BANCA D'ITALIA

EUROSISTEMA

Temi di Discussione

(Working Papers)

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January 2013

Number 898

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ISSN 1594-7939 (print)
ISSN 2281-3950 (online)

Printed by the Printing and Publishing Division of the Bank of Italy

FIRM SIZE AND JUDICIAL EFFICIENCY: EVIDENCE FROM THE NEIGHBOUR'S COURT

by Silvia Giacomelli* and Carlo Menon♦

Abstract

We investigate the causal relationship between judicial efficiency and firm size across Italian municipalities exploiting spatial discontinuities in court jurisdictions for identification. The estimated coefficients suggest that the reduction of the length of civil proceedings could exert, all other things being equal, a significant and positive effect on the average size of Italian firms. Results are robust to a number of different specifications, based on two different databases.

JEL Classification: K4, L11, O18.
Keywords: judicial efficiency, firm size, spatial discontinuity, Italy.

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* Bank of Italy, Economic Research and International Relations.

♦ OECD and Bank of Italy

1 Introduction

A well-functioning judicial system that ensures the enforcement of contracts and the protection of property rights is essential for the working of market economies.[1]

Because it shapes the contractual environment in which firms operate, the functioning of the judicial system may affect several aspects of firms' behaviour with respect, for instance, to investment, employment, organizational models, and contractual relationships with counterparts, all of which influence firm size and, ultimately, aggregate employment. In this paper, we empirically investigate the relationship between judicial efficiency and firm size. Improving on the existing literature, we employ a spatial discontinuity design that allows us to address identification and reverse causality issues and to provide evidence of the causal effect of judicial efficiency on firm size. The identification strategy consists in restricting the sample to observations which are located nearby a spatial discontinuity affecting only the particular variable of interest and in mean-differentiating all the variables within the group of observations which share the same boundaries (see, among others, Black (1999); Holmes (1998); Duranton, Gobillon and Overman (2011)). We apply this strategy to Italian municipalities exploiting spatial discontinuities in court jurisdictions. More specifically, we compare the average size of manufacturing firms in contiguous municipalities that are located across court jurisdiction borders. This allows us to isolate the effects of judicial efficiency as municipalities on opposite sides of court boundaries experience a discrete jump in this variable, but not in other unobserved factors. We use as a measure of judicial efficiency the average length of judicial proceedings.

We find that less efficient courts lead to smaller average firm size. The economic impact of our results is important: halving the length of civil proceedings would lead to an 8-12 per cent increase in average firm size (measured as the average number of employees). These results are robust to the inclusion of additional controls at municipality level, to the use of different proxies of firm size (turnover) and to the use of different measures of judicial inefficiency. We also find that judicial inefficiency has a negative effect on firms' turnover growth.

Several empirical studies find a positive association between the quality of the judicial system and firm size, though these analysis are generally affected by omitted variable and reverse causality issues.

[1] This has been confirmed by a large body of empirical literature both as regards financial and real economic outcomes. For instance, it has been shown that judicial efficiency affects the development of financial and credit markets (Djankov, Hart, McLiesh and Shleifer, 2008), the availability and cost of credit (e.g. Qian and Strahan (2007); Bae and Goyal (2009); Fabbri (2010)), the volume of trade (Berkowitz, Moenius and Pistor, 2006), sectoral specialization (Nunn, 2007) and competition in markets (Johnson, McMillan and Woodruff, 2002).

Kumar, Rajan and Zingales (1999), using data on firm size in Western European countries, found that better judicial systems are associated with larger average firm size; the effects are bigger for industries where physical assets are less important. Beck, Demirg-Kunt and Maksimovic (2006) using firm level data on the largest industrial firms in 44 countries, found that firm size is positively associated with institutional development (including judicial efficiency) and with the development of financial intermediaries. The link between firm size and judicial efficiency has also been proved exploiting within-country variation in the functioning of courts. Laeven and Woodruff (2007), using firm census data in Mexico showed that judicial efficiency has a positive link with average firm size and that this effect is larger for proprietorship than for corporations. Similar results were obtained by Fabbri (2010) on Spanish data; she found that more efficient courts are associated with larger firms and less costly bank financing.[2]

The studies based on cross-country analysis employ either broad measures of quality of the legal system that do not distinguish between the content of the laws and their enforcement in courts (Kumar et al., 1999) or they use direct measures of court performance (Beck et al., 2006). In both cases these measures may reflect other (unobserved) features of the institutional setting of a country. The omitted variable issues are less severe in within-country studies where it is possible to distinguish between laws that apply across the country, and their enforcement, which may vary due to differences in the actual functioning of courts (Laeven and Woodruff, 2007). Nevertheless, in these settings identification issues may also arise due to within-country variation in informal institutions (unwritten norms and rules that affect the behaviour of individuals and organizations). In addition, the results presented in those papers may be biased due to reverse causality, as firm size may influence court caseload hence judicial efficiency.

Our identification strategy allows us to provide evidence on the economic impact of judicial efficiency in isolation from other institutions, both formal and informal.

Italy provides an ideal, though challenging, environment for exploiting spatial discontinuities for identification: it is a centralized nation, thus across the national territory the same laws apply (for instance, regarding contracts, labour, corporations, civil and criminal procedures), yet it displays wide variation in judicial efficiency across courts (World Bank, 2013; Carmignani and Giacomelli, 2009). Although informal institutions vary widely across Italian regions producing significant economic effects (Guiso, Sapienza and Zingales, 2004), the availability of data at municipal level allows us to account for this by restricting the analysis to contiguous municipalities for which it is reasonable to assume that the same informal rules apply.

[2]More recent empirical papers addressing this issue with different approaches are Mora-Sanguinetti and Garcia-Posada (2012) and Dougherty (2012).

Another contribution of this paper is that it provides evidence on the determinants of small firm size in Italy linking it to a distinctive feature of the Italian institutional environment i.e. weak contract enforcement institutions. Compared with other European countries (UE-15) the size of Italian firms is on average 40 per cent smaller; significant disparities persist even if differences in sectoral specialization are accounted for. Small firm size is widely held to be a weakness of the Italian productive system and one of the causes of the low productivity and GDP growth experienced by the Italian economy in recent years (Brandolini and Bugamelli, 2009).[3] At the same time judicial efficiency in Italy is very poor: according to the World Bank's "Doing Business" report, Italy ranks 160th out of 185 countries in the *enforcing contracts* indicator. This is largely due to the extreme length of judicial proceedings. In Italy it takes on average 1,210 days to resolve a commercial dispute through the courts; it is about four times the number of days needed in the US and three times the number of days needed in the UK and in Germany.

Empirical evidence on the determinants of firm size in Italy is scarce. In a recent paper Cingano and Pinotti (2011) found that higher levels of interpersonal trust are associated across Italian regions with larger firm size; Schivardi and Torrini (2008) analyzing the effect of the more stringent employment protection legislation that applies in Italy to firms with more than 15 employees found that it reduces average firm size, though the effect is quantitatively modest. Previous studies on the effects of poor judicial efficiency in Italy have focused on the functioning of credit markets (Jappelli, Pagano and Bianco, 2005; Fabbri, 2010; Magri, 2010). Our paper shows that this inefficiency also has a negative impact on the size of Italian firms.

The paper is organized as follows: the next section briefly sketches the channels through which judicial efficiency may affect firm size; the third section discusses the empirical methodology; the fourth describes the data sources and the variables, the fifth presents the results and the sixth concludes.

2 Theoretical predictions

In principle, it is possible to identify several channels through which the efficiency of the judicial system may affect firm size; all of them depend on the fact that lengthy trials reduce contract enforceability.

[3]Similar conclusions were reached with reference to Portugal and France by two recent papers (Braguinsky, Branstetter and Regateiro, 2011; Garicano, Lelarge and Van Reenen, 2012). More in general, although growth theory does not provide unambiguous predictions on the relationship between firm size distribution and growth (Peretto, 1999), a positive association has been found in empirical studies (Acs, Armington and Robb, 1999; Pagano and Schivardi, 2003).

First, an inefficient judicial system affects firm size through investment decisions by entrepreneurs. Since poor contract enforcement increases the risks faced by entrepreneurs and raises the expected return, this can lead to less investment and lower growth opportunities.

Second, the functioning of courts influences the employment decisions of firms as it affects the enforcement of employment protection legislation (EPL). Although the literature has not reached clear-cut conclusions on the relationship between the strictness of EPL and firm size, it can be argued that the potential constraints EPL imposes on firms' growth are also closely related to effective implementation through the courts. This is particularly true with regard to dismissal procedures which, at least to some extent, are generally subject to judicial scrutiny.

Third, as poor contract enforcement determines higher transaction costs, firms may respond by vertically integrating the production process, thus increasing their size.

Fourth, if formal contract enforcement institutions are not efficient, parties tend to rely more on relational contracting and are less willing to work with new partners; this reduces the demand for a given firm's output and hinders its growth. Yet, the overall effect on average firm size is ambiguous as relational contracting also creates barriers to entry for new firms that are usually smaller than incumbent firms, thus reducing average firm size (Johnson et al., 2002).

Finally, firm size can be indirectly influenced through the credit channel. Well-functioning judicial systems, providing stronger protection for creditors, increase the availability of credit and improve the contractual terms for prospective borrowers, thus lessening financial constraints to growth for existing firms. Yet, also in this case, the overall effect of a more efficient credit market on average firm size is ambiguous: since also prospective entrepreneurs would have better access to external finance and usually new firms are smaller, this could reduce the average size.

To summarize, the first and second channels imply that judicial efficiency increses average firm size, the third channel suggests a negative effect, while the overall impact of the remaining channels is ambiguous since the effect is positive on both incumbents' growth and entry rate. Therefore, as existing theories do not provide a clear-cut prediction of the sign of the relationship between judicial efficiency and average firm size, we rely on empirical analysis.

3 Identification strategy

3.1 Spatial discontinuity design

Our identification strategy is based on a spatial discontinuity design, similar to that employed by Black (1999) and applied by Holmes (1998) and Duran-

ton et al. (2011), among others.[4] The methodology consists in restricting the sample to observations which are located near a spatial discontinuity affecting only the variable of interest, and in mean-differentiating all the variables within the group of observations which share the same discontinuity. We apply this methodology to a sample of Italian municipalities located across court jurisdiction borders, the outcome variable being firm size. Figures 1 and 2 show municipality borders (gray lines) and court jurisdiction borders (bold black lines) in Northern Italy, while coloured areas indicate municipalities that share common jurisdiction borders. In a nutshell, our approach consists in restricting the sample to coloured municipalities and mean-differentiating all the variables among municipalities of the same colour (by including a group dummy). The fact that our identification only exploits mean-differences among municipalities which are very close to each other implies that our estimates are not biased by omitted local factors which vary smoothly over space.

There are two crucial assumptions behind this approach: 1) spatial discontinuities affecting the variable of interest should not introduce any sharp discontinuity in other variables; 2) the spatial border should introduce a sharp discontinuity in the variable of interest.

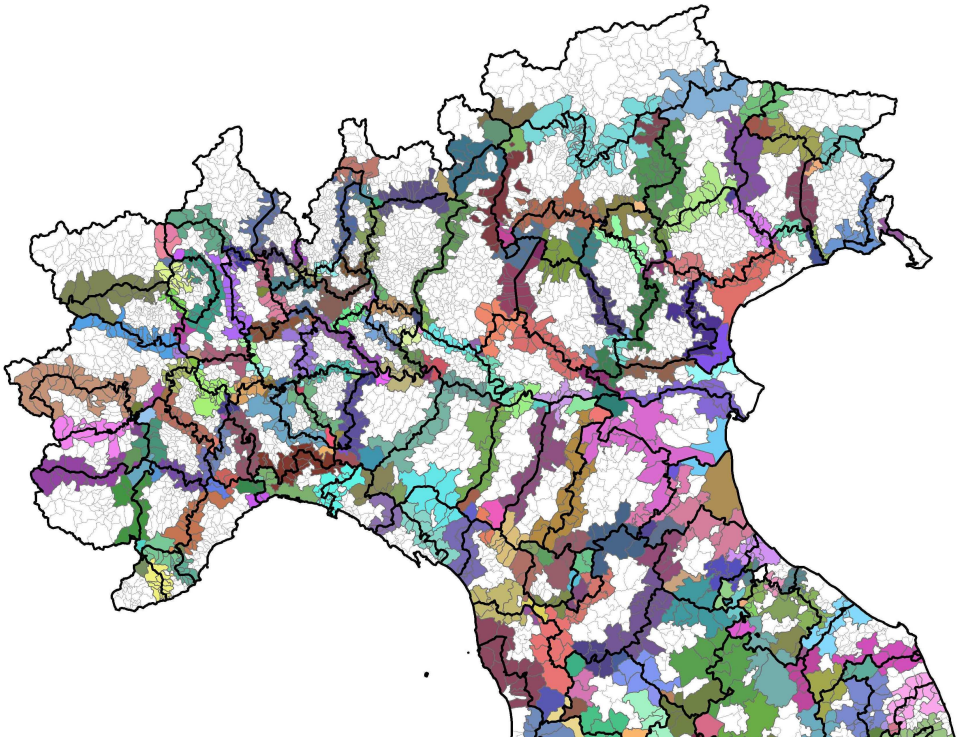
Our setting fits well the assumptions required by the identification strategy. As regards the first assumption, the territorial organization of the Italian judicial system is based on 165 court jurisdiction areas; within these areas, the courts of first instance administer both civil and criminal justice. The current territorial distribution of courts was mainly determined by historical factors and today still largely resembles the one shaped in 1865, immediately after the unification of Italy, which in turn was based on the judicial systems of the previous states. Since then, no existing jurisdiction has ever been removed, although some new courts have recently been inserted into existing classification.[5] This system is widely recognized to be inefficient and anachronistic due to the presence of a multitude of very small courts which might have been necessary in the past to ensure access to justice, but which is no longer justified. After a long debate and despite strong opposition at local level, it is now undergoing a major revision.[6]

[4]Black (1999) applies the methodology to housing prices as a function of school quality in the U.S., by comparing the difference in prices of similar neighbouring houses located at different sides of schools districts. Holmes (1998) instead exploits spatial variation in US State legislations to find that there is a large increase in manufacturing activity when one crosses a state border from an antibusiness state into a probusiness state. Duranton et al. (2011) use municipality borders in the U.K. to investigate the effect of local taxation on firm location and growth.

[5]Over the last 50 years, 11 new small courts have been established (5 in the 1960s and 6 in the 1990s). As we will discuss later, our results are unaffected by excluding these courts.

[6]Legislative Decree No. 155/2012 of 9 September provides that the number of courts will be reduced from 165 to 134 within 18 months.

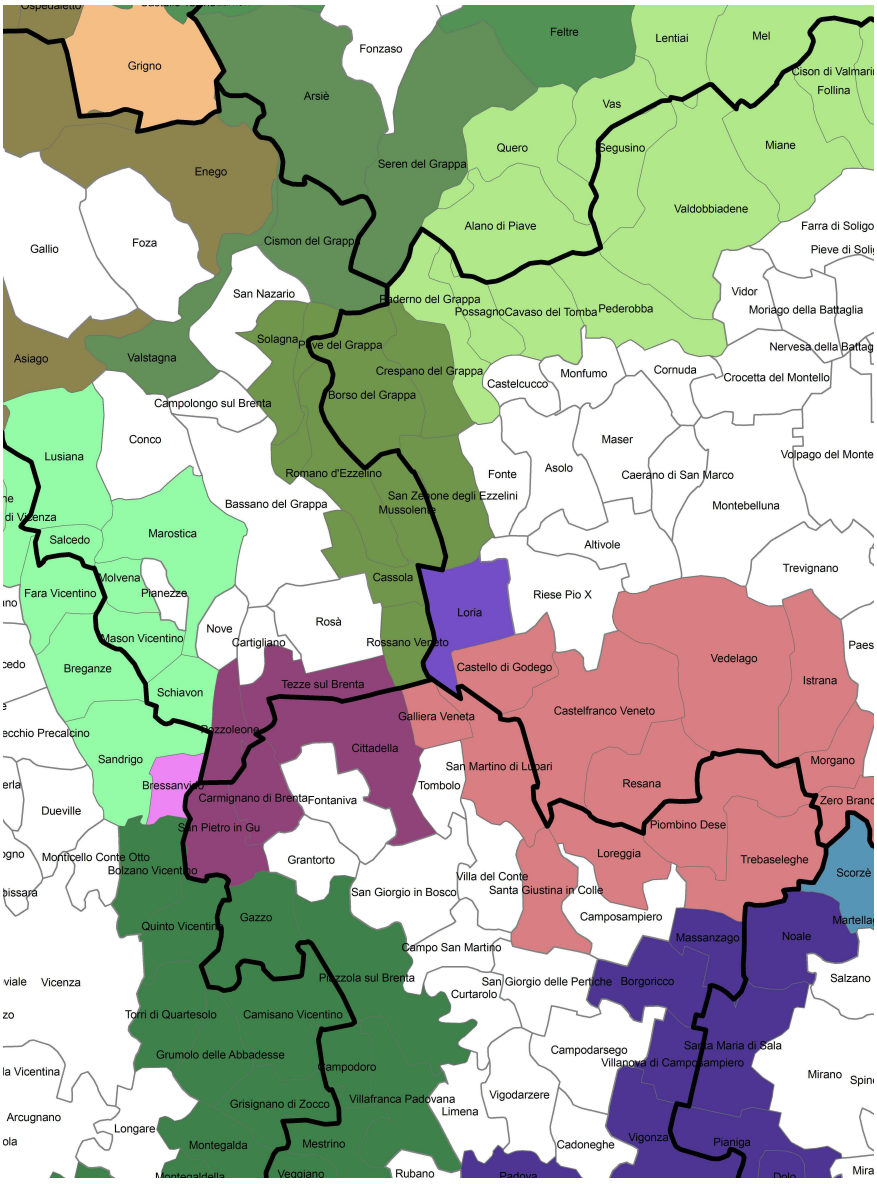
Figure 1: Jurisdiction of the courts, Northern Italy



Note: the darker bold lines in the map correspond to jurisdiction borders, while the thinner gray lines correspond to municipality borders. The map shows the Italian northern regions. Different colours correspond to different border groups.

Source: Based on ISTAT and Italian Ministry of Justice data.

Figure 2: Jurisdiction of the courts, Northern Italy, detail



Note: the darker bold lines in the map correspond to jurisdiction borders, while the thinner gray lines correspond to municipality borders. The map is centered on the Veneto region. Different colours correspond to different border groups.

Source: Based on ISTAT and Italian Ministry of Justice data.

Court jurisdiction boundaries do not systematically match other administrative boundaries, although in some cases court boundaries coincide with regional and provincial boundaries.[7] In these circumstances spatial discontinuities not related to the efficiency of justice might be introduced. This would be a cause of concern only if these discontinuities were correlated with court efficiency. However, this is unlikely to occur since the judicial system is fully autonomous and separate from local administrative bodies and regions and provinces play no part in the functioning of local courts.

Nonetheless, since regions have important regulatory powers over economic activity, we control for regional differences on opposite sides of court jurisdiction borders adding regional fixed effects to the regressions. We are less concerned about the matching of court borders with provincial borders as, unlike regions, provinces have very limited autonomous power over matters related to business activities.[8] Nevertheless, in the robustness section we exclude from the sample all court jurisdictions whose borders coincide with the provincial ones.

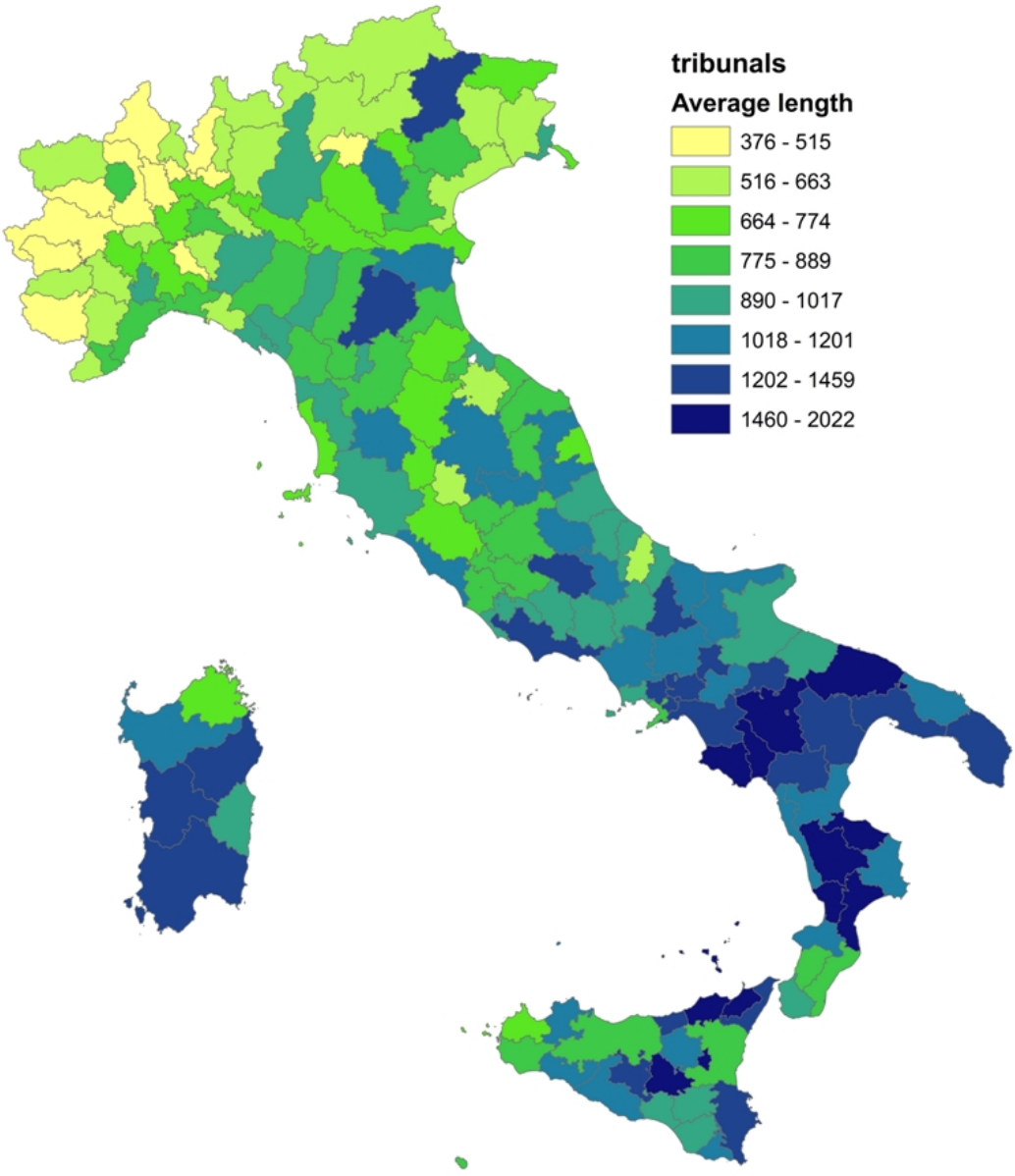
As to the second assumption, neighbouring courts show significant differences in efficiency. As we can see from Figure 3, which maps the average estimated length of judicial proceedings by court jurisdiction in the period 2002-2007, although there is a clear geographical pattern (Southern courts on average are twice as slow as Northern ones), there is a fair amount of variation even within regions and between neighbouring courts.

Furthermore, since civil proceedings are assigned to courts on a geographical basis, the variation in tribunal efficiency leads to variation in judicial efficiency for local firms. As a general rule, the Italian code of civil procedure provides that cases should be assigned to a court of first instance according to the residence of the defendant, unless parties agree otherwise in a contract. This implies that if a firm sues an insolvent customer and there is no previous agreement as to a different forum, the residence of the customer determines the jurisdiction. In these cases, it is not possible to establish once and for all which is the relevant court. However, in certain matters, some of which are very important for business activity such as employment and bankruptcy proceedings, the court's jurisdiction is always determined by the residence of the firm, irrespective of who initiates legal action. Consequently, crossing a jurisdiction border may correspond to a marked difference in the average duration of at least some types of proceedings potentially involving a given firm. Yet, as not all the proceedings in which a given firm is party are heard in the local court, it is worth stressing that our analysis assesses the effect of the efficiency of the *local court*, not of the national judicial system as a whole.

[7] Regions and provinces are the administrative territorial units which correspond respectively to level 2 and level 3 in the Eurostat NUTS classification.

[8] Their main tasks are related to environmental protection, road maintenance, school buildings (construction and maintenance), and waste disposal.

Figure 3: Court jurisdiction and average length of judicial proceedings, 2002-2007



Note: the polygons in the map correspond to the Italian court jurisdictions. The average length of judicial proceedings is estimated by an index based on caseflow data, as explained in section 4.5.

Source: Based on ISTAT and Italian Ministry of Justice data.

3.2 Econometric specification

A simple formalization may help in understanding the econometric properties of the methodology. We are interested in assessing the effect of court efficiency on average firm size at municipality level. Consider the following model:

$$y_{i,p} = E_{k,p}\beta + X_i\gamma + f(p)\delta + \varepsilon_i \quad (1)$$

i.e. average firm size y in municipality i in the hypothetical 'place' (a unique point in the space) p is a function of the efficiency E of the court k in the same place p and of a vector X of the observable characteristic of municipality i. The function *f(p)* represents unobserved factors influencing the outcome variables which vary across the space and are potentially correlated with both E and X. In such a setting, our estimates of β are biased. In theory, we could obtain unbiased estimates by differentiating across observations located in the same place p:

$$y_{i,p} - y_{j,p} = (E_{k,p} - E_{k,p})\beta + (X_i - X_j)\gamma + [f(p) - f(p)]\delta + \varepsilon_i - \varepsilon_j \quad (2)$$

However, this model is not usable, as our variable of interest (the variation in E) is always zero. But we can take a reasonably small variation of p next to a court jurisdiction border, from p_1 to p_2, which leads to a change in judicial efficiency, from E_k to E_q. If the following condition holds:

$$Corr((f(p_1) - f(p_1)), (E_k - E_q)) = 0 \quad (3)$$

i.e. the change in the local unobservables in the two contiguous places is uncorrelated with the change in tribunal efficiency, the estimate of β is unbiased.

Another useful feature of this approach is that we can assume that the side of the border (S=0 or S=1) where the municipality is located is uncorrelated with its observable characteristics X:

$$E[X|S] = E[X] \quad (4)$$

which implies that, on average, municipalities on one side of the border are similar to municipalities on the other side. This also implies that adding additional controls to our specifications may increase the efficiency of the estimates of the court effect, but does not affect their consistency (and the value of the point estimates).

Assumption 4 is testable, as long as there are variables which are not, affected by judicial efficiency, or only affected very slightly. A simple way to do such a test is to regress the unaffected variables on a dummy equal to one (zero) if the municipality is located on the side of the border with a fast (slow) court, the sample being restricted only to municipalities on opposite sides of a jurisdiction border. If the assumption holds true, the dummy should not

be significantly different from zero. As "unaffected variables", we selected two demographic controls we later include in the main regressions: the share of non-Italians and the share of high-school graduates (see the section 4 for definitions). The dummy variable is never significant and always close to zero (Table 1). The assumption can also be graphically tested. In Figure 4 we plot the kernel density distributions of the two variables at municipality level. The black continuous lines refer to the sample of municipalities located on the "slow" side of a jurisdiction border. Symmetrically, the dotted red lines plot the distribution of the border municipalities located on the "fast" side of the jurisdiction border. As the graphs show, there are no systematic differences between the two subsamples.

Operationally, the main specification is based on the following OLS estimation, restricted to the sample of municipalities contiguous to a court border b:

$$y_{mjb} = E_j\beta + X_m\gamma + \sum_{b=1}^{B} \delta_b + \varepsilon_{mjb} \tag{5}$$

where

- y_{mjb} is a measure of average firm size in municipality m, in jurisdiction j, and belonging to the border group b
- E_j is a set of efficiency measures of jurisdiction j
- X_m is a set of municipality controls
- δ_b is a set of border group dummies (equal on both sides of the border).

We identify 377 different border groups (the coloured areas in Figure 1). In order to minimize arbitrariness and to allow replicability, their composition results from a completely automated procedure using a Geographic Information System (GIS).[9] On average, they comprise 10 municipalities each, with a minimum of 2 and a maximum of 64. All the results we present are robust to the exclusion of border groups with more than 10 municipalities.

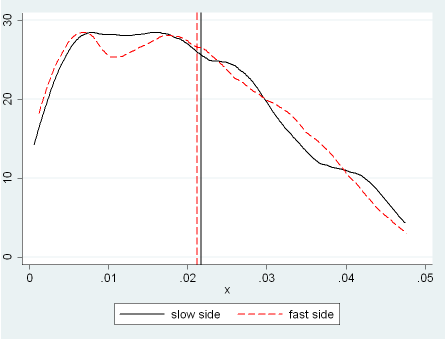
3.3 Other identification challenges

There are a few additional challenges to our identification strategy.

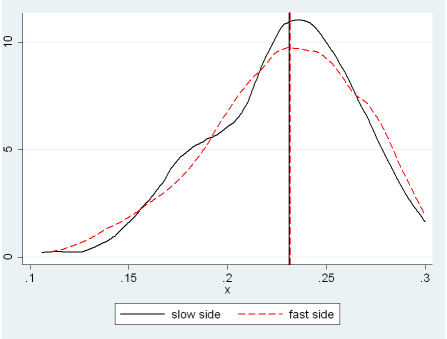
The first relates to the sorting of firms. If firms choose their location after observing the efficiency of the local court, and if larger firms expect

[9]For each municipality we ask the GIS to identify all jurisdiction polygons at zero distance from the municipality border. Border municipalities are those with 2 (or more) jurisdictions at zero distance (the one the municipality belongs to, and the contiguous one). If there is more than one contiguous jurisdiction, only one is selected, based on the distance between the municipality and jurisdiction centroids. Each border group is composed of all municipalities sharing the same couple of zero-distance jurisdictions.

Figure 4: Kernel distributions of demographic variables on either side of a jurisdiction



Share of non-Italians



Share of high-school graduates

Note: The graphs show the Epanechnikov kernel distribution of the relative variables. The last quintile of the distribution is dropped for easy readability. Vertical lines show the mean values. The sample is restricted to municipalities over 5,000 inhabitants located along a jurisdiction border.

Source: Basedon ISTAT and Italian Ministry of Justice data.

to benefit more from faster courts, then part of the effect we find is not due to a growth-enhancing effect of judicial efficiency, but rather to an attraction effect. However, if sorting were driving our results, we would not find any significant effect on firms' growth, but only on firms' average size. We anticipate, however, that this is not the case, the two sets of results being extremely similar. In the robustness section we address a related concern, i.e. the possibility that border municipalities with faster (slower) courts have more (less) large plants than non-border municipalities within the same court jurisdiction, due to cross-border sorting of firms among municipalities belonging to the same border group. This would lead to an overestimate of the real effect, but our test suggests that this is not the case.

To the extent that larger firms increase the local demand for civil justice, reverse causality might also appear as a potential source of bias. This would definitely be an important limit in a standard OLS regression, suggesting that we may find a positive bias in our inconsistent, full sample regressions. However, the assumptions on which the spatial discontinuity approach is based also imply that reverse causality is not an issue. More specifically, if assumption 1 is satisfied i.e. if court jurisdiction borders are exogenous, then the local demand for civil justice is treated in the same way as are all the other unobserved confounding factors: to the extent that demand changes only smoothly across space, there are no significant variations at a jurisdiction border. Therefore, even if the local demand for civil justice affected local courts' efficiency, the border group dummy would fully absorb the reverse causality effect, in the same way as it absorbs the effect of the

other omitted variables.

4 Data sources and variable definition

We assembled a dataset with data on judicial efficiency, firm size (employment and accounting based measures) in the manufacturing sector and controls at municipal level.

4.1 Judicial efficiency

Data on the functioning of the judicial system are provided by the Italian Ministry of Justice. Since data on the actual duration of civil proceedings are not available, we use caseflow data to construct an index that proxies the average length of proceedings (in years) which is calculated as follows:

$$D_t = \frac{P_t + P_{t+1}}{E_t + F_t} \tag{6}$$

where P are pending cases at the beginning of the year t, F are the new cases filed during the year and E are the cases that ended with a judicial decision or were withdrawn by the parties during the year. This index provides an estimate of the average lifetime of proceedings in a court.[10] We consider two kinds of civil proceedings: ordinary civil proceedings (which include disputes on contracts, property law, tort, corporate law)[11] and labour proceedings. While our focus is on the functioning of civil justice, we also need to control for the efficiency of courts in deciding criminal cases since, as already pointed out, the same court deals with both civil and criminal cases. For criminal proceedings we use data on the actual duration. Our data cover the period 2002-2007 and we take the average value across the six years.

4.2 Firm size

We first measure firm size using data on employment. As we cannot rely on unit-based data, to calculate employment-based proxies we use the ASIA database produced by the Italian National Institute of Statistics (Istat) which contains information, at municipal level, on the number of firms, the number of plants, the number of employees and the distribution of firms and plants by size bin. These data refer to the year 2008 and are available only for municipalities with more than 5,000 inhabitants, hence the sample is restricted accordingly. Originally we considered both firm- and plant-level data, being

[10] This is the index used by the Italian Ministry of Justice and by the Italian National Institute of Statistics (Istat) to estimate the duration of proceedings when actual data are not available. In the robustness section, we show that our results are consistent with the use of a different version of the index.

[11] Unfortunately disaggregated data for each of these subjects are not available.

a-priori agnostic on which kind of unit would be most suitable for our analysis. We found that while the two sets of results are very similar, plant-level data produce slightly more precise results. This seems to suggest that the firm records are a noisier source of information than plant records. In the light of that, and also considering that only a very tiny share of Italian firms are multi-plants, in what follows we use plant-level data.[12]

Our main dependent variable is the ratio between the total number of employees and the total number of plants (*Av. plant size*).

We also estimate separately the effects of judicial efficiency on total employment (*Plants/pop.*) and on the number of plants (*Employment/pop.*), in order to check whether the effect on average firm size may be driven by specific dynamics in the numerator or in the denominator of the ratio. Significant effects on the number of firms, rather than on their average size, would suggest that judicial inefficiency reduces the entry rate of firms, decreses their probability of survival, or pushes them to re-locate in a more efficient jurisdiction (in the following of the paper, we refer to latter mechanism as "sorting").

Accounting-based measures of size are taken from the CERVED database, run by the private company Cerved Group, containing balance sheet data for the universe of Italian corporations. As this dataset does not contain information on sole proprietorships and partnerships, which are generally smaller than corporations, large firms are over-represented. From this dataset, we construct a measure of firm size and a measure of firms' growth; since employment is not available, both the measures are based on total turnover. More precisely, we consider the average value of corporations' turnover at municipal level over two years for the periods 2001-2002 and 2008-2009.[13] The average turnover value for the period 2008-2009 (*Average turnover 2008/09*) is our measure of firm size, while the growth rate between the two periods is our measure of firms' growth (*Av. turnover growth 2001/09*). The sample only retains single-plant firms[14] which survived for the whole period and, as the data are quite noisy, we also dropped the first and last centiles of the firms' distribution of total turnover growth.

4.3 Local controls

In addition to these data sources, we use information provided mostly by Istat to construct a number of control variables at municipal level. As a proxy for the size of the municipality we use the municipal population as

[12] Firm-level results are available from the authors upon request.

[13] We average the value of turnover over a two-year period to smooth short-term disturbances.

[14] In the CERVED archive there is no a plant identifier, only a firm identifier. Therefore, it is not possible to correctly calculate an individual contribution of different plants to firm turnover.

recorded in the 2001 Census data (*Population*). To take into account the effects of the availability of skilled workers on firms' growth potential, we include the share of high-school graduates in the population as a measure of local human capital (*Share of h.s. graduates*). High crime rates may discourage economic activity and thus the birth and growth of firms, and at the same time congest local courts. To take these factors into account we include the ratio of reported crimes to population as a proxy for crime rates (*Crime*). We include the share of non-Italians in the population (*Foreigner share*) as foreign workers increase the labour supply, especially in manufacturing. As financial development is an important determinant of firm size, we include the number of retail banking branches in our dataset. In order to control for court congestion (and a possible reverse causality channel), we include a measure of litigation intensity within the court's jurisdiction (*Litigation rate*), expressed as the ratio of the number of filed proceedings in the period 2002-2007 to the total population of the jurisdiction in the year 2001. Finally we include a measure of local taxation on business real estate (*Imposta Comunale sugli Immobili*), since this is an important policy tool at municipality level which may affect firms' location choices and growth opportunities (*Local tax rate*).

In Table 3 we report the main descriptive statistics of the variables used in the empirical analysis, either in the full or the restricted sample. As it is possible to see, there are no statistically significant differences between the two groups. This suggests that the restricted sample of border municipalities is representative of the the full sample of Italian municipalities. In the regression analysis, all variables are expressed in logarithmic form.

5 Results

5.1 Employment

We first estimate Equation. 5 using employment-based measures of firm size.

Table 4 presents the inconsistent estimates based on the whole sample of municipalities; columns 2, 4 and 6 also include controls at municipal level and regional fixed effects. The coefficient of the length of judicial civil proceedings, our main variable of interest, is negative and significant when control variables are excluded (cols. 1, 3, 6) and is always positive but not significant otherwise. Unreported regressions including only regional fixed effects suggest that the latter fully absorb the negative correlation. These results might be biased due to reverse causality, as discussed above, or to omitted variables which positively correlate both with firm size and length of proceedings; both would push the expected negative coefficient toward zero. A possible omitted variable is the presence of industrial districts associated with a smaller average firm size: to the extent that industrial districts are more frequent in areas with higher endowments of civicness and better per-

forming institutions, this may explain the bias toward zero. The coefficient of length of criminal proceedings is instead negative and highly significant, while the length of labour proceedings is not significant.

We then turn to the consistent estimation. Figure 5 gives a graphical representation of its essence. Analogously to Figure 4, it shows the kernel density distribution of the variables on the slow (black continuous line) and fast (red dotted line) sides of the border, respectively. While the distributions of the demographic controls overlap and mean values are almost coincident, both average firm size and manufacturing employment in the population show a rightward shift of the red dotted lines (for number of local units over population the effect is weaker). Consequently, the mean vertical lines are also shifted to the right. The rest of the analysis shows that the effect is statistically significant, economically important, and robust.

Table 5 shows the estimates of the consistent model obtained by restricting the sample to those municipalities situated along a border of court jurisdictions and by introducing a set of fixed effects for all the groups of municipalities sharing the same border. By identifying a very small group of observations located in the same area, these fixed effects control for a wide set of observable and unobservable factors, while still leaving within-group variability in the judicial efficiency variables due to the change in court jurisdiction. Now, the effect of the length of civil proceedings on average firm size and employment share becomes negative and significant; the magnitude of the effect is sizable. As regressions are log-linear and coefficients can be interpreted as elasticities, our estimates imply that, halving the length of civil proceedings, average firm size would decrease by around 8.5%. Since the slowest court in the top decile for efficiency (Trento) is roughly 1.4 times faster than the fastest in the bottom decile (Nola), these results also indicate that moving from the jurisdiction of Trento's Court to the jurisdiction of Nola's Court would lead to a reduction in average firm size of 23%. This elasticity value, however, has to be scaled in proportion to the tiny average size of Italian firms, equal to 8.2 employees in our sample. Therefore, the absolute effect for the average firm moving from Trento to Nola is in the region of two employees.

As the length of civil proceedings has a negative effect on total employment (columns 5 and 6) but does not affect the number of firms (columns 3 and 4), we interpret these results as an indication of the fact that judicial inefficiency is an obstacle to firms' growth, rather than to firms' net entry.

Turning to labour proceedings, we find that their length does not affect our dependent variables. These results are particularly interesting because in Italy, until the 2012 reform of labour legislation, the length of judicial proceedings on worker dismissal directly translated into higher firing costs for larger firms[15] with potential negative effects on firm size. The results are

[15]The law provided that if a dismissal was ruled to be unfair, firms with more than

consistent with Schivardi and Torrini (2008) who find that workers' dismissal provisions that apply to firms with more than 15 employees have quantitatively modest effects on the size distribution of Italian firms. The length of criminal proceedings reduces both average firm size and employment.

As expected, the inclusion of additional controls produces only minor changes in the point estimates of the coefficients of the variables of interest. Regional fixed effects are generally significant, but leave the judicial efficiency coefficients unaffected. This is particularly supportive of the robustness of our methodology, since, as already pointed out, Regions in Italy are the local authorities with the strongest autonomy and decision-making powers on matters which are relevant to business activity. As to the other controls, they are generally not significant with the exception of the share of college graduates, which has a positive effect on average firm size, but a negative effect on the number of firms.[16] It is also interesting to point out that our proxy of local taxation is not significant for firm size, while it is significant and has a negative sign for the number of firms. This is consistent with previous findings indicating that local taxes are more effective at the extensive margin, rather than at the intensive one, because part of their effect is capitalized into rents (Duranton et al., 2011).

5.2 Turnover

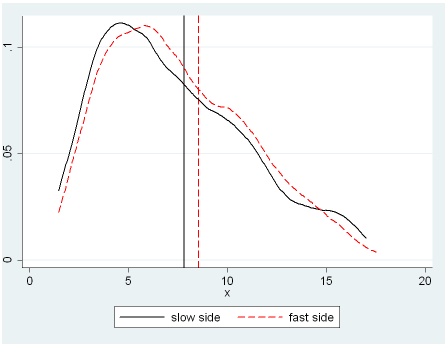
Columns 1-3 of Table 6 report the results for the average turnover level in years 2008-9 (average value across the two years); the specifications mirror those of the regressions run using employment-based measures. In particular, column 1 presents the inconsistent model estimated on the full sample, while columns 2 and 3 show the consistent model, without and with local controls, respectively. Columns 4-6 present the estimates for turnover growth between 2001 and 2009, calculated as the log of the ratio of the final level to the initial one. The specifications mirror those of columns 1-3, with the addition of a control for the turnover level at the beginning of the period.

There are some advantages in running these regressions. First, by so doing we implicitly control for time-invariant unobserved factors potentially correlated with average firm size. Second, as mentioned above, we rule out a possible bias due to the sorting of larger firms into municipalities with faster courts, since we use a closed sample of firms (we exclude firms which enter or exit during the whole period). Finally, we directly test the effect of judicial inefficiency on firm's growth. While the main results on firm size are confirmed, these estimates are less precise than those reported in

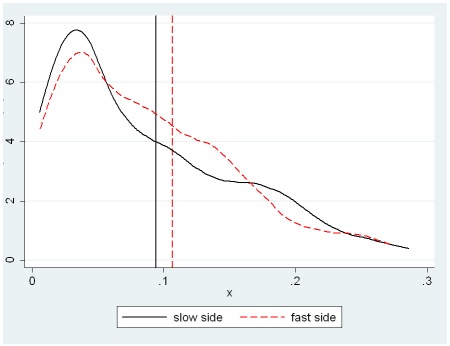
15 employees had to compensate employees for the forgone wages in the time elapsing between the dismissal and the court's decision (besides the reinstatement of the employee, unless she or he opts for a further severance payment equal to 15 months' salary).

[16] A possible explanation is that human capital endowment favours the location of small, labour-intensive companies with limited growth potential.

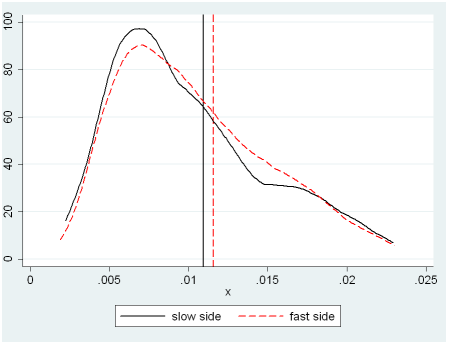
Figure 5: Kernel distributions of average firm size, employment and number of firms on either side of a jurisdiction



Average firm size



Manufacturing employees over population



Number of local units over population

Note: The graphs show the Epanechnikov kernel distribution of the relative variables. The last quintile of the distribution has been dropped to improve readability. Vertical lines show the mean values. The sample is restricted to the municipalities with over 5,000 inhabitants located along a jurisdiction border.

Source: Based on ISTAT and Italian Ministry of Justice data.

Table 5 suggesting either that employment is a better proxy for firm size or that the ASIA archive, based on the full sample of Italian firms, is a better datasource for this kind of analysis. All in all, we find evidence that judicial inefficiency hinders firms' growth. Furthermore, these results also suggest that most of the effect we find on level variables is due to the (lack of) growth of incumbent firms, rather than to the sorting of larger firms into more efficient jurisdictions.

5.3 Robustness checks

We ran a series of robustness checks on our estimates which leaves the main results unaffected.

A first concern is related to the possibility that border municipalities with more efficient (less efficient) courts have larger (smaller) firms than non-border municipalities in the same court's jurisdiction, due to the sorting of firms among municipalities belonging to the same border group. For instance, let us assume that there is an industrial district (composed of several municipalities) with a very friendly business environment and a jurisdiction border crossing the district. Firms may want to marginally change their location and relocate only a few kilometers away, in the "good side" of the jurisdiction border, while still enjoying the positive district business environment. Firms located in municipalities which are further away from the jurisdiction border, instead, may decide not to relocate, since the distance is greater and the business environment may be critically different. As a consequence, border municipalities would be systematically different from non-border municipalities. In our setting, this would lead to overestimating the effect of judicial efficiency on firm size, because border municipalities (included in the analysis) would have more and larger firms than other non-border municipalities in the same court's jurisdiction (excluded from the sample), although the local court is the same. Fortunately, there is an easy way to test for this. If sorting were in place, we would find that border municipalities on the "fast (slow) side", i.e. those where the local court is more efficient (less efficient) than the neighbouring one, on average are endowed with more (less) and larger (smaller) firms than non-border municipalities in the same court's jurisdiction, since border municipalities on the fast side would attract firms located just across the border. We therefore define two binary dummy variables identifying border municipalities located on the fast and slow sides, respectively. Using the full sample of municipalities (border and non-border ones), we then regress our set of independent variables on the two dummies (the non-border municipalities are the omitted group), on the controls, and on the court jurisdiction fixed effects. Our results show that, although the coefficients have the expected sign, they are never significant and rather small in magnitude (Table 7). We conclude that our results are not biased by this kind of sorting.

Another cause of concern is the coincidence of jurisdictional and provincial borders. To account for this, we exclude from our sample the observations for which courts and provincial borders are coincident. The results are presented in Table 8, column 5. Our main findings on the effects of judicial inefficiency on average firm size are fully confirmed, although the estimations are less precise, probably due to the smaller sample size.

The next test relates to newly established courts. As mentioned above, although the general shaping of court jurisdictions goes back to 1864, 11 small courts were added during the 1960s and the 1990s. We may worry that more recent courts would show endogenous borders: for instance, a politically influential mayor may manage to get their municipality included within the more efficient court, and their activism may also affect the growth of local firms. To test for this, we exclude from the sample all border groups involving a court created after 1960. Results are almost identical to those of the main regressions.[17]

Further robustness checks are presented in Table 8. In columns 1-3 we estimate separate regressions for each kind of judicial proceeding to account for possible multicollinearity. Inefficiency in deciding civil disputes and criminal cases have a negative effects on average firm size, while lengthy labour proceedings do not affect firm size. In column 4 we tackle concerns related to the index used to approximate the length of proceedings. We build an alternative index, originally suggested by Clark and Merryman (1976), based on the following formulation:

$$D = \frac{Pt + F}{E} - 1 \tag{7}$$

where P are pending cases at the beginning of the year, F are the new cases filed during the year and E are the cases completed or withdrawn during the year. The index is averaged across the six years for which we have data (2002-2007).[18] The new index is correlated at 97% with the previous one, and provides to almost identical results. Since an imprecise index may also introduce a measurement error, and thus an attenuation bias in the estimates, we also try to instrument the first index with the second. To the extent that the measurement error in the two indexes is uncorrelated, the IVE strategy is consistent. The 2SLS coefficient, however, is only 10% bigger (in absolute terms), suggesting that the component of the measurement error linked to the choice of the index is negligible (results are not reported).

A further robustness test relates to possible outliers due to the presence of a small number of extremely large firms in small municipalities (for instance, the automotive industry plants in Italy are mainly located in small municipalities). We therefore exclude firms with more than 200 employees

[17]The results, unreported for brevity, are available from the authors upon request.

[18]More precisely, we summed all the components over the whole period, and then we calculated the index on the aggregate figures.

from the calculation of all the dependent variables. The results, unreported for brevity but available upon request, are not dissimilar to our main estimates, albeit less significant. A last point of concern is the large variability in municipality populations. Those in our sample go from a minimum of 5,062 inhabitants to a maximum of 2,545,860, with a standard deviation of 72,566 and a 95th percentile of 53,219. However, dropping the municipalities in the top 5% of the population from the sample, leaves the results unaffected. Weighting the restricted sample according to population gives very similar results, although they are less precise (again, the results are omitted but are available upon request).

Finally, our simple measure of average firm size can be misleading in the presence of a large number of very small firms. As we are ultimately interested in assessing whether judicial inefficiency is an obstacle to the presence of large firms, we also adopt an alternative measure, originally proposed by Davis and Henrekson (1997) and later adapted by Kumar et al. (1999) to data at the level of firm size bins, that places more emphasis on large firms. Following Kumar et al. (1999), we use an employee-weighted average size indicator (EWAS) that is calculated as follows:

$$EWAS = \sum_{bin=1}^{n} \left(\frac{emp_{bin}}{emp_{tot}} \right) * \left(\frac{emp_{bin}}{firms_{bin}} \right) \tag{8}$$

Where emp_{bin} and emp_{tot} refer to total employment in the plant size bin and in the sector, respectively, and $firms_{bin}$ corresponds to the number of firms (or plants) in the size bin. The size bins we used are those originally defined in the ASIA archive: 1-9, 10-19, 20-49, 50-99, 100-199, 200-499, 500-999, 1,000-4,999, and more than 5,000. Results using the EWAS index are reported in Table 8, column 6 and show that the effect of the length of judicial proceedings on large firms is even greater, the coefficient being twice as large as the one on average firm size.

6 Conclusion

We explored the effect of judicial (in)efficiency on the size of firms. Since the theory did not ultimately provide an answer as to the expected sign of the relationship, we resorted to empirics to shed light on the subject. Improving on the existing literature, we addressed the identification and causality issues by applying a spatial discontinuity design to Italian municipalities, exploiting the fact that court jurisdictions were shaped in the XIX century and do not systematically match political geography. More specifically, we compared average firm size across contiguous municipalities that are located on the borders of court jurisdictions. This allowed us to isolate the effects of judicial efficiency, as municipalities on the opposite sides of court boundaries

experience a discrete jump in this variable, but not in other unobserved factors. As a measure of judicial efficiency we took the average length of judicial proceedings.

We found that in municipalities where civil proceedings took longer, average firm size in manufacturing industries was smaller. These results are robust to the inclusion of additional controls at municipality level (population, human capital, financial development, and court caseload) and to the use of different measures of judicial inefficiency and average firm size. The effect of lengthy criminal proceedings on firm size is also negative, but smaller and less significant; while inefficiencies in dealing with labour proceedings do not affect firm size.

The economic impact of our results is important: reducing the length of ordinary civil proceedings by half would lead to an 8-12 per cent increase in average firm size. We also found that the impact of judicial inefficiency on firms' growth has a remarkably similar magnitude, suggesting that most of the effect is at the intensive margin. This is consistent with previous evidence from Duranton et al. (2011), who found that local factors - in their case taxes - are capitalized into rents for the incumbents only marginally, due to mobility constraints. On the contrary new entrants are perfectly mobile and need to negotiate rents and so the capitalization of local factors is higher for them. Given that we were assessing the effect of the efficiency of the local court, our results may be interpreted as a lower bound of the effect of the inefficiency of the national judicial system as a whole, as not all the civil disputes involving a firm in a given jurisdiction area are dealt with at the local court.

Although our data do not allow for direct testing of the channels through which judicial inefficiency affects firm size, our results indicate that the negative effects on investment decisions, on the willingness to engage in relationships with new trading partners and on the cost and availability of external financing prevail over the incentive to expand by vertically integrating the production process. We did not find any evidence of an effect related to EPL enforcement.

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Table 1: Test of unconfoundness

VARIABLES	(1) Share of graduates	(2) Share of foreigners
Slow side dummy	0.012	0.033
	(0.008)	(0.038)
Observations	1,019	1,019
R-squared	0.633	0.749

*Robust standard errors in parentheses. All variables are in logarithms. All regressions include border group fixed effects. The sample is composed of municipalities with a population of over 5,000 inhabitants contiguous to a jurisdiction border. *** p<0.01, ** p<0.05, * p<0.1.*

Table 2: Definitions of variables

Variable	Definition	Area	Period	Source
Av. plant size	Employment over number of plants	Municip.	2008	ASIA-ISTAT
Plants/pop.	Number of plants over population	Municip.	2008/2001	ASIA-ISTAT
Empl/pop.	Employment over population	Municip.	2008/2001	ASIA-ISTAT
EWAS	Av. plant size with greater weight on large plants (see sect. 4)	Municip.	2008	ASIA-ISTAT
Av. turnover 2008-9	Average plant turnover	Municip.	2008-2009	CERVED
Turnover growth 2001-9	Plant turnover in 2008-9 over plant turnover in 2001-2 divided by the number of surviving plants	Municip.	2001-2009	CERVED
Length civil	Estimated length in days of civil cases (see sect. 4)	Court jur.	2002-2007	Italian Ministry of Justice
Length labour	Estimated length in days of labour cases (see sect. 4)	Court jur.	2002-2006	Italian Ministry of Justice
Length criminal	Estimated length in days of criminal cases (see sect. 4)	Court jur.	2002-2007	Italian Ministry of Justice
Population	Total population residing in the municipality	Municip.	2001	Population Census 2001, ISTAT
Litigation rate	Number of new cases over total population	Court jur.	2002-2007	Italian Ministry of Justice
Share of foreigners	Non-Italian residents over total population	Municip.	2001	Population Census 2001, ISTAT
Bank branches	Number of bank branches	Municip.	2001	Atlante Stastico Comunale, ISTAT
Share of h.s. graduates	High-school graduates over total population	Municip.	2001	ISTAT
Crime	Number of reported crimes over total population	Municip.	2004-2009	Italian Interior Ministry
Local tax rate	Average municipal tax rate on real estate (ICI)	Municip.		Bank of Italy

Table 3: Summary statistics

VARIABLES	Mean	st. dev.	Mean	st. dev.
	All obs. (2,163)		Border obs. (1,131)	
Av. plant size	8.3	5.5	8.2	5.6
Plants/pop.	0.011	0.006	0.011	0.007
Empl./pop.	0.1	0.095	0.1	0.094
EWAS	88	249	92	296
Average turnover 2008-9	6,291	19,687	6,114	12,221
Turnover growth 2001-9	1.4	0.74	1.4	0.85
Length civil	931	307	914	301
Length labour	718	297	725	309
Length criminal	299	152	311	161
Population	20,577	73,029	24,167	97,320
Share of foreigners	0.021	0.015	0.021	0.015
Bank branches	10	42	12	55
Share of graduates	0.23	0.042	0.23	0.042
Crime	0.15	0.86	0.15	0.96
Litigation rate	0.0062	0.0019	0.0063	0.002
Local tax rate	6.2	0.68	6.3	0.68

Table 4: Full sample of municipalities

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Av. plant size		Plants/pop.		Employment/pop.	
Length civil	-0.328***	0.090	-0.184*	0.073	-0.512***	0.163
	(0.089)	(0.058)	(0.095)	(0.088)	(0.163)	(0.113)
Length labour	0.039	0.020	0.068	0.016	0.107	0.036
	(0.057)	(0.039)	(0.079)	(0.059)	(0.117)	(0.073)
Length criminal	-0.486***	-0.094**	-0.468***	-0.059	-0.954***	-0.153*
	(0.058)	(0.045)	(0.072)	(0.058)	(0.119)	(0.084)
Population	0.057***	0.081***	0.883***	0.925***	0.940***	1.006***
	(0.018)	(0.018)	(0.017)	(0.015)	(0.031)	(0.028)
Litigation rate		-0.006		0.079		0.073
		(0.041)		(0.064)		(0.080)
Share of foreigners		-0.002		0.075***		0.073**
		(0.021)		(0.024)		(0.036)
Bank branches		0.001		0.125***		0.126**
		(0.034)		(0.035)		(0.060)
Share of graduates		0.235***		-0.387***		-0.152
		(0.085)		(0.086)		(0.141)
Crime		-0.017		-0.017		-0.034
		(0.032)		(0.034)		(0.056)
Local tax rate		-0.128		-0.418***		-0.546***
		(0.099)		(0.096)		(0.156)
Constant		1.874***		-2.239***		-0.365
		(0.696)		(0.823)		(1.192)
Region F.E.	NO	YES	NO	YES	NO	YES
Observations	2,267	2,185	2,267	2,185	2,267	2,185
R-squared	0.253	0.444	0.064	0.797	0.181	0.702

*Robust standard errors in parentheses. All variables are in logarithms. The sample is composed of all municipalities with over 5,000 inhabitants for which data are available. *** p<0.01, ** p<0.05, * p<0.1.*

Table 5: Border municipalities

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Av. plant size		Plants/pop.		Employment/pop.	
Length civil	-0.173*	-0.221**	-0.085	-0.112	-0.258	-0.333*
	(0.088)	(0.103)	(0.103)	(0.112)	(0.171)	(0.187)
Length labour	-0.023	-0.012	0.128**	0.089	0.105	0.077
	(0.048)	(0.045)	(0.062)	(0.060)	(0.090)	(0.089)
Length criminal	-0.107**	-0.133**	-0.066	-0.009	-0.173*	-0.142
	(0.049)	(0.056)	(0.073)	(0.069)	(0.101)	(0.104)
Population	0.070***	0.043	0.929***	0.943***	0.998***	0.986***
	(0.025)	(0.028)	(0.017)	(0.023)	(0.036)	(0.044)
Litigation rate		0.011		0.047		0.058
		(0.049)		(0.068)		(0.096)
Share of foreigners		0.025		0.072*		0.096*
		(0.045)		(0.040)		(0.055)
Bank branches		0.048		0.127**		0.175*
		(0.069)		(0.049)		(0.097)
Share of graduates		0.341*		-0.547***		-0.206
		(0.177)		(0.139)		(0.227)
Crime		-0.025		0.027		0.001
		(0.061)		(0.064)		(0.099)
Local tax rate		0.046		-0.521***		-0.476*
		(0.185)		(0.150)		(0.256)
Constant	2.934***	4.451***	-3.839***	-2.168*	-0.906	2.283
	(0.819)	(1.227)	(0.836)	(1.269)	(1.475)	(2.055)
Region F.E.	NO	YES	NO	YES	NO	YES
Observations	1,019	1,019	1,019	1,019	1,019	1,019
R-squared	0.635	0.644	0.877	0.889	0.823	0.829

*Robust standard errors in parentheses. All variables are in logarithms. All regressions include border group fixed effects. The sample is composed of municipalities with over 5,000 inhabitants contiguous to a jurisdiction border. *** p<0.01, ** p<0.05, * p<0.1.*

Table 6: Effect on the level and growth of turnover

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Average turnover 2008/09			Av. turnover growth 2001-09		
Sample	All	Border	Border	All	Border	Border
Length civil	0.049	-0.261	-0.371	0.061	-0.195**	-0.187*
	(0.128)	(0.243)	(0.250)	(0.053)	(0.088)	(0.103)
Length labour	0.076	0.070	0.053	0.031	-0.011	-0.019
	(0.077)	(0.140)	(0.140)	(0.029)	(0.052)	(0.055)
Length criminal	-0.176*	-0.292*	-0.266	-0.017	-0.110	-0.152
	(0.096)	(0.160)	(0.180)	(0.032)	(0.092)	(0.111)
Population	0.236***	0.214***	0.182***	0.030**	0.002	0.010
	(0.037)	(0.039)	(0.047)	(0.012)	(0.018)	(0.025)
Av. turnover 2001/02				-0.025		-0.050*
				(0.016)		(0.028)
Litigation rate	0.060		0.087	-0.022		0.010
	(0.089)		(0.134)	(0.032)		(0.065)
Share of foreigners	0.086*		0.181*	-0.023		0.028
	(0.044)		(0.100)	(0.016)		(0.040)
Bank branches	0.146*		0.210	-0.003		-0.022
	(0.078)		(0.139)	(0.031)		(0.067)
Share of graduates	-0.105		0.121	-0.074		-0.098
	(0.192)		(0.424)	(0.066)		(0.166)
Crime	-0.055		-0.089	-0.009		0.013
	(0.059)		(0.131)	(0.026)		(0.045)
Local tax rate	-0.491**		-0.176	-0.132		0.204
	(0.216)		(0.436)	(0.101)		(0.178)
Constant	9.010***		13.555***	-0.509		2.357*
	(1.455)		(2.787)	(0.582)		(1.304)
Region F.E.	YES	NO	YES	YES	NO	YES
Observations	1,942	967	967	1,942	967	967
R-squared	0.299	0.531	0.549	0.025	0.309	0.328

*Robust standard errors in parentheses. All variables are in logarithms. All regressions include border group fixed effects. The sample is composed of municipalities with over 5,000 inhabitants contiguous to a jurisdiction border. *** p<0.01, ** p<0.05, * p<0.1.*

Table 7: Robustness: sorting within jurisdictions

VARIABLES	(1) Av. plant size	(2) Plants/pop.	(3) Employment/pop.	(4) Av. turnover growth 2001-09
Slowside	-0.048	-0.027	-0.074	0.014
	(0.030)	(0.032)	(0.049)	(0.026)
Fastside	0.015	0.038	0.053	0.026
	(0.033)	(0.035)	(0.056)	(0.027)
Other controls	YES	YES	YES	YES
Observations	2,051	2,051	2,051	1,942
R-squared	0.506	0.615	0.627	0.132

*Robust standard errors in parentheses. All variables are in logarithms. All regressions include regional and jurisdiction fixed effects. The sample is composed of municipalities with over 5,000 inhabitants for which data are available. *** p<0.01, ** p<0.05, * p<0.1.*

Table 8: Robustness: one variable at a time, alternative index, excluding courts coinciding with provinces, and EWAS

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES			Av. plant size			EWAS
Sample			Border		No prov.	Border
Length civil	-0.253**				-0.283*	-0.503**
	(0.102)				(0.151)	(0.227)
Length labour		-0.063			0.012	0.024
		(0.045)			(0.081)	(0.101)
Length criminal			-0.155***		-0.157**	-0.133
			(0.054)		(0.073)	(0.132)
Length civil (alternative index)				-0.249***		
				(0.095)		
Other controls	YES	YES	YES	YES	YES	YES
Observations	1,019	1,019	1,019	1,019	646	1,019
R-squared	0.642	0.640	0.642	0.642	0.669	0.592

*Robust standard errors in parentheses. All variables are in logarithms. All regressions include regional and border group fixed effects. Other controls include regional fixed effects and variables listed in table 5. The sample is composed of municipalities with over 5,000 inhabitants contiguous to a jurisdiction border (col. 1 to 4 and 6) and excluding jurisdiction coinciding with provinces (col. 5). *** p<0.01, ** p<0.05, * p<0.1.*

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