Contract Enforcement, Litigation and Economic Development

Baptiste Massenot*

March 2010

Abstract

The quality of contract enforcement can be undermined by excessively costly litigation. To address this issue and its consequences on economic development, a legal sector is embedded in an overlapping-generations model of capital accumulation. Litigation may arise because entrepreneurs privately observe their production and want to hide it from investors. Lawyers are hired in order to solve these disputes in court. Because of rent-seeking through litigation, there are too many lawyers in the economy, which makes it more costly to enforce contracts and to hire workers in the productive sector. The model predicts the impact of different judicial reforms and corporate laws on the demand for lawyers, financial and economic development. The empirical evidence is consistent with some of these predictions.

1 Introduction

Good contract enforcement is believed to be beneficial for economic development. One program of the World Bank is based on this belief and reforms the legal system of some developing countries. The idea is that people are willing to sign more efficient contracts if they expect them to be well enforced. This should be good for economic development.

Another belief states that there are too many lawyers, and that this may be detrimental to the economy by making it too costly to enforce contracts and by taking too many resources to the productive sector. According to this view, lawyers are wasteful,

*Toulouse School of Economics; baptistemassenot@gmail.com. I am grateful to Chiara Canta, Ernesto Pastén, Franck Portier and Gilles Saint-Paul for many helpful discussions.
they seek rents but do not produce anything socially valuable. For example, lawyers are often accused of delaying trials by taking advantage of rigidities in the procedures. This phenomenon is not specific to countries with bad legal systems, as such complaints arose in the United States. Figure 1 presents the number of lawyers per 10,000 inhabitants for 64 countries. There is a huge variation, Israel has almost 50 lawyers per 10,000 inhabitants whereas South Korea has a little bit more than 1. This evidence is all the more striking that Israel and South Korea are both relatively rich countries. It is certainly a possibility that some countries have too many lawyers.

These two stories in mind, it is worth asking what are the characteristics of the legal system that lead to good contract enforcement and to a small size of the legal sector, two outcomes that are believed to be good for economic development. The first contribution of the paper is to build an overlapping-generations model that embeds rent-seeking and a legal sector. The presence of rent-seeking makes it possible to have an excessive number of lawyers. Contractual efficiency and the size of the legal sector will affect financial and economic development, partly through the legal sector and partly through better contract enforcement. The second contribution is to run an empirical analysis that first aims at explaining this variation in the number of lawyers, and second at explaining how
the number of lawyers may affect economic outcomes.

I analyze the role of the legal system on the decision to hire lawyers and on an economic decision that matters for economic development. I focus on a dispute between an entrepreneur and an investor, arising when the investor suspects the entrepreneur to hide some of his revenues in order to repay less. Both parties hire lawyers in order to be defended in court. In this paper, I allow lawyers to play two roles. Because they know the law, they can use it in order to defend their clients. This is beneficial for contract enforcement. But I also show that because of rent-seeking, the clients may end up hiring too many lawyers. If a plaintiff expects the defendant to hire more lawyers, this decreases his expected payoff from the trial and so, he may be willing to hire even more lawyers. This leads to a negative externality because the parties could both hire fewer lawyers while keeping their expected payoff from litigation constant. This negative externality will have consequences on the economy. All these lawyers could have worked in the productive sector as engineers or businessmen. The aggregate demand for labor will be higher, the higher the externality. This will increase wages, and the productive sector will end up with fewer workers, at the expense of economic development.

In this paper, I argue that one should disentangle between the characteristics of the legal system that improve the quality of enforcement but decrease rent seeking, and those that both increase enforcement and rent seeking. This distinction is useful if one wants to study the role of enforcement on economic development, because an increase in rent seeking even if associated with better enforcement will have an ambiguous effect on financial and economic development.

The paper is related to the literature on institutions and economic performance represented by North (1990). Acemoglu and Johnson (2005) treats separately property right institutions and contracting institutions. They find a positive role of property right institutions on economic development and no significant impact of contracting institutions. Unbundling further contracting institutions into legal rules and judicial efficiency may prove useful in identifying a significant impact of this type of institutions on economic performance.
Concerning judicial efficiency, Messick (1999) and Posner (1998) suggest some judicial reforms that may lead to more economic development. Variables measuring rule of law are generally positively correlated with financial and economic development. Djankov et al. (2003) create a new measure of formalism of courts that proxy for the rigidity of legal procedures. Their measure is also positively correlated with economic performance.

Concerning legal rules, La Porta et al. (1998), Levine (1999), Beck et al. (2003b), Beck et al. (2003a) present evidence of positive correlations between legal rules protecting investors and the level of financial development. Berkowitz et al. (2003) show how transplanting legal rules people are not familiar with can be detrimental.

On lawyers and rent-seeking, Murphy et al. (1991) analysed the role of a rent-seeking sector on economic growth. They find that rent-seeking may harm economic growth because the most productive entrepreneurs may end up in the rent-seeking sector where they do no good to society. To test their theory, they use the number of law graduates in order to proxy for the size of the rent-seeking sector. This is consistent with Galanter (1993), in which lawyers are seen as parasites and the anti-lawyerism movement is described. These studies however ignore the productive role of lawyers as people who know the law and can thus increase the quality of contract enforcement. Magee et al. (1989) pointed out both the benefits and costs of lawyers and computed the optimal number of lawyers. Their methodology was however criticized by Epp (1992).

On the theory side, many papers modelled the macroeconomic consequences of imperfect enforcement and of imperfect investor protection (the two are equivalent absent rent-seeking): Cooley et al. (2004), Castro et al. (2004), Caselli and Gennaioli (2005), Antunes and Cavalcanti (2007), Quintin (2008), Albuquerque and Wang (2008), Biais and Mariotti (2008). They all find a positive impact on economic or financial development with the exception of Castro et al. (2004) who point out a general equilibrium effect: better investor protection makes people save less in their model. The rent-seeking dimension of litigation was already modelled in Katz (1988). In this paper, I merge these two literatures so that the impact of better contract enforcement becomes not obvious anymore.
The paper is organized as follows. First, the economic and legal environments are presented and summed up in the timing. Then the model is solved in the case of not rent-seeking and in the case of pure rent-seeking. Conclusion follows.

2 Economic Environment

There are two types of agents in the economy: entrepreneurs and investors. They live for two periods. When young, they are endowed with one unit of labor that they supply inelastically as lawyers or as workers. When old, entrepreneurs produce output using capital and labor and investors supply capital. All the consumption takes place when agents are old.

Entrepreneurs produce output using the production function

\[ y = F(k, l_y) = \hat{a}k^{\alpha}l_y^{1-\alpha}, \]  

where \( k \) and \( l_y \) stand for capital and labor and where \( F(\cdot) \) is a constant returns to scale production function. The parameter \( \hat{a} \) is the productivity and is private information to entrepreneurs. It is a random variable that can be high \( \hat{a} = a \) with probability \( \pi \) or low \( \hat{a} = 0 \) with probability \( 1 - \pi \). Once they learn their productivity, entrepreneurs hire labor taking into account a cost function with the convenient form \( C(l_y) = w^\alpha l_y \).

Entrepreneurs worked during the first period of their life and saved all their wage because they only care about consumption at age 2. They are thus endowed with their savings \( s \) that will be used as capital. They borrow additional capital from investors before they observe the realization of their productivity. Borrowing takes place through the use of financial contracts that specify the amount to be lent \( k \) and an interest rate \( r \) in case productivity is high. If the project fails, nothing can be repaid. Investors cannot observe the productivity of entrepreneurs and so want to rely on incentive compatible contracts in order to ensure that entrepreneurs do not underreport their earnings. They dispose of only one instrument to ensure truth-telling: They can hire lawyers who verify the productivity of entrepreneurs in case of litigation. Entrepreneurs may as well hire
lawyers in order to defend themselves in court. The role of lawyers and litigation is described more precisely in the following section.

3 Legal Environment

The legal system allows investors to sue entrepreneurs whom they believe underreported their return. This suspicion occurs for all entrepreneurs announcing a low type. Although there is a financial contract that gives incentives to entrepreneurs not to underreport, it will be assumed that a proportion $p$ of them will cheat no matter what. In order to defend themselves in court, the parties hire lawyers who will produce arguments according to the following production functions:

\[ I = \ln(l_i) \]  \tag{2} \\
\[ E = \eta \ln(l_e), \]  \tag{3} 

where $l_e$ is the number of lawyers hired by the entrepreneur, $l_i$ the number of lawyers hired by the investor, $I$ the number of arguments found in favor of the investor, $E$ the number of arguments found in favor of the entrepreneur and $\eta$ is a rent-seeking parameter taking value 0 or 1. There are also $J$ arguments produced by the legal system that may be either interpreted as the evidence collected by the judge in civil law countries, the quality of the legal system or the merits of the case. The entrepreneur will be found guilty if the number of arguments in his favor is less than the number of arguments against him plus some error term, that is if and only if:

\[ I + J > E + Su, \]  \tag{4} 

where $u$ is an error term that follows a logistic distribution which variance is proportional to $S$. This parameter may be interpreted as the scrutiny in looking at the evidence, or reflect the complexity in interpreting the arguments. For example, if the law is very vague, it will be more difficult to assess whether one argument outweighs another.
Finally, the probability that the entrepreneur be found guilty is given by:

\[ X = \frac{jl_i}{jl_i + I} \text{ if the entrepreneur is guilty,} \]

with \( j = e^{j/S} \) and \( X = 0 \) if the entrepreneur is innocent. The parameter \( j \) can be thought of as the first dimension in the quality of contract enforcement, and may be interpreted as judicial efficiency.

The fact that innocent entrepreneurs are never found guilty is a normalization and simplifies the presentation of the results. As a consequence, all the evidence produced by the guilty entrepreneurs is counterproductive as it just misleads the judge.

If an entrepreneur is found guilty, he has to pay a fine \( f \) that will be partly or totally transferred to the investor. The parameter \( f \) may be thought of as a second dimension of better enforcement. Although it is referred to as a fine, it may be interpreted in various ways.

### 4 Equilibrium

The ex-ante utility of the entrepreneur is given by \( U_e \), which is equal to his expected production minus his expected cost of capital if he decides to be honest, minus his expected fine from litigation if he decides to be dishonest, minus the expected cost of labor, and minus his expected costs of litigation from lawyers:

\[ U_e = \pi y - \pi pr(k - s) - \pi(1 - p)Xf y - \pi C(t) - \pi(1 - p)w l. \]

The ex-ante utility of the investor is given by \( U_i \), which is given by the expected repayment from the loan depending on whether the project was successful or not and on whether the entrepreneurs was cheating or not, minus the litigation costs from lawyers that are paid if the project was unsuccessful or if the entrepreneur is cheating:

\[ U_i = \pi pr(k - s) + \pi(1 - p)Xf y - \pi(1 - p)w l - (k - s). \]
Investors compete with each other and end up with zero-profit. They form a cooperative such that their losses are compensated by their gains, like a large financial intermediary. This allows not to worry about limited liability constraints.

\[ U_i = 0. \]  (8)

The contract ensures that entrepreneurs do not want to hide their production. Conditional on having a successful project and on not cheating, the entrepreneur must have a higher utility by revealing his true type. It is assumed that no contract can induce the entrepreneurs who always cheat to tell the truth. This ensures that some entrepreneurs do cheat in equilibrium. Otherwise, the rent-seeking dimension of the model would not be possible.

\[ y - r(k - s) \geq y(1 - Xf) \]  (9)

It may be useful to summarize the whole timing:

1. Contract is signed.
2. Productivity is realized.
3. Lawyers and workers are hired.
4. Productivity is announced.
5. If announced productivity is low, litigation follows and evidence is produced.
6. The judge observes the evidence presented and renders a decision.
7. If found guilty, the entrepreneur pays a fine \( f \).

The timing of the hiring of lawyers is not the most natural but allows for simple solutions. A more natural timing would involve hiring the lawyers once litigation has started. This would complicate the presentation of the results without changing them. Another possibility would be to hire lawyers at the same time as or before signing the contract. This would give a role to lawyers as solicitors and not just as barristers. This
specification however makes the model much less tractable and implies a further departure from the literature. It is thus left for future work.

An equilibrium in this economy is characterized by:

1. a number of lawyers $l_e$ and $l_i$ and a number of workers $l_y$ such that entrepreneurs and investors maximize their utility given $k$, $r$, and $w$,

2. a financial contract specifying an amount to be lent $k - s$ and an interest rate $r$ such that entrepreneurs maximize their utility under the constraints that investors get a positive payoff and that the contract is incentive compatible, for a given $w$, and anticipating $l_e$, $l_i$ and $l_y$,

3. a wage $w$ such that the labor market clears, that is $l_e + l_i + l_y = L$.

4.1 No rent-seeking case

We first consider a benchmark case with $\eta = 0$. This specification is standard in the literature although it may not have been interpreted as litigation. It is consistent with the literature on audit, on imperfect enforcement or on investor protection. There is no externality of litigation in this case and I will show that it is not necessary to disentangle between different dimensions of contract enforcement if one sticks to this modelling approach. In this world, the arguments from a guilty entrepreneur are worthless, the judge identifies them immediately as unreliable. In this situation there will not be wasteful lawyers because none of the arguments produced by the entrepreneur will make the investor’s case less convincing. Lawyers will be hired until their costs reaches their marginal productivity.

The decision to hire lawyers

Financial intermediaries can sue those entrepreneurs whom they believe underreported their earnings. This possibility arises for all the entrepreneurs announcing to be of low productivity as the financial intermediary does not know whether the entrepreneur is truly unproductive or not. The litigation process is modeled as follows. The parties
(plaintiff: financial intermediary and defendant: entrepreneur) can hire lawyers who will defend them in case of trial. (They may also hire permanent lawyers in order to better design contracts for example.) The more lawyers will be hired, the higher the expected compensation the financial intermediary can hope to receive and the lower the expected compensation the entrepreneur can hope to pledge.

The quality of enforcement is:

\[ X = \frac{jl_i}{jl_i + 1} \quad \text{if the entrepreneur is guilty,} \]

with \( j = e^{\frac{j}{s}} \) and \( X = 0 \) if the entrepreneur is innocent.

The problem of the investor is:

\[
\max_{l_i} \pi (1 - p) X f y - w l_i, \\
\]

while the problem of the entrepreneur is:

\[
\max_{l_e} -\pi (1 - p) X f y - w l_e.
\]

Lawyers receive the same wage \( w \) as workers.

The entrepreneur hires no lawyers because it brings him no benefits but positive costs. The investor hires the following number of lawyers:

\[
l_i = \sqrt{\frac{\pi f y w j}{w j}} - w
\]

where the demand for lawyers increases with judicial efficiency \( j \) and the fine \( f \).

**Result 1** Absent rent-seeking through litigation, higher judicial efficiency \( j \) and higher fine \( f \) increase the demand for lawyers \( l_e + l_i \).

This gives an equilibrium probability of conviction:

\[
X = \frac{f y \sqrt{j} - \sqrt{w f y}}{\sqrt{j}}
\]
which is increasing in $j$ and decreasing in $w$.

**Result 2** Absent rent-seeking through litigation, higher judicial efficiency $j$ and higher fine $f$ increase the quality of enforcement $Xf$.

**Discussion**

The general quality of enforcement can be thought of being $Xf$ and is increasing in both $j$ and $f$. There are no further differences between the impact on the economy of these two parameters. They can thus be aggregated and treated as a single parameter representing a general quality of enforcement. This is what the literature has done. Without solving the full model, it is possible to guess what the impact of the quality of enforcement on production will be. An improvement in contracting institutions leads investors to lend more and litigants to hire more lawyers. When more lawyers are hired, the pressure on the labor market is high and it becomes more expensive for firms to hire workers. However, when more capital is lent, entrepreneurs also want to hire more workers. In the end, it is not clear whether there will be more or less workers and lawyers, but it is clear that the wage will be higher and that more capital will be lent. This increases production.

**Result 3** Absent rent-seeking through litigation, higher judicial efficiency $j$ and higher fine $f$ increase both financial development $k$ and economic development $y$.

### 4.2 Pure rent-seeking case

We now consider the case $\eta = 1$ which is a situation with rent-seeking in which the arguments presented by the entrepreneur matter for the decision of the judge. In a sense, this situation represents a judge who has an imperfect ability to screen between what are good and bad arguments.
The decision to hire lawyers

The problem of the investor becomes:

\[
\max_{l_i} \quad \pi(1 - p)f_{Xy} - w_{l_i},
\]

while the problem of the entrepreneur is:

\[
\max_{l_e} \quad -\pi(1 - p)f_{Xy} - w_{l_e}.
\]

This specification of the compensation function potentially creates an externality in the market of lawyers as people may engage in a race towards the highest number of lawyers. This is a standard assumption in the litigation literature.

This gives a symmetric solution:

\[
l_e = l_i = \pi(1 - p)f_{ujj} / w(j + 1)^2
\]

where the demand for lawyers decreases with judicial efficiency \(j\) and increases with \(f\). Because a similar quality of enforcement can be obtained with no lawyers at all, the demand for lawyers can be thought of as a measure of rent-seeking.

**Result 4** In the presence of rent-seeking through litigation, higher judicial efficiency \(j\) and lower fine \(f\) decrease the demand for lawyers \(l_e + l_i\).

This gives an equilibrium probability of conviction:

\[
X = \frac{j}{j + 1}
\]

which is increasing in \(j\).

The general quality of enforcement can be thought of being \(fX\) and is increasing in both \(j\) and \(f\). As opposed to the previous section, \(f\) and \(j\) both increase the quality of enforcement but the demand for lawyers increases with \(f\) and decreases with \(j\) instead of increasing with both parameters.
**Result 5** In the presence of rent-seeking through litigation, higher judicial efficiency $j$ and higher fine $f$ increase the quality of enforcement $X f$.

The decision to hire workers

This decision is made once entrepreneurs have learnt their productivity. The entrepreneur maximizes its expected profit for a given financial contract.

$$\max_{l_y} \pi a F(k, l_y) - C(l_y), \quad (19)$$

where $k$ will be specified in the financial contract, $r$ is the return on capital that the entrepreneur will be able to repay.

This gives a solution:

$$l_y = ((1 - \alpha)a)^{1/\alpha} \frac{k}{w}, \quad (20)$$

which gives a standard labor demand function decreasing in the wage $w$.

Once plugged into the production function of the entrepreneur, this gives:

$$y = \phi k, \quad (21)$$

with $w\phi^\alpha = a(1 - \alpha)$.

The Financial Contract

Investors and entrepreneurs sign financial contracts specifying an amount to be lent $k$ at an interest rate $r$ anticipating $l_y$, $l_e$ and $l_i$.

Investors compete with each other and end up with zero-profit. They require an interest rate such that:

$$\pi pr + \pi f (1 - p)(X r - \frac{j}{(j + 1)^2}) \geq 1 \quad (22)$$
The contract ensures that entrepreneurs do not want to hide their production.

$$\phi k - r(k - s) \geq \phi k(1 - Xf)$$ \hfill (23)

Combining the two constraints gives:

$$r = \frac{1 + j}{\pi(1 + j) - p(1 - \pi)}$$ \hfill (24)

$$k = \frac{r}{r - \phi f X_s}$$ \hfill (25)

**Result 6** In the presence of rent-seeking through litigation, higher judicial efficiency $j$ has a positive impact on financial development $k$ whereas a higher fine $f$ has an ambiguous impact.

The intuition for this result is that when the fine is higher, financial intermediaries hire more lawyers to be defended in court, they require a higher repayment, which decreases the amount they are willing to lend. At the same time, the quality of enforcement will increase, making it more likely to enforce the contract and financial intermediaries will lend more. The overall effect on how much will be lent is thus ambiguous. By contrast, when judicial efficiency $j$ increases, less lawyers are hired and the quality of enforcement increases, and as a consequence financial intermediaries lend more.

**Labor Market**

The labor market equilibrium is such that:

$$l_y + l_c + l_i = L,$$ \hfill (26)

which gives the equilibrium wage. The size of the legal sector is given by $l_c + l_i$. This gives an equilibrium wage:

$$w = \frac{A + B}{L(j + 1)^2},$$ \hfill (27)

where $A = 2\pi(1 - p)(k - s)fj$ and $B = (j + 1)^2(a(1 - \alpha))^{(1/\alpha)}$. 

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The level of economic development is given by (21). One can see that it is increasing in $k/w$. One can check that when the fine $f$ increases, $B$ increases and thus $k/w$ and subsequently $y$ decrease. When judicial efficiency $j$ increases, $B$ decreases and thus $k/w$ and subsequently $y$ increase.

**Result 7** In the presence of rent-seeking through litigation, higher judicial efficiency $j$ and a lower fine $f$ benefit economic development $y$.

The intuition is that when judicial efficiency is higher, less lawyers are hired, which relaxes the pressure on the labor market, and the production sector can hire cheaper labor. At the same time, more funds are lent. A larger amount of capital and cheaper labor benefits economic development. A lower fine reduces the number of lawyers hired, which has the same effect described above. But at the same time, it has an ambiguous effect on the amount financial intermediaries are willing to lend. Although the overall effect of a lower fine on economic development should be ambiguous, this particular model predicts a clearcut effect, which may be a limitation of the model.

### 5 Empirical Analysis

The model leaves us with several testable implications: First, how do different characteristics of the legal system and corporate laws influence the demand for lawyers? Second, how do lawyers influence the availability of credit? Third, how do lawyers influence the level of GDP? I present the empirical strategy and the results for each of these questions after having described the data and presented some descriptive statistics.

### Description of the Data

I collected data on the number of lawyers per 10,000 inhabitants for 64 countries in 2005. When there were no data available for this year, I chose the closest year with available data. There only existed readily available datasets for Europe and the American continent. The European data is compiled by the European Commission for the Efficiency
of Justice (CEPEJ). The American data is compiled by the Justice Studies Center for the Americas (CEJA). For the remaining countries, the data comes from the national bar associations or law societies. Because I am interested in analysing the impact of different corporate laws and characteristics of justice on the demand for lawyers, I focused on the countries covered by dataset compiled by La Porta et al. (1998) that has detailed information on the creditor and shareholder protection for 49 countries. However, there were 7 countries for which I could not find a reliable number of lawyers. Figure 1 summarizes the sources.

For corporate laws, I use the data compiled by La Porta et al. (1998). It gives detailed information for several laws of creditor and shareholder protections for 49 countries and 42 countries of my dataset. It also gives information on the accounting standards of 39 countries of my dataset.

For characteristics of the legal system, I use the data compiled by Djankov et al. (2003). They created a measure of legal formalism that proxies for how procedural the legal system is. A higher formalism entails higher costs and longer trials. They also have a measure of duration of a typical trial involving the collection of a bounced check. This data covers 60 countries of my sample.

I use real GDP per capita as a measure of economic development from Summers and Heston 6.3 that covers all my sample in 2005 and 53 observations of my sample in 1980. The data on the share of credit to GDP comes the World Development Indicators. Because this measure is very volatile, it is averaged over 2001-2005. It covers 62 countries out of my 64 observations.

I also use data on the legal origin of a country. Because lawyers play a much larger role in the collection of evidence process in common law countries, there could be more lawyers in countries endowed with this legal origin and could be a useful control. Besides common law, the other legal origins are French, German and Scandinavian.

Table 1 presents some summary statistics.
Table 1: Summary statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min.</th>
<th>Max.</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lawyers per 10,000 inhab.</td>
<td>13.942</td>
<td>11.51</td>
<td>1.3</td>
<td>46.6</td>
<td>64</td>
</tr>
<tr>
<td>Real GDP in 2005</td>
<td>20285.475</td>
<td>13550.478</td>
<td>1810.231</td>
<td>71209.25</td>
<td>64</td>
</tr>
<tr>
<td>Credit to GDP</td>
<td>75.926</td>
<td>55.056</td>
<td>7.014</td>
<td>208.768</td>
<td>63</td>
</tr>
<tr>
<td>Formalism</td>
<td>0.522</td>
<td>0.195</td>
<td>0</td>
<td>1</td>
<td>60</td>
</tr>
<tr>
<td>Accounting standards</td>
<td>0.592</td>
<td>0.237</td>
<td>0</td>
<td>1</td>
<td>39</td>
</tr>
<tr>
<td>English legal origin</td>
<td>0.25</td>
<td>0.436</td>
<td>0</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>French legal origin</td>
<td>0.422</td>
<td>0.498</td>
<td>0</td>
<td>1</td>
<td>64</td>
</tr>
</tbody>
</table>

The Demand for Lawyers

In order to answer the first question, how characteristics of the legal system and corporate laws influence the demand for lawyers, we want to estimate the following equation:

\[ L_c = \alpha J_c + \beta F_c + \gamma C_c + \epsilon_c, \] (28)

where \( L_c \) is the number of lawyers per capita in country \( c \), \( J_c \) is a set of characteristics of the legal system, \( F_c \) is a set of corporate laws, \( C_c \) is a set of controls and \( \epsilon_c \) is an error term. The parameters we want to estimate are \( \alpha \), \( \beta \) and \( \gamma \).

In the baseline specification, I use as characteristics of the legal system the degree of legal formalism provided by Djankov et al. (2003). I use as corporate laws different rules of creditor and shareholder protections and the degree of accounting standards provided in La Porta et al. (1998). I use as controls the legal origin of a country and the level of GDP in 1980 in order to avoid endogeneity issues.

The empirical strategy chosen to estimate these parameters is OLS. The results are given in Table 2.
Table 2: The demand for lawyers

<table>
<thead>
<tr>
<th>Dependent variable: Log of lawyers per 10,000 inhabitants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log of GDP per capita in 1980</td>
</tr>
<tr>
<td>(0.000)</td>
</tr>
<tr>
<td>English legal origin</td>
</tr>
<tr>
<td>(0.001)</td>
</tr>
<tr>
<td>French legal origin</td>
</tr>
<tr>
<td>(0.000)</td>
</tr>
<tr>
<td>Formalism</td>
</tr>
<tr>
<td>(0.001)</td>
</tr>
<tr>
<td>Accounting standards</td>
</tr>
<tr>
<td>(0.004)</td>
</tr>
<tr>
<td>No automatic stay</td>
</tr>
<tr>
<td>(0.765)</td>
</tr>
<tr>
<td>Mandatory dividends</td>
</tr>
<tr>
<td>(0.006)</td>
</tr>
<tr>
<td>Duration of a trial</td>
</tr>
<tr>
<td>(0.441)</td>
</tr>
<tr>
<td>Loser pay rule</td>
</tr>
<tr>
<td>(0.598)</td>
</tr>
<tr>
<td>Constant</td>
</tr>
<tr>
<td>(0.002)</td>
</tr>
<tr>
<td>N</td>
</tr>
<tr>
<td>adj. $R^2$</td>
</tr>
</tbody>
</table>

$p$-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
The following results obtain. Countries that were richer in the 80s have more lawyers. A one percent increase in the GDP of 1980 increases the number of lawyers by 0.6-0.8 percentage points. Countries that were rich in the 80s are likely to be rich also in 2005. As a consequence, lawyers are a normal good, when income increases, more lawyers are hired.

Then, the legal origin of a country matters. The reference group is the set of countries that either have a Scandinavian legal origin or a German legal origin. The table shows that these countries have significantly less lawyers than the other countries. Countries endowed with a English legal origin have between 100 and 170 percent more lawyers depending on the specification. French legal origin countries have 80 to 120 percent more lawyers than the reference group. Both coefficient estimates are significant at the one percent level. It is usually thought that common law countries have many more lawyers than the rest of the world because of the adversarial nature of their trials. This table shows that French legal origin countries can also have many lawyers. This is the case for example of countries like Italy, Greece and many south american countries.

The degree of formalism increases the number of lawyers. When a legal system is more formal, it is more rigid and requires more procedures for the complete execution of a trial. It is usually thought that lawyers take advantage of these rigidities and exploit them to make the trial last longer. Complex procedures that are not fulfilled can be used as an argument against one party. The results support this view. The measure is normalized from zero to one, zero being Venezuela and one being Hong Kong. The coefficient estimate predicts a 130 to 200 percent increase in the number of lawyers if Hong Kong was to adopt the same degree of formalism as the legal system of Venezuela and is significant at the one percent level.

Accounting standards play a very important role for the number of lawyers. The introduction of this variable increases the \( R^2 \) of 15 percentage points. When accounting standards are poor, it becomes more difficult to verify the accounts of a cheating firm, and so lawyers have a greater role to play in defending their client. This is consistent with the results. The measure is normalized from zero to one, zero being Uruguay and...
one being Sweden. The coefficient estimate predicts a 150 to 170 percent in the number of lawyers if Sweden was to adopt the accounting standards of Uruguay and is significant at the one percent level.

The impact of several corporate laws on the number of lawyers are then tested controlling for all the precedent variables. No automatic stay allows secured creditors to recover their assets during a bankruptcy procedure. This law does not seem to affect the number of lawyers. In some countries, firms are obliged to pledge dividends to their shareholder. The results show that this law increases the number of lawyers by almost 200 percent. In my sample, countries that have such a law include several south american countries and Greece.

Finally the loser pay rule in which the loser of a trial has to pay for all the litigation expenses of the trial does not seem to affect the number of lawyers. In some specifications not presented here, it seemed to have an negative impact, as the sign of the coefficient estimate suggests, but it is not significant and thus not robust. Finally, the duration of a trial, as measured by the estimated time it would take to recover a bounced check is not significant either. When formalism is not introduced, the impact of duration on the number of lawyers becomes significantly positive.

There exists a huge variation in the number of lawyers per country, from 1 to 50 lawyers per 10,000 inhabitants, about 1 being countries like Japan, Korea or the very poor countries of my sample like Nigeria or Kenya and about 50 being Israel. Up to 70 percent of this variation can be explained by the large variation in procedural law of these countries, as well as by the variation of income, of some corporate laws and of accounting standards.

**Lawyers, Credit and Economic Development**

In order to answer the second and third questions, how lawyers influence the availability of credit and economic development, we want to estimate the following equation:

\[ Y_e = \alpha L_e + \beta C_e + \epsilon_e, \]  

(29)
where $Y_c$ is either the ratio of private credit to GDP in country $c$ or log of GDP in 2005 and recall, $L_c$ is the number of lawyers per capita and $C_c$ is a set of controls. The parameters of interest are $\alpha$ and $\beta$.

There is a potential problem of reverse causality because credit is likely to influence the number of lawyers hired and the opposite may also be true. The OLS estimator may give biased estimates of the parameters of interest. One solution could be to use two stage least squares (2SLS). For this, we need to find an instrument that influences the number of lawyers without affecting directly credit or GDP. The previous regressions gave us a number of regressors that are correlated with the number of lawyers and that are thus potential candidates. Legal origin has been widely used in the literature as an instrument, so we will use it here. The degree of formalism of courts and the quality of accounting standards could be used as additional instruments. As a control variable, I use the log of GDP in 1980 in order to avoid endogeneity issues.

Table 3 and 4 presents the OLS and 2SLS estimates for respectively credit and GDP.

### Table 3: Number of lawyers and credit

<table>
<thead>
<tr>
<th></th>
<th>OLS</th>
<th>2SLS with legal origin</th>
<th>2SLS with legal origin and formalism</th>
<th>2SLS with legal origin, formalism and accounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>lawyer</td>
<td>0.197*</td>
<td>-0.201</td>
<td>-0.350**</td>
<td>-0.332**</td>
</tr>
<tr>
<td></td>
<td>(0.095)</td>
<td>(0.343)</td>
<td>(0.045)</td>
<td>(0.026)</td>
</tr>
<tr>
<td>lgdp80</td>
<td>0.840***</td>
<td>0.842***</td>
<td>0.849***</td>
<td>0.785***</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>_cons</td>
<td>-3.130***</td>
<td>-3.137**</td>
<td>-2.807**</td>
<td>-2.253</td>
</tr>
<tr>
<td></td>
<td>(0.009)</td>
<td>(0.011)</td>
<td>(0.021)</td>
<td>(0.101)</td>
</tr>
<tr>
<td>N</td>
<td>52</td>
<td>52</td>
<td>51</td>
<td>38</td>
</tr>
<tr>
<td>adj. $R^2$</td>
<td>0.428</td>
<td>0.428</td>
<td>0.397</td>
<td>0.445</td>
</tr>
</tbody>
</table>

$p$-values in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The results suggest that a one percent increase in the number of lawyers reduces credit by 0.2 to 0.3 percent depending on the specification and reduces GDP by 0.1 to 0.2 percent. This is consistent with the belief that lawyers are harmful to growth. It is also
consistent with Murphy et al. (1991) who found a negative correlation between the number of law graduates and economic growth. However, they do not address the potential problem of reverse causality between the number of lawyers and GDP. The instruments I use in order to address this concern merit discussion. Table 2 can be interpreted as the first stage regressions of the 2SLS. The $R^2$ are quite high and this rules out the problem of weak instruments. However, it is possible that the instruments be inconsistent. Indeed, it is not clear that the instruments do not cause credit and GDP directly and not only indirectly through the number of lawyers. The model above suggest that formalism and accounting standards may directly cause these economic outcomes if they are interpreted as the parameter $j$ and $f$. They may thus be inconsistent instruments. This is not clear that legal origin may have a direct impact on credit and GDP. Some authors suggest so but there is no clear evidence. Finally, the consistency of instruments is a potential problem in the regressions presented above and they must be considered with caution. They document a negative correlation between the number of lawyers and economic outcomes but further research needs to be done in order to assess any causality.
6 Conclusion

The paper has presented an overlapping-generations model in which a legal sector has been embedded. The main benefit of the legal sector is to allow investors to enforce payments from entrepreneurs. One cost of the legal sector is its size that may be too big because of rent-seeking through litigation. Within this framework, I have shown that it is worth disentangling between two dimensions of judicial reforms that improve contract enforcement: those that increase rent-seeking and those that do not. Their consequences on financial and economic development may be different.

References


