The impact of structural reforms of the judicial system: a survey

Ana Fontoura Gouveia

Sílvia Santos

Corinna Herber

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Ana Fontoura Gouveia[2] , Sílvia Santos[3] , Corinna Herber[4]

Abstract

This paper surveys the literature on the impact of structural reforms of the judicial system. We focus on two key types of reforms: those enhancing the overall efficiency of the system, in terms of quantitative outcomes; and those aiming at enhancing the bankruptcy regime. In the first branch, and given the way the existing literature is organized, we proceed in two steps. We first provide an overview of the studies linking judicial reforms with sectoral performance. We then elaborate on the effects of this improved performance on economic outcomes. In the second branch, we directly present the impact on economic outcomes, in particular concerning access to finance and investment. In a nutshell, reforms that increase courts' size, increase spending on information and communication technologies (ICT), improve governance or foster education and training have a positive impact on judicial efficiency, which, in turn, promotes investment, ensures better credit and allows firms to thrive. Concerning bankruptcy regimes, there is evidence that a more efficient system is related with a lower cost of funding and a higher amount and length of credit in the economy and consequently with more investment, innovation and entrepreneurship. These empirical results highlight the relevance of promoting judicial system reforms, as a way to ensure sustained economic growth.

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1.   Introduction

Structural reforms are crucial to ensure a flexible and resilient economy and promote sustained growth, as widely recognized both by national authorities[5] and by international organizations[6]. In a context of financial and economic crisis, many countries have implemented different structural reforms in areas such as the labor and product markets, education and R&D, fiscal frameworks or the judicial system. Quantifying the impact of these reforms is of paramount importance to inform policy makers (both ex-ante, before the implementation of the reform, and ex-post, to allow for fine-tuning and correction measures) and for political economy considerations, as a clear understanding of the benefits of the reforms   (which may entail some short run costs[7]) is essential to ensure support.

In this survey we focus on the impact of judicial reforms, in particular those in two key areas: (i) overall efficiency enhancing reforms[8] and (ii) reforms improving the bankruptcy regimes.

An efficient judicial system is considered a necessary condition for creditors to invest, as it is key to ensure contract enforcement. A judicial system that takes too long to take decisions is therefore innefective and highly detrimental for the economy, with important consequences for efficient business dynamics, credit markets and resource allocation. Also, it entails important costs that are particularly important in countries where fiscal consolidation is needed.

At the same time, a well-functioning bankruptcy regime, in particular in a context of high private indebtedness, is critical to ensure that resources are efficiently allocated and, ultimately, to promote sustained growth. Given that, in a context of financial distress, debtors' incapacity to re-pay its lenders on time increases, reforms that promote efficient and effective bankruptcy systems are key to promote the channelling of funds to economically viable firms (promoting restructuring), without sustaining the activity of non-viable firms (i.e. creating incentives for liquidation).

Indeed, reforms of the bankruptcy law that allow for faster and orderly processes, for instance by reducing the number of administrative steps to follow in a liquidation process or by coordinating the position of all creditors, bring important gains for the economy. In particular, the reduction in the value of the firm is minimized by decreasing the inherent administrative costs and avoiding assets' prices dilution. Additionally, an efficient liquidation process increases creditors' reimbursement expectations as it foresees the coordination of the actions to take control of firm's collateral (secured debt) or firm's assets (unsecured debt). In this vein, the reform of the liquidation process should also lead to the reduction of the cost of finance and to the increase of firms' availability of funds, thereby promoting investment.

In what regards the reforms of the process of debt' restructuring, the final outcome will depend on the relative weight of two opposite effects: in fact, although reforms may lead to efficiency gains (as again, creditors' coordination preserves firms' value), they are also responsible for the decrease of the debtor repayment incentives (misaligned incentives). Therefore, depending on

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[5] See, for instance, the Portuguese National Reforms Programme for 2016.
[6] Please see, for instance, the European Commission Annual Growth Survey 2016 ; the ECB Mario Draghi's speech of 9 June 2016; or the OECD document Structural Reforms in Europe: achievements and homework.
[7] For a discussion on short-run costs, see, for instance, Cacciatore, Duval and Fiori (2012).
[8] Issues related to quality/independence of the judiciary are also important but are outside the scope of this survey. See, for instance Botero et al (2003).

the intensity of these effects, a reform of the debt' restructuring regimes could have a positive or negative effect in the economy.

This survey is organized as follows: for the first type of reforms (Section 2), those enhancing the overall efficiency of the system, given the way the existing literature is structured and in order to grasp the impact of these reforms in the economy, we proceed in two steps. The first entails the quantification of the impact of the reforms on sectoral performance indicators, such as disposition time, trial length or back-log ratios. This branch of literature is presented in section 2 and covers reforms affecting (i) courts' size; (ii) courts' budget; (iii) specialized courts; (iv) alternative dispute resolution; (v) governance; (vi) education and training. To understand the economic effects of these reforms, it is then important to understand the link between judicial sectoral performance and economic outcomes, which is the focus of section 3. In particular, we focus on three main channels: (i) investment; (ii) firms' size and entry rates; and (iii) credit markets.

In the second case (Section 3), the literature provides direct estimates of the effect of bankruptcy regimes on access to finance and investment. We thus survey the existing empirical literature, shedding light on the main channels through which reforms of the bankruptcy regimes operate. Bankruptcy regime reforms are likely to have impacts on the cost of funding, collateral requirements, debt amounts and maturities, thereby affecting investment, innovation and entrepreneurship. In general, empirical research in this area does not separate the restructuring from the liquidation processes, which hampers the assessment of their individual impacts. Therefore, the survey focuses on aggregate results.

2. Efficiency-enhancing reforms

As described in the previous section, the effects of efficiency-enhancing reforms in the economy need to be assessed in two steps, following the structure of the existing empirical literature: in the first step, one needs to understand the impact of the reforms on sectoral efficiency and only afterwards assess the impact of that increased efficiency on economic outcomes.

2.1. Impact of judicial reforms on judicial performance indicators

In this section, and as a first step to understand the effects of efficiency-enhancing judicial reforms on the economy, we survey the literature assessing the impact of different civil justice reforms on measures of performance of the judicial system. A table summarizing the different studies is presented in Annex 1.

Court size

Larger courts are expected to have a positive impact on judicial performance, due to economies of scale and specialization. Alternatively, it may potentiate shirking and therefore not be efficiency improving.

The existing empirical evidence from cross-country studies points to a non-negative effect on performance. Lorenzani and Lucidi (2014), based on data for European countries, find a negative relation between court size and both the trial length and the backlog ratio. On the

contrary, Voigt and El-Bialy (2014), using the same dataset, do not find a significant effect of court size on resolution rates (although they find a positive effect of size on judicial independence). Buscaglia and Dakolias (1999), using data for 10 developed and developing countries, assess the relevance of the number of administrative staff and show that it has no impact on duration; additionally, the effect on clearance rates is negative.

The evidence from single-country studies, focusing on court-level data, do find a positive relation between court size and efficiency. Rosalés-López (2008) looks at courts in one region of Spain and finds a positive relation between the number of judicial employees and the number of resolutions. Murell (2001) uses data for Romania commercial courts to conclude that more judges per court reduce congestion. Hagstedt and Proos (2008) assess a reform of the Swedish judicial system that decreased the number of courts, increasing the average size of the existing ones, and show that the measure is efficiency improving, increasing the number of resolved cases. Marchesi (2003) also concludes that increasing the average size of Italian courts would enhance their productivity, a result also found for the United States by Dalton (2009). Pastor (2003) finds a positive impact of the number of judges in Spanish courts on duration. However, and in line with Buscaglia and Dakolias (1999), the author shows that duration is independent of the number of administrative staff.

There is also some country-level evidence that suggests no impact of court size on judicial performance. Mitsopoulos and Pelagidis (2007) use Greek data to conclude that the ratio of staff to number of cases only impacts the backlog ratio in higher instance courts, finding no effect for civil trial courts or administrative courts. Dimitrova-Grajzl et al (2012) find no effect of court size on the number of resolved cases in Slovenian courts. Similarly, Beenstock and Haitovsky (2004) show that, in Israel, the number of judges has not impact on the number of resolved cases.

It is interesting to add that while Lorenzani and Lucidi (2014), for a set of European countries, find a positive relation between the number of courts relative to the population and both disposition times and backlog ratios, Cross and Donelson (2010), using the same dataset, do not find a significant effect of the number of courts per inhabitants on efficiency. However, running the regression by quartiles, the authors conclude that the number of judges has a positive impact for countries in the bottom of the distribution, where additional resources are needed. Deynely (2011) use the same data to construct a measure of judicial efficiency based on the number of resolved cases (for both civil and criminal cases), concluding that it is positively impacted by the number of courts.

Courts' budget

Even though one could expect that more resources would improve efficiency, it is important to distinguish across different components of the budget. Indeed, while capital budget is likely to be beneficial (as, for instance, investment in Information and Communication Technology (ICT) facilitate monitoring and information flows), the effect of increases in the operational budget is less clear-cut. Higher pay may provide an incentive for judges to perform better but poorly designed reward schemes may demotivate top performers.

The studies assessing the impact of the overall budget of courts broadly conclude that it has no effect on efficiency. Indeed, Palumbo *et al* (2013), in a cross-country study, conclude that there is no link between budget allocated to justice and trial length. Cross and Donelson (2010) also do not find any effect on *perceived* efficiency. Yeung and Azevedo (2011) focus on the

Brazilian judicial system and find that lower resources is not the main driver of lower efficiency by those courts more distant from the efficiency frontier. Mitsopolous and Pelagidis (2007) study Greek courts and conclude that the budget has no beneficial impact on courts efficiency. In a cross-country study, Voigt and El-Bialy (2014) show that the impact of courts budget may even be negative, decreasing resolution rates.

Given that a large share of the courts' budget is related to operational costs, namely wages, it is important to ascertain their impact on performance. Cross-country studies point to a positive relation between wages and judicial efficiency. Indeed, Deynely (2011) shows that the number of resolved cases increases with judges' salaries. The same results is found by Cross and Donelson (2010) when considering *perceived* efficiency. The effect is however non-linear, with diminishing marginal returns. Voigt and El Bialy (2014) do not find a relation between other benefits (beyond wages) or bonuses on resolution rates. Buscaglia and Dakolias (1999) conduct a court-level assessment based on a dedicated survey and find no relation between wages of judicial personnel (administrative staff and judges) and duration (although they highlight the relevance of wages to other quality aspects of the system such as independency, transparency or the absence of corruption). However, the authors show that an increase in capital budget resources reduces the time to disposition. Lorenzani and Lucidi (2014) corroborate this finding: the authors show that ICT budget reduces both the disposition time and the backlog ratio. Palumbo et al (2013) argue that early identification of long or problematic cases and the production of monitoring statistics - two results potentiated by ICT - reduces duration, a result also found by Buscaglia and Dakolias (1999). The exception is Deynely (2011), who finds no impact of computerization on the number of resolved cases.

On top of level effects, composition of spending also plays a role. Palumbo et al (2013) find that courts that devote a higher share of the justice budget to ICT display shorter trial length. The authors also find a positive effect of the share of ICT budget on the number of cases disposed per judge (a measure of productivity), in particular in countries with higher computer literacy.

Specialized courts

Judicial specialization is expected to positively impact disposition rates, via economies of scale and uniformization of procedures. However, as discussed in Voigt and El Bialy (2014), expert judges may want to be more precise regarding their area of expertise, taking more time per case, or their productivity may be negatively affected by the routine that derives from specialization[9].

The existing cross-country evidence is indeed mixed. While Voigt and El Bialy (2014) show that countries with a higher percentage of specialized courts present lower overall resolution rates, Palumbo et al (2013) ascertain that specialization – measured by two synthetic measures derived from principal components analysis - is associated with shorter trial length.

Looking at court-level data, studies point to a non-negative effect of specialization. Pastor (2003) shows that specialization of Spanish courts is associated with more resolutions per judge. Garoupa *et al* (2010) do not find evidence of lower resolution times in specialized family courts in Madrid, Spain. However, there is some evidence that specialized courts conclude litigation in a short timeframe than regular courts.

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[9] The impact on the quality of the decisions is also not clear-cut. If more specialization can lead to better decisions, negative consequences can also arise, due, for instance, to reduced jurisprudential diversity or a compartmentalization of the law, with inconsistent partial law systems. For a discussion, please refer to Pascual and Mora-Sanguinetti (2015) and Voigt (2012).

Alternative dispute resolution

The rationale for introducing alternative dispute resolution (ADR) is mainly to reduce disposition times. However, the empirical evidence does not always corroborate this expectation. Djankov et al (2001), in a cross-country dataset based on data from law firms, conclude that the availability of alternative administrative procedures to solve dispute has no impact on efficiency. The same result is found by Kakalik et al (1997), who assess the 1990 US Civil Justice Reform Act and find no relation between ADR and disposition times. In a specific setting – i.e. US civil cases that reached a jury trial - Heise (2000) finds that alternative dispute resolution even increases trial length.

Governance

There are a number of governance reforms that are associated with higher judicial performance. The cross-country assessment by Palumbo et al (2013), shows that attributing managerial responsibilities to the chief judge reduces trial length. Buscaglia and Dakolias (1999), using cross-country court level data from a dedicated survey, add that the time spent by judges on administrative tasks increases duration. This is possibly the reason for the negative effect of judicial councils found by Voigt and El-Bialy (2014).

Education and training

Education and training are expected to translate into better results. Indeed, Deynely (2011) shows, in a cross-country sample, that the number of resolved cases is positively impacted by judges' education. However, based on a dedicated survey, Buscaglia and Dakolias (1999) fail to find a significant relation. Voigt and El Bialy (2014) conclude that countries with mandatory training for judges display higher resolution rates.

2.2. Impact of judicial efficiency indicators on economic outcomes

The previous section surveyed the impact of different civil justice reform variables on sectoral performance indicators. The next step is to quantify the impact of changes in judicial efficiency (e.g. improved disposition times or reduced back-log) on economic outcomes. Indeed, there is evidence that a functioning judiciary system reduces transaction costs and fosters economic growth (see, for instance, OECD, 2013). In the next subsections we explore three main channels that potentiate this result: investment; firms' size and entry rates; and, finally, credit markets[10]. A table presenting a summary of the different studies may be found in Annex 2.

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[10] There are other channels that may also be important. For the impact on housing markets, see, for instance, Casas-Arce and Saiz (2006) or Mora-Sanguinetti (2010).

Investment

A more efficient judicial system is expected to promote investment and this is indeed confirmed in empirical studies. In a cross-country analysis, Bellani (2014) finds evidence that judicial efficiency, measured by the Rule of Law indicator and the average length of trials, positively impacts FDI inflows in OECD countries. Staats and Biglaiser (2011) also concludes that, for a sample of developing countries, the improvement in judicial strength and rule of law are related with higher portfolio investment. Lorenzani and Lucidi (2014) show that higher efficiency of judicial systems in Europe, measured by disposition time and the ratio of pending cases, leads to higher foreign direct investments.

Credit markets

Several studies show that a sound judiciary system ehnances firms' and households' access to finance. Bae and Goyal (2009), covering a set of countries from Europe, East Asia and Latin America, show that a more efficient system, ensuring stronger property rights protection, leads to more efficient contracting. In particular, banks lend more, offer longer maturities and charge lower spreads on loans. With cross section loan information from 60 countries, Quian and Strahan (2005) examine the effect of legal origin, creditor and property rights and the quality of courts on bank loan contracts. Their results support the conclusion that more efficient judiciary positively impacts private contracts, both concerning term and interest rate conditions. By focusing on post-communist countries, Johnson et al (2002) find a positive relation between effective courts and new business relationships. Laeven and Majnoni (2003) show that judicial reforms, through a better enforcement of legal contracts, lower the costs of financial intermediation (interest rate spreads). La Porta (1997) uses a sample of 49 countries to show that law enforcement (measured by the World Bank "rule of law" indicator) positively influences the size and breadth of debt and capital markets and the ratio of private debt to GNP.

Firm level data from Spain were used by Fabbri (2009) to study the economic effects of differences in law enforcement. The author shows that in less efficient judicial districts (measured by average length of trials and by number of trials concluded after one year) firms' debt is costlier, as measured by banks interest rates. Further, the author shows that individuals working in the regions where trials are shorter save more than in regions with longer trials and that stronger enforcement of creditor rights (measured through the average length of trials) fosters individual capital accumulation and improves credit conditions (interest rates). Fabbri and Padula (2001), based on Italian data, find evidence that the quality of enforcement (measured by backlog of trials pending divided by the number of incoming cases) influence the probability of being credit-constrained, as whenever contracts are weakly enforced, the household's incentive to repay is reduced and banks respond by rationing credit. Also, in weak enforcement systems, banks tend to compensate the lower liquidation value of the collateral with higher interest rates, which reduces the equilibrium amount of debt. Horioka and Sekita (2009), on the basis of household-level data from the Japanese Panel Survey of Consumers, point out that better judicial enforcement (measured by the length of trials and the ratio of the number of pending civil trials to the number of incoming civil trials) increases the household's incentive to repay their loans and banks will be less likely to constrain credit. Jappelli *et al* (2002) use Italian panel data to show that longer trials or larger backlogs reduce the availability of credit. Moreover, they conclude that an improvement in judicial efficiency (measured by the fraction of inside or outside collateral that lenders can expect to recover from an insolvent borrower) reduces credit rationing and increases the volume of lending. Pinheiro and Cabral

(1999) referring to data from Brazil conclude that judicial enforcement (proxied by an index of judicial inefficiency regarding slowness, fairness and costs of the judiciary) has a positive impact on the ratio of credit to GDP, influencing also the development of the credit market and fostering economic development and growth. Christini *et al* (2001), by focusing on the credit market in Argentina, show that judicial efficiency has a positive impact on the amount of credit available and on the reduction of non-performing loans.

Firms' size and entry rates

A growing number of cross-country studies demonstrate the relationship between the efficiency of the judicial system and firms' size and entry rates. Beck *at al* (2004) use data on the largest industrial firms for 44 developing and developed countries and find a strong relation between firm size and the efficiency of the legal system. Lorenzani and Lucidi (2014), using European data, argue that increasing the efficiency of judicial systems (reflected in a decrease in disposition time and in pending cases as a ratio to population) enhances entrepreneurial activity measured by firms' entry rates. Ippoliti *et al* (2015) use the same dataset and find that judicial efficiency (measured by the clearance rate and the technical efficiency) has a positive effect on entrepreneurial actions. Kumer *et al* (2001), referring to a sample of firms across 15 European countries, conclude that countries with greater judicial efficiency have larger-sized firms and lower dispersion in firm size within industries. La Porta (1997), using data for a sample of 49 countries, shows that the number of domestic firms grows with law enforcement (measured by the World Bank indicator "rule of law"). Nunn (2007), based on data from 159 countries, focusses on the determinants of comparative advantage and concludes that good contract enforcement leads to specialization in industries where relationship-specific investments are most important.

The findings from single country studies corroborate these results. Fabbri (2009) uses firm level data for Spain and shows that in efficient judicial districts (measured by the average length of trials and by the trials concluded after one year) the firms' size is larger. Dougherty (2013) also shows that the improved efficiency of Mexico's legal system has a positive effect on firm size. Garcia-Posada and Mora-Sanguinetti (2013, 2014), based on Spain evidence, corroborate the conclusion that judicial efficiency has a positive effect on firms' size and on firms' entry rate. Giacomelli and Menon (2013), using Italian data, find a positive relation between judicial efficiency and average firm size.

3. Impact on bankruptcy regimes on economic and financial variables

Bankruptcy regime reforms are likely to have impacts on the cost of funding, collateral requirements, debt amounts and maturities, thereby affecting investment, innovation and entrepreneurship. We explore these different channels in the next subsections (Annex 3 provides an overview).

Cost of funding

One would expect that creditors in an efficient bankruptcy system, where they expect to be reimbursed in the event of default, would certainly request a lower risk premium as compared to those in a debtor friendly system, where the capacity to take assets possession or to revitalize an

insolvent firm doesn't exist or is lower. The existent empirical literature indeed finds this effect. Qian and Strahan (2005) employ a cross-country data set and find that loans made to borrowers in countries where creditors are able to take collateral in case of default are more likely to have lower interest rates. Bae and Goyal (2009) also find that strong property rights protection leads to smaller loans spreads. Additionally, they show that improved property rights protection causes a large reduction in the costs of external financing.

Araujo et al. (2012) by comparing Brazilian firms with firms from Argentina, Chile and Mexico, estimate the effect of the bankruptcy reform in Brazil on contractual and non-contractual debt variables. According to this study, there is a reduction of approximately 8% in the cost of debt after the implementation of reform. Visaria (2009), by using a loan level dataset of an Indian private sector bank, concludes that, after the establishment of new debt recovery tribunals, the costs of larger credits suffered a reduction. On the contrary, Berkowitz and White (1999), based on a sample of U.S. non-corporate and corporate firms, do not find evidence that bankruptcy exemption levels affect interest rates on loans.

Although in general the literature does not disentangle the effects of changes in restructuring and liquidations system, there are some exceptions. For instance, Rodano *et al* (2012), based on the 2005-2006 reform of the Italian bankruptcy law[11], conclude that the reorganization process increases the interest rates on bank loans, suggesting that the increase in misalignments incentives outweighs efficiency gains. Additionally, they find that gains related with creditor coordination in a liquidation process reduce the costs of funding.

Collateral

A bankruptcy system that does not secure debtors in the event of default would favour the recourse to more guarantees as a source of protection; but, at the same time, a more efficient system may intensify the use of collateral as the probability to take possession of it increases. It is thus particularly important to assess the results of the relevant empirical studies.

Qian and Strahan (2005) conclude that in countries where creditors take ownership of the collateral in the event of default the probability of having secured loans is higher. Based on data from France, Germany and the UK[12], Davydenko and Franks (2008) show that banks (and in particular French banks) respond to a debtor friendly system by requiring more collateral. Rodano *et al* (2012), taking as reference the Italian case, conclude that the use of secured lending increased significantly after the 2005-2006 reforms (both reorganization and liquidation reform), which is consistent with the fact that both reforms facilitated the preservation/acquisition of the collateral that guarantees secured funding. However, Haselmann *et al* (2006) focus on 12 CEE transition economies and find that collateral law has significant effect on bank lending, but improvements in bankruptcy legislation have not.

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[11] The Italian reform consists of two separate reforming system (one for reorganization and the other for liquidation) helping to disentangle the benefits/costs of each reform.
[12] Where France is considered a debtor-friendly system, UK a system creditor-friendly and Germany has an intermediate level of creditor protection.

Amount and debt maturity

Globally, a more efficient bankruptcy system would promote the canalization of funds within the economy, as creditors would have more confidence in the system. This should translate in better contracts' conditions, such as longer maturities, and more credit available.

Indeed, focusing on cross-country analysis, Fan *et al* (2010) find that the existence of an explicit bankruptcy code leads to higher leverage and more long-term debt. Safavian and Sharma (2007), referring to Europe, find a positive link between more creditor rights and the access to bank credits, but this relation is much weaker in countries with inefficient courts. The analysis by Djankov *et al* (2005), based on data from 129 countries, also concludes that an increase in the creditor rights score raises the ratio of private credit to GDP. Furthermore, they find that the power to grab and liquidate collateral by secured creditors supports successful debt markets. For an extensive sample of countries, Qian and Strahan (2005) show that stronger creditor rights cause longer term lending. On the contrary, using also cross-country evidence, Bae and Goal (2009) do not find evidence that stronger creditor rights matter for loan size and maturity. However, the authors conclude that banks reduce loans' length and amount when facing lower contract enforcement.

Turning to studies focusing on single countries, Rodano *et al* (2012) conclude that the new liquidation procedures in Italy cause a lengthening of loan maturities, reduce firms' credit constraints and lead to an increase in the number of per-firm bank relationships. This is consistent with the fact that a faster and orderly liquidation process releases funds to other viable projects. Araujo *et al* (2012) shows that the bankruptcy reform in Brazil lead to increases of 10% and 23% in the amount of total debt and long-term debt, respectively. In the case of US, Chang and Schoar (2006), conclude that a pro-debtor friendly system is related with higher re-filling rates and firm shutdowns, lower post-bankruptcy credit ratings and lower annual sales growth up to five years after the bankruptcy filing.

Covenants

As covenants provide restrictions on firm behaviour prior to default, the existence of more covenants can be expected in a context where in the case of bankruptcy creditor protection laws is low.

Qi *et al* (2010), using a cross-country dataset, demonstrate that the efficiency of bankruptcy law and public enforcement are both associated with the use of more debt covenants. They conclude that with more restrictive covenants creditors are able to force violating firms into bankruptcy, and this leads to a better outcome if the bankruptcy process is efficient and if covenants are easier to enforce. The authors also find that there is a negative relation between creditor protection and the use of covenants (and a positive relation between shareholder rights and the use of covenants), which supports that firm-level contracting protection substitutes country-level protection laws.

Investment, innovation and entrepreneurship

As stated above, a more efficient bankruptcy system would promote the channelling of funds within the economy in better conditions (low cost, longer maturities and higher amounts), fostering investment and stimulating the R&D in the economy.

Carcea *et al* (2015) find that the pre-insolvency system efficiency has a positive impact on self-employment rates in a sample of European countries. In particular, an increase by one percentage point in the efficiency of the recovery systems has an impact of 0.75 % in the self-employment rate. Focusing on Europe and North America, Amour and Cumming (2008) also find that bankruptcy law affects positively the level of entrepreneurship and self-employment, more than economic determinants as real GDP growth and stock market returns.

The positive relation between creditor friendly systems and new investments is also demonstrated by Safavian and Sharma (2007), referring to European data. Johnson *et al* (2002), based on data from Poland, Romania, Slovakia, Ukraine and Russia, find that firms' investment is affected by the perceived security of property rights. They demonstrate that security of property rights influences the reinvestment rate positively. In the opposite direction, Acharya and Subramanian (2009), analysing 85 countries, find evidence that strengthening creditor rights lowers innovation[13]. Detailing for the G-7 firms, the authors conclude that technologically innovative industries employ relatively less leverage and grow disproportionately slower when compared to other industries.

On single country studies, Ponticelli (2012) analysis shows that a pro-creditor bankruptcy reform in Brazil, together with a stronger court enforcement (measured by backlog per judge), increase capital investment and productivity.

4. Conclusions

Understanding the implications of judicial structural reforms is crucial to ensure informed decisions by policy makers, before and after implementation, allowing for the optimization of the design of individual policies and of their packaging with other reforms. It is also of utmost importance for political economy considerations and to ensure ownership of the process. This survey intended to shed light into the different mechanisms at play for the different types of judicial reforms.

Concerning sectoral efficiency, empirical evidence points to an, at least, non-negative effect of courts' size on judicial efficiency, with many studies showing a positive impact on performance. In what regards judicial resources, while there seems to be no relation between overall courts' budget and performance, the effect of wages and ICT spending is found to be positive. Also, education and training is associated with higher efficiency as is reforms aiming at enhancing the governance of the judicial system. The results for specialization of courts are less clear-cut, hinting at the need for a case-by-case assessment, as reforms in this area are less uniform. Finally, the existing evidence on alternative dispute resolution suggests no effect on performance.

But will improved sectoral performance translate in economic gains? Existing empirical evidence show that more efficient courts will lead to higher investment, higher availability of credit with longer maturities and lower interest rates, larger firms and higher firms' entry rates.

Concerning bankruptcy regimes, the literature shows that a more efficient system is related with a lower cost of funding and a higher amount and length of credit in the economy and,

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[13] In countries that underwent an increase (a decrease) in creditor rights, the more innovative industry generated 10.3% less (11.5% more) patents, 56.4% less (29.3% more) citations to these patents, and 9.5% less (10.5% more) patenting firms than its adjacent less-innovative industry.

consequently, to more investment, innovation and entrepreneurship. In what regards the relation between the efficiency of the bankruptcy system and the use collateral, the literature is not conclusive.

In general, the different mechanisms at play would suggest a positive impact of the liquidation process reform, but the same does not apply to the reform of the debt' restructuring regime, as in this case there is a negative effect related with the decrease of the debtor repayment incentives (misaligned incentives). Therefore, a better understanding of the economic impact of bankruptcy regimes would need to be based on additional research differentiating between restructuration and liquidation impact mechanisms.

In the context of structural reforms, these results highlight the relevance of reforming the judicial system, in particular for those countries more distant from the efficient frontier. The long-term gains and the channels through which these reforms operate (e.g. creation of new firms or more investment) will be key to ensure sustained economic growth. Nevertheless, as the effects of reforms depend on overall economic conditions (including the position over the cycle) and on the interactions between different policies, timing, bundling and sequencing of reforms should also be taken into consideration. This should be the focus of future research.

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Annex 1 – Studies on the effect of judicial reforms on sectoral efficiency – by area of reform

Authors	Data source	Countries covered	Dependent variable(s)	Method	Independent variables	Relevant results
			Court size			
Lorenzani and Ludici (2014)	dataset based on the reports by the Council of Europe's European Commission for the Efficiency of Justice (CEPEJ).	cross-country: Europe	(log) backlog ratio, (log) disposition time, firm entry rate, churn rates, national net inflows of FDI	*OLS and RE, FE*	court size, courts to population ratio, judges to population ratio, litigation ratio, share of public budget for courts ICT, disposition time	court size: **(-) trial length and backlog ratio**
Cross and Donelson (2010)	dataset based on the reports by the Council of Europe's European Commission for the Efficiency of Justice (CEPEJ).	cross-country: Europe	judicial independence, legal efficiency, rule of law, impartial courts	*OLS*	Judicial salary, Judicial budget, Number of courts, Number of judges, Common law, French civil law, Lawyers, Real GDP	number of courts: **not significant**
Deynely (2011)	dataset based on the reports by the Council of Europe's European Commission for the Efficiency of Justice (CEPEJ).	cross-country: Europe	court efficiency	*two-stage Data Envelopment Analysis: data envelopment analysis and Tobit regression model*	judge salaries, judges' education, Computerization, number of courts	number of courts: **(+) judicial efficiency**
Voigt and El-Bialy (2014)	dataset based on the reports by the Council of Europe's European Commission for the Efficiency of Justice (CEPEJ).	cross-country: Europe	efficiency, Independence, clearance and resolution	*OLS, least squares regression*	Income per capita, Legal Origin, Court budget, Judicial council, Duties, Size, Special, Enforcement, Recruitment, Training, Bonus, Sanction, Benefit, Legal aid	court size: **not significant**

Buscaglia and Dakolias (1999)	information from the federal first-instance courts, survey of each court, including a study of the time allocated to different tasks	cross-country: 10 developing and developed countries	procedural times and clearance rates	*jurimetric analysis*	capital budgets, technology, adjudicative time, administrative time, managerial activism by judges; cost per case, cost elasticity, salaries, general budget resources, number of staff	court size: **(-) clearance rate**, no impact on duration
Murell (2001)	cross-regional Romanian data	single country: Romania	number of cases, Index of Congestion	*three stage least squares (3SLS) and OLS*	Congestion, Appeal success rate, Number of enterprises, Level of economic activity, % large and medium enterprises, Urbanization, Industry, Caseload, Number of judges, Competing cases in the Tribunal, Criminal court congestion, % votes for Iliescu, Transylvania	more judges: **(-) congestion**
Hagstedt and Proos (2008)	three different sources; the Swedish Central Bureau of Statistics (SCB), National Courts Administration and the Swedish National Council for Crime Prevention	single country: Sweden	cost statistics as input	*DEA*	cases settled as output	decreased number of courts, increased average size: **(+) efficiency**

Mitsopoulos and Pelagidis (2007)	data from Hellenic Ministry of Justice, the Hellenic Ministry of Interior and the Greek National Statistical Service	single country: Greece	ratio of remaining plus postponed to total cases introduced	*SURE GLS regression and OLS*	ratio of employees to total cases introduced	ratio of staff to number of cases: **effect on backlog ratio** in higher instance courts
Dimitrova-Grajzl et al (2012)	empirical literature on court activity, two panel datasets, one for each type of courts of first instance in Slovenia	single country: Slovenia	Court output: ln(Resolved cases)	*Pooled OLS, Fixed Effects Estimation, 2SLS*	judicial staffing (number of serving judges), demand for court services (a court's caseload)	court size: **no effect on resolved cases**
Beenstock and Haitovsky (2004)	panel data on Israeli courts: annual observations on the three court systems in Israel	single country: Israel	Rates of compromise and appeal (%)	*WLS, SURE, OLS*	Magistrate Courts (Compromise rates, Appeal rates) and District Courts (Compromise rates, Appeal rates)	court size: **no effect on resolved cases**
Rosales-Lopez (2008)	Annual Report of Spain's General Council of the Judiciary, office for Justice and Public Administration of the "Junta de Andalusia"	single country: Spain	Judicial output (court's resolution)	*Multiple regression analysis, analysis of variance*	Judicial staff, Workload, Common procedural services, Judicial reinforcement, Judge turnover	court's size: **(+) court output**
Dalton (2009)	data set compiled by the Institute for the Advancement of the American Legal System at the University of Denver	single country: US	length of the case	*ANOVA model, HLM, linear regression, Hierarchical Linear Modelling*	number of attorneys, number of observations per court, court sizes	larger courts: **(+) more efficient**
Courts budget						
Palumbo et al (2013)	the OECD dataset, the dataset collected by the CEPEJ, and the Doing Business (DB) dataset collected by the	cross-country	Log Productivity of Judges, Log Trial length, Log litigation per	*OLS, IV regressions, Fixed effects regression*	budget to informatization, computer users*budget to informatization, computer users in	higher share of justice budget to ICT: **(+) trial length, (+) number of cases**

						disposed per judge
	World Bank		capita, Cost of trial		the population, GDP per capita, Litigation Per Capita, Number of Procedures, GDP PPP, Per Capita, Freely negotiated fees	**disposed per judge**
Cross and Donelson (2010)	dataset based on the reports by the Council of Europe's European Commission for the Efficiency of Justice (CEPEJ).	cross-country: Europe	Judicial independence, Legal efficiency, Rule of law, Impartial courts	*OLS*	Judicial salary, Judicial budget, Number of courts, Number of judges, Common law, French civil law, Lawyers, Real GDP	increasing the overall budget: **no effect on perceived efficiency**
Deynely (2011)	dataset based on the reports by the Council of Europe's European Commission for the Efficiency of Justice (CEPEJ).	cross-country: Europe	court efficiency	*two-stage Data Envelopment Analysis: data envelopment analysis and Tobit regression model*	judge salaries, judges' education, Computerization, number of courts	increase in investment in court equipment, infrastructure and judge's salaries: **(+) increased clearance rate** no impact of computerization
Voigt and El-Bialy (2014)	dataset based on the reports by the Council of Europe's European Commission for the Efficiency of Justice (CEPEJ).	cross-country: Europe	Efficieny, Independence, Clearance and Resolution	*OLS*	Income per capita, Legal Origin, Court BUDGET, Judicial council, Duties, Size, Special, Enforcement, Recruitment, Training, Bonus, Sanction, Benefit, Legal aid	budget: **(-) resolution rate,**

Buscaglia and Dakolias (1999)	information from the federal first-instance courts, survey of each court, including a study of the time allocated to different tasks	cross-country: 10 developing and developed countries on three continents	procedural times and clearance rates	*jurimetric analysis*	capital budgets, technology, adjudicative time, administrative time, managerial activism by judges; cost per case, cost elasticity, salaries, general budget ressources, number of staff	capital budget: **(-) time to disposition,** budget resources to infrastructure and IT: **(+) clearance rates, (-) expected duration of cases**
Lorenzani and Ludici (2014)	dataset based on the reports by the Council of Europe's European Commission for the Efficiency of Justice (CEPEJ).	cross-country: Europe	(log) backlog ratio, (log) disposition time, firm entry rate, churn rates, national net inflows of FDI	*OLS and RE, FE*	court size, courts to population ratio, judges to population ratio, litigation ratio, share of public budget for courts ICT, disposition time	ICT budget: **(-) disposition time and (-) backlog ratio**
Mitsopoulos and Pelagidis (2007)	data from Hellenic Ministry of Justice, the Hellenic Ministry of Interior (material resources) and the Greek National Statistical Service (annual tables of the "Statistics of Justice" publication)	single country: Greece	ratio of remaining plus postponed to total cases introduced	*SURE GLS regression and OLS*	ratio of employees to total cases introduced	budget: **no impact** on efficiency
Yeung and Azevedo (2011)	annual reports "Justiç̦a em N´umeros", issued by the National Council of Justice (Conselho Nacional de Justic)	single country: Brazil	output variables: number of adjudications in first- and second-degree courts	*data envelopment analysis (DEA)*	input variables: number of judges, number of auxiliary staff	lack of resources: **(-) efficiency**
			Specialized courts			
Voigt and El-Bialy (2014)	dataset based on the reports by the Council of Europe's European	cross-country: Europe	Efficieny, Independence, Clearance and	*OLS*	Income per capita, Legal Origin, Court BUDGET,	special courts: **(-) resolution rate** special courts:

	Commission for the Efficiency of Justice (CEPEJ).		Resolution		Judicial council, Duties, Size, Special, Enforcement, Recruitment, Training, Bonus, Sanction, Benefit, Legal aid	**(+) backlog ratio**
Palumbo et al (2013)	the OECD dataset, the dataset collected by the CEPEJ, and the Doing Business (DB) dataset collected by the World Bank	cross-country	Log Productivity of Judges, Log Trial length, Log litigation per capita, Cost of trial	*OLS, IV regressions, Fixed effects regression*	budget to informatization, computer users*budget to informatization, computer users in the population, GDP per capita, Litigation Per Capita, Number of Procedures, GDP PPP, Per Capita, Freely negotiated fees	specialization: **(-) trial lengths**
Garoupa et al (2010)	survey of Spanish family courts in the region of Madrid	single country: Spain	duration in first instance of non-mutual consent divorces and other litigious family procedures	*ordered probit following Wooldridge, linear regression model for the average duration*	Madrid 25, Getafe (regular court), Majadahonda (regular court), family court	specialized courts: **no significant effects on duration**
Alternative dispute resolution						
Djankov et al (2002)	derived from answers to questionnaires prepared by attorneys at Lex Mundi and Lex Africa member firms, data from surveys of business people on the quality of the legal system	cross-country	indices of formalism and its component indices,	*OLS, Instrumental variables regressions*	Log GNP per capita, Socialist/ French/ German/Scandinavian legal origin, Log of duration, Judicial efficiency, Access to justice, Enforceability of contracts, Corruption, Human Rights, Legal system is	ADR: **no significant effect on efficiency**

					fair and impartial, Legal system is honest or uncorrupt, Legal system is quick, Legal system is affordable, Legal system is consistent, Court decisions are enforced, Confidence in legal system	
Heise (2000)	collection of state civil justice data from court clerks office by the Civil Trial Court Network (CTCN)	single country: US	disposition time	*multivariate regression analysis*	case types, party types, chase characteristics and local legal culture	ADR: **(+) disposition time**
Kakalik et al (1997)	court records, records, reports and surveys of CJRA advisory groups, districts cost and delay reduction plans, detailed case processing and docket information on a sample of cases, surveys of judicial officers, mail surveys of attorneys and litigants, interviews in person with judges, court staff and lawyers	single country: US	time to disposition, costs, participants satisfaction, views of fairness	*descriptive tabulations, multivariate statistical techniques*	e.g. early judicial management of any type, effect of including trial schedule set early as part of early management, mandatory early disclosure, good-faith efforts before filling discovery motion, increase use of magistrate judges to conduct civil pre-trial case processing, ...	ADR: **no significant effect on disposition time**
			Governance			
Palumbo et al (2013)	the OECD dataset, the dataset collected by the CEPEJ, and the Doing Business (DB) dataset collected by the World Bank	cross-country	Log Productivity of Judges, Log Trial length, Log litigation per capita, Cost of	*OLS, IV regressions, Fixed effects regression*	budget to informatization, computer users*budget to informatization, computer users in the population,	attributing managerial responsibilities to the chief judges: **(-) trial length**

			trial		GDP per capita, Litigation Per Capita, Number of Procedures, GDP PPP, Per Capita, Freely negotiated fees	
Buscaglia and Dakolias (1999)	information from the federal first-instance courts, survey of each court, including a study of the time allocated to different tasks	cross-country: 10 developing and developed countries on three continents	procedural times and clearance rates	*jurimetric analysis*	capital budgets, technology, adjudicative time, administrative time, managerial activism by judges; cost per case, cost elasticity, salaries, general budget ressources, number of staff	time on administrative tasks: **(+) duration**
Voigt and El-Bialy (2014)	dataset based on the reports by the Council of Europe's European Commission for the Efficiency of Justice (CEPEJ).	cross-country: Europe	Efficieny, Independence, Clearance and Resolution	*OLS*	Income per capita, Legal Origin, Court BUDGET, Judicial council, Duties, Size, Special, Enforcement, Recruitment, Training, Bonus, Sanction, Benefit, Legal aid	judicial councils: **(-) efficiency**
Education and training						
Deynely (2011)	dataset based on the reports by the Council of Europe's European Commission for the Efficiency of Justice (CEPEJ).	cross-country: Europe	court efficiency	*two-stage Data Envelopment Analysis*: *data envelopment analysis and Tobit regression model*	judge salaries, judges' education, Computerization, number of courts	judges education: **(+) efficiency**

Buscaglia and Dakolias (1999)	information from the federal first-instance courts, survey of each court, including a study of the time allocated to different tasks	cross-country: 10 developing and developed countries on three continents	procedural times and clearance rates	*jurimetric analysis*	capital budgets, technology, adjudicative time, administrative time, managerial activism by judges; cost per case, cost elasticity, salaries, general budget ressources, number of staff	judges education: **no significant effect on efficiency**
Voigt and El-Bialy (2014)	dataset based on the reports by the Council of Europe's European Commission for the Efficiency of Justice (CEPEJ).	cross-country: Europe	Efficieny, Independence, Clearance and Resolution	*OLS*	Income per capita, Legal Origin, Court BUDGET, Judicial council, Duties, Size, Special, Enforcement, Recruitment, Training, Bonus, Sanction, Benefit, Legal aid	Mandatory training: **(+) resolution rates**

Annex 2 – Studies on the effects of judicial sectoral efficiency on economic performance

Authors	Data source	Countries covered	Dependent variable(s)	Method	Independent variables	Relevant results
Investment						
Bellani (2014)	FDI Markets data set	cross-country: OECD Countries	FDI	*OLS regression*	judicial effiency, skill, capital, comparative advantage and market size, for the extensive and intensive margins	judicial efficency: **(+) FDI**
Staats and Biglaiser (2011)	time-series data for 79 developing countries, period 1996-2005	cross country: Developing Countries	net Portfolio Bond, Equity and combindes Bond and Equity inflows (as % of GDP)	*panel-corrected standard errors multivariate regressions*	judicial strength, rule of law, Judicial Independence, Impartial Courts, Protection of Property	judicial strenght and rule of law: **(+) portfolio investment**
Lorenzani and Lucidi (2014)	dataset based on the reports by the Council of Europe's European Commission for the Efficiency of Justice (CEPEJ), over the period 2006-2010	cross-country: Europe	(log) backlog ratio, (log) disposition time, firm entry rate, churn rates, national net inflows of FDI	*OLS and RE, FE*	court size, courts to population ratio, judges to population ratio, litigation ratio, share of public budget for courts ICT, disposition time	justice efficiency (disposition time and backlog ratio): **(+) FDI**
Credit markets						
Bae and Goyal (2009)	Dealscan database compiled by the Loan Pricing Corporation (LPC)	cross-country (48 countries)	property rights and creditor rights, All loans, Non-U.S. borrowers Matched to Worldscope, Non-U.S. borrowers Matched to Worldscope US$ loans on LIBOR	*OLS regression*	Loan characteristics (e.g. Median loan spread, Senior loans indicator), Syndicate structure (e.g. Share of biggest lender, Median foreign banks as % of	property rights protection: **(+)banks lending, (+) maturities, (-) spreads**

					tota), Loan purpose indicators (e.g. Refinancing, Backup line) and Firm characteristics (e.g. Median profitability, Median tangibility)	
Quian and Strahan (2005)	Loan information comes from the Loan Pricing Corporation's Dealscan database	cross-country (60 countries)	log of the number of lenders, percent of the loan held by government banks, percent held by domestic banks, log of the loan maturity and Log of Drawn All-in Spreads		legal variables (e.g. Legal Origin, Credit Rights Index), Institutional variables (e.g. Property Rights Index, Corruption) and Country-Level variables (e.g. economic and financial development)	protection of creditor rights: **(+) term lending (-) interest rates** contracting costs (legal formalism): **(+) terms of bank loans**
Johnson et al (2002)	surveys undertaken in Russia and Ukraine in May and June 1997, and in Poland, Romania and Slovakia in September-December 1997	cross-country (post-communist countries)	belief in courts, percentage of the bill paid with delay, percentage of the bill paid after delivery, trade credit, Switching Costs	*OLS regression*	Customer Search Costs, Duration of relationship, Loyalty to existing suppliers, Complexity of Input, Information, Courts	Functioning courts: **(+) enforcing contracts (+) new interactions**
Laeven and Majnoni (2003)	country-level data on average lending rates and deposit rates from the IMF's International Financial Statistics (IFS) database and average interest rate spreads computed at a banklevel	cross-country	Spread1 and Spread2 (difference between the average lending rate and the average cost of funds)	*OLS regression*	Infl, Liqreq, Conc, State, Entry, Restrict, Fbank, Law, Prop, Pcr, Doll	Judicial efficiency: **(-) interest rate spreads**

	using data from Bankscope					
Fabbri (2009)	data on civil trials concluded by judicial district from an annual survey by the National Institute of Statistics (INE), Firm level data are drawn from the Survey on Firm Strategies	single country: Spain	average interest rate on the stock of bank debt, size of the firm, leverage ratio	*fixed-effects regressions, DSGE model*	Legal Costs, Age, Age Squared, Listed Firm, Asset Intangibility, Size, Herfindahl Index, GDP	enforcement of creditors' rights: **(+)credit conditions, (+)individual capital accumulation** law enforcement: **(+) individual savings**
Fabbri and Padula (2001)	Household data come from the Survey of Household Income and Wealth (SHIW)	single country: Itlay	Credit market participation, Credit rationing, amount of debt	*probit model with sample selection.*	Age of the household head, Age squared of the household head, Labor household income, Collateral, Years of schooling, Family size, Retiree, Unemployed, Marital status, City size, Per-capita gross domestic product, Justice (Backlog of trials pending, Number of incoming trials, Population, Number of judges, Size of the administrative staff)	enforcement: **(-) probability of being credit-constrained, (-) interest rates**

Horioka and Sekita (2009)	The Japanese Panel Survey of Consumers (JPSC)	single country: Japan	logarithm of the loan amount granted during the past year, household's loan application	*interval regression*	AGE, AGED, INC, WEALTH, HOME, LOAN, SELF-EMPLOYED, UNEMPLOYED, REPAY, TENURE, COLLEGE, MARRIED, CHILD, METRO, MEDIUM CITY, PREFECTURAL GDP, BAD LOANS, HERFINDAHL, DEPTH	better judicial enforcement (i.e., faster court proceedings): **(+) repayment of loans** **(+) loan size**
Jappelli et al (2002)	panel data on leding to firms, credit rationing and interest rates in Italian provinces, data from the Italian National Institute of Statistics (ISTAT), Credit market data from the Centrale dei Rischi database	single country: Itlay	ratio of loans to GDP, indicator of credit rationing, spread between the lending rate and the T-bill rate, ratio of values of non-performing loans to total loans, length of trial, pending trials	*OLS regression*	Length of trials (months), Stock of pending trials (per thousand inhabitants), Herfindhal index, First lag of real GDP, Second lag of real GDP	trial lengths/ backlog: **(-) availability of credit**
Pinheiro and Cabral (1999)	Returned Check Register managed by the Central Bank, Register of Defaulters, Credit Protection Service, databases from SERASA and SCI, survey conducted by IDESP	single country: Brazil	Log(Total Credit/GDP), log(Rural Credit/GDP), log(Non-Rural Credit/GDP)	*cross-country regressions, t-statistics derived using White's asymptotic covariance matrix*	Per Capita GDP, Share of Agr. Activ. in GDP, Index of Judic. Inefficiency, Cost, Slowness, Unfairness	judicial enforcement (slowness, fairness and cost of judiciary): **(+) ratio of credit to GDP, (+) development of credit markets, (+) economic development and growth**

Christini et al (2001)	survey of the manufacturing industry, survey of leading local banks, panel of provincial data, Foundation for Economic Research in Latin America	single country: Argentina	**CRP/PBG** (credit to the private sector as a percentage of GDP), **CRPA/CRP** (loans in arrears as a percentage of total credit to the private sector)	*variance-covariance matrix White's method*	public provincial banks, unemployment rate, interest rates on interbank loans, participation of regional banks in the respective jurisdictions, index of effectiveness of provincial judicial systems	Judicial effectiveness : **(+) amount of credit available, (-) stock of nonperforming loans, (+) credit-to-GDP ratio**
			Firms' size and entry rates			
Beck et al (2004)	annual data, for the period 1988-97 both developing and developed	cross-country (44 countries)	Firm Size	*crosssectional regressions*	private credit (as share of GDP), market capitalization (as share of GDP), judicial efficiency, corruption and property rights, Net Fixed Assets divided by Total Assets, Net Sales to Net Fixed Assets, Return on Assets	efficient legal systems: **(+) firm size, (+) external financing** protection of property rights: **(+) firm size**
Lorenzani and Lucidi (2014)	dataset based on the reports by the Council of Europe's European Commission for the Efficiency of Justice (CEPEJ), over the period 2006-2010	cross-country: Europe	(log) backlog ratio, (log) disposition time, firm entry rate, churn rates, national net inflows of FDI	*OLS and RE, FE*	court size, courts to population ratio, judges to population ratio, litigation ratio, share of public budget for courts ICT, disposition time	judicial efficiency (disposition time and pendency ratio): **(+) firm's entry rate**

Ippoliti et al (2015)	Data on judicial systems from the 4th CEPEJ Report (Council of Europe - European Commission for the Promotion of Judiciary Efficiency)	cross-country: European Countries	ESHIP (Enforcing Contract - Distance to Frontier index)	*OLS regressions, Truncated Regressions, Least Square Regressions*	EFF, Clearance Rate, Civil Liberties index, Budget, GDP, Education, Life, Population, GERM_D, SOCIAL_D, SCAND_D	Judicial efficiency (clearance rate and technical efficency): **(+) entrepreneurial action**
Kumer et al (2001)	publication of Enterprises in Europe by the European Commission	cross-country: European Countries	log of the weighted number of employees per firm, weighted coefficient of variation of the number of employees per firm	*cross-country regressions, OLS*	Size of the market, Investment per worker, R&D intensity, Sector wage, External dependence, Per capita income, Human capital, Human capital inequality, financial development	efficiency of the judicial system: **(+) firm size**
La Porta (1997)	sample of all firms from the WorldScope database	cross-country (49 countries)	External cap/GNP, Domestic firms/Pop, IPOs/Pop, Debt/GNP	*least squares regression*	GDP growth, Log GDP, Rule of law, Origin, Antidirector rights, One Share = One Vote, Creditor rights	legal rules and law enforcement: **(+) size, (+) breadth of capital markets**
Nunn (2007)	data from standard sources	cross-country	average contract intensity of production or exports, ln xic, natural log of exports in industry	*OLS regression*	Judicial quality, Number of obs., Skill interaction, Capital interaction	good contract enforcement: **(+) investment (relationship-specific)**
Dougherty (2013)	economic census microdata for measuring firm size and characteristics, and survey-based data, that measure judicial quality for	single country: Mexico	weighted average firm size		Judicial quality, Market size, Distance to int'l markets, Distance to domestic	quality of the legal system (institutional quality, duration of cases, quantity and efficiency in use

					markets, Foreign market potential, GDP size	of resources): **(+) firm size**
Garcia-Posada and Mora-Sanguinetti (2013)	firm-level database of more than half a million companies and real data	single country: Spain	log of the size-weighted average of the size index and log of the arithmetic average of the size index, corporate entry rate	*multivariate regressions, regressions with clustered standard errors robust to heteroskedasticity and serial correlation*	Judicial Inefficacy, Congestion rate, Incorporation rate, Capital intensity, Vertical Integratio, Log (population), GDP per capita, Unemployment rate, Demographic density, Credit/GDP, Npl ratio, Dar/GDP, Weight energy, Weight manufacturing, Weight construction, Weight services	judicial efficacy (set of efficacy measures, incl. type of civil procedure, congestion and resolution rate, etc.): **(+) firm size**
Garcia-Posada and Mora-Sanguinetti (2014)	data come from the DIRCE database (Directorio Central de Empresas) constructed by the Spanish National Statistics Institute (INE) and from the CGPJ database	single country: Spain	log of the entry rate of all firms, log of the entry rate of entrepreneurs, log of the entry rate of corporations, log of the exit rate of all firms, log of the exit rate of entrepreneurs, log of the exit rate of corporations	*regressions with clustered standard errors robust to heteroskedasticity and serial correlation*	Congestion Rate, GDP, unemployment rate, Credit/GDP, Npl ratio, Dar/GDP, Branches, Weight primary/ energy/ manufactoring/ construction/ services, vertical integration,	efficiency (see above): **(+) entry rate of firms**

					capital intensity, Foreigners, Regulation, Tax Pressure, Lawyers	
Giacomelli and Menon (2013)	dataset with data on judicial efficiency, firm size (employment and accounting based measures) in the manufacturing sector and controls at municipal level	single country: Italy	Av. plant size, Plants/pop., Employment/pop., EWAS	*OLS regression*	Average turnover 2008/09, Av. turnover growth 2001/09, Population, Share of h.s. graduates, Crime, Foreigner share, Litigation rate, Bank branches, Local tax rate	efficient tribunals (length of civil trials): **(+) firm size**

Annex 3 – Studies on the effect of reforms of the bankruptcy regime on economic outcomes

Authors	Data source	Countries covered	Dependent variable(s)	Method	Independent variables	Relevant results
Loans size and length						
Araujo et al (2012)	BCGI index: public sources firm-specific accounting data	single country: Brazil	cost of debt, amount of debt	pooled cross section	Bankruptcy law; Bankruptcy law*BCGI BCGI	Debt: **(+) Bankruptcy law**
Bae and Goyal (2009)	Dealscan database compiled by the Loan Pricing Corporation (LPC)	cross-country (US and non-US)	Loans size; Loans maturity; Loans spread	*OLS*	Property rights index; Creditor rights index; Loan characteristics; Syndicate structure Firm characteristics	Loans size: **(+) Property rights** Loans maturity: **(+) Property rights**
Chang and Schoar (2006)	Chapter 11 filings PACER Dun & Bradstree NETS	single country: US	ProDebtor/ProCreditor dummy	OLS	Refile; Out of Business; Rating; Sales	pro-debtor dummy: **(+) re-filing rates** **(+) out of business** After 5 years: **(-) rating** **(-) sales**
Djankov et al (2005)	IMF's International Financial Statistics Public data souces	cross country: 129 countries (european and non-european)	Private Credit to GDP	OLS	Contract enforcement days; Creditor rights	Private creditor to GDP: **(+) creditor rights** **(-) contract enforcement days**
Fan et al (2010)	Worldscope	cross country: 39 countries	Total debt/Market value of the firm; Long-term debt/Total debt; Total debt/Total	Famma MacBeth	Bankruptcy code	Total debt/Market: **(+) bankruptcy code** long-term

			Assets			debt/total debt: **(+) bankruptcy code** Leverage: **(+) bankruptcy code**
Qian and Strahan (2005)	LPC's Dealscan database; Worldbank	cross-country: 60 countries by legal origin (excludes US)	Loan maturity; Spreads; Secured indicator	Probit/OLS	Legal Origin, Credit Rights Index Property Rights Index,	Loans maturity: **(+) creditors rights** **(+) legal formalism**
Rodano et al (2012)	Central Credit Register; Taxia; Cerved database	single country: Italy	Interest Rate on loans; Number of banks; Secured lending; Short term lending; Leverage; Credit constrains	OLS	After Reorganization (AR); After Liquidation (AL); AR*treatment; AL*treatment; Interim period*treat	Short term lending: **(-) AF*Treat** Leverage: **(+) Interim Period*Treat** Number of banks: **(+) AF*Treat**
Safavian and Sharma (2007)	World Bank's "Enterprise Surveys" Doing Business	cross country: 27 european countries	Bank Investment Bank loan	Panel Regression	Creditor Rights (CR); CR*Enforcement; Court Time; Court Enforcement; Court Speed; Firm size	Bank investment: **(+) Creditor rights** **(+) CR*Enforce** **(-) Enforce** Bank loan: **(+) Creditor rights** **(+) Creditor rights*Enforce**
Cost of funding						
Araujo et al (2012)	BCGI index: public sources firm-specific accounting data	single country: Brazil	cost of debt, amount of debt	Difference-in-difference	Bankruptcy law; Bankruptcy law*BCGI	Cost of debt: **(-) Bankruptcy law**

					BCGI	
Bae and Goyal (2009)	Dealscan database compiled by the Loan Pricing Corporation (LPC)	cross-country (US and non-US)	Loans size; Loans maturity; Loans spread	*OLS*	Property rights index; Creditor rights index; Loan characteristics; Syndicate structure Firm characteristics	Loan spread: **(-) Property rights** **(-) Creditor rights**
Qian and Strahan (2005)	LPC's Dealscan database	cross-country (60 countries by legal origin)	Loan maturity; Spreads	Probit/OLS	Legal Origin, Credit Rights Index Property Rights Index,	Spreads: **(-) Property rights**
Rodano et al (2012)	Central Credit Register; Taxia; Cerved database	single country: Italy	Interest Rate on loans; Number of banks; Secured lending; Short term lending; Leverage; Credit constrains	OLS	After Reorganization (AR); After Liquidation (AL); AR*treatment; AL*treatment Interim Period*treat	Interest rate: **(-) AL;** **(+) AR** Secured lending: **(+) After CP*treat** **(+) Interim period*Treat** **(+) AF*Treat** Number of banks: **(+) AF*Treat**
Visaria (2009)	Data from a large Indian private sector bank with branches throughout the country	single country: India	Interest rates	OLS fixed effects	After state DRT; Log size; Log size*after DRT; Group 2*after DRT; Group 2*after DRT*log size	Interest rate: **(-) Group 2*after DRT*log size**

collateral						
Davydenko and Franks (2008)	sample of defaulted small-to-medium size firms from 10 banks	cross country (France, Germany, and the United Kingdom)	Formal Bankruptcy[14]; Piecemeal Liquidation[15]; Bankruptcy; Workouts	OLS Heckman	U.K.; FR; GE; EAD; Collateral/EAD	Bankruptcy: **(-)FR** **(+)Collateral/ EAD**
Haselmann et al (2006)	Bankscope database; EBRD; BEPS; Worldbank	cross country: 12 CEE transition economies	log (loans)	differences-in-differences	Creditor Rights; Collateral; Bankruptcy; Loans	Loans: **(+) collateral**
Qian and Strahan (2005)	LPC's Dealscan database	cross-country (60 countries by legal origin)	Loan maturity; Spreads; Secured indicator	Probit/OLS	Legal Origin, Credit Rights Index Property Rights Index,	Secured indicator: **(+)Creditors Rights** **(+)Property Rigths**
Rodano et al (2012)	Central Credit Register; Taxia; Cerved database	single country: Italy	Interest Rate on loans; Number of banks; Secured lending; Short term lending; Leverage; Credit constrains	OLS	After Reorganization (AR) After Liquidation (AL); AR*treatment; AL*treatment Interim; Period*treatment	Secured lending: **(+) After CP*treat** **(+) Interim period*Treat** **(+) AF*Treat**

Paper	Source	Cross-contry/ Single country	Dependent variable	Regression / Methods	Independent variable	Results
covenants						
Qi et al (2010)	FISD; US bonds' market	cross country: sample of corporate bonds issued in the U.S. by borrowers incorporated in more than 50 countries	Covenant dummy; number of covenants; types of covenants used; individual covenant used	*probit regression*	Creditor rights index; Shareholder rights index; Public enforcement index; Public information sharing; Effectiveness of bankruptcy law	Number/types of debt covenants: **(-) Creditor rights index;** **(+) Shareholder rights** Number debt covenants: **(+) Effective bankruptcy law** **(+) Public enforcement**
investment, self-employment and entrepreneurship						
Acharya and Subramanian (2009)	Patents: USPTO and NBER	85 countries	Number of citations; Number of patents Number of patenting firms	Difference-in-difference	Creditor rights change dummy	Number of citations: (-) CR dummy; Number of patents: (-) CR dummy Number of patenting firm: (-) CR dummy
Amour and Cumming (2008)	data on self-employment (Eurostat)	cross country: 15 countries (Europe and North America)	Self-Employment / Population	OLS, difference-indifferences regression	Different measures of bankruptcy system (discharge, exemptions, disability and composition)	Self-employment/ Population: **(+) bankruptcy law**
Carcea et al (2015)	pre-insolvency framework data; IMF Financial Soundness Indicators	cross country: Europe (28 member states)	Self-employment rate	*OLS*	Insolvency (4 dimensions); EPL	Self-employment: **(+) Efficiency;** **(+) EPL**

Johnson et al (2002)	Surveys of new firms in Russia, Ukraine, Poland, Romania and Slovakia	cross-country (post-communist countries)	Index of perceived insecurity of propriety rights	*Probit*	Reinvestment rate s	Reinvestment rate: **(-) perceived insecurity of propriety rights**
Ponticelli (2012)	monthly reports of Brazilian courts, surveys of firms constructed by the Brazilian Institute of Statistics (IBGE) Annual Industrial Survey (PIA) Survey of Technological Innovation (PINTEC)	single country: Brazil	change in log (capital investment); log (backlog/judge)	*difference-in-difference strategy, OLS, 2SLS*	Capital investment	Capital investment: **(+) bankruptcy court** **(-)backlog per judge**