

Financial Development in Adversarial and Inquisitorial Legal Systems*

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Abstract

This paper analyzes how the adversarial and inquisitorial evidence collection procedures affect financial development. In investigating the true returns of insolvent entrepreneurs, the adversarial procedure relies on lawyers whereas the inquisitorial procedure relies on judges. Investors are willing to lend more in adversarial than in inquisitorial legal systems if they are richer than entrepreneurs or if lawyers are more productive than judges. Manipulation of evidence by lawyers has an ambiguous impact on finance. The empirical evidence shows that a more inquisitorial procedure is associated with less developed financial markets.

Keywords: Adversarial; Inquisitorial; Financial Development; Legal origins

JEL Classification Numbers: K41; O16

1 Introduction

A puzzling stylized fact about legal origins is the apparent superior economic performance of common law countries compared to civil law countries.¹ La Porta et al. (1997) document that common law countries have larger financial markets while Mahoney (2001)

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¹Broadly speaking, common law is found in Anglo-Saxon countries and their former colonies, and civil law belongs to continental Europe and its former colonies. See Zweigert and Kötz (1998) for further details.

observe that economic growth is also higher in those countries. Hence the question: Does the legal origin of a country matter for its economic performance? One key distinction between these two legal origins is the procedure to collect evidence for a trial: It is adversarial in common law countries and inquisitorial in civil law countries. This paper investigates whether this difference can explain the better economic outcomes of common law countries.

In adversarial legal systems, the collection of evidence is the task of lawyers. The role of the judge is passive and he renders a decision depending on the evidence presented to him. In inquisitorial legal systems, the role of the judge is more active as he participates in the collection of evidence himself for example by appointing experts or interviewing witnesses. This difference has consequences on the process of evidence collection because litigants can design the incentives of lawyers by contracting directly with them while this would be more difficult with judges.²

A first implication concerns the determinants of the investigative effort of judges and lawyers. Because parties can choose their lawyer but not their judge, they take the quality of investigation as given in inquisitorial systems whereas it is a choice variable in adversarial systems. Rich parties, for example, can decide to hire a more competent and more expensive lawyer in adversarial systems while they have to deal with the judge they are assigned in inquisitorial systems. Also, incentives to search for evidence may be greater in adversarial systems because litigants can condition the payment to the lawyer on their success at trial. By contrast, judges are often tenured and their salary does not depend on the outcomes of the trials.

A second implication concerns the choice of which evidence to present in court. Because parties want to win a trial and can design their contract with lawyers accordingly in adversarial systems, their lawyers have an incentive to conceal or to manipulate the evidence detrimental to their case in order to maximize their probability of winning the trial. In case, for example, the opinion of an expert is needed for a case, lawyers may

²Although judicial corruption is common and can be seen as a form of contracting with the judge, it is not related to adversarial and inquisitorial systems. Bond (2009) provides an analysis of the role of corrupted judges on contracting. This paper also abstracts from judges's personal biases. See Gennaioli and Shleifer (2008), Gennaioli (2009), and Gennaioli and Perotti (2009) for research on this topic.

appoint their friends or shop for the most lenient expert. By contrast, judges are not given any such economic incentives.

I study how these implications influence financial development. Consider a cashless entrepreneur who borrows funds from an investor in order to run a risky project. If the outcome of the project is difficult to observe, the investor may suspect the entrepreneur of underreporting his earnings in order to repay less. Examples of this type of relationships include fraudulent bankruptcy and shareholder expropriation. The role of the legal system is then to investigate the true earnings of suspicious entrepreneurs and to punish those entrepreneurs found guilty. Investors are willing to lend more funds when they expect their financial contract to be better enforced in court. Then, the question is: How do adversarial and inquisitorial systems affect this mechanism?

First, if lawyers are better at collecting evidence than judges, for example because their incentives are better designed, then the model naturally predicts that there is going to be more finance in adversarial than in inquisitorial legal systems.

Second, the model predicts that those entrepreneurs willing to hire more competent and expensive lawyers in adversarial systems can enjoy a higher quality of contract enforcement than the same entrepreneurs in inquisitorial systems, who do not have the choice of their judge. The opposite is also true. If entrepreneurs are only willing to hire less competent and cheaper lawyers, they can face a lower quality of enforcement in adversarial systems than they would in inquisitorial systems. This model thus suggests that, if financial markets are more developed in common law countries, it could be because similar investors enjoy a higher quality of enforcement in adversarial than they would in inquisitorial legal systems. This is only true if investors are wealthier than entrepreneurs.

Third, the model predicts that the possibility to manipulate evidence has an ambiguous impact on financial development. Manipulation of evidence increases the probability to find an entrepreneur guilty, independently of whether he is guilty or innocent. Thus, the state is better verified when the entrepreneur is guilty and worse verified when the entrepreneur is innocent. This has two effects: First, investors are better-off and are willing to lend more. Second, entrepreneurs require to be compensated for this loss, and

investors are willing to lend less as a response.

Finally, the paper documents the relationship between a new measure of how inquisitorial a legal system is and two measures of financial development - the size of the credit market and stock market capitalization. This relationship is decreasing and is robust to controls that proxy for other channels related to legal origins.

Section 2 presents the main differences between adversarial and inquisitorial legal systems. Section 3 builds a model of law and finance. Section 4 compares the level of financial development in adversarial and inquisitorial legal systems. Section 5 documents some empirical evidence. Section 6 concludes. Alternative legal environments are studied in the Appendix.

1.1 Related Literature and Contribution

The present paper is not the first to provide an explanation for the higher economic outcomes of common law countries compared to civil law countries. It is the first, however, to rely on adversarial and inquisitorial procedures. See La Porta et al. (2008) for a detailed review. A first strand of the literature focuses on key differences between common and civil law: (i) In common law countries, judges are more independent from the government, and this fosters the protection of private property against state expropriation. (ii) Legal rules in common law countries are more adaptable to a changing environment and therefore more efficient because of the ability of common law judges to make the law through precedents. Posner (2007) makes this argument and Beck et al. (2003) finds some empirical support for it. Another strand of literature argues that legal origin is a proxy for something unrelated to law. Two examples of such alternative theories are: (iii) The proportion of catholics is higher in civil law countries and is negatively correlated with creditor rights. See Stulz and Williamson (2003). (iv) Politics is more left-wing in civil law countries, thus favoring workers at the expense of investors. See Roe (2000).

The literature on adversarial and inquisitorial systems has focused on comparing the efficiency of these two systems within the court while this paper analyzes the consequences

of these two systems on the economy. According to Shin (1998), the adversarial procedure produces more information because the judges receive two signals instead of one in the inquisitorial procedure. Dewatripont and Tirole (1999) find that adversarial systems are more efficient because less rents have to be given to two biased parties rather than to one neutral party to ensure effort. In Froeb and Kobayashi (2001), the average of two biased pieces of evidence is as informative as the evidence collected by a neutral party. Parisi (2002) analyzes rent-seeking in adversarial and inquisitorial systems.

This paper is part of a recent effort to integrate more micro-founded legal systems into economic models. Along these lines are the works of Gennaioli (2009) and of Gennaioli and Perotti (2009), with a focus on the impact on the form of contracts of judges' personal biases and limited expertise. The impact of corrupted judges on contracting is considered in Bond (2009). Anderlini et al. (2010) compare the impact of case law and statute law on economic growth. Massenet (2010) studies the role of lawyers and the litigation environment on the economy. The present paper's contribution is to focus on the role of the process of evidence collection on the economy. These previous papers are to be contrasted with the literature on investor protection and limited enforcement, that considers law as a black box. In this literature, law is modelled exogenously as a monetary punishment and/or a probability of detection. One reference on economic growth is Castro et al. (2004), who find that better investor protection has two opposing effects on economic growth: It makes entrepreneurs more credit-worthy but the resulting increase in the interest rate reduces future capital accumulation. Cooley et al. (2004) show that economic volatility decreases with the quality of contract enforcement. Shleifer and Wolfenzon (2002) provide a model consistent with a number of stylized facts on corporate finance and investor protection.

		Adversarial	Inquisitorial
Trial	Defense	Lawyer	Lawyer
	Investigation	Lawyer	Judge
	Decision	Judge	Judge

Figure 1: Inquisitorial and adversarial procedures

2 Differences Between Adversarial and Inquisitorial Legal Systems

The main difference between the two systems is the identity of the investigator (Posner, 2007). Figure 1 represents a typical trial involving three parts: defense, investigation and decision. While the defense part is generally done by a lawyer and the decision part is the responsibility of a judge independently of the legal family, the investigation part is conducted by lawyers in adversarial systems and by judges in inquisitorial systems. In reality, lawyers also play a role in the investigation in inquisitorial systems but this paper abstracts from it in order to make the distinction between the two systems appear more starkly. Also, some countries actually have hybrid legal systems. The proposition to suppress the *juge d'instruction* (investigating judge) in France is one example. Adversarial and inquisitorial systems remain, however, an essential feature to distinguish common law from civil law (Merryman, 1969).

This paper shall focus on three implications of adversarial and inquisitorial legal systems on the process of evidence collection:

1. **Incentives to search** Because of its competitive nature, the adversarial process induces lawyers to search harder than judges for evidence (Posner, 2007). This could be because the payment to lawyers is contingent on their success at trial, or

because of a repeated relationship between the lawyer and his client. By contrast, judges do not face such economic incentives.

2. **Income effects** The wealth of litigants matters to a greater extent in adversarial than in inquisitorial legal systems. Judges investigate the same way in inquisitorial systems, independently of whether litigants are rich or poor. By contrast, a richer litigant in adversarial systems can afford a better lawyer or induce him to provide more effort.
3. **Manipulation of evidence** Because they are given different incentives, lawyers only present the evidence that favors their case at trial and conceal or destroy any detrimental evidence. By contrast, judges present all the evidence they have found. This is a standard assumption in the literature (Shin, 1998; Dewatripont and Tirole, 1999; Froeb and Kobayashi, 2001). Manipulation of evidence is often seen as a downside of adversarial systems (Tullock et al., 1997).

3 A Model of Law and Finance

This section builds a model of law and finance to better understand the link between adversarial and inquisitorial legal systems and financial development. It presents a standard setting of financial contracting in which a dispute between an entrepreneur and an investor can arise. Adversarial and inquisitorial legal systems solve this dispute differently and thus, affect ex ante the financing decision.

3.1 The Environment

An economy is populated with entrepreneurs and investors who live for two periods. There are two goods in the economy: capital k and a final good y . Capital is used to produce the final good and can be stored, while the final good is used as numeraire or is consumed. Everybody is risk neutral and consumes during the second period.

In the first period, cashless entrepreneurs borrow capital k from investors and use it

to produce y units of final good. Their technology is given by:

$$y = \tilde{a}k, \tag{1}$$

where \tilde{a} is productivity. It can be high ($\tilde{a} = a_1 > 1$) with probability p_1 or low ($\tilde{a} = a_0 < 1$) with probability p_0 .

Entrepreneurs raise capital k by contracting a loan with investors. At the time of contracting, nobody knows the realization of the productivity \tilde{a} of the project. The loan contract specifies a repayment $r(\tilde{a})$ contingent on the level of productivity. Once the entrepreneur received the capital, he observes privately his productivity, announces it to the investor and repays him accordingly. The problem is that the entrepreneur has an incentive to claim his project failed in order to maximize his payoff. Whenever the entrepreneur announces that his project failed, the investor knows that the entrepreneur may not have respected the terms of the contract.

To solve this conflict of interest, investors can sue entrepreneurs to verify their true productivity. The threat of litigation is the only instrument available to investors to ensure that entrepreneurs do not prefer to default opportunistically. The following section describes more precisely this litigation process.

3.2 Law

When investors decide to litigate, they have the possibility to hire investigators whose job is to collect evidence on the productivity of entrepreneurs. Investigators spend effort collecting evidence that they then present in court. If the evidence is convincing enough to convict the entrepreneur, the court awards damages d to the investor.

Collection of evidence Investigators draw evidence from a distribution that depends on the true state of the world \hat{a}_j , $j = 0, 1$. The evidence a_0 is uncovered with probability π_j and the evidence a_1 with probability $1 - \pi_j$. I also assume that evidence consistent with the true state of the world is more likely to be uncovered by setting $\pi_0 > \pi_1$.

Investors make a payment c to investigators that influences the quantity of evidence collected. Investigators end up with two pieces of evidence with probability q , one piece of evidence with probability $\rho_L(c)$ and no pieces of evidence with probability $1 - \rho_L(c) - q$, with $L = A$ if the legal system is adversarial and $L = I$ if the legal system is inquisitorial. I also assume $\rho(0) = 0$, $\rho' > 0$, $\rho'' < 0$ and $\lim_{c \rightarrow \infty} \rho(c) = 1 - q$. As in Dewatripont and Tirole (1999), the point of introducing the possibility of finding two conflicting pieces of evidence is to open the door to manipulation of evidence.

The total cost of investigation for investors is equal to $\sigma_L c$, where σ_L is the marginal cost of investigation. The parameter σ_A can be interpreted as the marginal cost of investigation from the point of view of a particular investor. A higher value may mean that the investor is poorer and thus less willing to pay for litigation. By contrast, the parameter σ_I can be interpreted as the willingness to pay of society for its legal system.

Entrepreneurs can defend their case by presenting evidence in their favor. They can pay an exogenous cost c_E that allows them to find hard evidence a_0 with some probability π_E strictly less than one. The parameter π_E is kept exogenous because entrepreneurs know the true state of the world and thus do not need to investigate it. It also avoids the complications of modelling litigation like a contest (Katz, 1988; Parisi, 2002; Massenet, 2010). The parameter π_E could be made contingent on the true state of the world and on the wealth of entrepreneurs, but for clarity of exposition, the rest of the paper assumes $\pi_E = 0$. Indeed, the only effect of entrepreneurs presenting evidence is to decrease their probability of being convicted. All the results of the paper hold as long as $\pi_E < 1$.

Conviction The decision to convict only depends on the evidence presented to the judge. Conviction occurs when one piece of evidence a_1 is presented. If two conflicting pieces of evidence are presented, conviction does not occur. In making a decision, the judge does not take into account the distribution of guilty and innocent entrepreneurs because this type of evidence is not admissible in court.

We can now compute the probability X_{Lij} of convicting an entrepreneur, conditional on the origin of the legal system L , the true type of the entrepreneur $i = 0, 1$, and the number of pieces of evidence uncovered $j = 0, 1, 2$. Table 1 gives the resulting

analytical expressions for the probabilities of conviction as a function of the quantity of evidence uncovered and of the true productivity of the entrepreneur. The table shows that adversarial and inquisitorial systems only differ when two pieces of evidence are found, that is when the possibility of manipulation of evidence arises. Also, one can easily check that $X_{Ai2} > X_{Ii2}$, that is entrepreneurs are more often found guilty in adversarial systems than in inquisitorial systems, independently of whether they are guilty or innocent. Finally, when no evidence is found, the probability of conviction is zero.

Adversarial system	Inquisitorial system
$X_{Ai0} = 0$	$X_{Ii0} = 0$
$X_{Ai1} = 1 - \pi_i$	$X_{Ii1} = 1 - \pi_i$
$X_{Ai2} = (1 - \pi_i)^2$	$X_{Ii2} = 1 - \pi_i^2$

We can now compute the ex ante probabilities of conviction X_{Li} conditional on the true productivity of the entrepreneur:

$$X_{Li}(c) = \rho(c)X_{Li1} + qX_{Li2} \quad (2)$$

The general quality of verification $X_{L1} - X_{L0}$ increases with the payment c to investigators because this increases the probability of finding one piece of evidence instead of nothing. Likewise, it increases with q because finding two pieces of evidence is better than just finding one. This benefit is, however, smaller for adversarial systems because evidence can be manipulated.

The downside with the possibility of manipulation of evidence is that innocent entrepreneurs are more often found guilty. The benefit is that guilty entrepreneurs are also more often convicted. It is thus ambiguous whether the general quality of verification $X_{L1} - X_{L0}$ is better in one legal system or the other. Some algebra shows that the quality of verification is better in adversarial systems if $\pi_0 + \pi_1 > 1$ and worse otherwise.

Underlying assumptions First, courts are perfectly able to enforce contracts that only include variables observable at no cost like the repayment r or the amount lent k . Their imperfections lie in their inability to enforce contracts that depend on variables

that are costly to observe, like productivity \tilde{a} . Second, the allocation of litigation costs is made according to the American rule in which investors bear their litigation costs independently of the outcome of the trial. Section A.1 considers the case of the English rule which imposes that an entrepreneur who is found guilty has to reimburse the investor his litigation costs. Third, I assume that whenever a dispute arises, the parties end up in court. Section A.2 shows that out-of-court settlement is not an interesting option in this model.

3.3 Finance

Investors offer financial contracts to entrepreneurs. These contracts are defined by an amount to be lent k , a repayment contingent on the level of productivity announced by the entrepreneur, r_0 if the entrepreneur announces low productivity and r_1 if the entrepreneur announces high productivity, and litigation spending c . The objective of the investor is to maximize his expected utility. With probability p_0 , the project fails and the investor is paid r_0 , he receives expected compensatory damages X_0d , and he pays the litigation costs σc . With probability p_1 , he is paid the high return r_1 . Finally, his utility function also includes the opportunity cost of lending, which is equal to k , the benefit of storing. Then, the investor solves:

$$\max_{r_0, r_1, c, k} p_0(r_0 + X_{L0}d - \sigma_L c) + p_1 r_1 - k. \quad (3)$$

Investors only offer contracts that induce entrepreneurs to reveal truthfully their productivity. Otherwise, all the entrepreneurs would announce a low productivity and it would not be a profitable activity to lend. This gives us an incentive compatibility constraint for high productivity entrepreneurs. It tells us that the cost r_1 of announcing a high productivity should be lower than the cost $r_0 + X_{L1}d$ of announcing a low productivity and facing potential litigation costs. The incentive compatibility constraint of low productivity entrepreneurs is not presented as no entrepreneurs would want to pay something if they do not have to. The incentive compatibility constraint of high productivity

entrepreneurs is given by the following equation:

$$r_1 \leq r_0 + X_{L1}d. \quad (4)$$

Entrepreneurs have an outside opportunity that gives them a level of utility u that corresponds to the value of the financial contracts offered by alternative investors. This gives a participation constraint for entrepreneurs, which tells us that the expected utility of an entrepreneur should be greater than u :

$$p_0(a_0k - r_0 - X_{L0}d) + p_1(a_1k - r_1) \geq u. \quad (5)$$

Finally, entrepreneurs are protected by limited liability and they cannot be asked for a repayment that would give them a negative profit. This repayment is further reduced by the possibility of errors of type 1 in the judicial process. This type of errors happens when innocent entrepreneurs are convicted. Innocent entrepreneurs pay the expected damages to competitive insurers who pay the damages in case of conviction. This gives the following limited liability constraint:

$$a_0k - r_0 - X_{L0}d \geq 0. \quad (6)$$

These three constraints can be shown to be binding. Solving for this system of three equations and three unknowns gives the following financial contract as a function of c :

$$r_0 = a_0k - X_{L0}d, \quad (7)$$

$$r_1 = a_0k + (X_{L1} - X_{L0})d, \quad (8)$$

$$k = \frac{u + p_1d(X_{L1} - X_{L0})}{1 - a_0}. \quad (9)$$

After replacing these solutions in Equation (3), we can solve for the optimal payment c to the investigator. The investor chooses c such that its marginal cost is equal to its marginal benefit. As a consequence, the payment c decreases with σ_L and increases with

damages d .

Investors compete with each other by offering contracts of value u to entrepreneurs. Entrepreneurs shop around and choose the contract that maximizes their utility. Since there is perfect competition between investors, we get the following zero-profit condition:

$$p_1 r_1 + p_0(r_0 + X_{L0}d - \sigma_L c) = k. \quad (10)$$

Replacing Equations (7), (8), and (9) into Equation (10) gives the level of utility u for entrepreneurs delivered by the equilibrium contract. Replacing this value into Equation (9) gives the equilibrium stock of capital k^* :

$$k^* = \frac{p_1 d(X_{L1} - X_{L0}) - p_0 \sigma_L c}{1 - a_0}. \quad (11)$$

Consider a change in the technology of investigation. For example, let X_{L0} increase for a given level of c . Equation (11) tells us that financial development will then be lower. The reason is that if an entrepreneur expects to be more often found guilty although he is innocent, he can only be asked for a lower repayment r_0 because of limited liability. The profit of investors becomes negative and they adjust by lending less.

Let now X_{L1} increase for a given c . Equation (11) tells us that financial development will then be higher. This is because a higher probability of convicting guilty entrepreneurs relaxes their incentive compatibility constraint. This allows the investor to ask for a higher repayment r_1 in case of success. The zero-profit condition of investors tells us that investors will also lend more.

An increase in damages d has the two effects described in the last two paragraphs. First it makes it easier to enforce contracts and second it strengthens the limited liability of entrepreneurs. The overall effect on financial development can be shown to be positive because $X_{L1} > X_{L0}$.

Finally, an improvement in the quality of contract enforcement $(X_{L1} - X_{L0})d$ increases financial development k . This is consistent with a number of references that have identified a positive role of contract enforcement on the economy (North, 1990). This is also

consistent with more recent empirical work (Jappelli et al., 2005).

4 Adversarial Versus Inquisitorial Legal Systems

What happens to financial development if an economy switches from an adversarial to an inquisitorial legal system? Because we have identified three differences between the two systems, we answer this question in three steps. In each step, we shut down one difference and analyze the impact of the other difference on the economy. The two legal systems are equivalent if we set (i) $\rho_A = \rho_I$, (ii) $q = 0$, and (iii) $\sigma_I = \sigma_A$. The first restriction implies that lawyers are equally productive as judges. The second restriction rules out the possibility of finding conflicting evidence and thus the possibility of manipulation of evidence. The third restriction implies that the payments to the investigators are the same in both systems, such that the two investigators provide the same amount of effort.

Incentives to search If lawyers are better at collecting evidence than judges, for example because they receive a payment contingent on their success at trial, then we get the following result:

Result 1 *Holding $q = 0$ and $\sigma_I = \sigma_A$, financial development k is larger in adversarial systems than in inquisitorial systems if lawyers are better at collecting evidence than judges ($\rho_A > \rho_I$).*

This result follows directly from positive impact on finance of a better quality of state verification.

Income effects We then analyze the impact of the wealth of investors on financial development. We get the following result:

Result 2 *Holding $q = 0$ and $\rho_A = \rho_I$, financial development k is larger in adversarial systems than in inquisitorial systems if the marginal cost of litigation in adversarial systems is lower than in inquisitorial systems ($\sigma_A < \sigma_I$).*

We have found that the equilibrium level of litigation spending c is a decreasing function of σ_L . As a consequence, the level of litigation spending c is higher in adversarial

than in inquisitorial systems. Then, Equation (11) is a hump-shaped function of c , so this result is not trivial. It can be shown, however, that the equilibrium is always on the increasing part of this function, so that we can restrict our analysis to this part. It takes a few lines of algebra to show that the level of c that maximizes k in Equation (11) is always larger than the level of c that solves the problem of the investor. Intuitively, when investors choose how much to spend on litigation, they internalize the positive effect that this would have on their profit through a bigger loan. As a consequence, they would not choose a level of litigation spending that would induce them to lend less. Then, the result holds.

The model is consistent with the empirical evidence if and only if we set $\sigma_A < \sigma_I$. This restriction can be interpreted as a lower marginal cost of investigation for investors than for society. This restriction can be reasonable if we think of conflicts between, for example, banks and entrepreneurs, where banks have the capacity hire more competent lawyers. Then, a possible explanation for the higher level of financial development in common law countries is that rich investors are able to enjoy a higher quality of contract enforcement and are thus willing to lend more in adversarial than in inquisitorial legal systems. This is because the adversarial legal system allows rich investors to pay lawyers as much as they want while the inquisitorial system restricts them in doing so. A corollary is that relatively poor parties in a dispute, for example workers, should achieve a lower quality of contract enforcement in adversarial systems than in inquisitorial systems. This could be consistent with the work of Botero et al. (2004), who find systematic differences in the labor market and in labor regulation across legal origins. Testing this hypothesis is, however, outside the scope of this paper.

An interesting extension is to allow for heterogeneous agents. The centralized inquisitorial legal system would not allow each agent to enjoy their favorite level of quality of enforcement. By contrast, in adversarial systems, the choice of how much to spend on litigation is decentralized. Let us assume now that there is a proportion of investors with a low σ_{L0} (rich investors), while the rest of investors have a high σ_{L1} (poor investors). As a result of profit maximization, rich investors have a high willingness to pay for litigation

(a high c) while poor investors have a low willingness to pay (a low c). Then the following result holds:

Result 3 *Holding $q = 0$, $\rho_A = \rho_I$, and $\sigma_{A_i} = \sigma_{I_i}$ with $i = 0, 1$, a larger inequality $\sigma_{L1} - \sigma_{L0}$ between litigants decreases financial development k in adversarial systems compared to inquisitorial systems.*

This result holds because k is concave in c . Intuitively, following a switch from an adversarial to an inquisitorial legal system, rich investors decrease their lending by a smaller amount than poor investors increase theirs. This mechanism is similar to Banerjee and Newman (1993) and Galor and Zeira (1993), who claim that reducing inequality is beneficial for economic growth under credit constraints and a concave production function. This result is in contrast to a claim made by Posner (2007) that redistribution through the legal process is mostly harmful for economic growth because it impedes the functioning of the invisible hand.

Manipulation of Evidence We finally analyze the role of manipulation of evidence on financial development. We get the following result:

Result 4 *Holding $\sigma_A = \sigma_I$ and $\rho_A = \rho_I$, a greater possibility to manipulate evidence (a larger q) increases financial development k in adversarial systems compared to inquisitorial systems if and only if $\pi_1 + \pi_0 \geq 1$, and strictly decreases it otherwise.*

A higher level of q implies larger probabilities of conviction X_{L1} and X_{L0} . Financial development depends positively on X_{L1} and negatively on X_{L0} , thus it is not clear whether financial development is higher or not once the possibility to manipulate evidence is introduced.

This result is to some extent unexpected as manipulation of evidence is often blamed for being one downside of adversarial systems (Tullock et al., 1997). By contrast, this paper suggests that manipulation of evidence may be good for the economy as it may help convicting guilty entrepreneurs. The problem is that at the same time manipulation of evidence contributes to convicting innocent entrepreneurs more often, which is bad for the economy. The net effect of manipulation of evidence is thus ambiguous and depends on the distribution of signals.

5 Some Empirical Evidence

This section presents some empirical evidence on the relationship between the procedure to collect evidence for a trial and financial development. First, it builds a new indicator of how inquisitorial a country is. Second, it documents its relationship with two standard measures of financial development: private credit and market capitalization. Finally, it examines the robustness of the results by controlling for alternative channels.

5.1 Data

Inquisitorial indicator I build a new indicator of how inquisitorial a legal system is. I use four variables from Djankov et al. (2003) that describe the procedure to evict a tenant in court: (i) Judge cannot introduce evidence (EVI), (ii) Judge cannot reject irrelevant evidence (IRR), (iii) Mandatory prequalification of questions (PREQ), and (iv) Oral interrogation only by judge (ORAL). These variables are equal to 1 when the corresponding statement is true, 0 otherwise. The first two variables measure how adversarial a system is, while the last two measure how inquisitorial it is. The inquisitorial indicator (INQ) of how inquisitorial a legal system is computed as follows: $4*INQ=(1-EVI)+(1-IRR)+PREQ+ORAL$. The same measures are also available for the procedure to recover a bounced check in court and give similar results.

Table 2 presents the data obtained. The indicator is available for 104 countries. It ranges from 0 to 1, with a mean of .5. A higher value means a more inquisitorial procedure. The correlation between this indicator and a common law dummy is about 0.3, so this indicator contains some different information from legal origin. Chile, for example, is a civil law country but scores 0 on the indicator. By contrast, the UK is quite inquisitorial for a common law country.

Proxy for legal origins Besides a common law dummy variable (from Djankov et al., 2003), I use as controls two alternative measures that proxy for a legal origin channel. The legal origins theory states that common law countries are more financially developed because they have higher investor protection. I thus use the following measures of investor

protection: a measure of creditor protection from Djankov et al. (2007) and a measure of shareholder protection from Djankov et al. (2008). The ability of judges to make the law is one possible explanation for why investor protection is higher in common law countries. I thus use the legal justification index of Djankov et al. (2003) as a measure of the ability of judges to make the law. Levine uses additional proxies for legal origins from La Porta et al. (2004). The results using these variables are not presented because the number of observations drops to less than thirty.

Financial development I use the measures of financial development from the World Bank: a measure of the ratio of private credit to GDP and a measure of the ratio of stock market capitalization to GDP. I also use the logarithm real GDP per capita from Heston et al. (2009) as a control. All these variables are averaged over the period 1990-2005.

5.2 Results

Figures 2 and 3 plot the inquisitorial indicator against the two measures of financial development. They both show a negative relationship. This is consistent with earlier research that found a positive relationship between common law and finance (La Porta et al., 1997).

Figures 3 and 4 show the results from an OLS regression with robust standard errors of the level of financial development on the inquisitorial indicator and several controls: the logarithm of GDP per capita, investor protection (creditor rights for private credit, anti self-dealing for market capitalization), the legal justification index, and common law. The coefficients on the inquisitorial indicator are negative and significant in most specifications. However, two specifications present less conclusive results: the first one is when market capitalization is regressed on the anti-self dealing index, the coefficient of the inquisitorial indicator is reduced but remains significant; the second one is when private credit is regressed on common law, the coefficient of the inquisitorial indicator is reduced and loses its significance. Its size, however, is slightly larger than the coefficient of common law. Overall, the results indicate that switching from an adversarial to an inquisitorial legal system reduces the two measures of financial development by about 20

to 30 percentage points.

This section suggests that the procedure to collect evidence for a trial are likely to matter for financial development even when controlling for alternative relevant channels.

6 Conclusion

Why do common law countries have larger financial markets than civil law countries? the paper addresses this puzzle by focusing on the procedure of evidence collection: It is adversarial in common law countries and inquisitorial in civil law countries. The main difference between these two procedures is the identity of the investigator: a lawyer in adversarial systems and a judge in inquisitorial systems. The model predicts that manipulation of evidence has an ambiguous impact on financial development. More promising explanations could be that: (i) lawyers are given better incentives than judges to search for evidence, thus leading to more finance in adversarial legal systems; (ii) investors enjoy a higher quality of contract enforcement in adversarial than in inquisitorial legal systems. This is made possible by the decentralized nature of the adversarial process that allows rich parties to spend more on litigation and thus to improve the quality of contract enforcement.

The paper suggests a new channel through which law can affect finance. These results, however, should be taken with caution. Further research is needed to assess the importance of this channel. For example, more detailed data on the procedures of evidence collection and on the demand for lawyers of banks and firms would be very helpful.

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A APPENDIX: Alternative Legal Environments

In this section, I show how different assumptions on the legal environment affect the previous results.

A.1 English Rule

So far, the paper used the American rule of allocation of litigation costs, that is the investor always had to incur his litigation costs whatever the outcome of the trial. With the English rule, the loser of the trial has to compensate the winner for his litigation costs. In the context of this model this means that whenever an entrepreneur of low productivity loses a trial he has to reimburse the investor his litigation costs. This rule modifies the program of the investor in the following way: First the investor only has to incur the litigation cost when he loses a trial, which happens with probability $1 - X_0$. Second, all the damages that entrepreneurs have to pay when they lose a trial are increased by the litigation costs c . The problem of the investor becomes:

$$\max_{r_0, r_1, c, k} p_0(r_0 + X_0(d + c) - (1 - X_0)\sigma c) + p_1 r_1 - k, \quad (12)$$

such that

$$r_1 = r_0 + X_1(d + c), \quad (13)$$

$$k(a_0 - r_0 - X_0(d + c)) = 0, \quad (14)$$

$$p_0(a_0 k - r_0 - X_0(d + c)) + p_1(a_1 k - r_1) = u. \quad (15)$$

Allowing investors to compete with each other and solving the model as before gives us the stock of capital:

$$k = \frac{p_1(d + c)(X_1 - X_0) - (1 - X_0)p_0\sigma c}{1 - a_0}. \quad (16)$$

The first consequence of adopting the English rule is that it increases the amount of damages paid by guilty entrepreneurs to $d + c$ instead of d . The second effect is to

decrease the expected litigation spending to $(1 - X_0)p_0\sigma c$ instead of $p_0\sigma c$ due to the fact that investors only pay when they lose the trial. These two effects have two consequences: First, they increase the optimal litigation spendings because the marginal benefit of litigation increases while its cost decreases; Second, they make borrowers more credit-worthy for the same reasons. The overall consequence of the English rule is more financial development, independently of the legal family.

Softer English rule. In many countries, the English rule is not strictly applied in the sense that if the investor would incur large costs of litigation for example by choosing a very expensive attorney, only a fraction of these costs may have to be reimbursed. My results are however still valid with this modification of the allocation rule.

A.2 Out-of-court Settlement

In order to save the litigation costs, parties may decide to settle out of court. One party will make an out-of-court settlement offer and the dispute will be settled if the other party accepts the offer. In the real world, out-of-court settlement occurs in a large majority of conflicts.

The maximum offer investors can make such that high productivity entrepreneurs announcing low productivity are indifferent between paying the expected fine and accepting the out-of-court settlement offer is X_1d . It does not change anything for low productivity entrepreneurs but all the high productivity entrepreneurs anticipate out-court settlement and will claim being of low productivity because by doing so their expected fine would be equal to X_0d instead of X_1d . In other words, the contract is not incentive-compatible anymore because the screening ability of the legal system is no longer used. In this case, legal systems do not affect the efficiency of loan contracts as no lending occurs.

This model does not make a very interesting case for out-of-court settlement. This is because there are no alternative instruments to screen entrepreneurs. To keep the problem interesting, I thus assume that the investors commit to go to court when entrepreneurs announce low productivity.

A.3 A Social Planner in Inquisitorial Systems

The paper has assumed that the resources spent on litigation in inquisitorial systems are the result of profit maximization by investors, an unreasonable assumption. In this section, I allow a social planner to maximize the sum of investors' and entrepreneurs' profits in order to decide on the quality of contract enforcement, while nothing is changed in adversarial systems. The program of the social planner in inquisitorial systems is now:

$$\max_{r_0, r_1, c, k} p_0(a_0k - \sigma c) + p_1a_1 - k, \quad (17)$$

under the same constraints than before. The objective function is now larger for any level of c because it takes into account the positive effect of a larger c on the profit of the entrepreneur. As a consequence, this leads to one more difference between the two systems, as the level of litigation spendings c and thus the quality of contract enforcement in inquisitorial systems is now larger.

Table 2: Presentation of the data

Code	Country	Inquisitorial	Legal origin
ARG	Argentina	.5	FR
AUS	Australia	.25	UK
AUT	Austria	.75	GER
BEL	Belgium	.5	FR
BGD	Bangladesh	.5	UK
BLZ	Belize	.5	UK
BOL	Bolivia	.75	FR
BRA	Brazil	1	FR
BRB	Barbados	.25	UK
BWA	Botswana	.25	UK
CAN	Canada	.25	UK
CHE	Switzerland	.25	GER
CHL	Chile	0	FR
CIV	Cote d'Ivoire	.5	FR
COL	Colombia	.5	FR
CRI	Costa Rica	.75	FR
CYP	Cyprus	.5	UK
DEU	Germany	0	GER
DOM	Dominican Rep.	.75	FR
ECU	Ecuador	.75	FR
EGY	Egypt	.25	FR
ESP	Spain	.5	FR
FIN	Finland	.25	SC
FRA	France	.75	FR
GBR	UK	.75	UK
GHA	Ghana	.25	UK
GRC	Greece	.25	FR
GTM	Guatemala	.25	FR
HKG	Hong Kong	.5	UK
HND	Honduras	1	FR
IDN	Indonesia	.75	FR
IND	India	.5	UK
IRL	Ireland	.5	UK
ISL	Iceland	.5	SC
ISR	Israel	0	UK
ITA	Italy	.5	FR
JAM	Jamaica	.5	UK
JOR	Jordan	.75	FR
JPN	Japan	.25	GER
KEN	Kenya	.5	UK
KOR	Korea	.5	GER
LBN	Lebanon	.75	FR

(Continued)

Table 2 – *Continued*

Code	Country	Inquisitorial	Legal origin
LKA	Sri Lanka	.5	UK
LUX	Luxembourg	1	FR
MAR	Morocco	.5	FR
MEX	Mexico	.5	FR
MLT	Malta	.5	FR
MOZ	Mozambique	1	FR
MWI	Malawi	.25	UK
MYS	Malaysia	0	UK
NAM	Namibia	.5	UK
NGA	Nigeria	.25	UK
NLD	Netherlands	.25	FR
NOR	Norway	.25	SC
NZL	New Zealand	.5	UK
PAK	Pakistan	.5	UK
PAN	Panama	.5	FR
PER	Peru	.75	FR
PHL	Philippines	.25	FR
PRY	Paraguay	1	FR
SEN	Senegal	.25	FR
SGP	Singapore	.25	UK
SLV	El Salvador	.75	FR
SWE	Sweden	.25	SC
SWZ	Swaziland	.5	UK
THA	Thailand	.5	UK
TUN	Tunisia	.75	FR
TUR	Turkey	.5	FR
TWN	Taiwan	.25	GER
TZA	Tanzania	.25	UK
UGA	Uganda	.25	UK
URY	Uruguay	.5	FR
USA	United States	.25	UK
VEN	Venezuela	.25	FR
ZAF	South Africa	.5	UK
ZMB	Zambia	.5	UK
ZWE	Zimbabwe	.5	UK

Figure 2: Private credit versus inquisitorial indicator

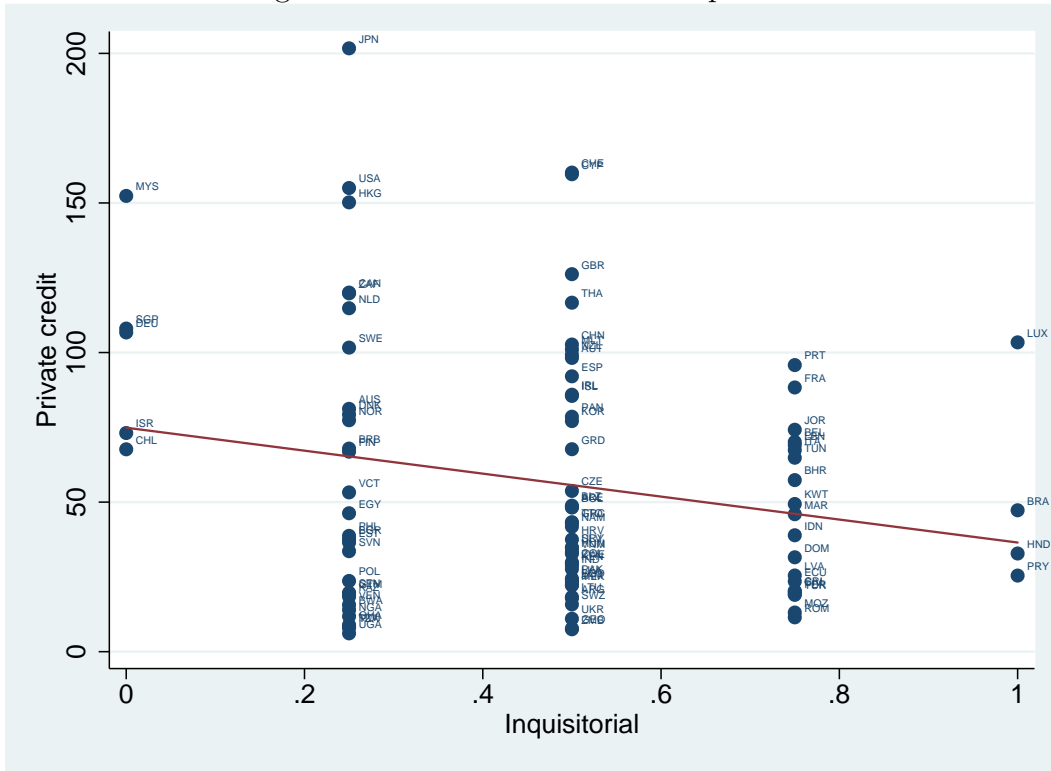


Figure 3: Market capitalization versus inquisitorial indicator

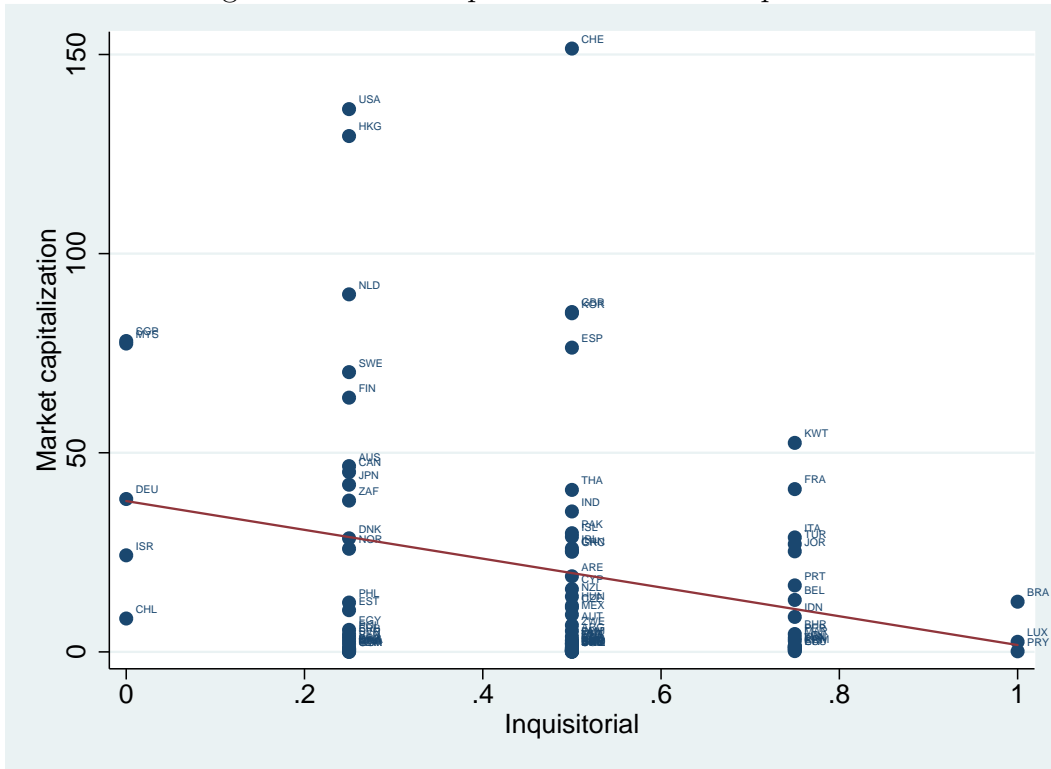


Table 3: Private credit versus inquisitorial indicator and several controls

Dependent variable: Private credit				
log GDP pc	27.267*** (0.000)	26.222*** (0.000)	27.807*** (0.000)	28.379*** (0.000)
inquisitorial	-28.020** (0.030)	-27.948** (0.047)	-24.794* (0.075)	-17.017 (0.220)
creditor rights		2.728 (0.315)		
legal justification			-9.961 (0.281)	
common law				14.600* (0.057)
constant	-177.475*** (0.000)	-173.536*** (0.000)	-177.042*** (0.000)	-198.163*** (0.000)
<i>N</i>	98	86	98	98
adj. <i>R</i> ²	0.445	0.448	0.446	0.464

p-values in parentheses

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

Table 4: Market capitalization versus inquisitorial indicator and several controls

Dependent variable: Market capitalization				
log GDP pc	15.614*** (0.000)	17.773*** (0.000)	15.416*** (0.000)	16.302*** (0.000)
inquisitorial	-33.682*** (0.004)	-25.528* (0.071)	-34.789*** (0.005)	-27.393** (0.017)
anti self-dealing		34.983** (0.031)		
legal justification			4.310 (0.558)	
common law				8.567 (0.202)
constant	-105.922*** (0.000)	-141.353*** (0.000)	-106.521*** (0.000)	-118.336*** (0.000)
<i>N</i>	92	68	92	92
adj. <i>R</i> ²	0.290	0.369	0.284	0.297

p-values in parentheses

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