

# Inheritance Law and Investment in Family Firms

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## Abstract

We investigate whether inheritance law may constrain investment in family firms. To this purpose, we build a model of the intergenerational transmission of family firms that takes into account that the law may constrain the entrepreneur to give a minimal stake to non-controlling heirs. We show that the magnitude of this stake reduces investment in family firms, by reducing the firm's ability to pledge future income streams to external financiers. This prediction is robust to a number of extensions of the model. We bring this prediction to the data, by collecting information about inheritance law in 62 countries. Using a newly built indicator of the permissiveness of inheritance law together with measures of investor protection and with data for 4,148 firms from 32 countries for the 1992-2004 interval, we find that indeed the strictness of inheritance law is associated with lower investment in family firms, while it leaves investment unaffected in non-family firms. Controlling for inheritance taxes leaves our results unaffected.

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Almost by definition, the development of family firm is tied to the dynastic history of its controlling family, and can be critically affected – for better or worse – by the way in which control over the firm is handed over from one generation to the next. So far, the literature has highlighted two main problems that may emerge in the intergenerational transmission of family firms. First, the heir may not be as talented as the founder or as a market professional, which may constrain the firm’s growth and profitability compared to non-family firms, as argued by Burkart, Panunzi and Shleifer (2003) and Caselli and Gennaioli (2005). Second, infighting among family members may paralyze decision-making or lead to underperformance: for instance, Bertrand, Johnson, Schoar and Samphantharak (2005) document with reference to Thai family firms that control by a larger number of male siblings is associated with lower performance.<sup>1</sup>

In this paper, we concentrate on another reason why succession may slow down a family firm’s growth and investment or even lead to its liquidation: the rights that inheritance norms confer to non-controlling heirs over the founder’s estate reduce the firm’s ability to pledge future income streams to external financiers, and thereby constrains its ability to fund investment. The larger the portion of the founder’s assets to be assigned to non-controlling heirs, the lower the fraction left to the heir designated to remain at the helm of the firm. Absent any friction in capital markets, a lower wealth of the controlling heir would not affect the family firm’s ability to borrow and invest. But in the presence of capital market imperfections, it may hinder the firm’s investment. This effect of inheritance law is empirically testable, as the heirs’ legal rights over family assets differ widely around the world. In most countries with a common law tradition, there are no restrictions on the fraction of assets that can be bequeathed to any heir. In civil law countries, instead, such legal restrictions generally exist, but vary considerably from country to country.

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<sup>1</sup> Bertrand and Schoar (2006) note that conflict in the wake of succession is particularly frequent when several siblings are involved in the family firm: “cooperation between siblings can be difficult to achieve, despite parental will. Even if strong ties originally exist between family members, daily interactions within the context of the family business may lead to brutal infighting. Indeed, there are many examples of families (and their businesses) ripped apart from such infighting.” (p. 79-80). The negative performance effects of family conflicts on business performance are also documented in the business literature on family firms (see for instance Davis and Harveston, 2001).

The contribution of this paper is threefold. First, we present a model to explain how inheritance law and financing constraints should be expected to interact and affect the growth and investment of family firms. Second, we measure the extent to which inheritance law constrains the intergenerational transmission of wealth within families around the world. Third, we take the model's main prediction to the firm-level data on investment and growth for a panel of countries.

In the baseline version of our model, we consider a firm that the founder bequeaths to his children, entrusting control to one of them. The controlling shareholder can divert a fraction of the cash flow as private benefits at the expense of other shareholders and financiers, to an extent determined by the degree of investor protection. The investment that the firm can undertake depends positively on investor protection, as more external finance is available when the threat of expropriation is reduced, and on controlling shareholder's wealth, as in Holmstrom and Tirole (1997). By reducing the controlling heir's wealth, inheritance law can adversely affect the firm's ability to invest. We show that, when legal investor protection is very strong, the firm can finance the first-best level of investment, irrespective of inheritance law restrictions. But, as legal investor protection worsens, inheritance law reduces the investment level because the resources paid out to non-controlling heirs cannot be compensated by external finance.

We also explore the extent to which these predictions are robust to several extensions of the model. First, we show that the presence of an inheritance tax has the effect of scaling down the level of investment of the family firms. The adverse effect of the inheritance tax on the investment is higher the weaker investor protection. In the baseline model we assume that the firm's assets can be perfectly partially liquidated. In another extension, we show that our conclusions survive under the assumption of inefficient partial liquidation. In this set up, the non controlling heir will be given a financial claim over the family firm's cash flow rather than cash. The larger the stake of the non controlling heir, the lower the firm's ability to raise funds on capital markets. Thus, as before, a less permissive inheritance law reduces the family firm's investment. There is a small difference

between this case and the one of efficient partial liquidation, though. When investor protection is very weak, the value of the financial claim of the non controlling heir may fall below the minimal threshold set by inheritance law. In other words, the value of a minority stake when expropriation by the controlling party is extremely high may be insufficient to ensure that the non controlling heir receives the share of family wealth set by the law. Then the family will be forced to liquidate the entire firm, even though this decision does not maximize total family wealth. Inefficient partial liquidation adds a new type of inefficiency. We also explore how inheritance constraints affects the transition from a family to a non-family firm status. Assuming that retaining the firm in the family also yields non-monetary benefits of control, and that family firms differ from non-family ones only for the presence of the inheritance constraint, we show that the stringency of the inheritance constraint makes the family less likely to retain control over the firm. Moreover, transition to non-family firm status should be less likely when investor protection so strong that the inheritance constraint has no impact on family firms.

Our next step is to assess whether the evidence is consistent with the main prediction of the model: that family firms' investment and growth is negatively affected by the extent to which inheritance law limits the wealth that can be bequeathed to a single heir (whereas this does not hold for non-family firms), and that this effect is stronger where investor protection is weaker. To perform this empirical test, we first collected data on inheritance law for 59 countries, mainly via questionnaires sent to law firms that are part of the Lex Mundi project. We measure the "permissiveness of the inheritance law" of each country as the maximum share of a testator's estate that can be bequeathed to a single child, depending on the presence or absence of a spouse and the total number of children. We then test the effect of this variable on the investment and growth of family firms, using a sample of family and non-family firms from 29 countries for 1992-2004.

Our empirical methodology is similar to that used by Rajan and Zingales (1998), suitably adapted to take into account that our data are at a different level of aggregation (firm-level as

opposed to industry-level) and that we are interested in the effect that inheritance law and investor protection (as opposed to financial development) have on firm investment. We regress the investment rate of each firm (averaged over the time interval of our sample) on an indicator of financial dependence (as defined by Rajan and Zingales, 1998), interacted with our measure of the permissiveness of the inheritance law, with various alternative measures of investor protection, and with the product of these two variables, controlling for country and industry fixed effects.

We find that, while the interaction between financial dependence and investor protection is significantly positive for both family and non-family firms, the interaction between financial dependence and the permissiveness of the inheritance law has a positive and significant coefficient only for family firms, as predicted by the model: the stringency of the inheritance law acts as a drag only on the investment and growth of family firms. Moreover, the interaction term between all three variables (financial dependence, inheritance law permissiveness and investor protection) generally has a positive coefficient for family firms alone, again as predicted by the model: the stringency of the inheritance law is more detrimental for the performance of family firms in countries where investor protection is weaker.

The rest of the paper is organized as follows. In Section 1, we present the baseline model, derive its predictions on how inheritance law affects the firm's investment and the family's liquidation decision for different degrees of investor protection. Section 2 contains a number of extensions of the baseline model, partly to explore the robustness of its main predictions and partly to provide other interesting predictions. In Section 3, we present the data. In Section 4, we explain our empirical strategy and report our estimates. Section 5 concludes, summarizing the results and drawing regulatory implications.

## 1. The model

We consider a firm that is initially owned by its founder, who has two prospective heirs, denoted as 1 and 2.<sup>2</sup> The firm is the combination of physical assets, whose scrap value is normalized to 1, and entrepreneurial “know-how”: to fix ideas, imagine that the firm is formed by a bakery and a unique pastry recipe. The founder’s wealth is entirely invested in the firm’s physical assets – the bakery. Only the founder and heir 1 have the know-how to run the firm – nobody else is capable of using the recipe to cook pastries, including heir 2.<sup>3</sup>

All parties are risk neutral and there is no discounting: they simply maximize their final wealth. Since we assume a perfectly competitive capital market, the equilibrium interest rate is zero.

### 1.1. Baseline model structure

We start by laying out the baseline version of the model, leaving extensions to Section 2. The model’s time line is shown in Figure 1.

**[Insert Figure 1]**

#### *Family succession*

We assume that the firm’s physical assets can be liquidated on a perfect secondary market (at their scrap value of 1) and are perfectly divisible (so that partial liquidation is feasible and efficient).

At  $t = 0$ , the founder retires and must choose how much he wants to leave to each of his heirs.<sup>4</sup> As all the family’s wealth is invested in the firm’s assets, the founder liquidates a fraction  $x$  of them and gives the proceeds to heir 2 (who invests it on the financial market at zero rate of return). The remaining fraction  $1 - x$  of the assets is given to heir 1, who becomes the new manager of the

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<sup>2</sup> We take the number of children as given, that is, not determined by rational considerations by the founder.

<sup>3</sup> If both heirs had the same managerial talent, there would be no trade-off in this model.

<sup>4</sup> If one relaxes the assumption that only heir 1 has the talent to run the company, the firm could be sold as a going concern to an outside manager at a value that exceeds the scrap value of its physical assets. In terms of our example, the founder could not only sell the bakery but also the pastry recipe to an outsider, and distribute the sale proceeds among the two heirs. We explore this extension in Section 2.4.

family firm. Equivalently, instead of receiving the proceeds from this partial liquidation, heir 2 may be given a financial claim of value  $x$  over time-2 cash flow, such as an equity or debt stake. The two arrangements (partial liquidation or retention of heir 2 within the investor base) are completely equivalent when partial liquidation is efficient. For expositional simplicity, we stick to the first interpretation. We discuss the case of inefficient partial liquidation in Section 2.2.

The founder chooses the split between the heirs,  $x$ , so as to maximize the sum of their wealth:<sup>5</sup>

$$w_f = w_1 + w_2, \quad (1)$$

The distinctive feature of the model is that the law constrains the founder's ability to allocate the family assets among his heirs. As we shall see in Section 2, in many countries the law sets a lower bound on the share of the estate that each of the founder's children must receive after his death.<sup>6</sup> We capture this legal constraint by a minimum amount of wealth  $u$  that the founder must assign to the non-controlling heir, that is,  $w_2 = x \geq u$ . Recalling that the family's estate is worth 1,  $u$  is also the minimum fraction of the founder's estate to be given to heir 2. Henceforth we shall refer to  $1 - u$  (the maximum fraction that can be bequeathed to the controlling heir) as a measure of the "permissiveness of inheritance law". For instance, a completely permissive legislation is one where this measure is 1, so that the controlling heir can inherit the whole family firm.

### *Investment technology*

At  $t = 1$ , heir 1 decides how much money to invest and therefore how much external finance to raise on the capital market. The firm's investment  $I$  is funded by heir 1's wealth  $1 - x$  plus external funds that he raises. Investors are given a claim  $R_f$  over the firm's cash flow. This claim can be thought

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<sup>5</sup> Our objective function ignores the possibility that the founder may have a preference for treating with fairness the two heirs. We discuss this point in Section 2.6.

<sup>6</sup> Generally, inheritance laws refer to the value of assets at  $t = 0$  (without incorporating future improvements in value). However, our model would not be significantly affected if the fraction  $u$  were defined with reference of the final value of the firm, taking into account the future gains from investment.

of as debt or a non-voting equity. Each unit of capital costs 1, and yields revenue  $g > 1$  at  $t = 2$ , up to a critical level  $\bar{I}$ .<sup>7</sup> Therefore, the firm's revenue is

$$R = \begin{cases} gI & \text{if } I \leq \bar{I}, \\ g\bar{I} & \text{otherwise.} \end{cases} \quad (2)$$

Clearly, it is inefficient to expand the firm's capital beyond this maximal scale. To focus on the interesting case, the maximal efficient scale is taken to exceed the family's initial wealth, i.e.  $\bar{I} > 1$ .

### *Private benefits of control*

At  $t = 2$  heir 1, being in control, decides on the allocation of revenues. The revenues can either be paid out to shareholders or diverted as private benefits – either via outright theft or more subtly via transactions with related parties, transfer pricing, perquisites consumption or excessive salaries. This non-contractible expropriation decision is modeled as the choice of a fraction  $\phi \in [0,1]$  of the revenues, so that private benefits are  $\phi R$  and security benefits to all claimholders are  $(1 - \phi)R$ .

Expropriation of outside investors is limited by the law, which sets an upper bound  $\bar{\phi} \in [0,1]$  on the revenues that can be diverted by heir 1. Therefore,  $1 - \bar{\phi}$  measures the minimum fraction of the firm's cash flow that the law guarantees to be disgorged in favor of investors: accordingly, it will be referred to as the degree of “investor protection” afforded by the law. The assumption that the legal degree of investor protection affects external finance to firms agrees with a large body of evidence (see Beck and Levine, 2005, and Malmendier, 2007, for two recent surveys).

## **1.2. Effect of inheritance law on family firm investment**

We analyze the founder's problem by solving the model by backward induction: we start from the expropriation decision at  $t = 2$  to obtain the investment level  $I$  at  $t = 2$ , and from this we determine

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<sup>7</sup> The assumption of a linear production function with an upper bound on investment is made only for simplicity. Our results would be qualitatively unchanged if the production function featured decreasing marginal returns.



the optimal fraction  $x$  of the firm's assets liquidated at  $t = 0$ . This yields the founder's welfare when control is kept inside the family, and the effect of the inheritance constraint on investment for different degrees of investor protection  $\bar{\phi}$ .<sup>8</sup>

At date 2, heir 1 decides how to allocate the revenues. The law constrains him to divert no more than  $\bar{\phi}R$  as private benefits. As diversion is costless, heir 1 extracts the maximum benefit allowed by the law,  $\bar{\phi}$ . Therefore, the firm's pledgeable income is  $(1 - \bar{\phi})R = (1 - \bar{\phi})gI$ .

Since the capital market is perfectly competitive, heir 1 appropriates the entire surplus generated by the investment. Moreover, as each unit of investment generates a profit margin equal to  $g - 1 > 0$ , heir 1 wants to invest as much as possible (up to  $\bar{I}$ ): investment  $I$  is constrained only by the funds that he can raise. The investors' cash flow rights  $R_I$  cannot exceed the firm's pledgeable income:  $R_I \leq (1 - \bar{\phi})gI$ . As heir 1 can contribute only  $1 - x$  to the firm's capital, he must raise  $I - (1 - x)$  from investors, whose participation constraint therefore is  $R_I = I - (1 - x)$ . The equality sign follows from the assumption that capital markets are perfectly competitive. Investment is maximized when  $R_I$  reaches its highest value, which is  $(1 - \bar{\phi})gI$ . Taken together, heir 1's optimal investment choice and the investors' participation constraint imply:

$$(1 - \bar{\phi})gI = I - (1 - x). \quad (3)$$

As in Tirole (2006, Chapter 3), one must distinguish two cases:

- (i) Unconstrained investment: if  $g(1 - \bar{\phi}) \geq 1$ , a dollar invested in the firm generates at least a dollar of pledgeable income, so that there is no upper bound on the external funds that can be raised: heir 1 will choose the maximal efficient investment level  $\bar{I}$  and will raise  $\bar{I} - (1 - x)$  externally.
- (ii) Finance-constrained investment: if  $g(1 - \bar{\phi}) < 1$ , a dollar invested generates less than a dollar of pledgeable income, so that heir 1's ability to finance investment is determined by the investors'

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<sup>8</sup> In Section 2.3 we analyze the decision to sell out the firm by comparing the founder's welfare under family control to its value when the family firm is entirely sold out

participation constraint, investment is determined by (3):  $I = (1-x)/[1-g(1-\bar{\phi})]$ , and heir 1 can borrow up to  $(1-x)g(1-\bar{\phi})/[1-g(1-\bar{\phi})]$ . In other words, for every dollar of his wealth  $1-x$  invested in the firm, heir 1 can borrow an additional amount  $g(1-\bar{\phi})/[1-g(1-\bar{\phi})]$ , which is increasing in the investment's profitability  $g$  and in the investor protection  $1-\bar{\phi}$ . Moreover, the larger the wealth invested by heir 1, the higher his borrowing capacity. Heir 1 will use his entire borrowing capacity only if investment is below the efficient scale  $\bar{I}$ . Therefore, investment is<sup>9</sup>

$$I = \min \left\{ \bar{I}, \frac{1-x}{1-g(1-\bar{\phi})} \right\}. \quad (4)$$

Equipped with heir 1's optimal investment at  $t = 1$ , now we turn to the founder's succession decision at  $t = 0$  regarding the fraction  $x$  of assets to be liquidated to pay heir 2, under the inheritance constraint  $w_2 = x \geq u$ .

Recall that by equation (1) the founder's utility is simply the sum of his children's final wealth  $w_1 + w_2$ . Since heir 1's utility is his initial wealth,  $1-x$ , plus the profit from the investment, that is,

$$w_1 = (g-1) \min \left\{ \bar{I}, \frac{1-x}{1-g(1-\bar{\phi})} \right\} + (1-x)$$

and heir 2's utility is simply his wealth  $w_2 = x$ , the founder's utility – and the firm's final value – is

$$w_f = (g-1) \min \left\{ \bar{I}, \frac{1-x}{1-g(1-\bar{\phi})} \right\} + 1. \quad (5)$$

Since this expression is weakly decreasing in  $x$ , the (weakly) dominant strategy for the founder is to set  $x = u$ , that is, liquidate the smallest amount of the family firm's assets to satisfy the inheritance constraint. We summarize these results in the following proposition:

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<sup>9</sup> When investment is constrained by his borrowing capacity, it is optimal for heir 1 to retain no cash flow right in the family firm. This conclusion may seem in conflict with the assumption that he retains control. In practice, control enhancing devices such as dual class shares may be used by heir 1 to limit the fraction of cash flow rights he needs to own to exert control. We discuss below the case where a minimal equity stake is required to exert control.

**Proposition 1.** *If the firm remain under family control, a fraction  $u$  of its assets are liquidated, its*

$$\text{investment is } I = \min \left\{ \bar{I}, \frac{1-u}{1-g(1-\bar{\phi})} \right\} \text{ and its final value is } w_f = (g-1) \min \left\{ \bar{I}, \frac{1-u}{1-g(1-\bar{\phi})} \right\} + 1.$$

This proposition implies that the firm can achieve the efficient level of investment  $\bar{I}$  if  $1-\bar{\phi} \geq [1-(1-u)/\bar{I}]/g$ . The unconstrained region defined by this condition is represented in Figure 2 as the area above the downward sloping line. As shown by the figure, for any given degree of inheritance law permissiveness  $1-u$ , there is a sufficiently strong degree of investor protection  $1-\bar{\phi}$  that the inheritance law imposes no efficiency loss. This is most clearly seen in the limiting case of perfect investor protection,  $1-\bar{\phi}=1$ , where the previous condition is always met (recalling that  $\bar{I} > 1$  by assumption) and we are above the vertical intercept in Figure 2: absent agency problems between firm and investors, even a controlling heir with a very low amount of wealth can raise externally the funds required to invest at the efficient level.

**[Insert Figure 2]**

If, instead, investor protection falls short of this level, i.e.  $1-\bar{\phi} < [1-(1-u)/\bar{I}]/g$ , the inheritance law constrains the controlling heir to a suboptimal level of investment: weak investor protection prevents him from fully offsetting his low wealth with more external funding, and thus achieve the efficient investment level. In this region, which corresponds to the shaded area in Figure 2, the inheritance law matters: the higher  $1-u$ , the lower is the share of family assets to be liquidated, and the larger are investment and founder's utility. Moreover, in this constrained region, stronger investor protection enhances investment, and its positive effect is larger the more permissive is inheritance law (the larger  $1-u$ ). These results follow from the following derivatives being all positive in this region:

$$\frac{\partial I}{\partial(1-u)} = k, \quad \frac{\partial I}{\partial(1-\bar{\phi})} = (1-u)gk^2, \quad \frac{\partial^2 I}{\partial(1-u)\partial(1-\bar{\phi})} = gk^2, \quad (6)$$

where for brevity we define  $k \equiv 1/[1-g(1-\bar{\phi})]$ .

But the derivatives in (6) do not tell the entire story, since a small increase in the permissiveness of inheritance law would have no effect on investment in the unconstrained region, where all three derivatives would be zero.

These results are summarized formally in the following proposition:

**Proposition 2.** *If investor protection is low ( $1-\bar{\phi} < [1-(1-u)/\bar{I}]/g$ ), a marginal increase in the permissiveness of inheritance law  $1-u$  increases the investment of family firms. This effect is increasing in the degree of investor protection  $1-\bar{\phi}$ . If instead investor protection is high ( $1-\bar{\phi} \geq [1-(1-u)/\bar{I}]/g$ ), an increase in the permissiveness of inheritance law  $1-u$  has no effect on the investment of family firms.*

As these predictions are to be tested empirically later in the paper, it is worth noticing that they only apply to family firms: for non-family firms, the effect of inheritance law should be zero irrespective of the degree of investor protection. Of course this does not imply that the degree of investor protection *per se* may affect investment also in non-family firms, insofar as for these firms too face agency problems in the capital market – which however are not modelled in this setting.

This is also illustrated in Figure 2, where we consider a relaxation of the inheritance law in two countries (A and B) with different degrees of investor protection. In country A, shareholder protection is so poor that companies are in the constrained regime: the effect of a relaxation in inheritance law on investment is  $k \cdot \Delta u$  and increases in the degree of shareholder protection (since  $k$  is increasing in  $1-\bar{\phi}$ ). In country B, instead, the change in inheritance law has no effect, because legal protection is so strong that the investment is anyway at the efficient level  $\bar{I}$ .

## 2. Extensions

In the baseline model just analyzed, we have made a number of stark simplifying assumptions. In this section, we remove some of them, both to test the robustness of the predictions presented so far and to bring out new and interesting predictions of the model. We also investigate an issue that we have neglected so far, that is, how inheritance law and shareholder protection affect the family's decision to keep control over the company or sell it out altogether at the succession stage.

### 2.1. Inheritance taxes

So far we assumed that the founder can bequeath his entire wealth, but in practice in many countries the government taxes the founder's estate upon his death. If we denote by  $\tau$  the tax rate on the bequest, the wealth transmitted by the founder to his heirs is only a fraction  $1 - \tau$  of the bequest.<sup>10</sup> The other variable affected by the estate tax is the level of wealth that must be assigned to heir 2, which decreases from  $u$  to  $u(1 - \tau)$ .<sup>11</sup>

Going through the same steps as in the previous analysis, it is easy to show that the level of investment is  $I = \min\{\bar{I}, (1 - \tau)(1 - u)/[1 - g(1 - \bar{\phi})]\}$ . The tax has two effects on the level of investment by family firms: first, it magnifies the region where investment is below the first-best level; second, in the region where investment is constrained, it is decreased by a factor  $1 - \tau$ . It is interesting to note also the effect of the inheritance tax on the effect of the permissiveness of inheritance law, whenever investment is constrained even after the change in inheritance law. The relevant region is now defined by the inequality  $1 - \bar{\phi} < [1 - (1 - \tau)(1 - u)/\bar{I}]/g$ , and therefore is larger than with  $\tau = 0$  and increasing in  $\tau$ . In this range  $\Delta I = k' \cdot \Delta u > 0$ , where

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<sup>10</sup> The presence of the inheritance tax may also affect the consumption behavior of the founder. In particular, the effect of a tax is to make the heir's consumption more costly. This may translate into greater consumption by the founder, so that the wealth transmitted to the heir becomes  $1 - \tau - c$ , where  $c$  is the extra-consumption by the founder.

<sup>11</sup> If there is extra-consumption by the founder, this term becomes  $u(1 - \tau - c)$ .

$k' \equiv (1-\tau)/[1-g(1-\bar{\phi})] < k$ . As before, in this region a more permissive inheritance law has the effect of boosting investment, but with a lower impact with respect to the case of no inheritance tax. In the unconstrained region, i.e. for  $1-\bar{\phi} \geq [1-(1-\tau)(1-u)/\bar{I}]/g$ , investment is unaffected by inheritance law, as before.

To sum up, the main empirical predictions emerging from this analysis are that the inheritance tax should reduce the level of investment of family firms and that its effects on investment are dampened relative to the case where the inheritance tax is not considered.

## 2.2 Inefficient partial liquidation

So far we have made the extreme assumption that the firm's assets are perfectly divisible, so that any fraction of them can be sold without reducing their liquidation value. In most circumstances assets are only imperfectly divisible, i.e., a fraction  $x$  of the assets may be worth much less than  $x$  times their value when undivided. Here we consider the opposite case, assuming that the liquidation value of any fraction  $x < 1$  of the assets is zero.

Inefficient partial liquidation implies that the founder will never liquidate a fraction of the assets to compensate heir 2. Either he liquidates the assets completely or he keeps all the assets into the family firm. In the latter case, to satisfy the inheritance constraint, heir 2 is given a debt claim  $R_2$  over the firm cash flow.<sup>12</sup> The difference with the benchmark case is that inefficient partial liquidation adds a further constraint to the problem, as it implies that it is inefficient to invest less than the entire asset base, whose value is 1:  $I \geq 1$ . This additional constraint may reduce the family's welfare, insofar as it forces the founder to inefficiently liquidate the family assets to satisfy the inheritance constraint. So in this modified setting the inheritance constraint, besides reducing the level of investment, as shown in the baseline model, can also force inefficient liquidation, and the more so the weaker legal investor protection.

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<sup>12</sup> None of our conclusions depend on this assumption. If heir 2 is given an equity stake, all results would still hold.

The only amendment to be made to the timing of actions in the baseline model is at  $t = 0$ : if the founder turns control over the firm to heir 1, heir 2 is entitled to receive  $R_2$  out of the firm cash flow at  $t = 2$ . As before, at  $t = 2$ , heir 1 will extract all the private benefits allowed by legal protection, that is  $\bar{\phi}gI$ . Anticipating his decision, the investors' participation constraint at  $t = 1$  is

$$R_I \geq I - 1,$$

which is binding in equilibrium as capital markets are perfectly competitive. This implies that all the surplus generated by the investment is captured by heir 1, and since each unit of investment generates a positive net present value, he wants to invest as much as possible (up to  $\bar{I}$ ). Heir 1's funding capacity is limited by his ability to pledge income to outside investors:  $R_I$  cannot exceed the pledgeable income  $(1 - \bar{\phi})gI$  minus heir 2's claim,  $R_2$ . Formally,  $R_I \leq (1 - \bar{\phi})gI - R_2$ .

Combining this constraint with the investors' participation constraint, we have

$$(1 - \bar{\phi})gI - R_2 = I - 1.$$

As in the baseline model, we must distinguish between two cases. If  $g(1 - \bar{\phi}) \geq 1$  the firm can raise any amount of funding it wishes, so that it will invest  $\bar{I}$ . Heir 2's inheritance constraint is satisfied whenever  $R_2 \geq u$ . In this case  $w_f = (g - 1)\bar{I} + 1$ .

As before, when  $g(1 - \bar{\phi}) < 1$ , the firm's external funding capacity is limited, and to maximize investment, the founder must maximize the income pledgeable to outsider investors. Since  $R_I \leq (1 - \bar{\phi})gI - R_2$ , the inheritance constraint is binding:  $R_2 = u$ . Then the claim that can be given to outside investors is  $R_I = (1 - \bar{\phi})gI - u$ , which together with their participation constraint yields  $(1 - \bar{\phi})gI = I - (1 - u)$ .

It is easy to see that the maximum investment in the constrained regime is again given by expression (4), obtained under the assumption of no liquidation costs. The reason is that, heir 2 is just like another outside investor in the family firm. It is as if the family wealth invested in the

family were only  $1-u$ , i.e., heir 1's wealth. Heir 1's capacity to raise external funding is unchanged, and equal to  $I-(1-u)$ .

However, as partial liquidation is inefficient, the investment level must also satisfy the constraint  $I \geq 1$ , so that heir 1's borrowing capacity must be at least  $u$ : he must at least be able to satisfy the participation constraint of the non-controlling heir, who contributes a stake  $u$  to the firm. If  $I = \bar{I}$  this constraint is not binding since  $\bar{I} > 1$ , by assumption. But in the constrained regime, the constraint  $I \geq 1$  is satisfied only if  $1 - \bar{\phi} \geq u/g$ . If instead  $1 - \bar{\phi} < u/g$ , then the firm's pledgeable income would not even be sufficient to repay heir 2 for his contribution to the firm's investment. In this case, the founder must liquidate the company to satisfy the inheritance constraint, so that  $w_f = 1$ . This is inefficient, since if the company was not liquidated it would have been worth an additional  $(g-1)I$ .

In conclusion, the additional insight from the presence of liquidation costs is that, if investor protection is sufficiently weak, the founder is forced to liquidate the firm, since its pledgeable income is insufficient to confer to heir 2 a stake in the family firm whose value satisfies the inheritance constraint.

### 2.3. Minimal control stake

In Section 1 it was shown that, to maximize investment heir 1 will want to raise the maximal number of cash flow rights to outside investors, hence retaining none for himself. As he still remains in control, this is equivalent to assuming that it is possible to retain control without cash flow rights. In practice, such a complete dichotomy between control and cash flow rights may be impossible to achieve. Suppose that heir 1 must own a minimal equity stake  $\underline{\alpha}$  to retain control, so that the maximum pledgeable income is  $(1 - \underline{\alpha})(1 - \bar{\phi})gI$ .



Then, if  $(1-\underline{\alpha})(1-\bar{\phi})gI \geq 1$ , the firm will invest at the efficient scale  $\bar{I}$ , whereas if  $(1-\underline{\alpha})(1-\bar{\phi})gI < 1$  the firm's investment is

$$I = \min \left\{ \bar{I}, \frac{1-u}{1-(1-\underline{\alpha}_1)g(1-\bar{\phi})} \right\}.$$

So assuming that a minimum stake is required for control leaves unaffected the predictions of the baseline model regarding the effect of inheritance law on investment. Indeed, it expands the parameter region where investment is constrained, since heir 1's need to retain a control stake reduces the fraction of the firm's pledgeable income earmarked to external investors, and therefore the external funds that can be raised from them. By the same token, a larger minimum control stake  $\underline{\alpha}$  also reduces the investment that the firm can carry out if it is finance-constrained, as well as the family final wealth  $w_f$ . From a different perspective, this suggests that pyramids and multiple class shares – which reduce the minimum fraction of cash flow rights that the controlling shareholders must retain – may help to increase the level of investment in the family firm.

## 2.4. Sell-out decision

So far only heir 1 was assumed to be able to manage the firm after the founder's demise. In this section we relax this assumption by considering outsiders who have the same managerial ability as heir 1, and therefore may be willing to buy the firm as a going concern. Since the inheritance constraint limits the firm's ability to raise external funds, selling out it to an external acquirer who does not face the same constraint on investment may be more appealing than keeping it within the family. Indeed, if the firm can be sold at its fair value, the sell-out option will always dominate when investment would be constrained under family management. However, a trade-off arises if the firm cannot be sold at its fair value (for instance, because the private equity market is not competitive) or if keeping the firm within the family generates an “amenity potential”, that is, a

non-pecuniary private benefit of control.<sup>13</sup> Between these two modelling options, we consider the latter, by assuming that if control is kept inside the family, the founder's utility is  $w_f = w_1 + w_2 + B$ , where  $B$  is the amenity potential. If instead the company is sold out, the founder's utility coincides with the sale proceeds that are distributed to his heirs.

We assume that the market for control is perfectly competitive, so that the price paid for the firm is equal to its (pecuniary) value to the acquirer, who does not face any capital rationing, and therefore can invest up to efficient level  $\bar{I}$ . So the price obtained from the firm's sale

$$P = (g - 1)\bar{I},$$

so that the founder's utility is  $w_f = (g - 1)\bar{I} + 1$ .

If instead the firm is handed over to heir 1, the founder's utility is

$$w_f = \min \left\{ (g - 1)\bar{I} + 1 + B, \frac{(g - 1)(1 - u)}{1 - g(1 - \phi)} + 1 + B \right\}.$$

Therefore, if the amenity potential is so high as to exceed the competitive price of the firm ( $B \geq (g - 1)\bar{I}$ ), then obviously the firm will remain under the family's control. When instead the amenity potential is below the firm's price ( $B < (g - 1)\bar{I}$ ), a tradeoff arises: the family will be ready to sacrifice the amenity potential only if keeping the firm under family control would severely limit its investment. This happens if investor protection is sufficiently poor, that is,

$$1 - \bar{\phi} \leq \frac{1}{g} - \frac{(g - 1)(1 - u)}{(g - 1)\bar{I} - B}.$$

This expression also shows that, a stricter inheritance law (higher  $u$ ) widens the interval where selling out occurs, *ceteris paribus*. These results are relevant for our empirical analysis, as they

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<sup>13</sup> This term was introduced by Demsetz and Lehn (1985). Contrary to the private benefits of control, the amenity potential gives utility to the party in control without reducing profits and therefore the firm's value. For instance, the founder may draw pleasure from having his child manage the family firm. Alternatively, in some industries, such as media or sports, the ownership of firms allows the family to be a member of important political or social networks.

predict that the family firm status is itself affected by both investor protection and inheritance law: in a country with either weaker investor protection or stricter inheritance law (or both), we should observe fewer firms under family control. Since this is precisely the parameter region where investment is predicted to be more severely constrained, this sample selection should bias the evidence against finding an effect of both investor protection and inheritance law on family firm investment.

## 2.5. Shared control

So far, a key assumption has been that the founder can confer control over the firm only to a single heir. What would happen if heirs can share control? To answer this question, consider that control has two possible dimensions: (i) ability to extract private benefits and (ii) power to decide how much the firm should borrow and invest.

Suppose first that shared control were to refer only to ability to extract private benefits, so that heir 2 might be entitled to grab a fraction of these benefits. This assumes that either heir 2 has an informational advantage over outside investors that allows him to verify private benefits extraction, or that heir 1 is altruistic vis-à-vis heir 2 and therefore willingly accepts to share the private benefits of control with him. Since private benefits have no deadweight cost, the two heirs will agree to extract the maximum benefit  $(1-\bar{\phi})gI$ . This will leave the firm's borrowing and investment capacity unaffected, and simply confer a rent to heir 2, in excess of his legal entitlement  $u$ . This argument rests on the premise that the wealth  $u$  to which heir 2 is entitled by the law refers solely to the cash flow generated by the firm, and not to the unverifiable private benefits that he may obtain.

A more extreme interpretation of shared control is that the two heirs manage to joint decide over the investment undertaken by the firm. This implies that heir 2 accepts to leave his stake  $u$  invested in the firm and to pledge the corresponding cash flow to outside investors, so as to maximize the firm's investment. Of course, this presupposes that heir 2 can be confident to share in the private

benefits of control so as to (at least) recover his investment  $u$ . If this arrangement can be set in place, the financially constrained level of investment will rise from  $(1-u)/[1-g(1-\bar{\phi})]$  to  $1/[1-g(1-\bar{\phi})]$ , and inheritance law will have no effect on the choice of investment.

Therefore, in this extreme version, shared control completely offsets the effect of inheritance law: the empirical prediction is that, if this form of shared control is widespread in family firms, one should expect to find no effect of inheritance law on family firm investment. This does not rule that shared control may have efficiency costs due to deadlocks and disagreements between the two heirs, and thereby curtail family firm investment below its efficient level. However, this investment shortfall will not be systematically related to inheritance law.

## 2.6. Fairness in bequest allocation

Another assumption of the model is that the founder is only interested in the sum of his heir's wealth, and not in its distribution. Indeed, the inheritance distribution computed in the benchmark model is inequitable: heir 2 gets a share  $u \leq 1/2$  of the estate, while heir 1 gets no less than  $1-u$  (which is what he gets when the firm has zero borrowing ability). Therefore, if the founder cares for the fairness of the inheritance allocation, his bequest  $x$  to heir 2 will exceed the minimum share  $u$  prescribed by the law. In the limit, a perfectly egalitarian split of the estate will require him to set heir 2's stake at  $x = g\phi/[2g\phi - (g-1)] > 1/2$ , if the firm is in the financially constrained region ( $g(1-\bar{\phi}) > 1$ ): heir 2 must get more than half of the cash flow rights, since he is not going to enjoy the private benefits of control.

Naturally, the more egalitarian is the founder, the greater is the efficiency cost that the family must bear in terms of forgone investment: intuitively, the egalitarianism of the founder is equivalent to a more stringent inheritance law constraint. This result highlights a potentially important caveat about the empirical relevance of our model's predictions: if in most countries social norms dictate a greater degree of fairness in inheritance than is required by the local law, then family firms

investment will reflect differences in the national social norms rather than in national laws. However, our empirical predictions will still apply to the extent that these social norms have some correlation with inheritance law. This would not be surprising since typically the law is initially generated by social custom, as highlighted by the history of both Roman and Common law.

### **3. The data**

In our empirical test of the model's prediction about firm investment we bring together two types of data: (i) measures of country-level institutional characteristics, which include novel indicators about the permissiveness of inheritance law, and measures of investor protection drawn from existing studies; and (ii) firm-level data for investment, total assets, ownership structure and control for a sample of companies from different countries.

#### **3.1. Inheritance law and investor protection data**

To measure the permissiveness of inheritance law around the world, we gathered information for 62 countries about the maximum share of the estate that can be bequeathed to a single child by a valid will. The data were collected via questionnaires to law firms belonging to the Lex Mundi association and in some cases via other sources, such as direct access to legal sources.<sup>14</sup> The resulting measure is displayed in the first five columns of Table 1. In each country, this measure varies depending on the presence of a surviving spouse and of the total number of children.<sup>15</sup>

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<sup>14</sup> We stress that the indicator refers to the maximum share that can be left to a single child conditional on writing a valid will, and not to the amount that a child would receive by a parent who dies intestate.

<sup>15</sup> For some countries, the inheritance law is so complex that in computing the measure reported in Table 1 we had to make more specific assumptions about the case under consideration and/or disregard some clauses in the law that could not be captured with our simple indicator. Specifically: (i) for Bangladesh, Jordan, Kuwait and Saudi Arabia, we assume that heirs are all male children, as in that country male heirs receive twice as much as females; (ii) in Canada, we disregarded the case of Quebec, where 50% of the estate must go to the spouse of the deceased; (iii) for India, where the applicable law depends on the religion of the deceased, we focus on the laws applying to non-Muslim citizens; (iv) for Slovakia, we assume that children are over 18 years of age (stricter rules apply for children below that age); (v) for Sweden, we disregard that the surviving spouse is entitled to € 17,750; (vi) in the United States, many states entitle the surviving spouse to an "elective share" which is generally 30% but in some states can be up to 50%, but we disregarded

Table 1 clearly shows that the degree of permissiveness of inheritance law is greater in common law countries than in civil law ones: in most common law countries, there is complete freedom to leave one's estate to a single child, irrespective of the presence of a spouse and of the number of siblings.<sup>16</sup> In contrast, in civil law countries the law constrains the maximum share that can be left to a single child, the more so if the child concurs with a surviving spouse and/or with other siblings. For instance in Italy, a person with a spouse and two children can freely allocate only one fourth of his total wealth. This implies that he cannot give more than 50% of the family's wealth to one child. The figure goes down to 41.7% with three children, and decreases monotonically to 33.3% with six children (not reported in the table for brevity). These tighter bounds may be not be unrealistic considering the increasing occurrence of multiple marriages and the implied number of children.

That civil law countries have a more restrictive inheritance law is confirmed by the figures in Panels A and B of Table 2: on average, in civil law countries the largest share that can be left to a child in the presence of a surviving spouse is 57.8% if there are two siblings and 50.6% if there are three, while in common law countries the corresponding figure is 97.2 % in both cases. However, Tables 1 and 2 also document that there is considerable variation in the figures for civil law countries: for instance, the range of variation is from 33.3% to 75% for the case of two children and a spouse, and from 22.2% to 66.7% for the case of three children and a spouse. In other words, not all civil law countries are equally restrictive.

The presence of some dispersion in this indicator within civil law countries is quite important if empirically this variable is to play a distinct role from that of a mere indicator of the country's legal origin, and therefore from measures of shareholder protection, which are known to correlate highly with the legal origin, particularly with the divide between common law and civil law countries: see

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this norm since it can be circumvented by setting up a trust. Moreover, we disregarded the more restrictive laws of the state of Louisiana.

<sup>16</sup> However, it should be noticed that even in these countries social norms may *de facto* prevent a testator from neglecting altogether one or more of his/her children and his/her spouse. These social norms inspired to a minimal standard of equity among potential heirs are sometimes buttressed by judicial practice in some common law countries: for instance, in New Zealand a child or a spouse who has been neglected in the deceased will has some judicial remedies to redress the situation and obtain a share of the estate. However there are no general and clear guidelines regarding the circumstances in which such judicial remedies can be successfully used.

La Porta, Lopez-de-Silanes, Shleifer and Vishny (1997, 1998). Even more encouraging in this respect is that the correlation between the inheritance law indicators of Table 1 and measures of investor protection is far less than perfect, as shown by Panel C of Table 2. For the case with 3 children and a surviving spouse, the inheritance indicator's correlation with investor protection measures ranges from 0.62 for the self-dealing index proposed by Djankov et al. (2006) and 0.37 for the anti-director rights measure by La Porta et al. (1997) to 0.13 (and not significant) for the legality index proposed by defined by Berkowitz et al. (2003).<sup>17</sup> The correlation with the ratio between stock market capitalization to GDP, which is barely 0.20 (and not significant), is also of interest, because even though the latter is likely to be correlated with investor protection, even though it does not measure it directly.

### **3.2. Firm-level data**

Our original dataset is composed of a total of 4,528 international over the period 1992-2004, for a total of 32,735 firm-year observations. The firms come from 36 different countries as shown in Table 3. The data are drawn from three different sources: (i) the data set of Faccio and Lang (2002)<sup>18</sup> that includes European companies from 17 different countries and contains large, medium and small sized publicly-listed companies; (ii) U.S. firms that were included in the Fortune 500 list as of 1994; (iii) data on non-European ADRs with a Level II or III program and listed on the NYSE as of 1992. In detail, our original dataset is composed of the following firms: 450 firms in the Fortune 500 firms as of 1994, 3,894 firms from the Faccio and Lang dataset, and 184 non-European firms with an ADR program as Level II or Level III.

It should be noted that while the Faccio and Lang data set contains a total of 5,232 firms, we end up with a lower number of firms. First, consistent with the literature, we delete financial firms (SIC code between 6000 and 6900, and classified as "Financial" by Faccio and Lang (2002)). There

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<sup>17</sup> The Legality index is a weighted average of the legal index variables introduced by La Porta et al. (1997, 1998).

<sup>18</sup> The dataset can be found in the following website: <http://jfe.rochester.edu/data.htm>

are 1,114 of such firms, leaving us with a total pool of 4,118 firms. Second, we require financial and accounting data for at least 10 years for each firm. The source of the financial and accounting data for the Faccio and Lang dataset is Worldscope. We can find at least 10 years of data for only 3,294 of such firms. Upon including also the U.S. companies from the Fortune 500 list and the non-European ADRs for which we have at least 10 years of data, we end up with a dataset containing 4,148 firms from 32 countries.

The ownership data for the firms in the Faccio and Lang (2002) dataset come from a variety of sources, the major one being the various national Stock Exchange ownership files over the period 1996-1999.<sup>19</sup> Faccio and Lang collect the information on the ownership stake of blockholders using two cut-off points for control purposes: (a) a cut-off point at 10%, and (b) a cut-off at 20%. We hand-collected data on the ownership structure of the 450 US and 184 non-European ADRs in our sample by using 20-F forms and proxy statements without imposing any control cut-off. We supplement these sources by looking at firms' websites and other sources that can provide information about its history and founders.

In our empirical analysis, we define family firms as those where more than 10% of the control rights are owned by a single family or an unlisted firm, the reason being that very often families own shares in a listed firm via an unlisted holding that they control or fully own. Panel A of Table 3 shows that under this definition the breakdown between family and non-family firms is fairly balanced in almost every country, generally with a prevalence of family firms (except for the Denmark, Finland, Israel, New Zealand, Philippines, Taiwan, U.K. and U.S.). Panel B of the table shows that all sectors are well represented in the sample. In most sectors, the breakdown between family and non-family firms is rather balanced, and their ratio appears to reflect mainly the importance of the efficient scale of operation and capital intensity. The incidence of family firms is

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<sup>19</sup> To quote the authors: "To ensure accuracy, we include only countries for which we can obtain alternative sources (especially primary or official) to permit cross-checking. We do not rely on Worldscope if we have an official data source (i.e., the Stock Exchange ownership files). When official data sources are not available, we collect data from alternative sources. We use Worldscope for ownership data only when information for a specific firm can not otherwise be identified." (page 367)



larger in sectors with low capital-intensity and minimal scale, such as apparel, footwear, furniture, glass, leather, office and computing, paper products, pottery and wood products. Conversely, it is lower in drugs, food products, motor vehicle, other chemicals, petroleum and coal products, and professional goods.

#### 4. The evidence

The empirical methodology that we use to test the main predictions of the model in Section 1 is akin to that proposed by Rajan and Zingales (1998) – henceforth RZ – suitably adapted to take into account that our data are at a different level of aggregation (firm-level as opposed to industry-level) and that we are interested in the effect that inheritance law and investor protection (as opposed to financial development) have on firm investment. RZ construct their test by first identifying each industry’s need for external finance from firm-level data for the U.S., under the assumption that financial development is highest in that country. Then they interact this industry-level “external dependence” variable with a country-level proxy for the degree of financial development (so as to obtain a variable that measures the extent to which financial development constrains the growth of each industry in each country) and use this variable in a regression for industry-level growth.

In our case the dependent variable is the average firm-level investment rate over the sample period, defined as the ratio of capital expenditure to total assets ( $I_{j,s,c}$ ), where  $j$  identifies the firm,  $s$  the industry sector and  $c$  the country. In our most general specification, this variable is regressed on the initial level of total asset of firm  $j$  relative to the  $s$  industry median ( $X_{j,s,c}$ , an indicator of the initial capital stock of the firm), on financial dependence  $D_i$  interacted with a measure of investor protection  $IP_c$ , with our measure of inheritance law permissiveness  $H_c$  and with their

product  $IP_c \cdot H_c$ , on sector fixed effects  $\alpha_s$  ( $s = 1, \dots, S$ ) and country-level fixed effects  $\delta_c$  ( $c = 1, \dots, C$ ):

$$I_{i,s,c} = \beta_1 X_{i,s,c} + \beta_2 D_i \cdot IP_c + \beta_3 D_i \cdot H_c + \beta_3 D_i \cdot IP_c \cdot H_c + \alpha_i + \delta_c \quad (9)$$

The financial dependence  $D_i$  measure measures each industry's need for external finance from U.S. firm-level data. The assumption is that for U.S. listed firms access to financial markets is not an obstacle to investment, so that U.S. firms face a perfectly elastic supply curve for funds. Thus, differences across U.S. firms in reliance to external finance reflect primarily differences in demand triggered by differences in technology. Therefore, the methodology rests on the RZ assumption that technology, and therefore capital requirements, vary across industries but not across countries.

Table 4 reports the estimation results for various specifications, separately for family firms (Panel A) and for non-family firms (Panel B). The first noticeable result concerns the role of investor protection. The specification in Columns 1 to 3 of the table shows that the interaction between financial dependence and investor protection is positively associated with firm investment, both for family and non-family firms, and whichever measure of investor protection is used. The same applies to the more general specifications of Columns 4 to 9. But it is striking that for family firms the magnitude of the relevant coefficient is invariably larger by an order of 10 times or more than for non-family firms: the evidence suggests that family firms face tighter financing constraints than non-family ones, so that an improvement in investor protection promotes their investment much more than that of non-family firms.

The second striking result – and the most important one in the context of this paper – is that in Columns 4 to 9 the interaction between financial dependence and the permissiveness of the inheritance law has a positive and significant coefficient *only* for family firms, as predicted by the model: the stringency of the inheritance law acts as a drag only on the investment of family firms, but leaves non-family businesses unaffected. This result conforms to the prediction of our model,

and suggests that relaxing inheritance law would on average promote the investment of family firms.

Thirdly, in the specification of the last three columns of the table, we add also the interaction term between all three variables (financial dependence, inheritance law permissiveness and investor protection). This coefficient has a positive coefficient for family firms alone (and significantly different from zero when investor protection is measured by the anti-director rights index or the self-dealing index), while it is not significantly different from zero for non-family firms. In other words, the stringency of the inheritance law is more detrimental for the performance of family firms in countries where investor protection is weaker. Recall that our model predicts that this amplifying effect of inheritance law should be observed insofar as family firms are in the region where investment is finance-constrained (the case of country A in Figure 2 and the first interval to the left in Figure 3). This squares with the fact that, as already mentioned, the estimates in Table 4 indicate that family firms are finance-constrained, indeed much more severely than non-family ones.

In Table 5 we repeat the estimation of Table 4 with the addition of a variable capturing the tax rate on bequests, using data from the Coopers and Lybrand International Tax Summaries (kindly provided by Antoinette Schoar). The inclusion of this regressor leaves the main results of Table 4 unaffected: the coefficient of interaction between financial dependence and investor protection is positive and significant, and larger for family firms than for non-family ones; the further interaction with inheritance law permissiveness is positive and significant only for family firms. Moreover, as predicted by the model, the effect of inheritance taxes on investment is negative and larger for family firms, though not significant even in their case, and the cross-effect of investment protection is slightly reduced compared to the case where the inheritance tax is not considered.

## 5. Concluding remarks

Even though the literature produced by academic research on family firms is vast and rapidly expanding, so far very little attention has been devoted to the role that inheritance norms can have in constraining their investment and growth. This is quite surprising, considering that in contrast to economists, businessmen are keenly aware of the problem, the more so as the impact of inheritance law on family firms has been exacerbated in recent years by the increasing shift from the traditional family to extended families, with children being born in different marriages and/or out of wedlock.

For example, in Italy family firms are advocating a less stringent inheritance law. A family entrepreneur claims: “Today the family is no longer what it used to be sixty years ago: Italian society has changed and, in my opinion, it would be obvious to adjust the norms on inheritance law, giving to the testator more flexibility in disposing of his assets... In my opinion, the possibility [for the testator] of disposing freely of at least 50% of the estate would be a good step forward”.<sup>20</sup> As stated by the main business newspaper, the current law (which as shown in Section 3 is quite restrictive) is seen as inadequate: “In the likely case where the designated (controlling) heir does not have enough wealth to compensate the other heirs, the generational transfer would be possible only when the family firm has a large borrowing capacity”.<sup>21</sup> Under the current law, the potential claims of non-controlling heirs are so large that can destabilize even the largest family firms, such as Fiat.<sup>22</sup>

This paper shows that such concerns are consistent with theory and evidence. In the context of a stylized model of succession in a family firm, we show that larger legal claims by non-controlling heirs to the founder’s estate can lead to lower investment by the family firm, insofar as they reduce the firm’s ability to pledge future income streams to external financiers. This conclusion is robust to a number of extensions of the model. We are able to bring this prediction to the data, since we collect information about inheritance law in 62 countries, and build indicators of its permissiveness

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<sup>20</sup> “E l’eredità? Dev’essere libera”, *Corriere Economia*, 2 April 2007, page 9.

<sup>21</sup> “Sulla legittima è tempo per i correttivi”, *Il Sole 24 Ore*, 7 May 2007, page 35.

<sup>22</sup> In June 2007 Margherita Agnelli has challenged the inheritance agreement subscribed by all heirs after the death of Giovanni Agnelli in 2004 because she thought it was too penalizing for the children born in our second marriage and too advantageous for the children born from her marriage with Alan Elkann and especially for John Elkann, the heir of Giovanni Agnelli as the head of the FIAT industrial and financial empire.

from the viewpoint of a testator who wishes to bequeath the largest possible fraction of his/her estate to a single child. Using a newly built indicator of the permissiveness of inheritance law together with measures of investor protection and with data for 4,148 firms from 32 countries for the 1992-2004 interval, we find that indeed the strictness of inheritance law is associated with lower investment in family firms, while it leaves investment unaffected in non-family firms.

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**Table 1. Inheritance Law and Investor Protection Around the World**

The table provides data on the largest share of the estate that in each country a testator can bequeath to a single child in the absence of a surviving spouse (columns 1 and 2) or in the presence of a surviving spouse (column 3, 4 and 5), for different numbers of children. For example, column 1 shows the share that can be given to a child in the presence of 2 children but no spouse, while column 4 shows the maximum share that can be given to a child in the presence of 2 children and a spouse. In column 6, 7 and 8 we show the Revised Anti-Director Index, the Self Dealing Index and the Ratio of Stock Market Capitalization to GDP, all drawn from Djankov et al. (2006).

Country	2 children, no spouse	3 children, no spouse	1 child, spouse	2 children, spouse	3 children, spouse	Anti- director index	Self- dealing index	Stock market cap. /GDP
Argentina	0.667	0.556	0.667	0.556	0.5	2	0.34	58.1
Australia	1	1	1	1	1	4	0.76	102
Austria	0.75	0.667	0.833	0.667	0.611	2.5	0.21	16.4
Bangladesh	0.5	0.333	0.667	0.333	0.222			
Belgium	0.667	0.5	0.5	0.333	0.25	3	0.54	67.2
Bolivia	0.6	0.467	0.8	0.5	0.4	2	0.14	15.6
Brazil	0.75	0.667	0.75	0.667	0.625	5	0.27	38.4
Bulgaria	1	1	1	1	1	3	0.65	5.5
Canada	1	1	1	1	1	4	0.64	106.2
Cayman Islands	1	1	1	1	1			
Chile	0.75	0.667	0.75	0.625	0.6	4	0.63	89.7
Colombia	0.75	0.667	0.5	0.375	0.333	3	0.57	14.3
Costa Rica	1	1	1	1	1			
Croatia	0.75	0.68	0.75	0.68	0.625	2.5	0.25	16.5
Cyprus	0.625	0.5	0.625	0.5	0.438			
Denmark	0.75	0.667	0.833	0.667	0.611	4	0.46	58.6
El Salvador	1	1	1	1	1	2	0.43	17.3
Estonia	0.75	0.667	0.75	0.667	0.625			
Finland	0.75	0.667	1	0.75	0.667	3.5	0.46	177.1
France	0.66	0.5	1	0.66	0.5	3.5	0.38	89.5
Germany	0.75	0.667	0.75	0.667	0.625	3.5	0.28	54.7
Greece	0.75	0.667	0.875	0.688	0.625	2	0.22	91.4
Guatemala	1	1	1	1	1			
Hungary	0.75	0.667	1	0.75	0.667	2	0.18	24.0
Iceland	0.667	0.556	0.778	0.556	0.481	4.5	0.24	64.2
India	1	1	1	1	1	5	0.58	33.8
Ireland	1	1	0.667	0.667	0.667	5	0.79	67.6
Israel	1	1	1	1	1	4	0.73	53
Italy	0.667	0.556	0.667	0.5	0.417	2	0.42	52.8
Jamaica	1	1	1	1	1	4	0.35	65
Japan	0.75	0.667	0.75	0.625	0.583	4.5	0.5	69.2
Jordan	0.5	0.333	0.667	0.333	0.222	1	0.16	77.6
Kenya	1	1	1	1	1	2	0.21	15.3
Kuwait	0.5	0.333	0.667	0.333	0.222			
Latvia	0.75	0.667	0.75	0.667	0.625	4	0.32	8.5
Lebanon	0.75	0.667	0.9	0.7	0.633			
Liechtenstein	0.75	0.667	0.666	0.5	0.444			
Lithuania	0.75	0.667	0.875	0.688	0.625	4	0.36	12.8
Luxembourg	0.667	0.5	1	0.66	0.5	2	0.28	144.6
Malta	0.833	0.778	0.75	0.583	0.528			
Monaco	0.667	0.5	1	0.667	0.5			

Netherlands	0.75	0.667	0.75	0.667	0.625	2.5	0.2	131.7
New Zealand	1	1	1	1	1	4	0.95	40.1
Norway	0.667	0.556	0.75	0.417	0.305	3.5	0.42	39.7
Peru	0.667	0.556	0.667	0.556	0.5	3.5	0.45	22.8
Philippines	0.5	0.333	0.5	0.333	0.25	4	0.22	48
Portugal	0.667	0.556	0.667	0.542	0.472	2.5	0.44	46.2
Romania	0.667	0.5	0.875	0.583	0.438	5	0.44	5.5
Saudi Arabia	0.5	0.333	0.667	0.333	0.222			
Slovak Rep.	0.75	0.5	0.75	0.5	0.375	3	0.29	5.3
South Africa	1	1	1	1	1	5	0.81	155.8
South Korea	0.75	0.667	0.7	0.643	0.611	4.5	0.47	54.1
Spain	0.833	0.778	0.667	0.5	0.444	5	0.37	79.9
Sri Lanka	1	1	1	1	1	4	0.39	10
Sweden	0.75	0.667	1	0.75	0.667	3.5	0.33	112.3
Switzerland	0.625	0.5	0.75	0.5	0.417	3	0.27	249
Taiwan	0.75	0.667	0.75	0.667	0.625	3	0.56	101.9
Thailand	1	1	1	1	1	4	0.81	44.8
United Kingdom	1	1	1	1	1	5	0.95	157.7
United States	1	1	1	1	1	3	0.65	142.1
Uruguay	0.667	0.5	0.667	0.5	0.438	1	0.18	1.2
Venezuela	0.75	0.667	0.75	0.667	0.625	1	0.09	5.5



**Table 2. Inheritance Law: Descriptive Statistics**

Panels A provides descriptive statistics on the maximum share that can be bequeathed to a single child in the absence or presence of a surviving spouse, for 2 or 3 numbers of children in civil law countries. Panel B provides the same statistics for common law countries. Panel C shows the correlation of the maximum share that can be bequeathed to a single child with the Revised Anti-Director Index, the Self Dealing Index and the ratio of Stock Market Capitalization to GDP drawn from Djankov et al. (2006) and the Legality Index defined by Berkowitz et al. (2003).

**Panel A**

<b>Civil law</b>	<b>2 children, no spouse</b>	<b>3 children, No spouse</b>	<b>2 children, Spouse</b>	<b>3 children, spouse</b>
Mean	0.70	0.60	0.57	0.51
Standard deviation	0.08	0.11	0.13	0.14
Minimum	0.50	0.33	0.33	0.22
Maximum	0.83	0.78	0.75	0.67

**Panel B**

<b>Common law</b>	<b>2 children, no spouse</b>	<b>3 children, No spouse</b>	<b>2 children, Spouse</b>	<b>3 children, spouse</b>
Mean	1	1	0.97	0.97
Standard deviation	0	0	0.10	0.10
Minimum	1	1	0.67	0.67
Maximum	1	1	1	1

**Panel C**

<b>Correlation with (p-value)</b>	<b>2 children, no spouse</b>	<b>3 children, No spouse</b>	<b>2 children, Spouse</b>	<b>3 children, spouse</b>
Anti-director index	0.48 (0.004)	0.47 (0.005)	0.35 (0.043)	0.37 (0.031)
Self Dealing Index	0.73 (0.000)	0.72 (0.000)	0.59 (0.000)	0.62 (0.000)
Stock Market Cap./GDP	0.12 (0.496)	0.12 (0.502)	0.23 (0.188)	0.203 (0.250)
Legality Index	0.16 (0.386)	0.13 (0.448)	0.181 (0.330)	0.13 (0.475)

**Table 3. Company Data: Sample Description**

**Panel A. Geographical Distribution of the Sample**

<b>Country</b>	<b>Number of non-Family Firms</b>	<b>Number of Family Firms</b>	<b>Country</b>	<b>Number of non-Family Firms</b>	<b>Number of Family Firms</b>
Argentina	2	5	Mexico	6	23
Australia	12	26	Netherlands	20	24
Austria	34	28	New Zealand	3	0
Belgium	20	52	Norway	62	128
Brazil	14	18	Peru	2	10
Colombia	0	2	Philippines	2	0
Denmark	6	2	Portugal	20	32
Finland	60	21	South Africa	4	13
France	158	214	South Korea	6	9
Germany	194	308	Spain	46	83
Greece	2	6	Sweden	82	96
India	1	1	Switzerland	32	128
Ireland	58	64	Taiwan	8	4
Israel	14	8	UK	708	605
Italy	28	131	USA	404	46
Japan	16	31	Venezuela	2	4

**Panel B. Industrial Classification of Sample Firms**

<b>Industrial Sector</b>	<b>Number of non-Family Firms</b>	<b>Number of Family Firms</b>	<b>Industrial Sector</b>	<b>Number of non-Family Firms</b>	<b>Number of Family Firms</b>
Apparel (322)	18	89	Other industries (390)	152	87
Basics ex. fert. (3511)	20	35	Paper products (341)	14	47
Beverage (313)	34	38	Petroleum and coal products (354)	40	15
Drugs (3522)	86	54	Petroleum refining (353)	46	21
Electric machinery (383)	96	111	Plastic products (356)	48	87
Food products (311)	167	104	Pottery (361)	56	75
Footwear (324)	14	31	Printing and publishing (342)	74	73
Furniture (332)	43	89	Professional goods (385)	134	39
Glass (362)	34	71	Pulp paper (3411)	60	95
Iron and steel (371)	112	49	Radio (3832)	24	14
Leather (323)	30	57	Rubber products (355)	24	59
Machinery (382)	64	81	Ship (3841)	38	49
Metal products (381)	66	82	Spinning (3211)	18	47
Motor vehicle (3843)	33	22	Synthetic resins (3513)	34	31
Non-ferrous metal (372)	42	69	Textiles (321)	74	53
Non-metal products (369)	65	54	Tobacco (314)	12	35
Office and computing (3825)	30	62	Transportation equipment (384)	62	75
Other chemicals (352)	132	49	Wood products (331)	30	73

**Table 4. Impact of Inheritance Laws and Investor Protection on Firm Investment**

This table presents the estimates of a cross-sectional regression model for 4,148 international firms. The dependent variable is the mean of the ratio of Capital Expenditure in year  $t$  over Total Assets in year  $t-1$ . The mean is calculated over the period 1992-2004 for all firms for which we have at least 10 years of non-missing data. The independent variables are: Financial Dependence  $\times$  Investor Protection is the industry-specific financial dependence interacted with Investor Protection; Financial Dependence  $\times$  Inheritance Law is the interaction between financial dependence and the maximum share that can be given to a child in the presence of a spouse and three children; and Financial Dependence  $\times$  Inheritance Law  $\times$  Investor Protection is the interaction of all three variables. We use three different measures of Investor Protection: the Revised Anti-Director Index of LLSV (1998) in columns (1), (4) and (7); the Self Dealing Index from Djankov et al. (2006) in columns (2), (5) and (8); and the Stock Market Capitalization to GDP from Djankov et al. (2006) in columns (3), (6) and (9).

**Panel A: Non-Family Firms**

	1	2	3	4	5	6	7	8	9
Financial Dependence $\times$ Investor Protection	0.0055** (8.60)	0.0305** (8.79)	0.0017** (8.60)	0.0027** (2.21)	0.0251** (2.04)	0.0010* (1.92)	0.0021** (1.98)	0.0259** (2.01)	0.0010* (1.89)
Financial Dependence $\times$ Inheritance Law				0.0140 (1.23)	0.0050 (0.40)	0.0140 (1.34)	-0.0038 (-0.24)	0.0050 (0.40)	0.0124 (1.08)
Financial Dependence $\times$ Inheritance Law $\times$ Investor Protection							0.0055 (1.63)	-0.0008 (-1.58)	0.00003 (1.49)
Assets in 1992 (x100000)	-0.0968 (-1.27)	-0.0012 (-0.98)	-0.0018 (-1.02)	-0.0015 (-0.99)	-0.0018 (1.10)	-0.0031 (-1.22)	-0.0018 (-1.01)	-0.0020 (-1.21)	-0.0028 (-1.19)
Industry Dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country Dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES
Adjusted R <sup>2</sup>	0.3665	0.3675	0.3665	0.3667	0.3673	0.3668	0.3672	0.3669	0.3665
Number of Observations	2,026	2,026	2,026	2,026	2,026	2,026	2,026	2,026	2,026

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**Panel B: Family Firms**

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Financial Dependence × Investor Protection	0.0904** (5.73)	0.5195** (9.41)	0.0025** (10.11)	0.0643** (4.76)	0.1518* (1.92)	0.0016 (1.60)	0.0617** (2.56)	0.3251** (2.26)	0.0012 (1.51)
Financial Dependence × Inheritance Law				0.1403** (1.99)	0.3356** (2.81)	0.7187** (5.50)	0.1293* (1.82)	0.3327** (2.77)	0.7612** (3.47)
Financial Dependence × Inheritance Law × Investor Protection							0.0576** (2.85)	0.1804* (1.85)	0.0007 (1.42)
Assets in 1992	-0.1220** (-2.08)	-0.1881** (-2.97)	-0.1251* (-1.88)	-0.1152* (-1.85)	-0.1261* (-1.90)	-0.0971 (-1.59)	-0.1273* (-1.81)	-0.0911 (-1.55)	-0.0856 (1.48)
Industry Dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country Dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES
Adjusted R <sup>2</sup>	0.3693	0.3591	0.3225	0.3701	0.3651	0.3708	0.3720	0.3657	0.3711
Number of Observations	2,122	2,122	2,122	2,122	2,122	2,122	2,122	2,122	2,122

**Table 5. Impact of Inheritance Laws and Investor Protection on Firm Investment, Accounting for Inheritance Taxes**

This table presents the estimates of a cross-sectional regression model for 4,148 international firms. The dependent variable is the mean of the ratio of Capital Expenditure in year  $t$  over Total Assets in year  $t-1$ . The mean of the ratio is calculated over the period 1992-2004 for all firms for which we have at least 10 years of non-missing data. Financial Dependence  $\times$  Inheritance Tax is the level of industry-specific financial dependence interacted with Inheritance Taxes, which is the inheritance tax transfer rate from the Coopers and Lybrand International Tax Summaries. Other explanatory variables are defined as in the legend to Table 4.

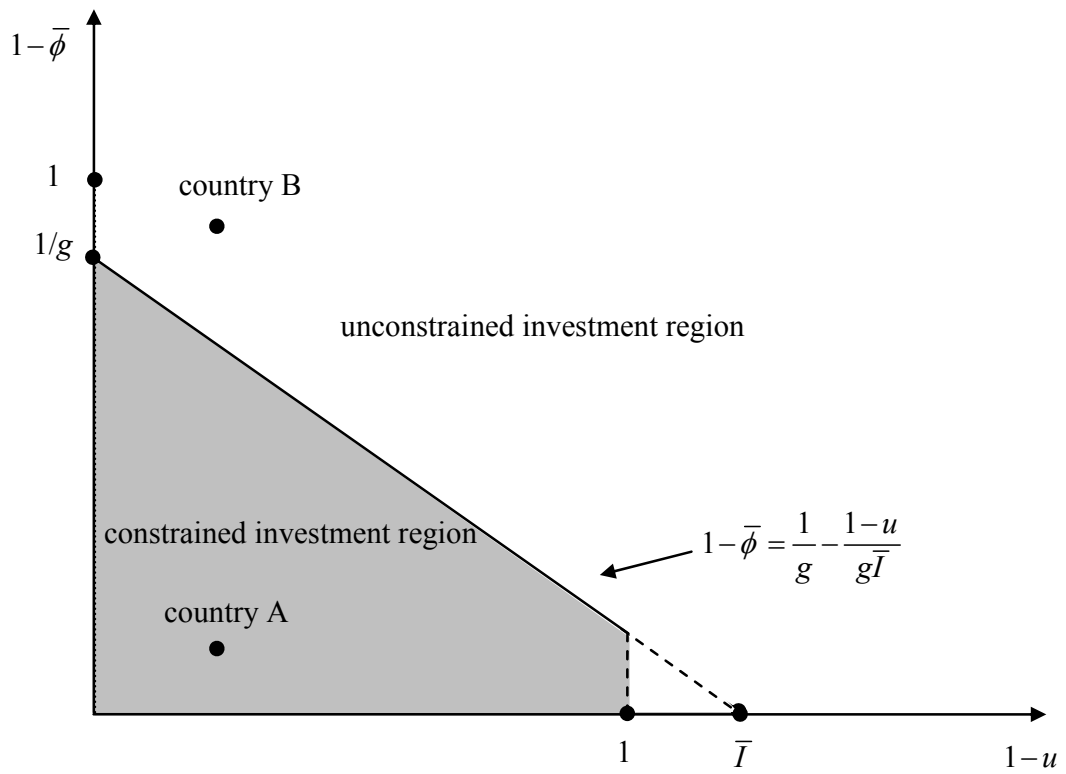
<b>Panel A: Non-Family Firms</b>									
	1	2	3	4	5	6	7	8	9
Financial Dependence $\times$ Investor Protection	0.0052** (8.51)	0.0287** (8.41)	0.0016** (8.24)	0.0025** (2.18)	0.0240** (1.98)	0.0011* (1.85)	0.0020* (1.94)	0.0251** (1.97)	0.0010* (1.85)
Financial Dependence $\times$ Inheritance Law				0.0132 (1.20)	0.0051 (0.40)	0.0132 (1.28)	-0.0035 (-0.21)	0.0046 (0.38)	0.0120 (1.05)
Financial Dependence $\times$ Inheritance Law $\times$ Investor Protection							0.0049 (1.58)	-0.0008 (-1.57)	0.00003 (1.41)
Financial Dependence $\times$ Inheritance Tax	-0.0012 (-0.62)	-0.0014 (-0.70)	-0.0018 (-0.84)	-0.0010 (-0.60)	-0.0012 (-0.72)	-0.0016 (-0.84)	-0.0010 (-0.58)	-0.0011 (-0.60)	-0.0018 (-0.75)
Assets in 1992 (x100000)	-0.0955 (-1.21)	-0.0012 (-0.95)	-0.0018 (-1.02)	-0.0014 (-0.95)	-0.0018 (1.08)	-0.0031 (-1.22)	-0.0018 (-1.00)	-0.0019 (-1.18)	-0.0027 (-1.15)
Industry Dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country Dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES
Adjusted R <sup>2</sup>	0.3712	0.3785	0.3815	0.3702	0.3715	0.3708	0.3702	0.3695	0.3692
Number of Observations	2,014	2,014	2,014	2,014	2,014	2,014	2,014	2,014	2,014

**Panel B: Family Firms**

Financial Dependence × Investor Protection	0.0851** (5.27)	0.4918** (8.12)	0.0022** (8.95)	0.0604** (4.20)	0.1500* (1.84)	0.0016 (1.58)	0.0592** (2.14)	0.3200** (2.11)	0.0012 (1.49)
Financial Dependence × Inheritance Law				0.1286** (1.97)	0.3162** (2.19)	0.6987** (4.95)	0.1195* (1.79)	0.3257** (2.45)	0.7588** (3.12)
Financial Dependence × Inheritance Law × Investor Protection							0.0562* (1.75)	0.1749 (1.55)	0.0007 (1.41)
Financial Dependence × Inheritance Tax	-0.0028 (-1.16)	-0.0025 (-1.21)	-0.0026 (-1.54)	-0.0027 (-1.12)	-0.0026 (-1.15)	-0.0024 (-1.58)	-0.0025 (-1.18)	-0.0026 (-1.25)	-0.0029 (-1.59)
Assets in 1992	-0.1182** (-1.97)	-0.1815** (-2.97)	-0.1109* (-1.72)	-0.1012* (-1.81)	-0.1215* (-1.86)	-0.0911 (-1.49)	-0.1204* (-1.75)	-0.0891 (-1.49)	-0.0801 (1.41)
Industry Dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country Dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES
Adjusted R <sup>2</sup>	0.3723	0.3652	0.3288	0.3789	0.3692	0.3802	0.3781	0.3715	0.3786
Number of Observations	2,094	2,094	2,094	2,094	2,094	2,094	2,094	2,094	2,094







**Figure 2. Family firm investment, investor protection ( $1-\bar{\phi}$ ) and permissiveness of inheritance law ( $1-u$ )**