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Stijn Claessens and Luc Laeven

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Stijn Claessens, Universiteit van Amsterdam and CEPR
Luc Laeven, World Bank

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Centre for Economic Policy Research
90–98 Goswell Rd, London EC1V 7RR, UK
Tel: (44 20) 7878 2900, Fax: (44 20) 7878 2999
Email: cepr@cepr.org, Website: www.cepr.org

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ABSTRACT

Financial Development, Property Rights and Growth*

This Paper investigates how the legal framework not only affects the amount of external financing available, but also firms' resource allocation among different types of assets. Using a simple model, we show that in a weaker legal environment a firm will get less financing, and thus invest less, but also invest less in intangible assets. Empirically, these two effects appear to be equally important drivers of growth in sectoral value added for a large number of countries and using a number of robustness tests. Using individual firm data, we find further supporting evidence as weaker legal frameworks are associated with relatively more fixed assets, but less long-term financing for a given amount of fixed assets.

JEL Classification: G31, G32, O34 and O40

Keywords: economic growth, financial development, intangible assets and property rights

Stijn Claessens
Universiteit van Amsterdam
Roeterstraat 11
1018 WB Amsterdam
THE NETHERLANDS
Tel: (31 20) 525 6020
Fax: (31 20) 525 5285
Email: stijn@fee.uva.nl

Luc Laeven
World Bank
1818 H Street, NW
Washington, DC 20433
USA
Tel: (1 202) 458 2939
Email: llaeven@worldbank.org

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1. Introduction

Recently, a large number of papers have established that financial development fosters growth and that financial development in turn is related to a country's institutional characteristics, including its legal framework. Furthermore, an independent influence of the quality of legal framework on growth has been established. The financial development and growth literature has convincingly established that finance matters for growth, both at the macro-economic and micro-economic level (King and Levine, 1993; see Levine 1997 for a survey of this literature). The law and finance literature has found that firms in countries with well-developed financial markets and strong legal frameworks find it easier to attract (long-term) financing for their investment needs (La Porta et al. 1998, Demirgüç-Kunt and Maksimovic 1998, Rajan and Zingales 1998). Related work has established that debt structures of firms differ across institutional frameworks (Rajan and Zingales 1995, Demirgüç-Kunt and Maksimovic 1999, Booth et al. 2000). In particular, it has been established that firms in developing countries have a smaller fraction of their total debt in the form of long-term debt.

Thus far, however, the literature has not paid much attention to differences across countries in firms' asset structure, i.e., differences in the allocation of investible funds by firms across various types of assets. But these differences are large as well. Demirgüç-Kunt and Maksimovic (1999) find, for example, that firms in developing countries have higher proportions of fixed assets to total assets. This is surprising as the literature on firms' optimal capital structure (Harris and Raviv 1991) would suggest that a lack of long-term financing typically in a developing country would make it more difficult to finance fixed assets. At the same time, firms in developing countries have less intangible assets than comparable firms in developed countries. So far, to our knowledge, no explanation of these findings on the asset side of firms has been provided. How come that firms in developing countries have more fixed assets while they find it more difficult to get long-term external financing? Is it that they need more nominal collateral to attract the same amount of external financing? And is the preference for fixed assets, and a corresponding lower share of intangible assets, in developing countries because the returns to fixed assets are easier to secure from the firm's point of view than the returns

on intangible assets? More generally, what is the role of property rights in terms of affecting investment patterns?

In this paper, we explore the role on property rights in influencing, besides the availability of external financing, the allocation of investable resources. Using a simple framework, we use the well established proposition that weaker legal frameworks diminish the availability of external resources available and thus reduce firm investment. We then use the framework to show that the quality of protection of property rights also affects the allocation of investable resources between fixed and intangible assets. In particular, we show that it may be efficient for a firm that operates in a market with weaker property rights to invest more in fixed assets relative to intangible assets. The degree to which the firm allocates resources towards fixed investment will in particular depend on the strength of a country's intellectual property rights.² The framework thus shows that the choice of a firm's asset structure in countries with imperfect financial markets and weaker property rights is influenced by two factors: a finance effect and an asset allocation effect. Both effects will influence firm growth. The lack of finance will determine the available resources for investment, which has a direct effect on firm growth. The asset allocation effect will determine the efficiency of investment and thus also affect growth. In particular, since the value of intangible assets often lies in future growth opportunities, a better protection of property rights can be expected to lead to more investment in intangible assets and higher future growth.

The paper next uses the framework to investigate empirically for a large number of countries the importance of the finance and asset allocation effects. We find that weaker property rights are associated with lower firm growth on account of both effects: firms get less financing, and thus underinvest overall; and they underinvest particularly in intangible assets relative to fixed assets. Empirically, the two effects appear to be equally important drivers of growth in sectoral value added for a large number of countries. The

² We use the term intellectual property rights to differentiate those property rights that specifically protect the returns to intangible assets from other property rights. In a narrow sense, such intellectual property rights include monopoly rights such as patents (property rights to inventions and other technical improvements), copyrights (property rights to authors, artists, and composers), and trademarks (property rights for distinctive commercial marks or symbols). In a broad sense, other property rights also protect the returns to intangible assets more than those to fixed assets do. In practice, the protection of intellectual and other property rights are highly correlated across countries.

results are robust to country sample and estimation techniques. Using firm specific data, we find supportive evidence for the importance of the two effects from actual investment and financing patterns. We show that firms in developing countries invest relatively more in fixed assets despite a legal framework that gives little collateral value to fixed assets. We also find that firms in these countries obtain less long-term financing for a given amount of fixed assets, as weaker creditor rights diminish the collateral value of their fixed assets. The fact that property rights protecting intangible assets in these countries are even worse than those protecting fixed assets may cause firms to favor investments in fixed assets over investments in intangible assets.

The paper is structured as follows. Section 2 reviews the related literature. Section 3 describes the finance and asset allocation effect using a simple framework and presents our methodology to disentangle the two effects empirically. Section 4 presents the data used in the empirical work. Section 5 presents the empirical results concerning the relationships between growth in valued-added and the finance and asset-allocation effects. Section 6 presents our robustness tests and the results using the firm-specific data. Section 7 concludes.

2. Related Literature

Our work is related to several strands of literature. The starting point is the work by King and Levine (1993), Levine and Zervos (1998), and Beck et al. (2000) that has established an empirical link between financial development and economic growth, with a focus on the role of legal systems. Complementary is the so-called law and finance literature initiated by La Porta et al. (1998) and Rajan and Zingales (1998). This literature focuses on the relationship between the institutional framework of a country and its financial development (see also La Porta et al. 1997, Demirgüç-Kunt and Maksimovic 1998, and Carlin and Mayer, 2000). This literature has established that financial sector development is higher in countries with better legal systems and creditor rights as such environments increase the ability of lenders to finance firms and collateralize their loans.

The second strand we draw on is the capital structure literature (Myers 1977, Titman and Wessels 1988, and Harris and Raviv 1991). This literature has established that real, tangible assets, such as plant and equipment, support more debt than intangible

assets. In particular, fixed assets can support more (long-term) debt as they have more liquidation and collateralizable value. As intangibles have value only as part of a going concern, it follows that, holding other factors constant, debt-to-firm value ratios will be lower the larger the proportion of firm values represented by investment options (Myers 1977). Bradley et al. (1984) and Long and Malitz (1985) provide empirical support for the argument that a larger amount of intangible assets reduces the borrowing capacity of a firm. Rajan and Zingales (1995) and Demirgüç-Kunt and Maksimovic (1999) show for firms in a cross-section of countries that debt maturity and asset structures are related, with firms with more fixed assets being able to support a greater share of long-term debt.

The third strand relates to the new growth literature, which highlights the importance of different types of inputs in firm production. This literature has broadened the set of productive inputs from capital and labor (Solow 1956) to human capital and technology (Romer 1990, and Barro 1991, among others). In particular, Romer (1986, 1987) shows that technology can exhibit increasing returns to scale and therefore the current endowment of technology is important for future growth. Empirically, a link has been established between equipment investment, which incorporates technology, and economic growth, especially for developing countries (De Long and Summers, 1991, 1993). Investment in intangibles also appears to foster growth. Nickell and Nicolitsas (1996) find a link between increased R&D expenditure and subsequent increase in fixed capital investment. Asset composition can thus have implications for growth, important for developing countries in light of difference in their firms' asset composition. A relatively lower investment in intangible assets by firms in developing countries (as shown by Demirgüç-Kunt and Maksimovic 1999) could thus mean that growth is below optimal levels in developing countries.

The lower degree of investment in intangible assets in developing countries may relate to the weaker protection of property rights in these countries, the fourth strand of related literature. The role of property rights in affecting overall investment has been long acknowledged and studied. Besley (1995) shows the role of property rights for investment incentives and provides evidence of the importance of property rights in the context of land ownership of farmers in Ghana. For a sample of firms in post-communist countries, Johnson et al. (2001) show that weaker property rights discourage the reinvestment of earnings, even when bank loans are available. The role of property rights

in affecting investment patterns has also been acknowledged, although little studied explicitly. Mansfield (1995) hints that there may be a relationship between protection of property rights and the allocation of investable resources between fixed and intangible assets. Using a survey of firm managers, he states that “Most of the firms we contacted seemed to regard intellectual property rights protection to be an important factor” ... “[influencing] investment decisions”. More generally, the institutional economics literature (North, 1990, and De Soto, 2000) can be interpreted to suggest that investment in different type of assets will tend to be higher the more protected the property rights of the particular asset are.³

3. Framework and Empirical Methodology

This section develops the link between on one hand the protection of property rights and on the other hand the amount of investable resources as well as its allocation between fixed and intangible assets. The law and finance literature already established that firms in a country with stronger property rights and more developed financial markets would find it easier to attract external financing. Using a simple framework, we also show that in a country with weaker property rights it may be efficient for firms to choose more investment in fixed assets relative to intangible assets compared to firms functioning in an environment with strong property rights. A firm’s asset size and structure will thus be affected by the strength of property rights in the country in two ways: an availability of external finance and an asset allocation effect.

Figure 1 develops the difference between the finance effect and the asset allocation effect in more detail for the case of a single firm operating in a particular institutional environment, but otherwise equal to other firms. We take labor and human capital as fixed and assume that the firm operates in a global market with full capital mobility and equal good prices for inputs and outputs. The optimal production point given world factor prices for fixed and intangible assets and output prices entails combinations of amounts of fixed and intangible assets that lay along the line from the origin through point A.

³ Keely (2000) surveys the evidence on the economic effects of intellectual property rights on growth and finds that some positive level of intellectual property protection is optimal. She also analyzes the arguments for and against strong intellectual property rights in developing countries given their comparative (dis-) advantages in producing and consumer intellectual property goods.

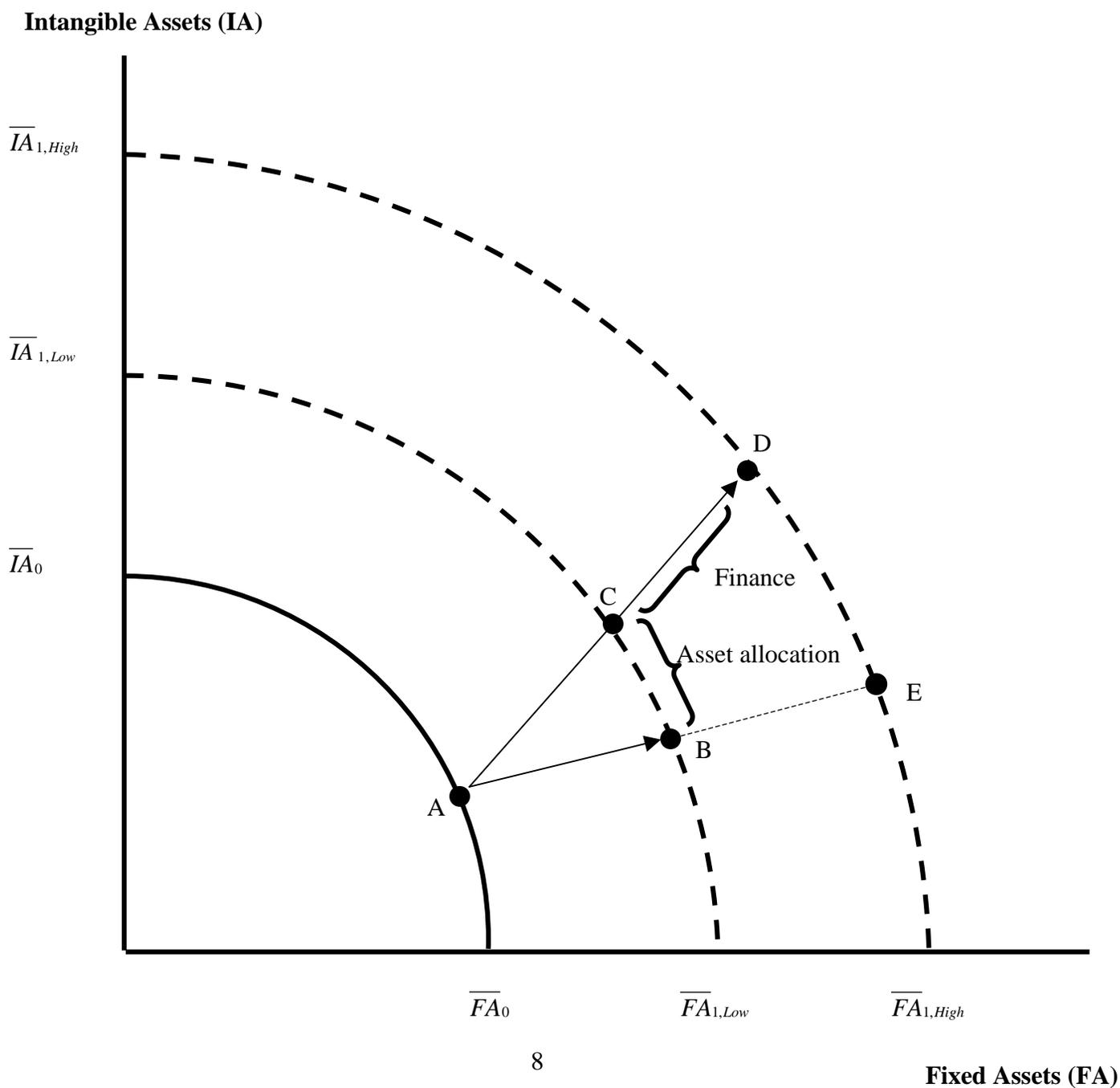
Assume the firm wants to expand from initial point A as demand increases. If the firm has access to highly developed financial markets and is able to collateralize all types of assets, it would be able to raise enough external financing to invest in an optimal proportion of fixed assets and intangible assets to arrive at say point D. The investment (and growth) of firms in countries with well-developed financial markets should exhibit such patterns.

If the supply of external financing is limited, the firm may only be able to reach point C. The difference between point D and point C could then be ascribed to the more limited supply of external financing. The firm, however, could also deviate from the optimal production line, the line along points A, C and D. It may, for example, find it more efficient to choose point B rather than point C. This would be if the firm finds it more difficult to secure returns from intangible assets compared to securing returns from fixed assets. This could be the case in countries where due to poor (intellectual) property rights it may be hard for a firm to collect revenues from assets such as patents and other intangible assets. More generally, a preference for investments in fixed assets rather than intangible assets may arise in countries with poor protection of property rights when there are fixed costs to producing intangible assets. With poor protection of property rights, it will be less attractive for a firm to incur any fixed costs to produce intangible assets, like investing in research and development, marketing, networks, human resources, etc. This could make it more attractive for a firm to invest relatively more in fixed assets.

The lack of finance view focuses on the difference between point D and C, as it considers the supply of external financing to be independent of the asset choice. Firms in countries that have both low financial development and poor property rights may however, choose systematically point B rather than point C. The lack of finance view then ascribes the whole difference between point D and B, and any impact on firm growth, to limited financial development and poor legal frameworks only. In other words, the lack of finance view ignores any differences on the asset side of the firm's balance sheet when studying the effects of financial development and legal frameworks on firm financing and growth patterns. But the difference between point D and B is not only due to a lack of finance effect, but also due to an asset allocation effect. The two effects are not only different, but may also have different and complementary effects on final firm growth. Note that in our example firms in countries with a well-developed

financial sector but poor protection of property rights would choose point E in Figure 1. Thus, point E illustrates the case where the finance effect is absent and the deviation from the optimal allocation (point D) can be contributed fully to the asset allocation effect that arises from poor property rights. The empirical question thus is how the asset allocation effect can be differentiated from the finance effect, and what its quantitative importance might be.

Figure 1: Investment in intangible assets versus fixed assets: finance and asset allocation effects



Overall, the above discussion provides two hypotheses: firms in countries with better legal and financial systems will have more overall investment; and firms in countries with better property rights more efficient asset structures. Both aspects will in turn be reflected in higher growth rates. To empirically test what aspects of the frameworks affect growth rates and to what extent, we use a setup similar to that used by Rajan and Zingales (1998, RZ) to assess the relationship between financial development and growth.⁴ In particular, we test whether industrial sectors that typically use a lot of intangible assets grow faster in countries with stronger property rights. We use the same methodology used by RZ, but also perform a number of robustness tests on the importance of controlling for country-specific factors. In addition to investigating the effects of property rights on firm growth, we directly explore the asset allocation effect by investigating whether firms in countries with weaker property rights invest less in intangible assets. We also directly explore the law and finance effect by investigating the relationships between the strength of legal rights and the development of the financial sector on the one hand and the amount of long-term debt extended by lenders per unit of firm fixed assets on the other hand. In what follows, we develop our regression specifications for each of these three tests.

Let there be m countries, each indicated by index k , and n industries, each indicated by index j . The first set of equations relates the growth in real value added in a sector in a particular country to a number of country and firm-specific variables. The law and finance effect is measured by the interaction term between the typical external dependence variable for the particular sector and the country's level of legal or financial development. The argument of RZ is that financially dependent firms can be expected to grow more in countries with a higher level of legal and financial development. In case of RZ, the specific test focussed on financial development and a positive sign was found for the interaction between the external financial dependence ratio and the level of financial development. Apart from testing the legal and finance effects, we expand this equation to also allow us to disentangle these effects from the asset allocation effect. We do this by testing directly whether growth is higher for firms that typically use a lot of intangible

⁴ Other papers which use this approach include Cetorelli and Gambera, 2001, and Fishman and Love, 2001.

assets in countries with better protection of property rights. Specifically, equation (1) extends the basic model in RZ by adding a variable that is the interaction of the typical ratio for each sector of intangible-to-fixed assets and an index of the strength of countries' property rights. Adding this second interaction variable makes the setup similar to that of Cetorelli and Gambera 2001 whom investigate the effects of banking concentration on sectoral growth using the same data set.

In line with RZ, we use US firm data to construct proxies for the typical external dependence for a particular industrial sector and the typical ratio of intangible-to-fixed assets for a particular industry. The presumption here is that the US financial markets are well developed and that property rights are well protected in the U.S. such that US firms are at the optimal external financing and asset structure points for their respective industrial sector. Following RZ, we add in the regression the industry's market share in total manufacturing in the specific country to control for differences in growth potential across industries. Industries with large market shares initially may have less growth potential than industries with small market shares initially when there is an industry-specific convergence. The initial share may also help to control for other variations between countries in their initial comparative advantage among certain industries based on factors other than financial development and property rights protection. Some countries may, for example, based on initial endowments of human skills relevant to a particular sector, have a growth performance of that sector below or above that of other countries. In line with RZ, we use the ratio of private credit to GDP as proxy for financial development.

$$\begin{aligned}
\text{Growth}_{j,k} = & \text{Constant} + \beta_{1\dots m} \cdot \text{Country indicators} + \beta_{m+1\dots m+n} \cdot \text{Industry indicators} \\
& + \beta_{m+n+1} \cdot (\text{Industry } j \text{ share of manufacturing in country } k \text{ in 1980}) \\
& + \beta_{m+n+2} \cdot (\text{External dependence US industry } j \cdot \text{Financial development country } k) \quad (1) \\
& + \beta_{m+n+3} \cdot (\text{Intangible assets/Fixed assets US industry } j \cdot \text{Property rights country } k) \\
& + \varepsilon_{j,k}.
\end{aligned}$$

The law and finance literature asserts that financial markets are more developed in environments with better law and order (and creditor rights). In this view, financial development is the result of a good legal framework and the supply of external financing

is not independent of the quality of the legal framework. We therefore also estimate a variation of the previous specification that uses the law and order index of a country rather than financial development, again interacted with a sector's financial dependence.⁵ As proxies for the level of protection of property rights we use a broad index of property rights, an index of intellectual property rights, as well as a more narrowly defined index of patent rights. In all three cases, we assume that a better rating of (intellectual) property protection indicates a relatively better protection of intangible versus tangible assets.

4. Data

We use the dataset from RZ, country-specific data from a variety of sources and firm-level data from WorldScope. Table 1 presents an overview of the country-specific and firm-specific variables used in the empirical analysis and their sources. Most of the variables are self-explanatory and have been used in other cross-country studies of firm financing structures and firm growth.

We use three indices of property rights from different sources. One index is based on the rating of protection of property rights from the Index of Economic Freedom constructed by the Heritage Foundation. A second index of property rights aims at rating the protection of intellectual property rights in particular by using data on the so-called "Special 301" placements of the Office of the US Trade Representative (USTR). "Special 301" requires the USTR to identify those countries that deny adequate and effective protection for intellectual property rights or deny fair and equitable market access for persons that rely on intellectual property protection. Countries can be placed on different lists, depending on their relative protection of intellectual property. For example, countries which have the most onerous or egregious acts, policies or practices and which have the greatest adverse impact on relevant U.S. products are designated "Priority Foreign Countries". We use these different qualifications to construct an index of intellectual property rights. As an alternative to the aforementioned index of intellectual property rights we use the patent rights index constructed by Ginarte and Park

⁵ We should note that we tend to use the term law and order when referring to the impact of the legal framework on the supply of external financing and the term property rights when referring to the impact of the legal framework on the asset composition choices.

(1997). This index focuses more narrowly on the protection of patents and is therefore less broad than the previous two indices.

We construct our index of protection of property rights using 1995-1999 data and our index of protection of intellectual property rights using 1990-1999 data. The growth regressions include, however, data for the period 1980-89, as in RZ. Ideally, one would want to construct property rights indices for the period 1980-89 as well. However, this is not possible for the first two property rights indices due to data limitations. We therefore assume that these property rights indices are relatively stable across time. This is indeed the case for the period for which we have the indexes. For the third property rights index, the patent rights index, we do have data from the period 1980-89. Therefore, this index does not suffer from the time period problems associated with the other two indices. In the regressions we use the patent rights index for the year 1980, the beginning of the period 1980-89.

Although the three indices of property protection are from different sources and for different time periods, they appear quite related and are positively correlated. The correlation between the property rights index and the intellectual property rights index is 0.62; the correlation between the patent rights index and the property rights index is 0.71; and the correlation between the patent rights index and the intellectual property rights index is 0.43. More details on the construction of these three indices of property protection can be found in Table 1.

[Insert Table 1 here]

Table 2 presents the summary statistics of the country-specific and some firm-specific variables grouped by developing and developed countries (Annex 1 presents the same summary statistics, but by individual country). We use the developed versus developing countries classification to illustrate the differences in the various variables by institutional settings, but otherwise do not use this classification in our empirical work. The country summary statistics in panel A show that developing countries as a group have less developed financial systems, weaker law and order systems, worse protection of (intellectual) property rights, and fewer patents per capita. All variables excepts for the private-credit-to-GDP ratio are statistically significant different between the two groups

of countries. The differences in the degree of law and order between developed and developing countries has been documented extensively in other work. This difference in legal frameworks partly, but not fully, relates to the differences in the credit-to-GDP between these two groups of countries, where low contract enforcement environments have hindered the development of financial systems in developing countries. The result for the relative levels of patents granted suggests that developing countries generate lower levels of research and development. The level of patents relates in part to the quality of property rights, which has a rather strong correlation with the number of patents (- 0.51 if measured by the property rights index, - 0.49 if measured by the intellectual property rights index, and 0.57 if measured by the patent rights index), suggesting that lower property rights deter the adoption of patents. Of course, other factors, such as the level of education, capital investment and general development, will also affect the outcome of the number of patents in a country.

In general, good (poor) law and order and good (poor) property rights tend to go together and are related to the overall level of development of the country. This would imply that only points D (high law and order and strong property rights) or B (low law and order and strong property rights) in Figure 1 are relevant. As such, analyzing the differential effects of the quality of law and order and property rights on the level of external financing available and the allocation of investment would be more difficult. However, the correlation between the two concepts is not perfect and it is possible to be at either points C or E, i.e., there exist countries with good property rights and poor law and order systems, and vice versa. South Korea, for example, scores high score on the protection of property rights (property rights index equals 1), but relatively poor on the law and order index (only 5.35, which is well below the sample median of 7.8). France, on the other hand, has a good legal system (reflected by a law and order index of 8.98), but the protection of its property rights is only average (with a property rights index of 2). Calculating the simple correlation between the property rights index and the law and order index, 0.77, confirms that the relationship between the two concepts is close, but not perfect. The correlation between the patent rights index and the law and order index is only 0.65, and the correlation between our intellectual property rights index and the law and order index is even lower, 0.58.

Panel B of Table 2 presents the means by country-groupings of the country-medians of firm-specific WorldScope data, again for the groups of developed countries and developing countries. The means are taken across countries, while within-countries medians are calculated across firms and over the period 1995-1999. The raw statistics show that the median firm size for our sample is about the same in developing countries as in developed countries. This reflects in part that Worldscope only covers publicly listed firms, which are larger than the average firm in developing countries. But it does mean that our results are probably not due to any size differences. In terms of total financial leverage, firms in developing countries are slightly more leveraged, but this is not significantly different between the two groups. And, although firms in developing countries have higher internal cash flow, this is not statistically significant different (at the 5% level) either from firm cash flow in developed countries.

We do find many (statistically significant) differences, however, in terms of assets and debt structures. Firms in developed countries use significantly less fixed assets and more intangible assets. This greater emphasis on intangibles is confirmed in the flow ratios, such as the ratio of capital expenditures to sales, which is significantly lower for developed countries, and the ratio of R&D expenditures to sales, which is significantly higher for developed countries. In terms of debt structures, firms in developed countries have significantly more long-term and less long-term debt per dollar of total assets compared to firms in developing countries. Firms in developed countries also have significantly more long-term debt per unit of fixed assets.

[Insert Table 2 here]

Our firm-specific data, and the above statistics, were obtained for the whole sample of countries for which Worldscope has coverage, 51. Since for some of our tests we use data from RZ, and more generally to allow for a consistent comparison with their results, we want to use the same set of countries. For four countries out of the 43 countries RZ uses, data is not available from WorldScope. The overlap between the WorldScope dataset and the dataset of RZ implies thus a dataset that includes 39

countries.⁶ For the three basic regressions described in section 3, we therefore use data on these 39 countries.⁷ For robustness, however, we also estimate equation 1 using all countries in the RZ dataset for which we have data. In addition, we estimate equations 2 and 3 using the larger dataset that include all WorldScope countries, i.e., including the four countries outside the RZ sample.

Similarly to RZ, we construct benchmark data on an industry basis. We use the benchmark data from RZ for almost all of our variables, except that for our regression specifications we need to add the intangible-to-fixed-assets ratio. Analogue to RZ, we assume that the intangible-to-fixed-assets ratio for each industry in the U.S. forms a good benchmark (similar to RZ that the US financial dependence ratio forms a good benchmark). In the same way RZ calculated the external financing dependence ratios by industry, we calculate this benchmark using COMPUSTAT-data on US firms for the years 1980-89. Table 3 reports the intangible-to-fixed assets benchmarks for different industrial sectors on a two-digit SIC level. The total number of firms used to calculate these benchmarks is 5,241. The benchmark intangible-to-net-fixed-assets ratio ranges from as low as 2.0% for the petroleum and coal products industry to as high as 454% for the printing and publishing industry, and the average intangible-to-net-fixed-assets ratio during the 1980s for US manufacturing firms is 77%.

[Insert Table 3 here]

5. Empirical Results

In this section, we present the results of the regression model of section 3, that is the analysis as in RZ, expanded to include a term to capture the potential effect of differences in property rights on firm growth across countries (equation (1)). The dependent variable

⁶ The 39 countries studies here include Australia, Austria, Belgium, Brazil, Canada, Chile, Colombia, Denmark, Egypt, Finland, France, Germany, Greece, India, Indonesia, Israel, Italy, Japan, Jordan, Korea, Malaysia, Mexico, Netherlands, New Zealand, Norway, Pakistan, Peru, Philippines, Portugal, Singapore, South Africa, Spain, Sri Lanka, Sweden, Turkey, United Kingdom, Venezuela, Zimbabwe and United States. Compared to the RZ data, we miss four countries (Bangladesh, Costa Rica, Kenya and Morocco) for which we do not have data from WorldScope.

⁷ For the growth regressions (equation 1a and 1b in section 3) we need to drop the benchmark country, the United States, as in RZ, and therefore we use 38 countries for the growth regressions.

is the growth in real value added in a particular sector in a particular country over the 1980-90 period. The results of the different regression specifications are in Table 4a. We find that industrial sectors that rely relatively more on external finance develop disproportionately faster in countries with more-developed financial markets as the coefficient for the interactive variable Credit-to-GDP times External Financial Dependence is statistically significant (at the 1% level, column 1). Hence, financial development facilitates economic growth through greater availability of funds, consistent with the findings of RZ. This financial development effect is related to the quality of the legal system in the country as the statistically significant coefficient for the interactive variable Law and Order times External Financial Dependence indicates (column 2). While, as noted by Beck et al. (2000) and others, the quality of the legal system influences financial sector development, it also has a separate, additional effect on economic growth. The two regression results together confirm the law and finance view that better legal systems and increased availability of external financing enhance firm growth.

In terms of the asset allocation effect, we find that industrial sectors that use relatively more intangible assets develop faster in countries with better protection of property rights as the coefficient for the interactive variable Property times Intangible-to-Fixed Assets is statistically significant and positive (column 3). We find similar results if we interact the Intangible-to-Fixed Assets variable with the Intellectual Property index (column 4) or the patent Rights index (column 5). Hence, better (intellectual) property rights can facilitate economic growth as it favors growth in firms that would naturally choose a higher share of investment in intangible assets.

The asset allocation effect on growth appears to be in addition to the increase in firm growth due to greater external financing since in the regressions where both the external financing dependence (or the quality of law and order) and the asset allocation variables are included (columns 6-11), both interactive variables remain statistically significant. The coefficients in these regressions for both effects are also of similar magnitudes as in the regression where they are included separately (columns 1-5), suggesting that the two variables measure complementary effects.

The effects of external financial development (or quality of law and order) and property protection on firm growth are not only both statistically significant but also

economically important. The average effect on real value added growth is 0.9 percentage points for the financial development variable, 1.0 percentage points for the law and order variable, 0.8 percentage points for the property rights variable, 0.6 percentage points for the intellectual property rights variable, and 1.3 percentage points for the patent rights variable.⁸ It follows that the impact of good property rights on firm growth is economically as important as is the impact of a well-developed financial system (or a good legal system). In other words, the results indicate that the asset allocation effect, due to differences in property rights, is as important as the finance effect, due to differences in availability of external financing (or quality of the legal system), is.

[Insert Table 4a here]

It is worth noting that the two interacted variables, external financing dependence and intangible assets usage interacted respectively with the law and order and property rights indexes, measure different concepts. Annex 2 Table 1 reports the correlations between the five variables. The correlation between the external financing dependence variable interacted with the law and order index and the intangible usage variable interacted with the property rights index is low (0.187). So is the correlation between the external financing dependence variable interacted with the financial development measure and the intangible usage variable interacted with the property rights index (0.152). The correlation between the external financing dependence variable interacted with the financial development measure and with the law and order index respectively, is very high, 0.9, exactly as the law and finance literature has documented. Correlations of a similar order of magnitude are found when the intellectual property rights index and the patent rights index are used rather than the property rights index.

The results presented in Table 4a are based on data for the core group of 39 countries (38 countries plus US). For robustness, we re-estimate the regression models presented in Table 4a using all available data (up to 45 countries). The results are found

⁸ These figures are calculated by multiplying the regression coefficients with the sample average values for the regression variables. In other words, $0.0780 \times 0.1154 = 0.009$ for the credit-to-GDP*external financial dependence, $0.0046 \times 2.1574 = 0.010$ for law*external financial dependence, $0.0195 \times 0.3895 = 0.008$ for property*intangible-to-fixed assets, $0.0146 \times 0.3888 = 0.006$ for intellectual property*intangible-to-fixed assets, and $0.0076 \times 1.7085 = 0.013$ for patent rights*intangible-to-fixed assets. The sample averages can be found in Table 2 of Annex 2.

in Table 4b and are very similar to those in Table 4a. This shows that using either the sample of 39 or 43 countries does not affect the main results. Note that the results in column (1) of 4b are identical to those in the basic specification of RZ (Table 4, Column 2 in their paper). Also, in column 4, 8 and 9 of Table 4b the results are the same as in the same columns in Table 4a as the sample of countries ends up being the same for both regressions.

[Insert Table 4b here]

As an additional investigation in the channels through which property rights and financial development affect firm growth, we analyze whether industries grow because new establishments are added to the industry or because existing establishments grow in size. Following RZ, we decompose the effects of access to financing and asset allocation on overall firm growth in terms of the effects on growth in the number of establishments and effects on growth in the size of the existing establishments. There are two reasons why it is interesting to decompose the effects of access to financing and asset allocation in terms of number and size of firms. First, as also highlighted by RZ, the creation of new establishments more likely requires external funds, while the expansion of existing establishments can rely more easily on internal funds. Thus, the effect of financial development should be more pronounced for new firms than for the growth of existing firms. Second, new firms are often set up in reaction to and to take advantage of new technological developments, while established firms tend to grow through expansion of scale, maybe because they are slower in reacting to new developments.⁹ Furthermore, existing firms may be able to preserve the value their intangible assets in other ways than just using formal property rights (for example, using their brand names, or networks). Thus, the importance of property rights protecting the returns to (new) technology might be more pronounced for the emergence of new firms than for the growth of existing firms.

As before, we follow RZ and use data derived from the U.N. Industrial Statistics Yearbook database for the growth in the number of establishments and the growth in the

⁹ In fact, many new firms that take advantage of new technological developments are spun off from existing firms that have developed some elements of these new technologies.

average size of the existing establishments. The growth in the number of establishments is calculated by RZ as the log of the number of ending-period establishments less the log of the number of beginning-of-period establishments. The average size of establishments in the industry is calculated by dividing the value added in the industry by the number of establishments, with the growth in average size again obtained as a difference in logs. RZ report that in their sample of countries roughly two-thirds of the growth in value-added comes from an increase in the average size of existing establishments, while the remaining one-third is accounted for by an increase in the number of establishments.

We use the same specification for the basic regression, but replace the dependent variable growth in value added by the growth in number of establishments or the growth in average size. As Table 5 indicates, the external financing dependence interacted with financial development or law and order variables are statistically significant for most regressions in explaining both the growth in the number of establishments and the growth in average size. This contrasts with RZ whom do not find any statistical significance, perhaps because they use accounting standards as a measure for financial development (see their Table 7) rather than private credit to GDP or rule of law, and do not include the asset allocation interaction variable. The only regression in our regressions where the external financing variable is not significant is when the regression specification for the growth in average size also includes the intellectual property rights interacted with the intangible-to-fixed-assets ratio variable (column 5).

Interestingly, the asset allocation interacted with either one of the three property rights variables is only significant when explaining the growth in the number of establishments and not when explaining the growth in the average size of firms. This finding is consistent across all three measures of property rights. It suggests, in terms of affecting growth through asset allocation, that the protection of property rights largely works through the growth of new establishments. Good property rights can thus indirectly influence growth by allowing new ideas to develop, be financed and come to market, particularly in those industries that typically rely more on intangibles in their optimal asset and production mix. For established firms that depend on intangibles, growth seems less affected by the strength of intellectual property rights in the country. This may be because such firms have other means of protecting their returns from investment in intangibles.

[Insert Table 5 here]

6. Further statistical robustness and firm-specific data tests

We have already shown that the results are robust to the sample of countries and the measures of financial development and protection of property rights chosen. We next present evidence that the results are also robust if we use alternative specifications that capture more of the institutional differences between countries. We furthermore present regression results using our firm-specific data.

We start with documenting that the effects of better property rights on growth work mostly through the improved asset allocation effect, rather than generally increasing growth, through, say, an improvement in the overall business environment making higher growth more likely. To show this, we include in our basic regression specification (1) also the three property rights indexes directly, that is not interacted with the asset mix variables. The results are reported in Table 6 using the sample of 38 countries also used in Table 4a. We find only a direct, statistically significant positive effect of improved property rights in case of our patent rights index and then also only when using private credit to GDP in the financial sector development interaction variable, column 5. For the other specifications is the property rights variable either not statistically significant (columns 1 and 2, and 6) or, in case of the intellectual property rights index, actually takes on negative, statistically significant values (columns 3 and 4). Most importantly, including the property rights indexes directly does not change the magnitude or significance of the coefficients for the interaction variables in any meaningful way. Both the financial dependence and the asset mix interaction variables remain statistically significant. This suggests that the major effect of improved property rights on sectoral growth operates through improvements in asset allocation and that the interaction variable does not capture any general effects.

Our specification so far focuses on the differential effect on growth of property rights across industries with different asset mixes (captured by the interaction term of property rights and the intangible to fixed assets ratio). To avoid possible biases caused by any omitted country-specific regressors, we included country dummies to capture any

institutional or other differences, such as comparative advantage, affecting growth. Since we are less interested in the importance of general country differences, we used this setup rather than a vector of specific country control variables. Still, it might be interesting to analyze these first-order country effects directly. We do this by replacing our country dummies with some of the country-specific variables that have been used in the general growth literature. Examples of such country-specific variables include financial depth, level of per capita GDP, human capital, and institutional variables. This alternative model specification with country-specific variables and no country dummies also provides for a robustness check whether any of our earlier results are affected if we control in another way for country differences

As country-specific variables we use the ratio of private credit to GDP in 1980, stock market capitalization over GDP in 1980, a measure of the level of human capital in 1980, the logarithm of per-capita income in 1980, and an accounting standards indicator. These variables have also been used by RZ and Cetorelli and Gambera (2001). Private credit to GDP and stock market capitalization to GDP are proxies for banking system development and stock market respectively, and for financial development more generally. Financial development has been shown to have a positive effect on growth (see, for example, Beck, Levine and Loayza 2000). The level of human capital is measured as the average for 1980 of the years of schooling attained by the population over 25 years of age (as in Barro and Lee, 1993), and is expected to have a positive effect on growth in value added. Per-capita GDP captures the convergence effects of the economy as a whole to a long-run steady state, and is therefore expected to have a negative effect on growth in value added (see among others, Barro, 1991). The accounting standards indicator is an index reflecting the quality of accounting and is taken from RZ. This variable is expected to have a positive effect on growth as well as it proxies for the quality of information investors have regarding firm prospects and firms regarding investment prospects. The model continues to include industry dummies to control for any sector-specific effects. We also include the property rights indexes directly in the regressions. Since the country variables included in the two interaction terms – private credit to GDP and an index of property rights – are now part of the country controls, we assess both the first-order effect of bank development and property

protection on value added growth and the second-order effects captured by the two interaction terms.

The results are reported in Table 7a and 7b using the sample of 38 countries also used in Table 4a. In Table 7a we report the regression results of estimation of model 1 without country dummies, but with country controls, except for the accounting standards index. Table 7b shows the results when we include the accounting standards variable. We exclude the accounting standards variable in the first specification since data on accounting standards is missing for a number of countries, resulting in a loss of several countries from the sample. Except for the human capital variable, the country controls have the expected relationships with growth. The depth of the financial systems—private credit to GDP and the size of the stock market as a ratio to GDP—has a statistically significant, positive influence on growth in sectoral value added. The degree of human capital in the country, proxied by the average years of schooling attained by the population over 25 years of age, has surprisingly sometimes a statistically significant negative sign in Table 7a (and is insignificant in Table 7b). The accounting index is statistically significant positive in Table 7b. The general level of development, proxied by the log of income per capita, has a negative sign, confirming the convergence effect. The first-order effects of the quality of property rights on growth are not as clear as the signs of the property rights variables vary. They are positive for the property rights index, and sometimes positive for the patents right variable, while they are negative for the intellectual property rights index and sometimes also negative for the patents rights index. Better property rights in themselves do thus not necessarily translate into higher growth rates of sectoral value added.

The focus of our attention, the effect of property rights on the allocation of resources, is, however, very robust to the change in model. The coefficients on the interaction terms between the property rights indexes and the intangible to fixed asset ratio remain positive and statistically significant in all specifications of Table 7a and 7b. The sizes of the coefficients are also only slightly different from those in Table 4a and 4b, and the statistical significance is only slightly less (generally 5% compared to 1%). The general result regarding the interaction variable between property rights and the ratio of intangible to tangible assets is thus not altered. Also, the interaction terms between financial development and external financing dependence remain statistically significant

positive. The regression results thus shows that the effect of property rights on growth operates in an important way through the asset allocation, and not through a first order effect on growth, especially in case of intellectual property rights and patent right that do not have positive coefficients on their own.

In addition to reporting the robustness of the growth effects, we also investigate whether there is supporting evidence using firm-specific data for the actual allocation of investment and financing pattern. We use two sets of regressions to describe firm's actual choices of investment and financing patterns.¹⁰ The first set of regressions investigates the investment structure of firm j in county k in relation to the quality of property rights in country k . Equation (2) specifically investigates whether firms in countries with better protection of property rights have relatively less investment in fixed assets and more investment in intangible assets. To investigate robustness, different variations are used for the dependent variable, including the ratio of fixed assets to total assets, the ratio of intangible asset to total assets and the ratio of intangible assets to fixed assets. Furthermore, as accounting practices differ considerably across countries in the extent to which intangible assets can be recorded on firms' balance sheets, we also use two flow variables, the ratio of capital expenditures to sales and the ratio of research and development expenditure to sales, as indicators of firms' investment structures.

$$\begin{aligned} \text{Intangible assets/Fixed assets}_{j,k} = & \text{Constant} + \beta_{1\dots n} \cdot \text{Industry indicators} \\ & + \beta_{n+1} \cdot \text{Property rights of country } k + \varepsilon_{j,k} \end{aligned} \quad (2)$$

The second set of firms-specific regressions investigates the relative amounts of long-term and short-term debt for industry j in country k in relation to the quality of law and order in the country. If the hypothesis that firms in countries with a weaker legal framework have less long-term and more short-term debt is correct, then equation (3) should produce a positive coefficient (after correcting for industry-specific effects) for the law and order index. Again, different variations of the dependent variable are used, including the ratio of long-term and short-term debt to total assets, the ratio of total debt to assets and the ratio of long-term debt to fixed assets. Furthermore, both the index of

¹⁰ These regressions are not meant as tests of explanatory models, but rather as ways to describe the firm-specific data.

the quality of property rights as well as the share of fixed assets out of total assets are used as independent variables to investigate the importance of collateralizable assets for firm financing patterns.

$$\begin{aligned} (\text{Long - term or Short - term debt})/\text{Assets}_{j,k} = & \text{Constant} + \beta_{1..n} \cdot \text{Industry indicators} + \\ & + \beta_{n+1} \cdot \text{Law and order of country } k + \varepsilon_{j,k} \end{aligned} \quad (3)$$

The results of the analysis whether firms in countries with weaker property rights invest less in intangible assets are presented in Table 8.¹¹ We find that firms in countries with weaker property rights have indeed less intangible assets relative to fixed assets (row 1), a relatively larger share of fixed assets (row 2) and less investment in intangible assets out of total assets (row 3). Also, firms in countries with weaker property rights have higher ratios of spending on plant and equipment relative to sales (row 4) and less research and development spending (row 5). These findings are in line with those of Demirgüç-Kunt and Maksimovic (1999) who find that firms in developing countries have higher proportions of net fixed assets to total assets. This result provides supportive evidence that a greater protection of property rights supports higher firm investment in intangible assets.

[Insert Table 8 here]

We next analyze firm financing structures. We start with investigating the amount of debt used by a firm across countries in relationship to the quality of law and order, i.e., we estimate equation (2) in section 3. The results are presented in Table 9. We find that long-term debt as a share of assets is lower and short-term debt as a share of assets is higher in countries with weaker law and order (rows 1 and 2). Given that countries with weaker law and order are typically developing countries, these results are similar to those of Demirgüç-Kunt and Maksimovic (1999) who report that firms in developing countries

¹¹ Note that the number of observations for each regression in Tables 4a, 6 and 7 is larger than in Tables 8 and 9 (although the number of countries is the same in each Table) because in Tables 8 and 9 we use 2-digit SIC codes to create 20 industry dummies, while for Tables 4a, 6 and 7 we follow RZ and use 3 or 4-digit SIC codes to create 36 industry dummies. Hence, the number of different industries distinguished in Tables 4a, 6 and 7 is almost twice as large as the number of industries distinguished in Tables 8 and 9.

use less long-term debt. We also find, however, that total debt as a share of assets is higher in countries with weaker law and order (row 3). Our interpretation is that the lack of alternative sources of external financing (other than debt) in countries with weaker law and order leads to more extensive use of debt, and that this debt is mostly of a short-term nature, possibly as weaker creditor rights reduce the attractiveness of extending long-term financing.

[Insert Table 9 here]

We also find that firms in countries with weaker law and order have lower ratios of long-term debt to fixed capital (row 4), reflecting that they on one hand invest more in fixed capital and on the other hand are less able to attract long-term debt. The inability to attract more long-term financing per unit of fixed assets may be because the collateralizable value of fixed assets is lower in countries with weaker law and order. Put differently, from the perspective of a lender, the collateral value of the fixed assets of a firm that operates in an environment with weaker law and order is more likely less than the book value of fixed assets than in environments with stronger laws. Indeed, if we interact the fixed assets-to-total assets ratio with the law and order index to proxy for the collateralizable value of the fixed assets, we find that this independent variable is positively related to the ratio of long-term debt to total assets (row 5). This suggests that, as the collateral values of fixed assets are reduced due to weak law and order, lenders provide less long-term debt. We also find that both collateral (as measured by the relative amount of fixed assets) as well as an index of law and order are important explanatory variables for the relative amount of long-term firm debt (rows 6 and 7). This confirms again that it is the collateralizable value of fixed assets, which influences the ability of firms to attract long-term financing.

For consistency, the results in Tables 8-9 are based on the same set of countries as in RZ, totaling 39 countries. This is a subset, however, of all the countries for which we have data. For robustness, we repeat the above analysis using a larger dataset that includes all countries in WorldScope for which we have the law and order index or the property rights index. Table 10 shows the results of estimating model 2 in section 3 using the expanded dataset that includes all countries in WorldScope, 51, for which we

also have the property rights index (and otherwise replicates Table 8). The results of Table 10 are very similar to those of Table 8. Again, we find that firms in countries with weaker property rights have more (investment in) fixed capital and less (investment in) intangible assets and research and development than firms in countries with better property rights.

Table 11 replicates Table 9 by using an expanded dataset that includes all countries for which we have the law and order index. This sample amounts to 45 countries. The results of Table 11 are very similar to those of Table 9. Again, we find that long-term debt is lower and short-term debt is higher in countries with weaker law and order. We also find again that total debt is higher in countries with weaker law and order due to higher amounts of short-term debt. Again, firms in countries with weaker law and order seem to have much lower ratios of long-term debt to fixed capital because the collateralizable value of fixed assets is lower. Together, these two Tables suggest that our results using firm-specific data are robust to the use of different sample of countries.

7. Conclusions

Countries differ from each other in many ways. One aspect is the quality of their property rights. This paper shows that the existence of an environment with poorer property rights and weaker (enforcement of) laws has two effects: first, it reduces the value of collateral of firm assets, which in turns leads to lower external financing; and second, it leads to lower investment in intangible assets. The first effect has already been shown in the so-called law and finance literature. This paper shows that the second consequence of weaker property rights, a result we call the asset allocation effect, is economically as important as the lack of financing effect. Specifically, the paper shows that both effects impede the growth of firms to the same quantitative magnitude. The asset allocation effect seems to be particularly important in hindering the growth of new firms. We confirm the possible channels for the growth effects by documenting differences in firms' actual assets allocations and financing structures in relationship to the quality of property rights and financial development, providing supporting evidence that investment and financing structures can both be affected by the quality of the legal framework in a country, leading in turn to the effects on (sectoral) growth.

We thus confirm and extend the importance of property rights for firm growth by demonstrating the importance of an efficient allocation of investable resources between tangible and intangible assets. To the extent that the emergence of the “new economy” has increased the returns to intangible assets going forward, our results could even underestimate the overall costs of weak property rights. If indeed new economy assets and future growth opportunities are more related to investment in intangible assets, and the old economy is more related to investment in fixed assets, an over-allocation of investable resources towards tangible assets is likely to impede the future growth of firms, and the economy more generally, even so more going forward. The implications of our results likely go beyond showing the importance of an efficient choice between tangibles and intangible assets, but indicate more generally that an efficient allocation of firm resources can be impeded by weak property rights. Our results thus have the important policy implication that, equally important as the establishment of a proper functioning legal system to help develop a good financial system, is the presence of a strong protection of returns to different type of assets.

Table 1 The Variables

This table describes the variables collected for the countries included in our study. The first column gives the names of the variable as we use it. The second column describes the variable and provides the source from which it was collected. Unless otherwise noted amounts are in current US dollars.

Variable	Description
Developing	Takes value of 1 if the country is defined by the World Bank as a developing country; and 0 otherwise. Source: World Bank
Population	The population of the country in millions at the end of 1997. Source: World Bank Development Indicators 1999.
Patents	The number of patents granted during the year 1997 to (non-)residents of the country. Source: World Intellectual Property Organization.
Law and Order	Assessment of the law and order tradition in the country. Average of the months of April and October of the monthly index between 1982 and 1995. Scale from 0 to 10, with lower scores for less tradition for law and order. Source: International Country Risk Guide and La Porta et al. (1998) ("Legal determinants of external finance")
Property	A rating of property rights in each country (on a scale from 1 to 5). The more protection private property receives, the lower the score. The score is based, broadly, on the degree of legal protection of private property, the probability that the government will expropriate private property, and the country's legal protection to private property. The index equals the median rating for the period 1995-1999. Source: The Index of Economic Freedom from the Heritage Foundation.
Intellectual Property	An index of intellectual property rights (on a scale from 1 to 5). The more protection private property receives, the lower the score. The index is calculated using the "Special 301" placements of Office of the U.S. Trade Representative (USTR). Special 301 requires the USTR to identify those countries that deny adequate and effective protection for intellectual property rights or deny fair and equitable market access for persons that rely on intellectual property protection. Countries which have the most onerous or egregious acts, policies or practices and which have the greatest adverse impact on relevant U.S. products are designated "Priority Foreign Countries". Countries can also be placed on other lists. We assign the following ratings: 5=Priority foreign countries; 4=306 Monitoring; 3=Priority Watch List; 2=Watch List; 1=Not listed. The index equals the median rating for the period 1990-1999. Source: International Intellectual Property Alliance (Original source: USTR).
Patent Rights	An index of patent rights (on a scale from 0 to 5) in 1980. The more protection patents receive, the higher the score. The index criteria are: coverage, membership, duration, enforcement and loss of rights. Source: Ginarte and Park (1997)
Private Credit-to-GDP	Private Credit divided by GDP in 1980. Source: International Financial Statistics, IMF
Assets	Total assets. Source: WorldScope May 1999 CD-Rom.
Fixed assets	Net fixed assets or Net property, plant and equipment (represents gross property, plant and equipment less accumulated reserves for depreciation, depletion and amortization). Source: WorldScope May 1999 CD-Rom.
Intangible assets	Intangible assets (represents assets not having a physical existence). The value of these assets lies in their expected future return. It includes goodwill, patents, copyrights, trademarks, formulae, franchises of no specific duration, software, organizational costs, customer lists, licenses of no specific duration, capitalized advertising cost, capitalized servicing rights, purchased servicing rights). Source: WorldScope May 1999 CD-Rom.
Long-term debt	Long-term debt (represents all interest bearing financial obligations, excluding amounts due within one year). Source: WorldScope May 1999 CD-Rom.
Short-term debt	Short-term debt and current portion of long term debt (represents that portion of debt payable within one year including current portion of long term debt and sinking fund requirements of preferred stock or debentures). Source: WorldScope May 1999 CD-Rom.
Total debt	Short-term debt plus long-term debt. Source: WorldScope May 1999 CD-Rom.
Sales	Net sales. Source: WorldScope May 1999 CD-Rom.
Cash flow	Cash flow. Source: WorldScope May 1999 CD-Rom.
CAPEX	Capital expenditures (represents the funds used to acquire fixed assets other than those associated with acquisitions. It includes additions to property, plant and equipment, and investments in machinery and equipment). Source: WorldScope May 1999 CD-Rom.
R&D	Research and development (represents all direct and indirect costs related to the creation and development of new processes, techniques, applications and products with commercial possibilities). Source: WorldScope May 1999 CD-Rom.
Growth in value added	Real annual growth in value added by ISIC sector over the period 1980-89. Source: UN. Taken from Rajan and Zingales (1998).
Growth in average size	Growth in average size by ISIC sector over the period 1980-89. Source: UN. Taken from Rajan and Zingales (1998).
Growth in number of establishments	Growth in number of establishments by ISIC sector over the period 1980-89. Source: UN. Taken from Rajan and Zingales (1998).
Fraction of value added	Fraction of ISIC sector in value added of total manufacturing sector in 1980. Source: UN. Taken from Rajan and Zingales (1998).
External financial dependence (US)	External financial dependence of US firms by ISIC sector over the period 1980-89. Source: Compustat. Taken from Rajan and Zingales (1998).
Intangible-to-fixed assets (US)	Average ratio of intangible-assets-to-net fixed assets of US firms by ISIC sector over the period 1980-89. Source: Compustat (US).

Table 2 Summary Statistics

This table reports summary statistics of the variables used in our study. For each variable, we report the mean across all sampled countries, across developing countries and across developed countries. For comparison purposes, we also present t-statistics of tests of differences in the means of the variables across developing and across developed countries. Panel A reports summary statistics of country variables and panel B presents summary statistics of firm-based country variables. The firm-based variables are calculated in two stages. First, we calculate for each firm the median value of the firm-specific variable during the period 1995-1999. Second, the median is taken over these median-firm values across all firms in the country. See Annex 1 for the median values of the country-specific variables for each country and the selection of countries. The sources of the data are reported in Table 1. Figures in bold indicate statistical significance at a 5% level.

	<i>Means across countries:</i>			<i>t-Tests of difference in means</i>
	Developed countries	Developing countries	All countries	Developed versus Developing countries (t-statistics)
<i>Panel A: Country variables</i>				
Private Credit-to-GDP (1980)	0.41	0.38	0.39	0.37
Law and Order (during 1982-1995)	9.19	4.74	7.01	10.45
Property (1995-99)	1.26	2.39	1.88	-6.45
Intellectual Property (1990-99)	1.43	2.34	1.91	-5.31
Patent rights (1980)	3.33	2.10	2.74	5.29
Patents (per mln pop)	1076.44	112.73	629.84	6.12
<i>Panel B: Firm-based variables</i>				
Assets (in US\$)	377,597	304,508	337,469	0.36
Total debt/Total assets	0.23	0.25	0.24	-0.82
Cash flow/sales (%)	8.84	11.56	10.33	-1.83
Net fixed assets/Total assets	0.33	0.44	0.39	-5.00
Intangible assets/Total assets	0.02	0.01	0.01	2.32
Intangible assets/Net fixed assets	0.06	0.01	0.04	2.68
CAPEX/Sales (%)	5.40	7.94	6.80	-3.42
R&D/Sales (%)	2.04	0.76	1.42	3.05
Long-term debt/Total assets	0.12	0.09	0.10	2.10
Short-term debt/Total assets	0.08	0.12	0.10	-2.76
Long-term debt/Net fixed assets	0.36	0.19	0.27	4.04
Number of countries	23	28	51	

Table 3 Benchmark US Intangible-to-Fixed assets ratio

The table reports intangible-to-net fixed assets ratios for each sector are averages for all US firms in the Compustat (US) database for the period 1980-89. For external financial dependency benchmarks across sectors we refer to the original source: Table 1 in Rajan and Zingales (1998). The table also reports the number of US firms used to construct the benchmark for each industrial sector. As in Rajan and Zingales (1998) we focus on manufacturing firms and use 1980s data to construct the benchmarks. The total number of firms is 5,241 and the average intangible-to-net fixed assets ratio during the 1980s for US manufacturing firms is 0.77.

SIC Code	Industrial sectors	Intangibles-to-fixed assets	Number of firms
20	Food and kindred products	0.75	304
21	Tobacco manufactures	0.49	21
22	Textile mill products	0.21	131
23	Apparel and other textile products	0.53	139
24	Lumber and wood products	1.20	97
25	Furniture and fixtures	0.49	87
26	Paper and allied products	0.20	130
27	Printing and publishing	4.54	202
28	Chemicals and allied products	0.96	556
29	Petroleum and coal products	0.02	86
30	Rubber and miscellaneous plastics	0.46	191
31	Leather and leather products	0.33	41
32	Stone, clay, glass, and concrete products	0.05	96
33	Primary metal industries	0.11	191
34	Fabricated metal products	0.31	277
35	Industrial machinery and equipment	0.25	795
36	Electrical and electronic equipment	0.77	815
37	Transportation equipment	0.24	262
38	Instruments and related products	0.90	660
39	Miscellaneous manufacturing industries	2.29	160

Table 4a Growth, financial dependence, property rights and intangible assets

The table presents the results from the same OLS regression as in Table 4 in Rajan and Zingales (1998), except they are extended to include the ratio of Intangible-assets-to-total-assets times a measure for property rights in the country. Table 1 describes all variables in detail. As measure for protection of property rights we use the inverse of the property rights index from the Index of Economic Freedom from the Heritage Foundation. This index provides a rating of property rights in each country (on a scale from 1 to 5). The more protection private property receives, the lower the score. The score is based, broadly, on the degree of legal protection of private property, the probability that the government will expropriate private property, and the country's legal protection to private property. We use the median rating during 1995-1999. Since we take the inverse, our index ranges from 0.2 to 1, with a higher score indicating more protection of private property. Similarly, as measure for protection of intellectual property rights we use the inverse of the intellectual property rights index calculated using the "Special 301" placements of Office of the U.S. Trade Representative. We use the median rating during 1990-1999. As measure for the protection of patent rights we use the patent rights index by Ginarte and Park (1997). We use the rating for the year 1980. A higher rating of the patent rights index indicates more protection of patent rights. The dependent variable in all regressions is the real growth in value added of a particular sector in a particular country taken from the dataset of Rajan and Zingales (1998). External financial dependence is the fraction of capital expenditures not financed with internal funds for US firms in the same industry between 1980-1989. We refer to Rajan and Zingales (1998) for a detailed description of these two variables. Intangible-to-fixed assets is the industry average of the intangible-to-fixed assets ratio for US firms during 1980-1989. We construct these ratios using the Compustat (US) database. All regressions include industry dummies and country dummies but these are not reported. Robust standard errors are shown below the coefficients. From the set of countries that Rajan and Zingales (1998) use we drop Nigeria, because we do not have private credit-to-GDP figures for 1980; Bangladesh, Costa Rica, Jamaica and Morocco because we do not have rule of law figures; and Kenya because we do not have WorldScope data. The remaining countries are a subset of the WorldScope countries and include 38 countries: Australia, Austria, Belgium, Brazil, Canada, Chile, Colombia, Denmark, Egypt, Finland, France, Germany, Greece, India, Indonesia, Israel, Italy, Japan, Jordan, Korea, Malaysia, Mexico, Netherlands, New Zealand, Norway, Pakistan, Peru, Philippines, Portugal, Singapore, South Africa, Spain, Sri Lanka, Sweden, Turkey, United Kingdom, Venezuela, and Zimbabwe. United States is dropped as it is the benchmark. For two additional countries we do not have data on the rating of intellectual property rights: Sri Lanka and Zimbabwe. The final dataset for the regressions that use data on the rating of intellectual property rights (regressions 4, 8 and 9) is therefore 36.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Constant	.0428 ^a (.0156)	.0438 ^a (.0163)	.0546 ^a (.0153)	.0383 ^c (.0203)	.0470 ^a (.0155)	.0456 ^a (.0155)	.0470 ^a (.0163)	.0275 (.0207)	.0268 (.0222)	.0388 ^a (.0157)	.0400 ^b (.0164)
Fraction of sector in value added of total manufacturing in 1980	-.5613^a (.1533)	-.5450^a (.1484)	-.5362^a (.1507)	-.5171^a (.1578)	-.5385^a (.1502)	-.5915^a (.1554)	-.5729^a (.1506)	-.5695^a (.1624)	-.5559^a (.1576)	-.5909^a (.1547)	-.5751^a (.1500)
Private credit-to-GDP * External Financial Dependence (US)	.0780^a (.0255)					.0756^a (.0254)		.0741^a (.0252)		.0730^a (.0254)	
Law and order * External financial dependence (US)		.0046^b (.0022)					.0042^c (.0022)		.0044^b (.0022)		.0042^c (.0022)
Property *Intangible-to-fixed assets (US)			.0195^a (.0063)			.0185^a (.0063)	.0180^a (.0063)				
Intellectual property *Intangible-to-fixed assets (US)				.0146^a (.0053)				.0138^a (.0053)	.0133^a (.0054)		
Patent rights *Intangible-to-fixed assets (US)					.0076^a (.0027)					.0070^a (.0026)	.0071^a (.0027)
R ²	.3442	.3419	.3419	.3538	.3433	.3472	.3447	.3592	.3570	.3482	.3460
N	1129	1129	1129	1090	1129	1129	1129	1090	1090	1129	1129
Number of countries	38	38	38	36	38	38	38	36	36	38	38

Note: ^a Significant at 1%; ^b Significant at 5%; ^c Significant at 10%.

Table 4b Growth, financial dependence, property rights and intangible assets

(Robustness of results presented in Table 4a)

The table presents the results from the same OLS regression as in Table 4 in Rajan and Zingales (1998), except they are extended to include the ratio of Intangible-assets-to-total-assets times a measure for property rights in the country, and are for a larger sample of countries. Table 1 describes all variables in detail. As measure for protection of property rights we use the inverse of the property rights index from the Index of Economic Freedom from the Heritage Foundation. This index provides a rating of property rights in each country (on a scale from 1 to 5). The more protection private property receives the lower the score. The score is based, broadly, on the degree of legal protection of private property, the probability that the government will expropriate private property, and the country's legal protection to private property. We use the median rating during 1995-1999. Since we take the inverse, our index ranges from 0.2 to 1, with a higher score indicating more protection of private property. Similarly, as measure for protection of intellectual property rights we use the inverse of the intellectual property rights index calculated using the "Special 301" placements of Office of the U.S. Trade Representative. We use the median rating during 1990-1999. As measure for the protection of patent rights we use the patent rights index by Ginarte and Park (1997). We use the rating for the year 1980. A higher rating of the patent rights index indicates more protection of patent rights. The dependent variable in all regressions is the real growth in value added of a particular sector in a particular country taken from the dataset of Rajan and Zingales (1998). External financial dependence is the fraction of capital expenditures not financed with internal funds for US firms in the same industry between 1980-1989. We refer to Rajan and Zingales (1998) for a detailed description of these two variables. Intangible-to-fixed assets is the industry average of the intangible-to-fixed assets ratio for US firms during 1980-1989. We construct these ratios using the Compustat (US) database. All regressions include industry dummies and country dummies but these are not reported. Robust standard errors are shown below the coefficients. The Rajan and Zingales (1998) dataset includes 44 countries: Australia, Austria, Bangladesh, Belgium, Brazil, Canada, Chile, Colombia, Costa Rica, Denmark, Egypt, Finland, France, Germany, Greece, India, Indonesia, Israel, Italy, Jamaica, Japan, Jordan, Kenya, Korea, Malaysia, Mexico, Morocco, Netherlands, New Zealand, Nigeria, Norway, Pakistan, Peru, Philippines, Portugal, Singapore, South Africa, Spain, Sri Lanka, Sweden, Turkey, United Kingdom, Venezuela, and Zimbabwe. United States is dropped as it is the benchmark. We do not have data on certain variables for some countries. For Nigeria, we do not have private credit-to-GDP figures for 1980. For Bangladesh, Costa Rica, Jamaica and Morocco, we do not have rule of law figures. And, for Bangladesh, Costa Rica, Jamaica, Kenya, Morocco, Nigeria, Sri Lanka and Zimbabwe, we do not have data on the rating of intellectual property rights, making for the same countries and regression results as in Table 4a.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Constant	.0444 ^a (.0160)	.0387 ^a (.0166)	.0611 ^a (.0163)	.0383 ^c (.0203)	.0527 ^a (.0165)	.0471 ^a (.0159)	.0423 ^a (.0165)	.0284 (.0233)	.0268 (.0222)	.0401 ^b (.0161)	.0351 ^b (.0167)
Fraction of sector in value added of total manufacturing in 1980	-.8987^a (.2446)	-.7292^a (.1881)	-1.002^a (.2493)	-.5171^a (.1578)	-.9592^a (.2449)	-.9267^a (.2462)	-.7598^a (.1917)	-.5695^a (.1624)	-.5559^a (.1576)	-.9241^a (.2451)	-.7542^a (.1886)
Private credit-to-GDP * External Financial Dependence (US)	.1176^a (.0372)					.1148^a (.0369)		.0741^a (.0252)		.1126^a (.0370)	
Law and order * External financial dependence (US)		.0071^a (.0025)					.0066^a (.0025)		.0044^b (.0022)		.0067^a (.0025)
Property *Intangible-to-fixed assets (US)			.0257^a (.0071)			.0196^a (.0064)	.0216^a (.0067)				
Intellectual property *Intangible-to-fixed assets (US)				.0146^a (.0053)				.0138^a (.0053)	.0133^a (.0054)		
Patent rights *Intangible-to-fixed assets (US)					.0074^a (.0026)					.0072^a (.0026)	.0066^a (.0026)
R ²	.2900	.3052	.2624	.3538	.2521	.2928	.3085	.3592	.3570	.2933	.3079
N	1217	1174	1277	1090	1277	1217	1174	1090	1090	1217	1217
Number of countries	43	40	44	36	44	43	40	36	36	43	40

Note: ^a Significant at 1%; ^b Significant at 5%; ^c Significant at 10%.

Table 5 Growth in average size and number of establishments

The table presents the OLS regression results from Table 8 in Rajan and Zingales (1998), which are extended to include the ratio of intangible-assets-to-total-assets times a measure of property rights in the country. Table 1 describes all variables in detail. As measure for protection of property rights we use the inverse of the property rights index from the Index of Economic Freedom. This index provides a rating of property rights in each country (on a scale from 1 to 5). The more protection private property receives, the lower the score. We use the median rating during 1995-1999. Similarly, as a measure for protection of intellectual property rights we use the inverse of the intellectual property rights index calculated using the “Special 301” placements of Office of the U.S. Trade Representative. We use the median rating during 1990-1999. As measure for the protection of patent rights we use the patent rights index by Ginarte and Park (1997). We use the rating for the year 1980. The dependent variable is either the growth in average size or the growth in the number of establishments of a particular sector in a particular country taken from the dataset of Rajan and Zingales (1998). External financial dependence is the fraction of capital expenditures not financed with internal funds for US firms in the same industry between 1980-1989. We refer to Rajan and Zingales (1998) for a detailed description of these three variables. Intangible-to-fixed-assets is the industry average of the intangible-to-fixed-assets ratio for US firms during 1980-1989. We construct these ratios using the Compustat (US) database. All regressions include industry dummies and country dummies but these are not reported. Robust standard errors are shown below the coefficients. The Rajan and Zingales (1998) dataset includes 44 countries: Australia, Austria, Bangladesh, Belgium, Brazil, Canada, Chile, Colombia, Costa Rica, Denmark, Egypt, Finland, France, Germany, Greece, India, Indonesia, Israel, Italy, Jamaica, Japan, Jordan, Kenya, Korea, Malaysia, Mexico, Morocco, Netherlands, New Zealand, Nigeria, Norway, Pakistan, Peru, Philippines, Portugal, Singapore, South Africa, Spain, Sri Lanka, Sweden, Turkey, United Kingdom, Venezuela, and Zimbabwe. United States is dropped as it is the benchmark. We do not have data on certain variables for some countries. For Nigeria, we do not have private credit-to-GDP figures for 1980. For Bangladesh, Costa Rica, Jamaica and Morocco, we do not have rule of law figures; for Bangladesh, Costa Rica, Jamaica, Kenya, Morocco, Nigeria, Sri Lanka and Zimbabwe, we do not have data on the rating of intellectual property rights; and for Costa Rica, France, Indonesia, Italy, Jamaica, Netherlands, South Africa, and Zimbabwe we do not have data on the growth of the average size and the number of establishments.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Growth	Growth	Growth	Growth	Growth	Growth	Growth	Growth	Growth	Growth	Growth	Growth
	average	number	average	number	average	number	average	number	average	number	average	number
	size		size		size		size		size		size	
Constant	.0416 (.0314)	.0909 ^a (.0183)	-.1018 (.0659)	.0700 ^b (.0295)	.0118 (.0140)	.0470 ^a (.0163)	.0081 (.0145)	-.0110 (.0123)	.0420 (.0314)	.0878 ^a (.0181)	-.1019 (.0660)	.0698 ^b (.0294)
Fraction of sector in value added of total manufacturing, 1980	-.7436^b (.3325)	-.2241 (.1454)	-.4488^b (.2022)	-.4320^b (.1725)	-.2697 (.1984)	-.2759^c (.1490)	-.2733 (.1964)	-.2822^c (.1519)	-.7463^b (.3324)	-.2215 (.1451)	-.4510^b (.2025)	-.4222^b (.1707)
Private credit-to-GDP * External Financial Dependence (US)	.0625^b (.0290)	.0364^b (.0186)			.0310 (.0229)	.0344^b (.0167)			.0626^b (.0290)	.0346^b (.0187)		
Law and order * External financial dependence (US)			.0056^a (.0019)	.0043^b (.0018)			.0029^c (.0018)	.0035^a (.0013)			.0056^a (.0019)	.0045^b (.0018)
Property *Intangible-to-fixed assets (US)	-.0039 (.0061)	.0148^a (.0048)	-.0051 (.0062)	.0198^a (.0062)								
Intellectual property *Intangible-to-fixed assets (US)					-.0014 (.0055)	.0133^a (.0052)	-.0021 (.0055)	.0126^b (.0052)				
Patent rights *Intangible-to-fixed assets (US)									-.0008 (.0024)	.0055^a (.0020)	-.0014 (.0024)	.0045^b (.0021)
R ²	.4208	.4548	.4540	.3723	.4449	.3878	.4453	.3892	.4208	.4550	.4540	.3701
N	1047	1073	1040	1071	975	994	975	994	1047	1073	1040	1071
Number of countries	35	35	34	34	31	31	31	31	35	35	34	34

Note: ^a Significant at 1%; ^b Significant at 5%; ^c Significant at 10%.

Table 6 Growth, financial dependence, property rights and intangible assets

(Robustness of results presented in Table 4a)

The table presents the results from the same OLS regression as in Table 4 in Rajan and Zingales (1998), except (1) they are extended to include the ratio of Intangible-assets-to-total-assets times a measure for property rights in the country, and (2) they include country-specific property rights indices rather than country dummies. Table 1 describes all variables in detail. As measure for protection of property rights we use the inverse of the property rights index from the Index of Economic Freedom from the Heritage Foundation. This index provides a rating of property rights in each country (on a scale from 1 to 5). The more protection private property receives, the lower the score. The score is based, broadly, on the degree of legal protection of private property, the probability that the government will expropriate private property, and the country's legal protection to private property. We use the median rating during 1995-1999. Since we take the inverse, our index ranges from 0.2 to 1, with a higher score indicating more protection of private property. Similarly, as measure for protection of intellectual property rights we use the inverse of the intellectual property rights index calculated using the "Special 301" placements of Office of the U.S. Trade Representative. We use the median rating during 1990-1999. As measure for the protection of patent rights we use the patent rights index by Ginarte and Park (1997). We use the rating for the year 1980. A higher rating of the patent rights index indicates more protection of patent rights. The dependent variable in all regressions is the real growth in value added of a particular sector in a particular country taken from the dataset of Rajan and Zingales (1998). External financial dependence is the fraction of capital expenditures not financed with internal funds for US firms in the same industry between 1980-1989. We refer to Rajan and Zingales (1998) for a detailed description of these two variables. Intangible-to-fixed assets is the industry average of the intangible-to-fixed assets ratio for US firms during 1980-1989. We construct these ratios using the Compustat (US) database. All regressions include industry dummies but these are not reported. Robust standard errors are shown below the coefficients. From the set of countries that Rajan and Zingales (1998) use we drop Nigeria, because we do not have private credit-to-GDP figures for 1980; Bangladesh, Costa Rica, Jamaica and Morocco because we do not have rule of law figures; and Kenya because we do not have WorldScope data. The remaining countries are a subset of the WorldScope countries and include 38 countries: Australia, Austria, Belgium, Brazil, Canada, Chile, Colombia, Denmark, Egypt, Finland, France, Germany, Greece, India, Indonesia, Israel, Italy, Japan, Jordan, Korea, Malaysia, Mexico, Netherlands, New Zealand, Norway, Pakistan, Peru, Philippines, Portugal, Singapore, South Africa, Spain, Sri Lanka, Sweden, Turkey, United Kingdom, Venezuela, and Zimbabwe. United States is dropped as it is the benchmark. For two additional countries we do not have data on the rating of intellectual property rights: Sri Lanka and Zimbabwe. The final dataset for the regressions that use data on the rating of intellectual property rights (regressions 3 and 4) is therefore 36.

	(1)	(2)	(3)	(4)	(5)	(6)
Constant	.0486 ^a (.0161)	.0554 ^a (.0163)	.0890 ^a (.0164)	.0896 ^a (.0163)	.0649 ^a (.0174)	.0657 ^a (.0176)
Fraction of sector in value added of total manufacturing in 1980	-.6672^a (.1385)	-.6189^a (.1374)	-.5746^a (.1442)	-.5490^a (.1426)	-.6606^a (.1404)	-.6289^a (.1398)
Property	.0030 (.0097)	.0085 (.0102)				
Intellectual property			-.0757^a (.0084)	-.0771^a (.0093)		
Patent rights					.0065^a (.0029)	-.0044 (.0034)
Private credit-to-GDP * External Financial Dependence (US)	.0782^a (.0247)		.1152^a (.0245)		.0973^a (.0280)	
Law and order * External financial dependence (US)		.0005 (.0024)		.0067^a (.0024)		.0027 (.0022)
Property *Intangible-to-fixed assets (US)	.0188^a (.0076)	.0194^a (.0076)				
Intellectual property *Intangible-to-fixed assets (US)			.0138^b (.0068)	.0130^b (.0068)		
Patent rights *Intangible-to-fixed assets (US)					.0065^b (.0029)	.0068^b (.0029)
R ²	.1001	.0915	.1382	.1285	.0986	.0880
N	1129	1129	1090	1090	1129	1129
Number of countries	38	38	36	36	38	38

Note: ^a Significant at 1%; ^b Significant at 5%; ^c Significant at 10%.

Table 7a Growth, financial dependence, property rights and intangible assets

(Robustness of results presented in Table 4a – country variables rather than country dummies)

The table presents the results from the same regressions as in Table 4a, except that they include country-specific control variables rather than country dummies. Table 1 describes all variables in detail. The dependent variable in all regressions is the real growth in value added of a particular sector in a particular country. As measure for protection of property rights we use the inverse of the property rights index from the Heritage Foundation. We use the median rating during 1995-99. Since we take the inverse, a higher score indicates more protection of private property. Similarly, as measure for protection of intellectual property rights we use the inverse of the intellectual property rights index calculated using the “Special 301” placements of Office of the US Trade Representative. We use the median rating during 1990-99. As measure for the protection of patent rights we use the patent rights index by Ginarte and Park (1997). We use the rating for the year 1980. A higher rating of the patent rights index indicates more protection of patent rights. Private credit-to-GDP is the ratio of private domestic credit to GDP in 1980. Human capital is the average for 1980 of the years of schooling attained by the population over 25 years of age. External financial dependence is the fraction of capital expenditures not financed with internal funds for US firms in the same industry between 1980-89. Intangible-to-fixed assets is the industry average of the intangible-to-fixed assets ratio for US firms during 1980-89. We drop Nigeria, because we do not have private credit-to-GDP figures for 1980; Bangladesh, Costa Rica, Jamaica, and Morocco, because we do not have rule of law figures; Kenya, because we do not have WorldScope data; and Egypt, because of the lack of data on human capital. The final set of countries is 37: Australia, Austria, Belgium, Brazil, Canada, Chile, Colombia, Denmark, Finland, France, Germany, Greece, India, Indonesia, Israel, Italy, Japan, Jordan, Korea, Malaysia, Mexico, Netherlands, New Zealand, Norway, Pakistan, Peru, Philippines, Portugal, Singapore, South Africa, Spain, Sri Lanka, Sweden, Turkey, United Kingdom, Venezuela, and Zimbabwe. For two additional countries we do not have data on the rating of intellectual property rights: Sri Lanka and Zimbabwe. The final dataset for the regressions that use data on the rating of intellectual property rights is therefore 35. All regressions include industry dummies but these are not reported. Robust standard errors are shown below the coefficients.

	(1)	(2)	(3)	(4)	(5)	(6)
Constant	.1593 ^a (.0269)	.1653 ^a (.0269)	.1820 ^a (.0296)	.1963 ^a (.0285)	.1514 ^a (.0281)	.1605 ^a (.0279)
Fraction of sector in value added of total manufacturing in 1980	-.6437^a (.1369)	-.6414^a (.1370)	-.5465^a (.1460)	-.5781^a (.1464)	-.6723^a (.1473)	-.6899^a (.1484)
Private credit-to-GDP	.0384^a (.0137)	.0574^a (.0132)	.0738^a (.0144)	.0865^a (.0136)	.0435^a (.0159)	.0600^a (.0163)
Stock market capitalization-to-GDP	.0139^b (.0064)	.0150^b (.0063)	.0258^a (.0070)	.0259^a (.0069)	.0243^a (.0067)	.0250^a (.0066)
Human Capital (Schooling)	-.0061^a (.0017)	-.0060^a (.0017)	.0011 (.0015)	.0006 (.0015)	-.0021 (.0014)	-.0023 (.0014)
Log of per-capita GDP	-.0182^a (.0040)	-.0199^a (.0041)	-.0191^a (.0048)	-.0233^a (.0047)	-.0165^a (.0043)	-.0193^a (.0043)
Property	.0860^a (.0113)	.0799^a (.0115)				
Intellectual property			-.0321^a (.0111)	-.0323^a (.0110)		
Patent rights					.0079^c (.0048)	.0065 (.0047)
Private credit-to-GDP * External Financial Dependence (US)	.0663^b (.0277)		.0616^b (.0291)		.0600^b (.0286)	
Law and order * External financial dependence (US)		.0051^b (.0025)		.0100^a (.0025)		.0079^a (.0024)
Property *Intangible-to-fixed assets (US)	.0199^a (.0073)	.0190^a (.0073)				
Intellectual property *Intangible-to-fixed assets (US)			.0138^b (.0070)	.0116^c (.0071)		
Patent rights *Intangible-to-fixed assets (US)					.0070^b (.0029)	.0066^b (.0029)
R ²	.2121	.2126	.1799	.1956	.1641	.1724
N	1093	1093	1054	1054	1093	1093
Number of countries	37	37	35	35	37	37

Note: ^a Significant at 1%; ^b Significant at 5%; ^c Significant at 10%.

Table 7b Growth, financial dependence, property rights and intangible assets

(Robustness of results presented in Table 4a – country variables, including accounting variable)

The table presents the results from the same regressions as in Table 4a, except that they include country-specific control variables rather than country dummies. Table 1 describes all variables in detail. The dependent variable is the real growth in value added of a particular sector in a particular country. Property is the inverse of the property rights index from the Heritage Foundation. We use the median rating during 1995-99. Since we take the inverse, a higher score indicates more protection of private property. Similarly, Intellectual property is the inverse of the intellectual property rights index calculated using the US “Special 301” placements. We use the median rating during 1990-99. Patent rights is the patent rights index by Ginarte and Park (1997). We use the rating for the year 1980. A higher rating of the patent rights index indicates more protection of patent rights. Human capital is the average for 1980 of the years of schooling attained by the population over 25 years of age. Accounting standards is the accounting standards index in Rajan and Zingales (1998) scaled by 100. External financial dependence is the fraction of capital expenditures not financed with internal funds for US firms in the same industry between 1980-89. Intangible-to-fixed assets is the industry average of the intangible-to-fixed assets ratio for US firms during 1980-89. We drop Nigeria, because we do not have private credit-to-GDP figures for 1980; Bangladesh, Costa Rica, Jamaica, and Morocco, because we do not have rule of law figures; Kenya, because we do not have WorldScope data; Egypt, because of the lack of data on human capital; and Jordan, Pakistan, Sri Lanka and Zimbabwe due to missing values in the accounting standards variable. The final set of countries is 33: Australia, Austria, Belgium, Brazil, Canada, Chile, Colombia, Denmark, Finland, France, Germany, Greece, India, Indonesia, Israel, Italy, Japan, Korea, Malaysia, Mexico, Netherlands, New Zealand, Norway, Peru, Philippines, Portugal, Singapore, South Africa, Spain, Sweden, Turkey, UK, and Venezuela. All regressions include industry dummies but these are not reported. Robust standard errors are shown below the coefficients.

	(1)	(2)	(3)	(4)	(5)	(6)
Constant	.1193 ^a (.0264)	.1310 ^a (.0261)	.1180 ^a (.0299)	.1290 ^a (.0295)	.0995 ^a (.0319)	.1136 ^a (.0319)
Fraction of sector in value added of total manufacturing in 1980	-.4550^a (.1020)	-.4572^a (.1032)	-.4307^a (.1035)	-.4383^a (.1049)	-.3997^a (.1043)	-.4099^a (.1059)
Private credit-to-GDP	.0495^a (.0153)	.0632^a (.0136)	.0615^a (.0146)	.0729^a (.0131)	.0827^a (.0139)	.0921^a (.0123)
Stock market capitalization-to-GDP	.0206^a (.0070)	.0219^a (.0069)	.0244^a (.0078)	.0246^a (.0077)	.0250^a (.0066)	.0258^a (.0066)
Human Capital (Schooling)	-.0019 (.0020)	-.0018 (.0019)	.0004 (.0018)	.0001 (.0018)	.0012 (.0016)	.0009 (.0016)
Log of per-capita GDP	-.0171^a (.0043)	-.0194^a (.0043)	-.0162^a (.0053)	-.0183^a (.0053)	-.0134^a (.0053)	-.0161^a (.0054)
Accounting standards	.0521^a (.0180)	.0460^a (.0176)	.0520^a (.0190)	.0462^a (.0186)	.0768^a (.0210)	.0681^a (.0206)
Property	.0232^b (.0111)	.0203^c (.0110)				
Intellectual property			-.0173^c (.0106)	-.0181^c (.0106)		
Patent rights					-.0168^a (.0053)	-.0152^a (.0054)
Private credit-to-GDP * External Financial Dependence (US)	.0514^b (.0204)		.0509^b (.0206)		.0493^b (.0203)	
Law and order * External financial dependence (US)		.0051^a (.0019)		.0059^a (.0019)		.0053^a (.0019)
Property *Intangible-to-fixed assets (US)	.0139^b (.0073)	.0126^b (.0060)				
Intellectual property *Intangible-to-fixed assets (US)			.0126^b (.0058)	.0114^b (.0058)		
Patent rights *Intangible-to-fixed assets (US)					.0048^b (.0021)	.0045^b (.0021)
R ²	.2430	.2438	.2315	.2376	.2391	.2432
N	830	830	830	830	830	830
Number of countries	33	33	33	33	33	33

Note: ^a Significant at 1%; ^b Significant at 5%; ^c Significant at 10%.

Table 8 Regressions: Property rights and investment in intangible assets

The table presents the results of OLS regressions using the following 5 dependent variables: (1) Intangible assets as a fraction of fixed assets; (2) Intangible assets as a fraction of assets; (3) Fixed assets as a fraction of assets; (4) Capital expenditure as a fraction of sales; (5) Research and development as a fraction of sales. Table 1 describes all variables in detail. Median across years 1995-99 for each firm, and then median across sector for each country. Only manufacturing firms (SIC four-digit codes 2000-3999). We use the property rights rating during 1997, and do not take the inverse. All regressions include industry dummies on a two-digit industry level (20 dummies, 19 included). The industry dummies are not reported. Robust standard errors are shown below the coefficients. Dataset includes 39 countries: Australia, Austria, Belgium, Brazil, Canada, Chile, Colombia, Denmark, Egypt, Finland, France, Germany, Greece, India, Indonesia, Israel, Italy, Japan, Jordan, Korea, Malaysia, Mexico, Netherlands, New Zealand, Norway, Pakistan, Peru, Philippines, Portugal, Singapore, South Africa, Spain, Sri Lanka, Sweden, Turkey, United Kingdom, Venezuela, Zimbabwe, and United States.

	Dependent Variable	Cash flow/ Sales	Property	Constant	R ²	[N]
1	Intangible assets/Fixed assets		-.0507^a (.0151)		.1717 ^a (.0358)	.1029 [523]
2	Fixed assets/Assets		.0170^b (.0072)		.3602 ^a (.0205)	.3716 [535]
3	Intangible assets/Assets		-.0118^a (.0027)		.0498 ^a (.0094)	.1216 [523]
4	CAPEX/Sales	.0260 (.0328)	.8618^b (.4265)		.0526 ^a (.0118)	.1050 [527]
5	R&D/Sales		-.0427^a (.0134)	-.7151^a (.1459)	.0208 ^a (.0034)	.3744 [340]

Note: ^a Significant at 1%; ^b Significant at 5%; ^c Significant at 10%.

Table 9 Regressions: Rule of law, collateral and debt financing

The table presents the results of OLS regressions using the following 4 dependent variables: (1) Long-term debt as a fraction of fixed assets; (2) Long-term debt as a fraction of total assets; (3) Short-term debt as a fraction of assets; (4) Debt as a fraction of assets. Median across years 1995-99 for each firm, and then median across sector for each country. Only manufacturing firms (SIC four-digit codes 2000-3999). All regressions include industry dummies on a two-digit industry level (20 dummies, 19 included). The industry dummies are not reported. Table 1 describes all variables in detail. Robust standard errors are shown below the coefficients. Dataset includes 39 countries: Australia, Austria, Belgium, Brazil, Canada, Chile, Colombia, Denmark, Egypt, Finland, France, Germany, Greece, India, Indonesia, Israel, Italy, Japan, Jordan, Korea, Malaysia, Mexico, Netherlands, New Zealand, Norway, Pakistan, Peru, Philippines, Portugal, Singapore, South Africa, Spain, Sri Lanka, Sweden, Turkey, United Kingdom, Venezuela, Zimbabwe, and United States.

Dependent Variable	Cash flow/ Sales	Law and Order	Fixed assets/Assets * Law and Order	Fixed assets/ Assets	Constant	R ² [N]
1 Long-term debt/Assets	-.0008 (.0007)	.0069^a (.0018)			.0748 ^a (.0182)	.1013 [534]
2 Short-term debt/Assets	-.0040^b (.0017)	-.0124^a (.0018)			.2310 ^a (.0221)	.3781 [534]
3 Debt/Assets	-.0040^b (.0017)	-.0071^a (.0026)			.3359 ^a (.0300)	.2048 [534]
4 Long-term debt/Fixed assets	-.0018 (.0022)	.0698^c (.0388)			-.1799 (.2728)	.0341 [543]
5 Long-term debt/Assets	-.0008 (.0007)		.0235^a (.0039)		.0579 ^a (.0166)	.1489 [534]
6 Long-term debt/Assets	-.0008 (.0008)			.1883^a (.0425)	.0494 ^b (.0210)	.1249 [534]
7 Long-term debt/Assets	-.0008 (.0007)	.0085^a (.0016)		.2151^a (.0413)	-.0213 (.0225)	.1674 [534]

Note: ^a Significant at 1%; ^b Significant at 5%; ^c Significant at 10%.

Table 10 Robustness of results presented in Table 8

The table presents the results of OLS regressions using the following 5 dependent variables: (1) Intangible assets as a fraction of fixed assets; (2) Intangible assets as a fraction of assets; (3) Fixed assets as a fraction of assets; (4) Capital expenditure as a fraction of sales; (5) Research and development as a fraction of sales. Median across years 1995-99 for each firm, and then median across sector for each country. Only manufacturing firms (SIC four-digit codes 2000-3999). All regressions include industry dummies on a two-digit industry level (20 dummies, 19 included). The industry dummies are not reported. Table I describes all variables in detail. Robust standard errors are shown below the coefficients. Sample of 51 countries including Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, China, Colombia, Czech Republic, Denmark, Egypt, Finland, France, Germany, Greece, Hong Kong, Hungary, India, Indonesia, Ireland, Israel, Italy, Japan, Jordan, Korea, Malaysia, Mexico, Netherlands, New Zealand, Norway, Pakistan, Peru, Philippines, Poland, Portugal, Russian Federation, Singapore, Slovakia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Kingdom, Venezuela, Zimbabwe, and United States.

Dependent Variable	Cash flow to Sales	Property	Constant	R ² [N]
1 Intangible assets/Fixed assets		-.0394^a (.0116)	.1416 ^a (.0280)	.0930 [663]
2 Fixed assets/Assets		.0149^b (.0060)	.3781 ^a (.0176)	.3477 [680]
3 Intangible assets/Assets		-.0084^a (.0020)	.0406 ^a (.0075)	.1194 [663]
4 CAPEX/Sales	.0567 (.0410)	1.0594^a (.3774)	.0459 ^a (.0103)	.1184 [663]
5 R&D/Sales	-.0314^b (.0131)	-.6470^a (.1278)	.0182 ^a (.0030)	.3348 [405]

Note: ^a Significant at 1%; ^b Significant at 5%; ^c Significant at 10%.

Table 11 Robustness of results presented in Table 9

The table presents the results of OLS regressions using the following 4 dependent variables: (1) Long-term debt as a fraction of fixed assets; (2) Long-term debt as a fraction of total assets; (3) Short-term debt as a fraction of assets; (4) Debt as a fraction of assets. Median across years 1995-99 for each firm, and then median across sector for each country. Only manufacturing firms (SIC four-digit codes 2000-3999). All regressions include industry dummies on a two-digit industry level (20 dummies, 19 included). The industry dummies are not reported. Table I describes all variables in detail. Robust standard errors are shown below the coefficients. Sample of 45 countries including Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, Colombia, Denmark, Egypt, Finland, France, Germany, Greece, Hong Kong, India, Indonesia, Ireland, Israel, Italy, Japan, Jordan, Korea, Malaysia, Mexico, Netherlands, New Zealand, Norway, Pakistan, Peru, Philippines, Portugal, Singapore, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Kingdom, Venezuela, Zimbabwe, and United States.

Dependent Variable	Cash flow/ Sales	Law and Order	Fixed assets/Assets * Law and Order	Fixed assets/ Assets	Constant	R ² [N]
1 Long-term debt/Assets	-.0008 (.0007)	.0069^a (.0017)			.0744 ^a (.0175)	.1018 [618]
2 Short-term debt/Assets	-.0039^b (.0017)	-.0134^a (.0018)			.2432 ^a (.0212)	.3347 [618]
3 Debt/Assets	-.0038^b (.0017)	-.0083^a (.0025)			.3485 ^a (.0286)	.1849 [618]
4 Long-term debt/Fixed assets	-.0020 (.0021)	.0678^b (.0356)			-.1677 (.2509)	.0308 [627]
5 Long-term debt/Assets	-.0008 (.0007)		.0212^a (.0037)		.0630 ^a (.0160)	.1374 [618]
6	-.0010 (.0007)			.1520^a (.0359)	.0548 ^a (.0189)	.1160 [677]
7	-.0008 (.0007)	.0085^a (.0016)		.1890^a (.0376)	-.0120 (.0216)	.1551 [618]

Note: ^a Significant at 1%; ^b Significant at 5%; ^c Significant at 10%.

Annex 1: Country-specific data

This table reports several variables for the countries studied. Countries are sorted in ascending alphabetical order. The sample of countries includes all 51 countries represented in WorldScope. We have data on the protection of property rights for all 51 countries, but only for 48 countries we have data on the protection of intellectual property right and only for 45 countries we have data on the rule of law. Of these 45 countries, 39 countries are part of the Rajan & Zingales (1998) dataset. Panel A reports country data that is invariant across firms in the country. Panel B reports aggregate firm-level data for each country, calculated as the median value across all firms in the country of the median values of the firm-specific variables during the period 1995-1999. As source for the data in panel B we use WorldScope.

Panel A: Country data

	Developing	Population 1997 (in mln)	Private Credit-to- GDP in 1980	Law	Property	Intellectual Property	Patent rights index 1980	Patents (per mln pop)
Argentina	1	35.7	-	5.35	2.00	3.00	2.26	34.40
Australia	0	18.5	0.28	10.00	1.00	2.00	3.23	511.57
Austria	0	8.1	0.77	10.00	1.00	1.00	3.81	1978.40
Belgium	0	10.2	0.29	10.00	1.00	1.00	3.38	1732.65
Brazil	1	163.7	0.23	6.32	3.00	3.00	1.85	-
Canada	0	30.3	0.45	10.00	1.00	2.00	2.76	240.36
Chile	1	14.6	0.36	7.02	1.00	2.00	2.41	-
China	1	1227.2	-	-	4.00	4.00	-	2.85
Colombia	1	40	0.14	2.08	3.00	2.00	1.12	-
Czech Republic	1	10.3	-	-	2.00	2.00	-	143.40
Denmark	0	5.3	0.42	10.00	1.00	1.00	3.62	2283.58
Egypt	1	60.3	0.21	4.17	3.00	3.00	1.99	-
Finland	0	5.1	0.48	10.00	1.00	1.00	2.95	453.92
France	0	58.6	0.54	8.98	2.00	1.00	3.90	860.89
Germany	0	82.1	0.78	9.23	1.00	1.00	3.86	670.56
Greece	0	10.5	0.44	6.18	2.00	3.00	2.46	814.76
Hong Kong	0	6.5	-	8.22	1.00	1.00	2.24	228.77
Hungary	1	10.2	-	-	2.00	2.00	-	116.57
India	1	962.4	0.24	4.17	3.00	3.00	1.62	-
Indonesia	1	200.4	0.20	3.98	3.00	2.00	0.33	-
Ireland	0	3.7	-	7.80	1.00	1.00	2.99	1861.89
Israel	1	5.8	0.67	4.82	2.00	2.00	3.57	371.03
Italy	0	57.5	0.42	8.33	2.00	2.00	3.71	488.63
Japan	0	126.1	0.86	8.98	1.00	2.00	3.94	1171.18
Jordan	1	4.4	0.54	4.35	2.00	1.50	1.86	13.18
Korea (South)	1	46	0.50	5.35	1.00	3.00	3.28	534.33
Malaysia	1	21.7	0.48	6.78	2.00	2.00	2.57	36.22
Mexico	1	94.3	0.16	5.35	3.00	2.00	1.40	41.82
Netherlands	0	15.6	0.60	10.00	1.00	1.00	4.24	1525.26
New Zealand	0	3.8	0.19	10.00	1.00	2.00	3.32	1006.05
Norway	0	4.4	0.34	10.00	1.00	1.00	3.29	668.64
Pakistan	1	128.5	0.25	3.03	2.00	2.00	1.99	-
Peru	1	24.4	0.11	2.50	3.00	2.00	1.02	7.38
Philippines	1	73.5	0.28	2.73	2.00	2.00	2.67	12.46
Poland	1	38.7	-	-	2.00	2.00	-	60.21
Portugal	0	9.9	0.52	8.68	2.00	1.00	1.98	730.20
Russian Federation	1	147.3	-	-	3.00	3.00	-	201.58
Singapore	0	3.1	0.57	8.57	1.00	2.00	2.57	-
Slovakia	1	5.4	-	-	3.00	-	-	104.07

	Developing	Population	Private Credit-to-	Law	Property	Intellectual	Patent rights	Patents
		1997 (in	GDP in 1980			Property	index 1980	(per mln pop)
		mln)						
South Africa	1	40.6	0.26	4.42	3.00	2.00	3.57	-
Spain	0	39.3	0.76	7.80	2.00	2.00	3.29	524.50
Sri Lanka	1	18.6	0.21	1.90	3.00	-	2.79	8.60
Sweden	0	8.8	0.42	10.00	2.00	2.00	3.47	2205.91
Switzerland	0	7.1	-	10.00	1.00	1.00	3.80	2546.90
Taiwan	1	-	-	8.52	1.00	2.00	-	-
Thailand	1	60.6	-	6.25	1.00	2.00	1.85	12.03
Turkey	1	63.7	0.14	5.18	2.00	3.00	1.80	7.19
United Kingdom	0	59	0.25	8.57	1.00	1.00	3.57	758.54
United States	0	267.6	-	10.00	1.00	1.00	4.19	418.48
Venezuela	1	22.8	0.30	6.37	3.00	2.00	1.35	431.75
Zimbabwe	1	11.5	0.30	3.68	3.00	-	2.90	2.87

Panel B: WorldScope data

Country	Number of firms	Number of observations	Assets (in US\$)	Cash flow/ Sales (%)	R&D/ Sales (%)	CAPEX/ Sales (%)	Net fixed assets/ Total assets	Intangible assets/ Total assets	Intangible assets/ Net fixed assets	Total debt/ Total assets	Long-term debt/ Total assets	Long-term debt/ Total assets	Long-term debt/ Net fixed assets
Argentina	23	98	396,201	10.65	-	6.33	0.49	0.01	0.01	0.20	0.07	0.09	0.16
Australia	69	308	316,959	9.36	0.57	5.05	0.36	0.04	0.10	0.24	0.21	0.03	0.47
Austria	63	237	157,535	8.81	2.84	5.46	0.35	0.01	0.04	0.28	0.12	0.13	0.32
Belgium	62	230	146,743	10.57	2.92	6.44	0.25	0.03	0.13	0.24	0.09	0.12	0.36
Brazil	94	369	596,747	10.27	1.45	7.87	0.50	0.00	0.00	0.29	0.13	0.14	0.26
Canada	183	745	234,349	8.33	0.79	6.04	0.34	0.02	0.07	0.24	0.16	0.03	0.42
Chile	35	136	336,828	19.85	0.10	15.79	0.52	0.01	0.02	0.20	0.07	0.05	0.13
China	79	290	178,798	11.86	0.17	9.62	0.33	0.01	0.04	0.25	0.03	0.19	0.13
Colombia	15	55	472,517	10.20	-	4.01	0.49	0.00	0.00	0.10	0.04	0.05	0.21
Czech Rep	35	98	122,018	7.98	0.99	11.18	0.52	0.01	0.01	0.31	0.13	0.17	0.20
Denmark	93	400	74,849	8.68	4.13	5.40	0.35	0.00	0.00	0.22	0.13	0.07	0.36
Egypt	7	10	200,352	28.88	-	12.64	0.33	0.00	0.00	0.26	0.03	0.18	0.23
Finland	81	337	216,690	9.89	1.52	6.42	0.33	0.03	0.09	0.29	0.20	0.07	0.56
France	390	1,568	90,692	7.60	3.20	4.17	0.19	0.04	0.23	0.21	0.09	0.09	0.51
Germany	426	1,685	145,511	6.96	3.23	4.72	0.26	0.01	0.05	0.19	0.09	0.07	0.33
Greece	86	299	57,766	8.89	0.54	5.61	0.33	0.00	0.00	0.23	0.01	0.16	0.06
Hong Kong	138	585	165,196	7.21	0.49	5.92	0.38	0.00	0.00	0.23	0.06	0.14	0.16
Hungary	17	53	76,474	15.96	4.05	13.11	0.42	0.01	0.02	0.08	0.01	0.05	0.03
India	269	1229	99,063	8.67	0.26	7.32	0.42	0.00	0.00	0.37	0.20	0.14	0.50
Indonesia	82	313	135,727	14.63	0.06	9.73	0.38	0.00	0.00	0.45	0.08	0.25	0.24
Ireland	23	99	370,779	10.20	0.23	4.96	0.39	0.00	0.00	0.30	0.18	0.05	0.60
Israel	30	83	332,020	9.09	4.33	4.71	0.29	0.01	0.05	0.19	0.08	0.08	0.35
Italy	120	452	343,792	9.17	2.47	5.04	0.25	0.02	0.08	0.23	0.08	0.11	0.36
Japan	1,300	6,335	417,846	5.57	1.51	4.44	0.30	0.00	0.00	0.26	0.11	0.14	0.35
Jordan	2	4	390,344	32.13	0.27	16.99	0.61	0.00	0.00	0.24	0.18	0.06	0.29
Korea (South)	183	689	506,444	6.76	0.28	8.02	0.39	0.00	0.00	0.48	0.20	0.25	0.51
Malaysia	179	807	123,037	10.44	0.10	7.73	0.43	0.00	0.00	0.27	0.04	0.14	0.09
Mexico	48	188	661,168	13.26	0.45	7.26	0.63	0.02	0.03	0.31	0.17	0.09	0.28
Netherlands	101	441	273,268	8.96	4.08	4.55	0.34	0.00	0.00	0.23	0.12	0.07	0.32
New Zealand	16	73	140,723	8.18	0.38	5.13	0.36	0.00	0.01	0.26	0.21	0.02	0.53
Norway	72	286	85,554	7.38	5.15	7.15	0.29	0.03	0.09	0.20	0.14	0.02	0.56
Pakistan	79	324	32,379	5.23	0.10	3.35	0.45	0.00	0.00	0.43	0.11	0.22	0.24
Peru	16	47	52,257	13.36	-	5.48	0.44	0.00	0.00	0.27	0.08	0.13	0.16
Philippines	36	147	144,882	13.22	0.00	13.07	0.43	0.04	0.08	0.26	0.09	0.11	0.14

Annex 2

Table 1 Correlation matrix of explanatory variables in Table 4

	Private Credit-to-GDP * External Dependency	Law and order* External Dependency	Property* Intangible-to- fixed assets	Intellectual property* Intangible-to- fixed assets	Patent rights* Intangible-to- fixed assets
Private Credit-to-GDP * External Dependency	1.0000				
Law and order* External Dependency	0.8748	1.0000			
Property* Intangible-to- fixed assets	0.1520	0.1867	1.0000		
Intellectual property* Intangible-to- fixed assets	0.1439	0.1595	0.8918	1.000	
Patent rights* Intangible-to- fixed assets	0.1646	0.1676	0.9081	0.8975	1.0000

Table 2 Summary statistics of explanatory variables in Table 4

Variable	Mean	Standard deviation	Observations
Private Credit-to-GDP * External Dependency	0.1154	0.1783	1,468
Law and order* External Dependency	2.1574	3.0538	1,392
Property* Intangible-to-fixed assets	0.3895	0.5734	1,547
Intellectual property* Intangible-to-fixed assets	0.3888	0.5526	1,289
Patent rights* Intangible-to-fixed assets	1.7085	2.3510	1,547

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