

# Wharton

---

**Financial  
Institutions  
Center**

*Venture Capital and Corporate  
Governance*

by  
**Franklin Allen  
Wei-ling Song**

**03-05**





## The Wharton Financial Institutions Center

The Wharton Financial Institutions Center provides a multi-disciplinary research approach to the problems and opportunities facing the financial services industry in its search for competitive excellence. The Center's research focuses on the issues related to managing risk at the firm level as well as ways to improve productivity and performance.

The Center fosters the development of a community of faculty, visiting scholars and Ph.D. candidates whose research interests complement and support the mission of the Center. The Center works closely with industry executives and practitioners to ensure that its research is informed by the operating realities and competitive demands facing industry participants as they pursue competitive excellence.

Copies of the working papers summarized here are available from the Center. If you would like to learn more about the Center or become a member of our research community, please let us know of your interest.

  
Franklin Allen  
Co-Director

  
Richard J. Herring  
Co-Director

*The Working Paper Series is made possible by a generous  
grant from the Alfred P. Sloan Foundation*

## Venture Capital and Corporate Governance

Franklin Allen  
University of Pennsylvania

and

Wei-ling Song  
Drexel University

September 29, 2002

### **Abstract**

We consider data from 16 Asian countries, 16 European countries and the US to investigate the relationship between venture capital and corporate governance. There are five main findings. First, the variable measuring law and order is negatively related to the importance of venture capital finance. Second, the allocation of investment across different stages and different industries depends more on macroeconomic factors than on corporate governance variables. Third, in Low-GDP countries the allocation of venture capital is greater for low technology industries than for high technology industries. Fourth, venture capital boomed and became significant in many countries during the stock market boom or “bubble” of the late 1990’s. Finally, a comparison of Asian and European venture capital shows that in Asia there was more investment in early stage projects while in Europe there was more investment in late stage projects. Also, in Europe there was more investment in medical and biotechnology industries.

## **1. Introduction**

In the US venture capital has been particularly important in many new industries at the initial stage. It accounts for about two-thirds of the private-sector external equity financing of high-technology firms.<sup>1</sup> Venture capital differs from standard forms of financing in that there is much more involvement of providers of funds than is the case with other forms of lending such as bank loans in an attempt to avoid the problems arising from asymmetric information. Lenders are also concerned about resolving the uncertainty of cash flows. The absence of collateral means they cannot simply leave the entrepreneurs to their own devices, they must ensure resources are not squandered to try and earn a return on their investment. They provide finance in stages to ensure that option value is maximized. As Kaplan and Stromberg (2002) have documented these characteristics of venture capital mean that the contractual arrangements for venture capital are much more complex than for most types of finance. Typically they involve both sides receiving part of the upside potential of the project, in other words they have equity-type characteristics.

Venture capitalists typically provide finance for a limited period of time. If a firm is successful its needs for capital rapidly outstrip the capacity of limited partnerships that are the usual providers of venture capital in the US. An important exit mechanism for venture capitalists is an initial public offering (IPO) of the company. Even though IPO's are costly in a number of ways they often represent the best means for initial investors to obtain a return. Another common exit mechanism is outright sale of the start-up to a large firm.

The venture capital industry has prospered most in the US and the vast majority of the academic literature has been concerned with the US. In a cross-country study of venture capital, Jeng and Wells (2000) using data from 1986-1995 for 21 countries document that venture capital

---

<sup>1</sup> See Freear and Wetzel (1994).

is less important in other countries. Their main finding is that the existence of an active IPO market is the most important determinant of the importance of venture capital in a country. This is consistent with the finding of Black and Gilson (1998) in a comparison of the US and Germany, that the primary reason venture capital is relatively successful in the US is the active IPO market that exists there.

As Section 2 documents it took some time before a widely used contractual and institutional framework for venture capital became established in the US. This together with the complexity of the contract forms and the staging of finance suggests that corporate governance is a crucial component of venture capital. In this paper we consider the relationship between venture capital and corporate governance using data on venture capital from 33 countries during the 1990's. Whereas Jeng and Wells (2000) included only 4 Asian countries, our data set includes 16. The data we use to measure corporate governance come from La Porta et al. (1998). Our main findings are as follows.

First, corporate governance plays a different role than in the public equity and bond markets. The variable measuring law and order is *negatively* related to the importance of venture capital finance. In other words, countries with less law and order have a higher degree of venture capital. This is in marked contrast to the findings of La Porta et al. (1997) with regard to the public markets where the opposite relationship holds. This indicates that explicit contracts are not as important as the conventional wisdom suggests. In fact implicit relationships appear to provide a good substitute and this allows venture capital to fill the gap for the public markets. More in line with conventional wisdom, creditor rights are significant in determining the amount of venture capital in the market.

Second, the allocation of investment across different stages of finance and different industries depends more on macroeconomic factors than on corporate governance variables.

Third, in Low-GDP countries venture capital is more important for low technology industries than for high technology industries.

Fourth, venture capital boomed and became significant in many countries during the stock market boom or “bubble” of the late 1990’s.

Finally, a comparison of Asian and European venture capital shows that in Asia there was more investment in early stage projects while in Europe there was more investment in late stage projects. Also, in Europe there was more investment in medical and biotechnology industries.

The remainder of the paper proceeds as follows. In Section 2 we document the way in which venture capital developed and operates in the US. Section 3 describes the data and variables we use and Section 4 investigates the role of corporate governance in determining the importance of venture capital across countries. Section 5 concludes.

## **2. Venture Capital in the US**

Many high technology companies in the US have initially been funded with venture capital.<sup>2</sup> Although venture capital has been used for over 50 years it is only in the last 20 years or so that it has become a significant source of funds for new companies. American Research and Development (ARD), which was founded in 1946, was the first modern U.S. venture capital firm. It was a publicly traded, closed-end investment company. Initially, ARD was not particularly successful. It did not attract institutional investors in the way that its founders had hoped. Eventually it was profitable but not spectacularly so, providing investors with a 15.8 percent annual return over its 25 years as an independent firm compared to 12.8 percent on the

---

<sup>2</sup> This section draws on Fenn, Liang and Prowse (1997), Sahlman (1990) and Wright and Robbie (1998).

Dow Jones over the same period. A large proportion of this return came from a \$70,000 investment in Digital Equipment Corporation, without it the return to investors would have been only 7.4 percent.

Private venture capital companies were established to manage the investments of wealthy individuals but because of ARD's lack of success there were no publicly traded venture capital firms founded until Small Business Investment Companies (SBICs) were established under the Small Business Investment Act of 1958. These are tax-advantaged corporations licensed by the Small Business Administration (SBA) to provide professionally managed capital to risky companies. One of the main advantages that SBICs had was access to low-cost SBA loans. The SBIC program suffered from a number of difficulties including a lack of institutional investors, and investment managers that were not the most talented. Despite these problems SBICs did succeed in channeling many more funds to start-up companies than ARD.

In the late 1970's there were a number of important changes that allowed venture capital to start growing dramatically. The first was a change in the Labor Department's interpretation of the "prudent man" provision of ERISA. This had traditionally been interpreted as ruling out investments in new companies or venture capital funds. However, in 1978 a proposal was made to allow such investments provided the entire portfolio was not endangered and this was adopted the following year.

The second was the reduction in maximum capital gains tax rates from 49.5 percent to 28 percent in 1978 and to 20 percent in 1981.

The third important change was the start of the widespread use of limited partnerships as the investment form. Prior to the 1980s only a small fraction of venture capital investments were

structured in this way. During the 1980s and 1990s, however, over 80 percent of the capital committed to venture capital was in this form.

The limited partnership form has a number of advantages. The partnership's income is not subject to the corporate income tax. When a partnership distributes securities these are not taxed until they are sold. To qualify for these and other advantages several conditions must be met.

1. A fund's life must have a predetermined finite lifetime.
2. The transfer of limited partnership units is restricted so they cannot be easily bought and sold.
3. It is not possible to withdraw from the partnership before the termination date.
4. In order to preserve their limited liability, limited partners cannot participate in the day-to-day management of the fund.

The typical life of funds is ten years with extensions of from one to three years allowed. The fourth limitation means that the venture capitalists that run the fund are general partners and bear unlimited liability. However, the funds usually do not borrow or engage in activities that expose them to large liabilities so this is not an important restriction.

An important aspect of venture capital contracts is the way in which the venture capitalists are compensated. There are typically two components to this, a fixed fee and share of the profits. The fixed component is usually between 1.5 percent and 3 percent of net asset value and the other component is around 20 percent of profits.

Venture capital investment involves a number of stages.<sup>3</sup> Venture capitalists may provide funds for all or some of these stages. The basic document governing the relationship between the venture capital firm and the company they are investing in is the stock-purchase agreement.

---

<sup>3</sup> See Table 2 on p. 479 of Sahlman (1990) for a description of these.



This specifies the amount and timing of the investment in the company. Usually, the amount invested grows through time. At each stage the amount invested is expected to carry the firm through until the next stage. By staging the financing in this way the venture capitalists can maximize the option value of the investment by making sure the correct continuation decision is made.

The form of security that is usually used in venture capital investments is convertible preferred stock. The important parameters for these are:

- a. the conversion price which can be contingent on firm performance;
- b. liquidation preferences including a description of the events that trigger liquidation;
- c. dividend rate, payment terms, and voting rights (typically on an as-if-converted basis).

The convertible preferred typically does not pay a dividend on a current basis, but at the discretion of the board of directors. Sometimes the dividends accrue and are not paid in cash but the liquidation preference entitles the holders to the face value and the accrued dividends.

The agreements between venture capitalists and the firm typically have a number of other components. Venture capitalists can usually call for the redemption of the preferred stock. They also often have preemptive rights and rights of first refusal if new stock is issued. Key employees are often required to execute employment contracts with noncompete clauses. Employees in startups accept low salaries in return for some kind of equity interest and the vesting of shares is often laid out in the agreements. Finally, the agreements usually specify extensive access to information such as monthly financial statements, frequent operating statements and the right to inspect at will.

The evidence in this section suggests that venture capital requires a quite specific contractual and institutional framework to become a significant means of funding. The

complexity of the contractual forms and the role of stage financing also suggest that corporate governance is an important factor in venture capital, at least in the US. We next go on to consider the importance of corporate governance in other countries.

### **3. Data and Variables**

#### *3.1. Sample selection*

Venture capital information on 33 countries during the decade of the 1990s are obtained from the 2001 Yearbook of National Venture Capital Association (NVCA) for the US, The 2002 Guide to Venture Capital in Asia (AVCJ) for Asian countries, and various Yearbooks of European Private Equity and Venture Capital Association (EVCA) for European countries.<sup>4</sup> Because the focus of this paper is on the relationship between corporate governance and venture capital, we use the list of countries in La Porta et al (1998), which provide governance information on 49 countries, as the starting point. We then match this list with venture capital information available to us. This screening produces a sample contains 32 countries. We add China and obtain governance information from Allen, Qian and Qian (2002). All other macro indicators were downloaded from the World Bank online database except Taiwan, which is obtained from the National Statistics Bureau of Executive Yuan of the Republic of China. Legal origin information for each country is also obtained from La Porta et al (1998). China is not classified based on legal origin.

Because of information availability, we left out Canada and all South American and African countries. Among these countries, only Canada has average real GDP per capita (measured in constant 1995 US\$) above US\$10,000 during the 1990s. The remainder all have

---

<sup>4</sup> AVCJ reports Australia, New Zealand and Israel as Asian countries so we also classify them as belonging to the Asian group.

GDP per capital less than US\$10,000. They are likely to have fewer venture capital activities compared to more developed countries. Although many developing countries are left out in our study, we still retain 8 developing countries in Asia in our sample, which we classified as the Low-GDP group. Among the remaining countries, 12 having GDP per capital above US\$25,000 are defined as the High-GDP group, which contains US, Japan, and 10 European countries. The rest of the 13 countries are the Mid-GDP group that includes some European countries, Israel, New Zealand, Australia, and the 4 newly industrialized “little dragons” in Asia, i.e., Hong Kong, Singapore, South Korea, and Taiwan.

### 3.2. *Variables and Descriptive Statistics*

There is no standardized format of reporting information among the three trade associations, i.e., AVCJ, EVCA, and NVCA. Therefore, a detailed description of variable definition is necessary to ensure consistency and to facilitate interpretation of the results. Three proxies are employed to examine the level of venture capital activities. They are venture capital investment portfolio (VCIP), annual new fund raised, and total annual disbursements.<sup>5</sup> Most of the countries have information on VCIP from 1993 to 2000, the information on the remaining two variables are available from 1994 to 2000. We also examine the growth rates of venture capital activities. However, none of the independent variables in this study could explain the growth rates across countries, thus, we do not report the results.

VCIP for Asian countries is the cumulative total of existing investments less any divestments made as defined by AVCJ. That for European countries is the “Portfolio at Cost” on December 31 reported by EVCA. NVCA does not report VCIP, thus, “Capital Under

---

<sup>5</sup> In the venture capital industry, investments made to portfolio (venture) companies are referred to as disbursements, so it is not confused with investments made by investors who provide capital to the venture capital funds.

Management” is used as the proxy for VCIP for the United States. Note that capital under management includes total capital available for investment plus cumulative investment portfolio currently held. As will be discussed later, the venture capital information from NVCA is not directly comparable to that from the other two trade associations in many ways. In addition, economically, the venture capital industry in the US has a much longer history and is more developed than others. As a robustness check, all the analyses were repeated without US data. The findings are essentially unchanged and thus are not reported.

Table 1 reports VCIP in 1993 and 2000 in two measures, i.e., in constant 1995 US\$ in millions and as a percentage of GDP. Geometric average growth rates for both measures during this period are also reported. The last column shows the average real GDP per capita in 1995 US\$ during 1991 to 2000, which is used to classify country’s economic development into High-GDP, Mid-GDP, and Low-GDP group. From Panels A and B of Table 1, one can see that most of the Asian countries started with few venture capital activities in 1993 but European countries had higher levels in place. However, both regions grew dramatically during the 1990s with an average growth rate of 33% for Asia and that of 24% for Europe (Column 6 of Panel D, %GDP based). These two numbers are insignificantly different due to big variation among countries in each region. The average growth rate for US is also 24%.

In general, the growth rates of venture capital do not differ among groups with different GDP per capita, but the levels of venture capital differ, in particular, when the level is standardized by GDP regardless of time period. The Mid-GDP group has the highest level of venture capital (as % of GDP), followed by the High-GDP group, then the Low-GDP group. In terms of dollar measure (constant 1995 US\$), there is no difference between the High-GDP and the Mid-GDP groups in both 1993 and 2000. The Mid-GDP group has marginally significant

higher VCIP in dollar measure than the Low-GDP group in both 1993 and 2000. There are little differences among legal origin subgroups.

In Table 2 new funds raised are the total capital raised during 2000 and are given as a percentage of GDP. Similarly, total annual disbursements are the amounts invested in portfolio companies. For Asian and European countries, the numbers include both venture capital and buyouts. Although the figures of Asia are larger than those of Europe, these numbers are not significantly different. For US, only venture capital is included because NVCA reports allocation information based on capital committed to venture capital. The venture capital funds raised in US are \$92.9 billion in 2000. Including the capital committed to buyouts, mezzanine, and other private capital, total private equity capital in US summed to \$167.65 billion in 2000, which is a huge number compared to that of any other country in 2000. Both the High- and Mid-GDP groups raise (invest) significantly larger amounts of funds than the Low-GDP group in 2000. In general, there is little difference between groups with different legal origins. Most of the differences are not significant and those that are significant are only significant at the 10% level for a one-tailed test.

Figures 1 and 2 provide the time series information on new funds raised as a percentage of GDP each year from 1994 to 2000 by region and by GDP per capita level, respectively. It can be seen from Figure 1 that the US has a higher level of new funds raised near the end of the 1990s compared to the average figures for Asia and Europe. Before 1997, there are few differences among different regions. However, after 1997, venture capital activities pick up in all regions with different levels. Figure 2 demonstrates similar trends. Since 1997, the Mid-GDP group has the highest new funds raised as a percentage of GDP, followed by the High-GDP group, then by the Low GDP group.

Table 2 also reports the funding sources and allocations (uses) of funds in 2000 by region. Same region indicates the percentage of funds raised (sources) or disbursements (uses) in the same continent but outside the home country. Outside region indicates outside the home continent. The last 6 columns (% sources and uses) do not contain US data because the NVCA only provides US domestic activities. Thus, we do not have information on foreign funding sources and investments for the US.

Europe tends to have a higher percentage of funds provided by domestic investors, but Asia has a higher percentage of funds come from outside the continent. There is no difference in disbursements in region between Asia and Europe. In terms of funding sources, the High-GDP group has the highest percentage provided by domestic investors, followed by the Mid-GDP group. The Low-GDP group has the highest percentage of funds provided by investors outside its home continent. The reverse is true for disbursements of funds. The Low-GDP group invests a higher percentage of funds domestically than both the High- and Mid-GDP groups. Both the High- and Mid-GDP groups invest a higher percentage of funds in other countries in their home continents and outside the home continents.

Table 3 reports the allocations of funds by stage and by industry. Early stage includes seed and startup investments. Later stage includes Mezzanine, buyout and turnaround for Asia. That for Europe includes replacement capital and buyout. That for the US contains buyout/acquisition and other later stage firms funded by venture capital, which does not include funds raised specifically for buyouts and Mezzanine and other private equity. High-Tech includes computer related, electronics, information technology, and telecommunications industries for Asia as defined by AVCJ. That for Europe includes communications, computer related, and other electronic related industries as defined by EVCA. That for US includes online

specific, communications, computer software and services, semiconductor and other electronics and computer hardware industries as defined by NVCA. Med-Tech includes medical, health related and biotechnology industries. Non-Tech is the remaining industries excluding the High-Tech and Med-Tech industries.

Panel D, Table 3 shows that Asia tends to invest a higher percentage of funds at an early stage, while Europe invests a higher proportion at a later stage. Europe tends to invest more in the medical and biotechnology industry than Asia. The Low-GDP group allocates a significantly higher percentage of funds at the early stage than both the High- and Mid-GDP groups and in Non-Tech industry than the Mid-GDP group. Such results could be driven by the fact that Low-GDP countries have less developed stock markets, which discourage later stage investments. As Jeng and Wells (2000) have shown that IPOs have no effect on early stage investment but they are a significant factor that determines later stage investments. In addition, Non-Tech industry is not as risky as High-Tech industry and does not require highly skilled workers, which may explain higher investments in the Non-Tech sector by the Low-GDP group. The High-GDP group allocates a higher percentage of funds to the medical and biotechnology industry, followed by the Mid-GDP group, then by the Low-GDP group.

The English legal origin group does not differ from the German and Scandinavian legal origin groups in early stage investment, but invests more in early stage than French legal origin group, which has the weakest legal protections of investors investing more in expansion stage than all others. The Scandinavian legal origin group invests the highest percentage in the medical and biotechnology industry.

#### **4. The Role of Corporate Governance**

#### 4.1. *Links between law, financial development, and economic growth*

Because the direct governance structures between investors and venture capitalists and between venture capitalists and portfolio companies are not available, we resort to the analysis of the relationships between venture capitalism and governance to that between the level of venture capital activities and the extent of investor protection and contract enforcement across countries. The validity of this approach is supported by La Porta et al. (2000). It contends that empirical evidence that links investor protection to more valuable stock markets, higher IPO rates (see, for example, La Porta et al. (1997)) and insider ownership of cash flows and corporate valuation (see, for example, Gorton and Schmid (2000)) reflecting strong investor protection is associated with effective corporate governance. Himmelberg, Hubbard, and Love (2000) and Wurgler (2000) also provide evidence of links between investor protection and efficient allocation of capital. Therefore, in this study, we use investor protection and law enforcement to proxy the effectiveness of governance and examine its role on venture capital activities across countries.

La Porta et al. (1998) provide various measures of investor protection and enforcement, such as, shareholder rights, creditor rights, efficiency of judicial system, rule of law, corruption, accounting standards, etc.<sup>6</sup> However, among those, we find two variables, creditor rights and rule of law, have explanatory power on the levels of venture capital activities across countries. We discuss these two variables further next.

Creditor rights is an index aggregating four measures indicating creditor protection, the index ranges from 0 to 4. These four measures include “no automatic stay on assets,” “secured creditors first paid,” “restrictions for going into reorganization,” and “management does not stay in reorganization”. Rule of law assesses the law and order tradition in the country. The number ranges from 0 to 10, with lower scores for less tradition for law and order. Both creditor rights

---

<sup>6</sup> Shareholder rights are also antidirector rights in La Porta et al. (1998).



and rule of law information are obtained from La Porta et al. (1998) except for China, which is from Allen, Qian and Qian (2002).

Besides the governance variables, we also control for the level of economic development, the past real economic growth, and the development of the stock market.<sup>7</sup> Dummy variables indicating if a country is in Asia and country's legal origin are also included. Economic growth, financial development, governance and investor protection are correlated as suggested by many empirical studies.<sup>8</sup> The proxy for the level of economic development is average real GDP per capita in 1995 US\$ during 1991 to 2000. Both continuous measure (Log of GDP per capita) and dummy variable specification that indicate high or middle level of GDP per capita are employed in the regressions. Our findings are robust to both specifications, therefore, in most of the regressions, only one set of results is provided.

Past real economic growth is a 4-year average GDP growth rate based on constant 1995 US\$ prior to the year that dependent variables are measured. For example, where VCIP in 2000 is the dependent variable, the 4-year average for economic growth covers 1996 to 1999. The development of the stock market, i.e., the market capitalization as a percentage of GDP, is defined similarly. The control of market capitalization is crucial during our sample period for several reasons. First, it is documented that IPOs are an important exit method employed by venture capitalists (see Jeng and Wells (2000) and Black and Gilson (1998)).<sup>9</sup> A well-developed stock market implies a better channel of exit. Secondly, the development of the stock market may indicate the country's future economic condition and thus may signal an investment

---

<sup>7</sup> We also include market capitalization growth, however, this variable is rarely significant in the regressions. Thus we drop this variable in our analysis.

<sup>8</sup> See Beck, Levine, and Loayza (2000), Beck and Levine (2002), Levine and Zervos (1998), Rajan and Zingales (1998), and Demirguc-Kunt and Maksimovic (2002).

<sup>9</sup> See Barry, Muscarella, Peavy and Vetsuypens (1990) and Lin and Smith (1998) for the role of venture capitalists during IPOs.

opportunity to venture capitalists. In addition, the development of a stock market in a country could be the result of integrated legal and governance structures as La Porta et al. (1997) suggest. Finally, Johnson et al. (2000) link the measures of corporate governance with the declines of stock markets in emerging countries during 1997-98 Asian financial crisis. In aggregate, these reasons suggest that stock market development could affect venture capital investment in a country. However, it also contains information overlapping with the measures of governance. These discussions indicate the complexity of interpretation of regression results.

#### 4.2. *Determinants of venture capital activities*

Table 4 reports the determinants of venture capital activities across countries. VCIP 2000 measures the cumulative venture capital investment as a percentage of GDP at the end of 2000. The results of Model (1) show that creditor rights are a significant determinant of the level of venture capital across countries rather than shareholder rights (not reported). Venture capitalists tend to invest in countries with *less* tradition for law and order. It can be argued these findings are consistent with the nature and role of venture capital. Venture capital claims often more closely resemble creditor claims than equity claims. Therefore, creditor protection is more important for venture capital activities. The negative relation of VCIP with rule of law is perhaps more surprising. What this suggests is that relationships are more important in many countries than contracts. As a result venture capital investments become more important in countries where the rule of law is less established.<sup>10</sup>

The level of economic development (measured by GDP per capita) is positively related to the level of venture capital investments. Past real GDP growth does not affect the level of

---

<sup>10</sup> The results are not driven by collinearity between creditor rights and rule of law. We use alternative model specifications that drop each variable in turn. The findings are more significant.

venture capital investments but the size of market capitalization (as a % of GDP) does positively. As discussed above, the significant positive coefficient on market capitalization is consistent with several explanations. It may indicate any one or all of the following, an easier channel for venture capital exit, a better economic outlook for the country, or a more developed financial infrastructure as a result of better investor protection aggregated from various governance measures. The last explanation works in the direction of not finding significant results for governance measures.

The German legal origin group, which includes bank centered Germany and Japan, has a lower level of venture capital activities compared to the English legal origin group. As a robustness check, Model (2) uses a more continuous measure of economic development (Log of GDP per capita) than Model (1), which uses High-GDP and Mid-GDP dummy variables. As Table 4 indicates, the results are robust. Both new funds raised and total annual disbursements are the sums of 4 years (1997-2000) numbers measured as a percentage of GDP. The findings are essentially the same as those of VCIP 2000.<sup>11</sup>

We further examine the allocations in different stages and in industries. Although governance affects the level of venture capital activities, it does not influence the allocations to different stages of investments and industries except the medical and biotechnology industries as Table 5 shows. Higher past real GDP growth encourages more early stage investment. Larger market capitalization as a percentage of GDP encourages more later stage investment since the exit channel becomes more important for later stage. Better creditor protection is associated with a higher percentage of funds allocated to the medical and biotechnology industry. Higher GDP

---

<sup>11</sup> We use the data of last four years in the 1990s because, as Figures 1 and 2 indicate, the venture capital activities started to show variation across countries since 1997.

per capita and past real GDP growth are associated with higher allocation to High-Tech industry. The reverse is true for Non-Tech industry.

## **5. Conclusions**

Venture capital is a special funding source that has fueled the development of many big companies in the technology sector in recent years both in the US and internationally. In this paper, we examine the venture capital activities around the world in the 1990s and link such activities with corporate governance across countries. We build upon the recent empirical evidence on the links among law and external public financing and extend the financing menu to private equity funding such as venture capital.

Although the venture capital industry in the US started in 1946, this special funding source did not play a significant role in the economy until the 1980s, which is the decade many other countries started their venture capital industries or further developed the industries from their initial start. However, the dramatic boom of this industry did not occur until the decade of the 1990s not only in US but also in Asia and in Europe, regardless of the level of GDP per capita, and legal origin. All groups experienced impressive average growth rates above 20% while some are close to 40% during the period 1993 to 2000.

The prosperity of the venture capital industry in the 1990s raises an empirical question, does the level and growth of venture capital investments in different countries depend on corporate governance? Venture capital tends to invest in firms that are younger, more intangible, and riskier but have higher expected payoffs. Such investment objectives demand financial contracting between venture capitalists and venture firms resort to equity or equity-related claims but with the flavor and control of credit holders. Our findings show that venture

capitalists seeking to invest in countries with better creditor protection rather than shareholder protection, which is more relevant for publicly traded firms. It highlights the main difference between private and public equity in terms of the natures of their claims.

Despite the conventional wisdom that contracts play an important function in venture capital, we find a negative relation between the rule of law and venture capital. This suggests relationships can substitute for contracts with this type of financing. The findings contrast with those of La Porta et al. (1997) who find that the size of other funding sources, both debt and public equity, is larger in countries with more tradition of rule and order. This indicates venture capital can substitute for debt and equity financing in the public markets. Thus, we provide some evidence on the unique role of venture capital in the economy in contrast to other financing means.

We do not find any links between governance and venture capital allocations except for the role of creditor rights in the medical and biotechnology industry. It appears that governance matters for the level of venture capital activities across countries but does not affect allocations. Instead, fundamental economic conditions and the development of capital markets affect the industry and stage allocations, respectively.

In the US venture capital is primarily associated with high technology industries. Our findings indicate this is true in other countries that have high and medium GDP levels. However, in Low-GDP countries venture capital is more often used for low tech industries.

Finally, a comparison of the Asian and European venture capital industries indicates important differences. In Asia there is more investment in early stage projects while in Europe there is more investment in late stage projects. Also, in Europe there is more investment in medical and biotechnology industries.

## References

- Allen, Franklin, Jun Qian, and Meijun Qian, 2002. Law, finance, and economic growth in China. Unpublished working paper. University of Pennsylvania and Boston College.
- Barry, Christopher B., Chris Muscarella, John W. Peavy III, and Michael R. Vetsuypens, 1990. The role of venture capital in the creation of public companies: evidence from the going-public process. *Journal of Financial Economics* 27, 447-471.
- Beck, Thorsten, and Ross Levine, 2002. Industry growth and capital allocation: does having a market- or bank-based system matter? *Journal of Financial Economics* 64, 147-180.
- Beck, Thorsten, Ross Levine, and Norman Loayza, 2000. Finance and the sources of growth. *Journal of Financial Economics* 58, 261-300.
- Black, Bernard S. and Ronald J. Gilson, 1998. Venture capital and the structure of capital markets: bank versus stock markets. *Journal of Financial Economics* 47, 243-277.
- Demirguc-Kunt, Asli, and Vojislav Maksimovic, 2002. Funding growth in bank-based and market-based financial systems: evidence from firm-level data. *Journal of Financial Economics* 65, 337-363.
- Fenn, George W., Nellie Liang, and Stephen Prowse, 1997. The private equity market: An overview. *Financial Markets, Institutions & Instruments* 6, 1-105.
- Freear, John and William E. Wetzel, Jr., 1994. Who bankrolls high-tech entrepreneurs? *Journal of Business Venturing* 5, 77-89.
- Gorton, Gary, and Frank A. Schmid, 2000. Universal banking and the performance of German firms. *Journal of Financial Economics* 58, 29-80.
- Himmelberg, Charles P., R. Glenn Hubbard, and Inessa Love, 2000. Investor protection, ownership, and investment: some cross-country empirical evidence. Unpublished working paper. Columbia University.
- Jeng, Leslie A., and Philippe C. Wells, 2000. The determinants of venture capital funding: evidence across countries. *Journal of Corporate Finance* 6, 241-289.
- Johnson, Simon, Peter Boone, Alasdair Breach, and Eric Friedman, 2000. Corporate governance in the Asian financial crisis. *Journal of Financial Economics* 58, 141-186.
- Kaplan, Steven N. and Per Strömberg, 2002. Financial contracting theory meets the real world: An empirical analysis of venture capital contracts. *Review of Economic Studies*, forthcoming.
- La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny, 1997. Legal determinants of external finance. *Journal of Finance* 52, 1131-1150.

- La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny, 1998. Law and finance. *Journal of Political Economy* 106, 1113-1155.
- La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny, 2000. Investor protection and corporate governance. *Journal of Financial Economics* 58, 3-27.
- Levine, Ross, and Sara Zervos, 1998. Stock markets, banks, and economic growth. *The American Economic Review* 88, 537-558.
- Lin, Timothy H., and Richard L. Smith. 1998. Insider reputation and selling decisions: the unwinding of venture capital investments during equity IPOs. *Journal of Corporate Finance* 4: 241–263.
- Rajan, Raghuram G., and Luigi Zingales, 1998. Financial dependence and growth. *The American Economic Review* 88, 559-586.
- Sahlman, William A. 1990. The structure and governance of venture-capital organizations. *Journal of Financial Economics* 27, 473-521.
- Wright, Mike and Ken Robbie 1998. Venture capital and private equity: A review and synthesis. *Journal of Business Finance and Accounting* 25, 521-569.
- Wurgler, Jeffrey, 2000. Financial markets and the allocation of capital. *Journal of Financial Economics* 58, 187-214.

Table 1 Level and Growth of Venture Capital Investment Portfolio by Country

Country	VCIP in 1993 (US\$)	VCIP in 2000 (US\$)	%CAGR (US\$)	VCIP in 1993 (% GDP)	VCIP in 2000 (% GDP)	%CAGR (%GDP)	GDPPC (US\$)
Panel A. Asia							
Australia	1,268	2,650	11	0.37	0.58	7	21,159
China	429	4,051	38	0.08	0.39	26	602
Hong Kong, China	.	9,027	24	.	5.48	20	22,145
India	111	1,618	47	0.04	0.35	38	388
Indonesia	41	161	22	0.02	0.08	18	982
Israel	.	4,614	50	.	4.34	44	15,672
Japan	7,359	11,420	6	0.14	0.20	5	42,776
Malaysia	91	549	29	0.12	0.49	22	4,213
New Zealand	1	309	117	0.00	0.46	111	16,189
Pakistan	0	11	122	0.00	0.02	115	494
Philippines	30	221	33	0.04	0.25	28	1,100
Singapore	859	4,484	27	1.24	3.95	18	23,392
South Korea	1,629	7,312	24	0.39	1.18	17	10,768
Sri Lanka	14	45	18	0.12	0.27	12	731
Taiwan	505	3,525	32	0.22	1.29	29	11,893
Thailand	80	447	28	0.06	0.26	24	2,652
Panel B. Europe							
Austria	14	317	56	0.01	0.12	52	29,831
Belgium	1,072	2,776	15	0.41	0.88	11	27,759
Denmark	208	681	18	0.13	0.33	15	34,853
Finland	100	1,045	40	0.08	0.63	33	26,813
France	5,533	19,818	20	0.37	1.13	17	27,363
Germany	4,313	15,132	20	0.18	0.56	17	30,406
Greece	.	309	96	.	0.22	90	11,665
Ireland	263	630	13	0.46	0.60	4	19,972
Italy	1,727	6,327	20	0.17	0.53	18	19,324
Netherlands	1,811	7,420	22	0.46	1.51	18	27,635
Norway	203	919	24	0.15	0.54	20	34,139
Portugal	251	428	8	0.25	0.33	4	11,239
Spain	661	2,784	23	0.12	0.40	19	15,491
Sweden	545	4,843	37	0.24	1.75	32	27,785
Switzerland	367	1,641	24	0.12	0.49	22	44,593
United Kingdom	10,787	33,078	17	1.03	2.56	14	19,489
Panel C. America							
United States	32,969	192,164	29	0.48	2.13	24	28,441
Panel D. Average (Number of Observations) by Subgroup and <i>t</i> -test for Differences between Subgroup							
Asia	886.9 (14)	3152.7 (16)	39 (16)	0.2 (14)	1.2 (16)	33 (16)	10947.2 (16)
Europe	1857.0 (15)	6134.3 (16)	28 (16)	0.3 (15)	0.8 (16)	24 (16)	25522.2 (16)
Asia vs. European	-1.04	-1.22	1.10	-0.7	0.95	0.94	-3.88***



Table 1 (Continued)

Subgroup	VCIP in 1993 (US\$)	VCIP in 2000 (US\$)	%CAGR (US\$)	VCIP in 1993 (% GDP)	VCIP in 2000 (% GDP)	%CAGR (%GDP)	GDPPC (US\$)
Panel D. Average (Number of Observations) by Subgroup and <i>t</i> -test for Differences between Subgroup							
High-GDP	4541.3 (12)	21514.6 (12)	26 (12)	0.2 (12)	0.9 (12)	22 (12)	31866.1 (12)
Mid-GDP	1795.1 (10)	5806.0 (13)	36 (13)	0.4 (10)	1.7 (13)	30 (13)	16799.8 (13)
Low-GDP	99.4 (8)	887.7 (8)	42 (8)	0.1 (8)	0.3 (8)	36 (8)	1395.2 (8)
High-GDP vs. Mid-GDP	0.89	1.03	-0.94	-1.53 <sup>a</sup>	-1.51 <sup>a</sup>	-0.79	7.1 <sup>***</sup>
High-GDP vs. Low-GDP	1.34 <sup>a</sup>	1.07	-1.53 <sup>a</sup>	2.95 <sup>***</sup>	2.53 <sup>**</sup>	-1.27	13.77 <sup>***</sup>
Mid-GDP vs. Low-GDP	1.48 <sup>a</sup>	1.58 <sup>a</sup>	-0.43	2.54 <sup>**</sup>	2.22 <sup>**</sup>	-0.35	9.48 <sup>***</sup>
English legal origin	4222.1 (11)	19202.0 (13)	41 (13)	0.4 (11)	1.7 (13)	35 (13)	13456.7 (13)
French legal origin	1390.6 (8)	4471.6 (9)	29 (9)	0.2 (8)	0.6 (9)	25 (9)	15838.8 (9)
German legal origin	2364.68 (6)	6557.9 (6)	27 (6)	0.2 (6)	0.6 (6)	24 (6)	28377.7 (6)
Scandinavian legal origin	264.2 (4)	1871.8 (4)	3 (4)	0.2 (4)	0.8 (4)	25 (4)	30897.4 (4)
English vs. French	0.78	0.83	0.85	0.79	1.66 <sup>a</sup>	0.7	-0.53
English vs. German	0.44	0.58	0.88	0.99	1.3	0.7	-2.59 <sup>**</sup>
English vs. Scandinavian	0.77	0.64	0.59	0.93	0.87	0.52	-3.27 <sup>***</sup>
French vs. German	-0.77	-0.64	0.15	0.64	-0.19	0.1	-1.94 <sup>*</sup>
French vs. Scandinavian	1.21	0.78	-0.07	0.88	-0.69	-0.01	-2.69 <sup>***</sup>
German vs. Scandinavian	1.41 <sup>a</sup>	1.52 <sup>a</sup>	-0.29	0.36	-0.48	-0.15	-0.33

Venture capital investment portfolio (VCIP) for Asian countries is the cumulative total of existing investments less any divestments made as defined by Asian Venture Capital Journal. That for European countries is the “Portfolio at Cost” on December 31 reported by European Private Equity & Venture Capital Association. National Venture Capital Association does not report VCIP, thus, “Capital Under Management” is used as the proxy for VCIP for the United States. The unit for the first two columns is millions in constant 1995 US\$. “%CAGR” is the geometric annual growth rate in percentage for VCIP in real US dollar and in % of GDP over 1993-2000. The number of observations for growth rate calculation is 7 except those for Hong Kong, Israel, and Greece, which are 4, 3 and 5, respectively. GDPPC is average GDP per capita during 1991-2000 in constant 1995 US\$. High-GDP group contains countries having average GDP per capita greater than or equal to US\$25,000. Mid-GDP group includes countries having average GDP per capita less than US\$25,000 and greater than or equal to US\$10,000. Low-GDP group includes those with GDP per capita less than US\$10,000. Legal origin identifies the country’s Company Law or Commercial Code origin as classified by La Porta et al. (1998). There is no legal origin classification for China. <sup>a</sup> Significant at the 10 percent level for a one-tailed test. \*, \*\*, \*\*\*, Significant at the 10, 5, 1 percent level for a two-tailed test.

Table 2 Venture Capital Funds Sources and Disbursements in 2000 by Region and by Country

Country	New Funds Raised	%GDP Total Annual Disbursements	Domestic		Same Region		Outside Region	
			Sources (%)	Uses (%)	Sources (%)	Uses (%)	Sources (%)	Uses (%)
Panel A. Asia								
Australia	0.28	0.17	81	96	4	2	15	2
China	0.19	0.08	56	81	17	17	27	2
Hong Kong	1.94	1.49	9	13	20	84	71	3
India	0.26	0.19	10	92	21	5	69	3
Indonesia	0.00	0.02	52	100	14	0	34	0
Israel	3.41	2.77	72	89	2	0	26	11
Japan	0.10	0.05	76	82	4	7	20	11
Malaysia	0.19	0.12	46	89	26	10	28	1
New Zealand	0.30	0.20	90	89	10	11	0	0
Pakistan	0.01	0.01	87	100	0	0	13	0
Philippines	0.12	0.11	35	86	22	13	43	1
Singapore	1.98	1.40	30	16	31	67	39	17
South Korea	0.43	0.60	68	94	8	3	24	3
Sri Lanka	0.04	0.07	62	100	8	0	30	0
Taiwan	0.52	0.37	82	78	6	9	12	13
Thailand	0.25	0.07	23	91	15	8	62	1
Panel B. Europe								
Austria	0.11	0.08	92	88	9	12	0	0
Belgium	0.26	0.23	100	56	0	15	0	30
Denmark	0.40	0.16	99	69	1	23	0	8
Finland	0.42	0.29	83	70	14	25	4	5
France	0.44	0.38	58	88	22	7	21	4
Germany	0.30	0.23	79	82	11	9	9	9
Greece	0.25	0.16	66	31	3	64	31	5
Ireland	0.19	0.22	83	78	11	22	6	0
Italy	0.24	0.25	47	77	40	13	13	10
Netherlands	0.67	0.48	53	51	35	37	12	12
Norway	0.23	0.17	100	87	0	8	0	5
Portugal	0.08	0.16	100	93	0	7	0	0
Spain	0.32	0.19	57	97	31	2	12	1
Sweden	1.27	0.93	35	60	40	40	25	0
Switzerland	0.25	0.24	76	25	6	69	18	6
United Kingdom	1.12	0.86	37	69	17	24	46	8
Panel C. America								
United States	0.94	1.05	-	-	-	-	-	-

Table 2 (Continued)

Subgroup	%GDP		Domestic		Same Region		Outside Region	
	New Funds Raised	Total Annual Disbursements	Sources (%)	Uses (%)	Sources (%)	Uses (%)	Sources (%)	Uses (%)
Panel D. Average (Number of Observations) by Subgroup and <i>t</i> -test for Differences between Subgroup								
Asian (n=16)	0.6	0.5	55	81	13	15	32	4
Europe (n=16)	0.4	0.3	73	70	15	24	12	6
Asia vs. European	0.86	0.83	-2.03*	1.3	-0.43	-1.12	3.22***	-0.97
High-GDP (n=12)	0.4	0.4	77	69	13	23	10	8
Mid-GDP (n=13)	0.9	0.7	63	71	14	24	23	6
Low-GDP (n=8)	0.1	0.1	46	92	15	7	38	1
High-GDP vs. Mid-GDP	-1.31	-1.33 <sup>a</sup>	1.43 <sup>a</sup>	-0.16	-0.24	-0.08	-1.91*	0.91
High-GDP vs. Low-GDP	2.45**	2.39**	2.98***	-3.18***	-0.48	2.27**	-4.29***	2.48**
Mid-GDP vs. Low-GDP	2*	2.14**	1.48 <sup>a</sup>	-1.97*	-0.27	1.65 <sup>a</sup>	-1.75*	2.28**
English legal origin (n=13)	0.8	0.7	52	77	14	19	34	4
French legal origin (n=9)	0.3	0.2	63	75	18	18	18	7
German legal origin (n=6)	0.3	0.3	79	75	7	18	14	7
Scandinavian legal origin (n=4)	0.6	0.4	79	71	14	24	7	5
English vs. French	1.64 <sup>a</sup>	1.58 <sup>a</sup>	-0.88	0.12	-0.87	0.17	1.68 <sup>a</sup>	-0.99
English vs. German	1.29	1.15	-2.06*	0.13	1.58 <sup>a</sup>	0.09	1.94*	-1.21
English vs. Scandinavian	0.48	0.63	-1.52 <sup>a</sup>	0.34	-0.03	-0.32	2.08**	-0.25
French vs. German	-0.2	-0.48	-1.64 <sup>a</sup>	0.04	1.77 <sup>a</sup>	-0.05	0.68	0.01
French vs. Scandinavian	-1.75 <sup>a</sup>	-1.22	-1.07	0.3	0.51	-0.57	1.3	0.5
German vs. Scandinavian	-1.44 <sup>a</sup>	-0.69	-0.02	0.25	-0.84	-0.42	1.0	0.87

New funds raised (total annual disbursements) are total capital raised (invested) during 2000 as a percentage of GDP. For Asian and European countries, the numbers include both venture capital and buyouts. For the US, only venture capital is included. Same region indicates the percentage of funds raised (sources) or disbursements (uses) in the same continent. Outside region indicates region outside the home continent. The last 6 columns (% sources and uses) do not contain US data because, by the definition of NVCA, it only provides US domestic activities. Thus, we do not have information on foreign funding sources and investment for US. The numbers of observations for the means of High-GDP and English legal origin groups are 11 and 12, respectively. High-GDP group contains countries having average GDP per capita during 1991-2000 greater than or equal to US\$25,000. Mid-GDP group includes countries having average GDP per capita less than US\$25,000 and greater than or equal to US\$10,000. Low-GDP group includes those with GDP per capita less than US\$10,000. Legal origin identifies the country's Company Law or Commercial Code origin as classified by La Porta et al (1998). There is no legal origin classification for China. <sup>a</sup> Significant at the 10 percent level for a one-tailed test. \*, \*\*, \*\*\*, Significant at the 10, 5, 1 percent level for a two-tailed test.

Table 3 Venture Capital Disbursements in 2000 by Stage and by Industry

Country	% by Stage			% by Industry		
	Early	Expansion	Later	High-tech	Med-tech	Non-tech
Panel A. Asia						
Australia	16	53	31	26	7	67
China	43	43	14	30	7	63
Hong Kong	26	35	39	37	6	57
India	49	42	9	53	6	42
Indonesia	9	63	28	39	3	58
Israel	51	36	13	66	9	25
Japan	19	44	37	36	2	63
Malaysia	30	48	22	47	3	50
New Zealand	29	57	14	50	8	43
Pakistan	80	20	0	17	3	80
Philippines	19	63	18	44	0	56
Singapore	30	44	26	53	9	38
South Korea	28	38	34	41	1	57
Sri Lanka	53	37	10	33	2	66
Taiwan	33	42	25	65	6	30
Thailand	17	48	35	31	3	67
Panel B. Europe						
Austria	37	54	9	43	8	49
Belgium	47	46	7	47	9	43
Denmark	13	46	41	26	29	45
Finland	35	29	36	39	17	44
France	22	36	43	44	6	50
Germany	35	45	20	37	16	47
Greece	5	57	39	60	0	40
Ireland	50	45	5	81	6	13
Italy	18	33	49	28	3	69
Netherlands	19	55	26	32	6	62
Norway	35	63	2	43	5	53
Portugal	17	57	26	34	1	66
Spain	18	51	32	29	6	65
Sweden	10	15	76	19	8	73
Switzerland	9	20	71	16	5	79
United Kingdom	12	34	54	23	15	62
Panel C. America						
United States	23	54	23	85	7	8

Table 3 (Continued)

Subgroup	% by Stage			% by Industry		
	Early	Expansion	Later	High-Tech	Med-Tech	Non-Tech
Panel D. Average (Number of Observations) by Subgroup and <i>t</i> -test for Differences between Subgroup						
Asian (n=16)	33	45	22	42	5	54
Europe (n=16)	24	43	33	38	9	54
Asia vs. European	1.65 <sup>a</sup>	0.41	-1.8*	0.77	-2.04**	-0.01
High-GDP (n=12)	25	42	33	39	10	51
Mid-GDP (n=13)	26	45	30	46	6	48
Low-GDP (n=8)	38	46	17	37	3	60
High-GDP vs. Mid-GDP	-0.05	-0.5	0.36	-0.94	1.62 <sup>a</sup>	0.4
High-GDP vs. Low-GDP	-1.53 <sup>a</sup>	-0.5	1.74*	0.31	2.36**	-1.2
Mid-GDP vs. Low-GDP	-1.48 <sup>a</sup>	-0.17	2.19**	1.25	1.66 <sup>a</sup>	-1.6 <sup>a</sup>
English legal origin (n=13)	36	43	22	46	6	47
French legal origin (n=9)	19	51	30	40	4	56
German legal origin(n=6)	27	41	33	40	6	54
Scandinavian legal origin (n=4)	23	38	39	31	15	54
English vs. French	2.28**	-1.85**	-1.31	0.84	1.81**	-1.16
English vs. German	1.06	0.39	-1.3	0.68	0.08	-0.67
English vs. Scandinavian	1.2	0.57	-1.54 <sup>a</sup>	1.31	-2.46**	-0.56
French vs. German	-1.27	1.78**	-0.34	0.03	-1.16	0.34
French vs. Scandinavian	-0.54	1.46 <sup>a</sup>	-0.76	1.34	-2.88**	0.39
German vs. Scandinavian	0.46	0.22	-0.36	0.89	-1.65 <sup>a</sup>	0.03

Early stage includes seed and startup investments. Later stage includes Mezzanine, buyout and turnaround for Asia. That for Europe includes replacement capital and buyout. That for the US contains buyout/acquisition and other later stage funded by venture capital, which does not include funds raised specifically for buyouts, Mezzanine and other private equity. High-Tech includes computer related, electronics, information technology, and telecommunications industries for Asia as defined by AVCJ. That for Europe includes communications, computer related, and other electronic related industries as defined by EVCA. That for US includes online specific, communications, computer software and services, semiconductor and other electronics and computer hardware industries as defined by NVCA. Med-Tech includes medical, health related and biotechnology industries. Non-Tech is the remaining industries excluding the High-Tech and Med-Tech. High-GDP group contains countries having average GDP per capita during 1991-2000 greater than or equal to US\$25,000. Mid-GDP group includes countries having average GDP per capita less than US\$25,000 and greater than or equal to US\$10,000. Low-GDP group includes those with GDP per capita less than US\$10,000. Legal origin identifies the country's Company Law or Commercial Code origin as classified by La Porta et al. (1998). There is no legal origin classification for China. <sup>a</sup> Significant at the 10 percent level for a one-tailed test. \*, \*\*, \*\*\*, Significant at the 10, 5, 1 percent level for a two-tailed test.

Table 4 Determinants of the Level of Venture Capital Activities across Countries

Independent Variable	VCIP in 2000 (1)		VCIP in 2000 (2)		New Funds Raised		Total Annual Disbursements	
	Estimate	<i>t</i> -stat	Estimate	<i>t</i> -stat	Estimate	<i>t</i> -stat	Estimate	<i>t</i> -stat
Creditor rights	0.34	2.65***	0.37	2.44***	0.41	2.15**	0.22	1.91*
Rule of law	-0.36	-3.56***	-0.34	-2.64***	-0.64	-3.72***	-0.45	-4.34***
High-GDP (indicator variable)	4.14	5.37***	-	-	7.18	5.31***	4.96	6.15***
Mid-GDP (indicator variable)	3.12	6.15***	-	-	5.60	6.45***	3.70	7.15***
Ln(GDP per capita)	-	-	0.98	4.28***	-	-	-	-
Lag real GDP growth	0.03	0.35	0.10	1.21	0.12	1.09	0.12	1.76*
Lag market capitalization/GDP*100	0.01	5.12***	0.01	3.39***	0.02	4.50***	0.01	3.63***
Asia (indicator variable)	0.91	2.31***	0.59	1.32	0.66	0.96	0.21	0.51
French origin (indicator variable)	-0.30	-0.71	-0.04	-0.08	-0.48	-0.78	-0.35	-0.97
German origin (indicator variable)	-1.57	-3.72***	-1.10	-2.36***	-2.20	-3.29***	-1.38	-3.46***
Scandinavian origin (indicator variable)	-0.70	-1.40	-0.34	-0.61	-0.56	-0.68	-0.70	-1.44
Intercept	-0.69	-0.70	-7.41	-4.06***	-0.77	-0.58	-0.05	-0.07
Adjusted R <sup>2</sup>	0.74		0.62		0.71		0.70	
Number of Observations	33		33		33		33	

Venture capital investment portfolio (VCIP) for Asian countries is the cumulative total of existing investments less any divestments made as defined by Asian Venture Capital Journal. That for European countries is the “Portfolio at Cost” on December 31 reported by European Private Equity & Venture Capital Association. National Venture Capital Association does not report VCIP, thus, “Capital Under Management” is used as the proxy for VCIP for United States. The number is standardized by GDP. New funds raised (Total annual disbursements) are total capital raised (invested) from 1997 to 2000 as percentage of GDP. For Asian and European countries, the numbers include both venture capital and buyouts. For US, only venture capital is included. High-GDP group contains countries having average GDP per capita during 1991-2000 greater than or equal to US\$25,000. Mid-GDP group includes countries having average GDP per capita less than US\$25,000 and greater than or equal to US\$10,000. Low-GDP group includes those with GDP per capita less than US\$10,000. Creditor rights is an index aggregating four measures indicating creditor protection, the index ranges from 0 to 4. Rule of law assesses the law and order tradition in the country. The number ranges from 0 to 10, with lower scores for less tradition for law and order. Both creditor rights and rule of law information are obtained from La Porta et al. (1998) except China, which is from Allen, Qian and Qian (2002). Legal origin identifies the country’s Company Law or Commercial Code origin as classified by La Porta et al. (1998). There is no legal origin classification for China. Lag variables are 4-year average prior to the dependent variables’ time period. \*, \*\*, \*\*\*, Significant at the 10, 5, 1 percent level for a two-tailed test.

Table 5 Determinants of Venture Capital Stage and Industry Disbursements across Countries

Independent Variable	Disbursement by Stage						Disbursement by Industry					
	Early		Expansion		Later		High-Tech		Med-Tech		Non-Tech	
	Estimate	<i>t</i> -stat	Estimate	<i>t</i> -stat	Estimate	<i>t</i> -stat	Estimate	<i>t</i> -stat	Estimate	<i>t</i> -stat	Estimate	<i>t</i> -stat
Creditor rights	3.16	1.23	0.03	0.01	-3.20	-1.13	-0.52	-0.18	1.79	2.00*	-1.27	-0.42
Rule of law	-1.27	-0.58	2.57	1.32	-1.31	-0.54	-2.52	-0.99	0.63	0.83	1.89	0.73
Ln(GDP per capita)	-0.16	-0.04	-0.14	-0.04	0.31	0.07	8.84	1.96*	0.27	0.20	-9.10	-1.97*
Lag real GDP growth	2.70	1.87*	0.58	0.46	-3.28	-2.08**	3.66	2.20**	0.28	0.56	-3.94	-2.32**
Lag market capitalization/GDP*100	-0.08	-1.84*	-0.07	-1.79*	0.15	3.12***	-0.04	-0.77	-0.01	-0.43	0.05	0.88
Asia (indicator variable)	-5.50	-0.73	10.00	1.50	-4.50	-0.55	3.41	0.39	-3.09	-1.18	-0.31	-0.04
French origin (indicator variable)	-12.87	-1.50	11.45	1.51	1.38	0.15	-2.97	-0.30	-2.15	-0.72	5.12	0.51
German origin (indicator variable)	-2.92	-0.37	-3.50	-0.50	6.43	0.74	-7.96	-0.87	-1.09	-0.40	9.05	0.97
Scandinavian origin (indicator variable)	-8.39	-0.89	-4.54	-0.54	12.97	1.25	-15.66	-1.43	5.25	1.60	10.41	0.93
Intercept	37.39	1.20	22.40	0.81	40.18	1.18	-27.02	-0.75	-3.61	-0.33	130.63	3.56***
Adjusted R <sup>2</sup>	0.31		0.04		0.32		0.1		0.33		0.1	
Number of Observations	33		33		33		33		33		33	

The dependent variable is the percentage of funding allocated to each corresponding category. Early stage includes seed and startup investments. Later stage includes Mezzanine, buyout and turnaround for Asia. That for Europe includes replacement capital and buyout. That for the US contains buyout/acquisition and other later stage funded by venture capital, which does not include funds raised specifically for buyouts and Mezzanine and other private equity. High-Tech includes computer related, electronics, information technology, and telecommunications industries for Asia as defined by AVCJ. That for Europe includes communications, computer related, and other electronic related industries as defined by EVCA. That for the US includes online specific, communications, computer software and services, semiconductor and other electronics and computer hardware industries as defined by NVCA. Med-Tech includes medical, health related and biotechnology industries. Non-Tech is the remaining industries excluding the High-Tech and Med-Tech. Creditor rights is an index aggregating four measures indicating creditor protection, the index ranges from 0 to 4. Rule of law assesses the law and order tradition in the country. The number ranges from 0 to 10, with lower scores for less tradition for law and order. Both creditor rights and rule of law information are obtained from La Porta et al. (1998) except China, which is from Allen, Qian and Qian (2002). Legal origin identifies the country's Company Law or Commercial Code origin as classified by La Porta et al. (1998). There is no legal origin classification for China. Lag variables are 4-year average prior to the dependent variables' time period. \*, \*\*, \*\*\*, Significant at the 10, 5, 1 percent level for a two-tailed test.

Figure 1. New Funds Raised as a Percentage of GDP during 1994-2000 by Region

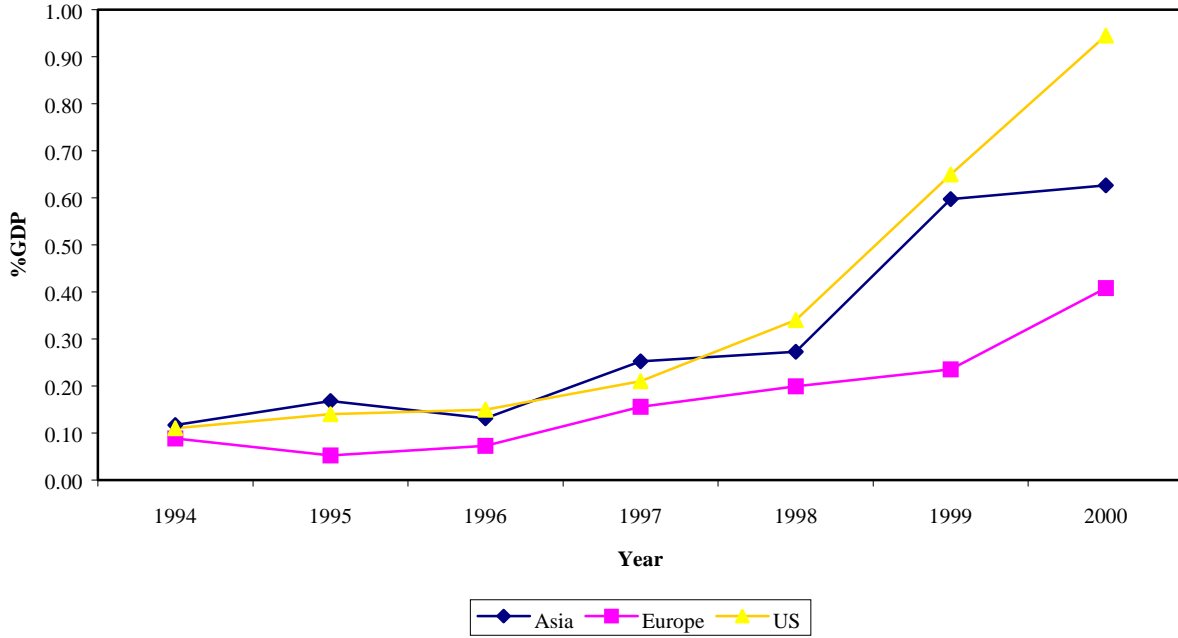


Figure 2. New Funds Raised as a Percentage of GDP during 1994-2000 by GDP per Capita Level

