-0.043	-0.010	-0.048**	-0.009	0.001	-0.095***	-0.019	0.011	-0.050**	-0.033***
	(0.131)	(0.032)	(0.029)	(0.048)	(0.024)	(0.061)	(0.124)	(0.035)	(0.062)	(0.042)	(0.024)	(0.011)
Human capital	0.033	0.324***	0.249*	-0.084*	0.241**	0.026*	-0.025	0.251**	-0.004	-0.096	0.185**	0.025
	(0.065)	(0.111)	(0.135)	(0.043)	(0.098)	(0.015)	(0.058)	(0.101)	(0.013)	(0.057)	(0.081)	(0.041)
Population growth	-0.253	-0.279	-0.375	-0.385*	-0.411*	0.144	-0.417	-0.219	0.189	-0.409*	-0.235	-0.114
	(0.254)	(0.192)	(0.626)	(0.203)	(0.211)	(0.819)	(0.347)	(0.202)	(0.161)	(0.206)	(0.168)	(0.494)
Common (dummy)			0.646			0.096			-0.016			0.125
			(1.125)			(0.116)			(0.048)			(0.157)
Civil (dummy)			0.349			0.002			-0.046**			0.038
			(0.977)			(0.074)			(0.019)			(0.086)
German (dummy)			-0.394			-0.023			-0.111*			0.054
			(1.137)			(0.289)			(0.065)			(0.239)
Nordic (dummy)			-0.399			-0.348***			-0.029			-0.229***
			(0.447)			(0.115)			(0.137)			(0.077)
Judicial Efficiency Indicators												

Clearance rate	0.053*	0.072	0.071									
	(0.029)	(0.066)	(0.057)									
Disposition time				0.033	-0.019	-0.218*						
				(0.030)	(0.031)	(0.111)						
Caseload (incoming cases)							-0.009	-0.022**	-0.002			
							(0.008)	(0.011)	(0.008)			
Caseload (pending cases)										0.002	-0.145*	-0.025**
										(0.009)	(0.008)	(0.011)
Country dummies	YES	YES	NO	YES	YES	NO	YES	YES	NO	YES	YES	NO
Time dummies	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO
Number of obs	136	136	136	128	128	128	140	140	140	128	128	128
Prob (J-statistic)	0.05	0.22	0.96	0.77	0.18	0.97	0.35	0.41	0.05	0.41	0.19	0.93

Note for Table 2: The table reports estimations of equation (1) for the four different measures of judicial efficiency and for different specifications of deterministic controls and estimation methods. Columns (1), (4), (7) and (10) report results from 2SLS models that include country and time fixed effects and no legal origin dummies. Columns (2), (5), (8) and (11) report results from 2SLS models that include country-fixed effects only and no legal origin dummies. Columns (3), (6), (9) and (12) report results from 2SLS models that include random effects and legal origin dummies. Robust standard errors in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% level.

Table 3: Dependent variable: Real Per Capita GDP Growth												
Efficiency Indicators:	**PCA index of Judicial Inefficiency**						**Composite index of Judicial Inefficiency**					
	OLS			**IV**			**OLS**			**IV**		
Dependent variabe: Real Per Capita GDP Growth	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Control Variables												
Constant	0.122	-0.178	0.107***	0.431*	-0.511**	0.147	0.098	-0.189	0.098***	0.281	-0.546**	-0.289
	(0.102)	(0.166)	(0.036)	(0.242)	(0.254)	(0.152)	(0.094)	(0.169)	(0.031)	(0.213)	(0.243)	(0.399)
Government expenditure (% GDP)	-0.420**	-0.303***	-0.316***	-0.244	0.097	-0.122	-0.432**	-0.309***	-0.298***	0.015	0.152	0.979
	(0.182)	(0.096)	(0.079)	(0.309)	(0.199)	(0.645)	(0.182)	(0.098)	(0.079)	(0.262)	(0.231)	(0.919)
Trade openness (% GDP)	0.033**	0.005	-0.003	-0.038	-0.093	-0.041**	0.035***	0.006	-0.002	-0.018	-0.074	-0.011
	(0.013)	(0.016)	(0.004)	(0.042)	(0.089)	(0.018)	(0.013)	(0.016)	(0.003)	(0.037)	(0.081)	(0.044)
Inflation	-0.041*	-0.032**	-0.042**	0.018	-0.043*	-0.013	-0.041*	-0.031**	-0.041**	-0.007	-0.042*	-0.018*
	(0.021)	(0.015)	(0.018)	(0.044)	(0.024)	(0.027)	(0.021)	(0.015)	(0.018)	(0.039)	(0.022)	(0.009)
Human capital	-0.016	0.079	-0.003	-0.092	0.199**	-0.006	-0.009	0.082	-0.002	-0.070	0.198**	0.039
	(0.026)	(0.050)	(0.009)	(0.061)	(0.092)	(0.005)	(0.024)	(0.052)	(0.008)	(0.054)	(0.088)	(0.038)
Population growth	-0.065*	-0.063**	-0.057*	-0.428*	-0.354	0.226	-0.062*	-0.058*	-0.057**	-0.307	-0.291	-0.284
	(0.036)	(0.029)	(0.029)	(0.237)	(0.217)	(0.174)	(0.036)	(0.031)	(0.027)	(0.205)	(0.188)	(0.620)
Common (dummy)			0.017			0.007			0.017			0.183
			(0.013)			(0.044)			(0.013)			(0.209)
Civil (dummy)			-0.012***			-0.025**			-0.012***			0.056
			(0.003)			(0.013)			(0.004)			(0.109)
German (dummy)			-0.025***			-0.108*			-0.023***			0.107
			(0.009)			(0.055)			(0.008)			(0.741)
Nordic (dummy)			-0.012			-0.111			-0.011			-0.194***

			(0.009)			(0.073)			(0.008)			(0.052)
Judicial Efficiency Indicators												
PCA index of Judicial Inefficiency	-0.009***	-0.010***	-0.011***	-0.001	-0.010*	-0.021***						
	(0.001)	(0.002)	(0.003)	(0.007)	(0.005)	(0.006)						
Composite index of Judicial Inefficiency							-0.018***	-0.020***	-0.022***	-0.006	-0.021**	-0.045***
							(0.003)	(0.003)	(0.004)	(0.012)	(0.010)	(0.016)
Country dummies	YES	YES	NO	YES	YES	NO	YES	YES	NO	YES	YES	NO
Time dummies	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO
Number of obs	180	180	180	128	128	128	180	180	180	128	128	128
Adj. R^2	0.61	0.51	0.31				0.62	0.51	0.31			
Prob (J-statistic)				0.53	0.27	0.31				0.31	0.21	0.89

Note for Table 3: The table reports estimations of equation (1) for the two different composite indices of judicial inefficiency and for different specifications of deterministic controls and estimation methods. Columns (1), (2), (3) and (7), (8), (9) report results from OLS models for both indices for alternative specifications of country and time fixed effects and legal origin dummies. Columns (4), (5), (6) and (10), (11), (12) report results from IV estimations (2SLS models) for both indices for alternative specifications of country and time fixed effects and legal origin dummies. Robust standard errors in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% level.

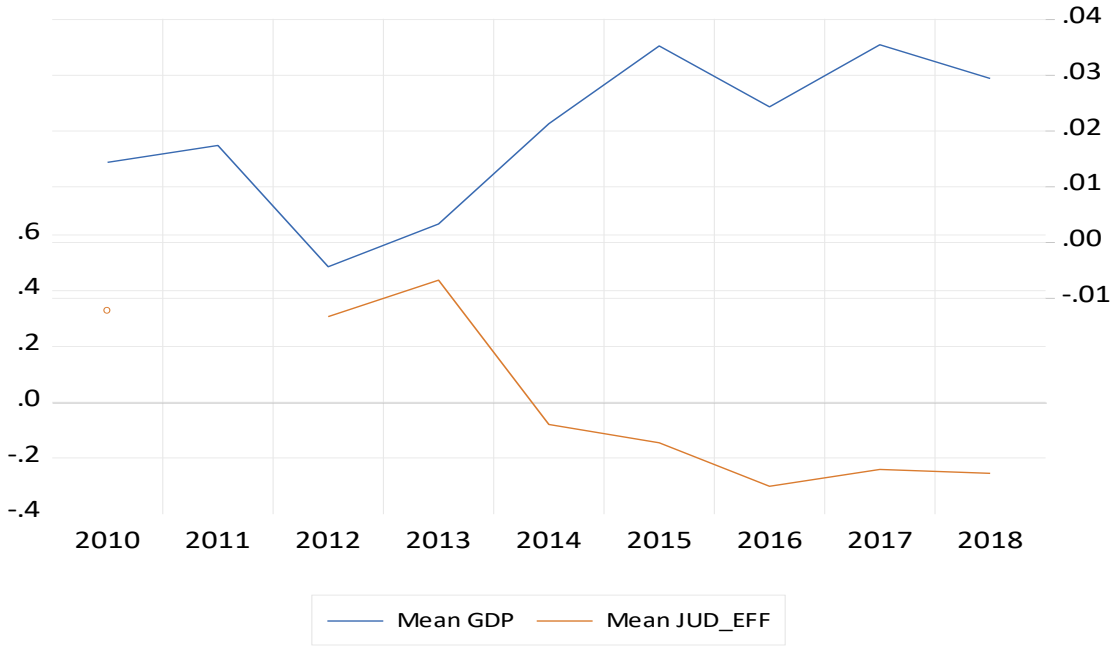
Table 4: Dependent variable: Real Per Capita GDP Growth (Dynamic version - GMM Estimations)												
Efficiency Indicators:	**Clearance rate**			**Disposition time**			**Caseload (incoming cases)**			**Caseload (pending cases)**		
Dependent variabe: Real Per Capita GDP Growth	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Control Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Constant	-0.141	-1.270***	0.394	0.387**	-0.399**	-0.114*	0.217	-0.749**	0.077	0.374*	-0.465***	0.048
	(0.299)	(0.409)	(0.338)	(0.192)	(0.154)	(0.064)	(0.149)	(0.293)	(0.092)	(0.211)	(0.144)	(0.107)
Real per capita GDP growth (lagged term)	-0.172	-0.052	0.065	0.168	0.330*	0.487***	-0.086	-0.057	0.225	0.242*	0.195	0.399**
	(0.319)	(0.326)	(0.336)	(0.163)	(0.170)	(0.174)	(0.246)	(0.249)	(0.309)	(0.144)	(0.147)	(0.198)
Government expenditure (% of GDP)	0.515	1.472	0.295	-0.107	0.315	0.749	-0.008	0.681	-0.026	0.034	0.518*	0.277
	(0.665)	(1.389)	(0.842)	(0.322)	(0.292)	(0.493)	(0.331)	(0.635)	(0.283)	(0.322)	(0.273)	(0.409)
Trade openness (% of GDP)	-0.048	-0.125	-0.111	-0.055**	-0.113	-0.014	-0.037	-0.080	-0.017	-0.026***	-0.069	-0.021
	(0.083)	(0.152)	(0.126)	(0.026)	(0.076)	(0.014)	(0.044)	(0.075)	(0.017)	(0.007)	(0.070)	(0.013)
Inflation	0.078	-0.050**	-0.024	0.015	-0.040***	-0.021	0.009	-0.095***	-0.035	0.013	-0.042**	-0.034
	(0.117)	(0.024)	(0.096)	(0.047)	(0.014)	(0.024)	(0.089)	(0.023)	(0.040)	(0.032)	(0.016)	(0.027)
Human capital	0.022	0.337***	0.012	-0.083*	0.158**	0.012**	-0.032	0.252***	0.002	-0.102	0.152**	-0.005
	(0.075)	(0.121)	(0.029)	(0.046)	(0.074)	(0.005)	(0.027)	(0.089)	(0.008)	(0.066)	(0.065)	(0.005)
Population growth	-0.464	-0.350	1.411	-0.392**	-0.323**	0.147	-0.382	-0.143	0.171	-0.345**	-0.165	0.150**
	(0.397)	(0.304)	(1.541)	(0.185)	(0.155)	(0.213)	(0.283)	(0.220)	(0.004)	(0.180)	(0.129)	(0.064)
Common (dummy)			-0.235			-0.016			-0.017			-0.011
			(0.210)			(0.054)			(0.017)			(0.019)
Civil (dummy)			-0.166			-0.027			-0.038			-0.018***
			(0.179)			(0.028)			(0.023)			(0.004)
German (dummy)			-0.505			-0.057			-0.077			-0.051
			(0.587)			(0.054)			(0.058)			(0.033)
Nordic (dummy)			-0.342			-0.138*			-0.070			-0.103***
			(0.336)			(0.082)			(0.053)			(0.038)

Judicial Efficiency Indicators												
Clearance rate	0.063*	0.085	-0.191									
	(0.033)	(0.065)	(0.143)									
Disposition time				0.026	-0.002	-0.037**						
				(0.039)	(0.029)	(0.017)						
Caseload (incoming cases)							-0.011**	-0.024***	-0.003			
							(0.005)	(0.008)	(0.004)			
Caseload (pending cases)										0.007	-0.009	-0.012*
										(0.011)	(0.007)	(0.007)
Country dummies	YES	YES	NO	YES	YES	NO	YES	YES	NO	YES	YES	NO
Time dummies	YES	NO	NO	YES	NO	NO	YES	NO	NO	YES	NO	NO
Number of obs	136	136	136	128	128	128	140	140	140	128	128	128
Prob (J-statistic)	0.13	0.34	0.86	0.80	0.54	0.93	0.51	0.58	0.12	0.73	0.25	0.55

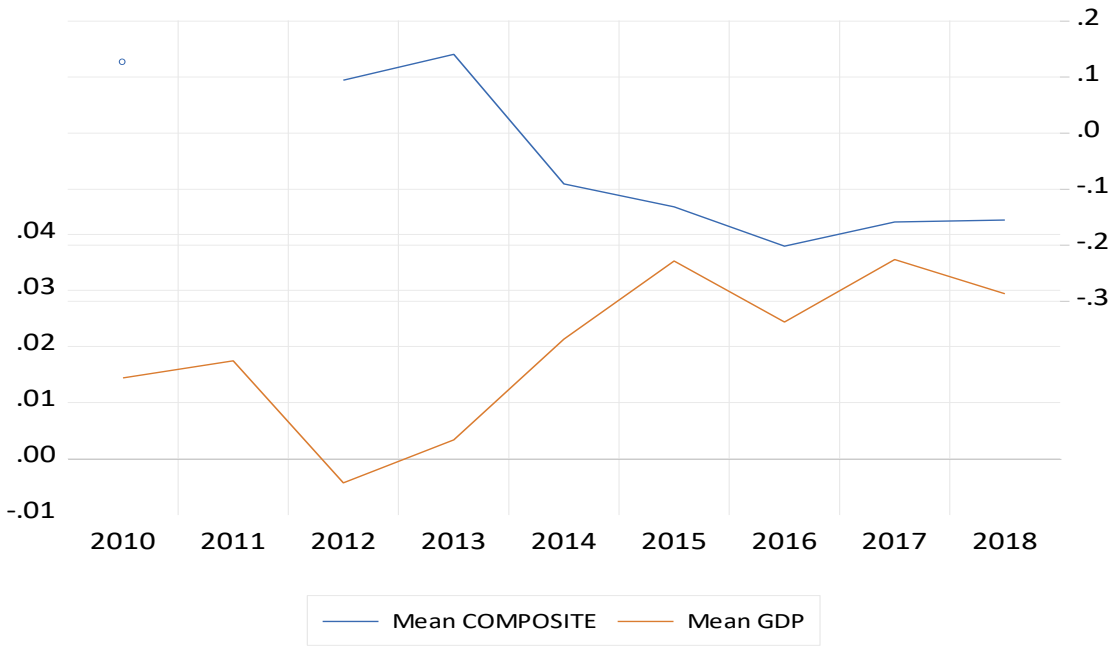
Note for Table 4: The table reports estimations of equation (1) for the four different measures of judicial efficiency and for different specifications of deterministic controls and estimation methods. Columns (1), (4), (7) and (10) report results from GMM models that include country and time fixed effects and no legal origin dummies. Columns (2), (5), (8) and (11) report results from GMM models that include country-fixed effects only and no legal origin dummies. Columns (3), (6), (9) and (12) report results from GMM models that include random effects and legal origin dummies. Robust standard errors in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% level.

Figures

Graph 1: PCA Index of Judicial Inefficiency (lhs) and per capita real GDP growth (rhs)



Graph 2: Composite Index of Judicial Inefficiency (rhs) and per capita real GDP growth (lhs)



Appendix

A.1 List of countries and summary statistics

Table A.1 List of countries

Austria	Italy
Belgium	Latvia
Bulgaria	Lithuania
Croatia	Luxembourg
Cyprus	Malta
Czech Republic	Netherlands
Denmark	Poland
Estonia	Portugal
Finland	Romania
France	Slovakia
Germany	Slovenia
Greece	Spain
Hungary	Sweden
Ireland	

Table A.2: Classification of countries by legal origin

Legal origin	Countries
Common	England, Ireland, Cyprus, Malta
Civil	Belgium, France, Greece, Italy, Luxembourg, Netherlands, Portugal, Spain
German	Austria,Germany
Nordic	Denmark, Finland, Norway, Sweden
Former Socialist	Russia, Bulgaria, Croatia, Hungary. Czech Republic, Estonia, Poland, Slovak Republic, Slovenia, Latvia, Lithuania, Romania
Source:	Djankov *et al.* (2003)

Table A.3 Descriptive statistics

	GDP (per capita growth)	Goverment consumption over GDP	Trade openess (exports + imports over GDP)	Inflation (HICP)	Human Capital index	Population growth	Clearance rate	Disposition time (in days)	Incoming caseload (per 100 inhabitants)	Pending caseload (per 100 inhabitants)	PCA index	Composite index
Mean	0.02	0.20	1.30	0.01	3.25	0.02	102.10	261.33	2.52	1.74	-0.05	0.00
Median	0.02	0.20	1.13	0.01	3.27	0.02	101.30	207.50	2.30	1.60	-0.10	-0.10
Maximum	0.24	0.27	4.08	0.06	3.82	0.33	181.60	849.00	6.90	6.30	2.51	4.73
Minimum	-0.09	0.12	0.52	-0.02	2.36	-0.28	55.60	53.00	0.10	0.10	-1.63	-2.92
Std. Dev.	0.03	0.03	0.71	0.14	0.28	0.09	14.18	149.24	1.64	1.39	0.65	1.43
Skewness	1.34	0.37	1.83	0.38	-0.65	0.52	1.11	1.17	0.94	1.00	0.75	0.67
Kurtosis	15.90	2.80	6.73	3.05	3.83	4.73	11.95	4.16	3.51	3.62	4.08	3.26
Observations	243	243	243	243	243	243	189	180	194	180	180	180
Sources:	Eurostat	Eurostat	Eurostat	Eurostat	Penn World Table	World Bank	2020 EU Justice Scoreboard				Judicial Inefficiency Indices	

Table A.4 Correlation Matrix

	GDP (per capita growth)	Goverment consumption	Trade openess	Inflation	Human Capital	Population growth	Clearance rate	Disposition time	Incoming caselod	Pending caseload
GDP (per capita growth)	1.00	-0.31	0.22	-0.13	-0.12	-0.18	0.17	-0.20	0.00	-0.23
Goverment consumption	-0.31	1.00	-0.35	-0.10	0.35	0.16	-0.13	-0.05	-0.46	-0.29
Trade openess	0.22	-0.35	1.00	0.08	0.08	0.51	0.26	-0.12	-0.24	-0.29
Inflation	-0.13	-0.10	0.08	1.00	-0.12	0.02	-0.01	-0.11	0.03	-0.09
Human Capital	-0.12	0.35	0.08	-0.12	1.00	0.31	-0.03	-0.11	-0.39	-0.32
Population growth	-0.18	0.16	0.51	0.02	0.31	1.00	0.12	0.05	-0.46	-0.23
Clearance rate	0.17	-0.13	0.26	-0.01	-0.03	0.12	1.00	-0.13	-0.18	-0.07
Disposition time	-0.20	-0.05	-0.12	-0.11	-0.11	0.05	-0.13	1.00	0.05	0.71
Incoming caselod	0.00	-0.46	-0.24	0.03	-0.39	-0.46	-0.18	0.05	1.00	0.63
Pending caseload	-0.23	-0.29	-0.29	-0.09	-0.32	-0.23	-0.07	0.71	0.63	1.00

Table A.5 Correlation between GDP per capita and composite indices of judicial inefficiency

	GDP (per capita growth)	PCA index		GDP (per capita growth)	PCA index
GDP (per capita growth)	1.00	-0.23	GDP (per capita growth)	1.00	-0.25
PCA index	-0.23	1.00	PCA index	-0.25	1.00