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Venture Capital Policy
Review: United States

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VENTURE CAPITAL POLICY REVIEW: UNITED STATES

Günseli Baygan

Abstract

The United States has the oldest and most developed venture capital industry in the OECD. Several successful high-technology companies in computers and communications, as well as in health-related sectors and services, were venture-backed. Young high-growth firms also benefit from a continuum of complementary finance from business angels, institutional investors and second-tier stock markets. The government played an active role in the early phases of the venture capital industry through the *Small Business Investment Company* (SBIC) program and various technology development schemes. A reduction in capital gains tax rates and liberalisation of rules for pension fund investments in risky assets in the late 1970s also unlocked new capital sources. Venture capital activity, however, has been quite cyclical. Periods of high fund-raising and investment in the 1980s and 1990s were followed by market downturns with negative effects on small firm survival and growth. Fundamental structural changes could enhance market resilience during speculative periods, and performance measures and accounting standards would render venture investing more transparent. Public programs at the federal and state level need to be re-evaluated to assess their role in volatile markets. This paper analyses trends in the US venture capital market and makes policy recommendations which have been developed through an OECD peer review process.

POLITIQUES DE CAPITAL-RISQUE AUX ETATS-UNIS

Günseli Baygan

Résumé

Le secteur du capital-risque aux Etats-Unis est le plus ancien et le mieux développé des pays de l'OCDE. Plusieurs sociétés de haute technologie, qui ont fait leurs preuves dans l'informatique et les communications, mais aussi dans les secteurs et services liés à la santé, ont été financées par du capital-risque. Les jeunes entreprises à forte croissance bénéficient également d'apports réguliers de financements complémentaires de la part des investisseurs providentiels (*business angels*), des investisseurs institutionnels, et des seconds marchés. Les pouvoirs publics ont joué un rôle déterminant pendant les premières phases du développement du secteur du capital-risque aux Etats-Unis par le biais du program *Small Business Investment Company* (SBIC) et de divers dispositifs de promotion de la technologie. La réduction des taux d'imposition des plus-values et l'assouplissement des règles applicables aux fonds de pension permettant à ces derniers de faire des investissements à risque à la fin des années 70 ont également libéré de nouvelles sources de capitaux. L'activité sur le marché du capital-risque se caractérise cependant par une grande sensibilité à la conjoncture. Les deux périodes de forte progression de la levée de capitaux et de l'investissement, pendant les années 80, puis les années 90, ont été suivies de phases de fléchissement qui ont eu des conséquences fâcheuses pour la survie et la croissance des petites entreprises. Des changements structurels fondamentaux pourraient améliorer la résistance du marché pendant les phases spéculatives, et l'évaluation des performances et le respect de normes comptables rendraient plus transparents les investissements en capital-risque. Il conviendrait de réexaminer les programs publics au niveau fédéral et au niveau des Etats afin d'évaluer leur rôle en période de volatilité. Ce document analyse les tendances sur le marché du capital-risque aux Etats-Unis et fait des recommandations qui ont été mises au point dans le cadre d'un processus d'examen par les pairs à l'OCDE.

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ASSESSMENT AND RECOMMENDATIONS

The US venture capital industry is the oldest and most developed in the OECD. Many leading US high-technology firms, which contributed to the spectacular growth in the United States in the late 1990s, were venture-backed. The United States has consistently ranked first overall in the OECD in terms of early and expansion stage placements as a share of GDP. However, US venture investing is characterised by a high degree of volatility. Prior to the late 1970s, very little venture capital flowed to US industry. During the 1980s, the annual flow of funds increased by a factor of ten and then declined steadily between 1987 and 1991. The pattern reversed again in the second half of the 1990s which saw a 25-fold increase in venture investments. This peak was followed by an 80% decline in 2002, with concomitant adverse effects on start-ups and small firms.

The US government played a significant role in the development of the venture capital market, starting in 1958 to encourage the private disbursement of large amounts of capital through the *Small Business Investment Company* (SBIC) program and various technology development schemes. These were supplemented by small business set asides in government procurement and small firm tax incentives. In 1978, the investment rules of the *Employee Retirement Income Security Act* (ERISA) were clarified such that pension funds could invest a small portion of plan assets in private equity. This was accompanied by a marked reduction in capital gains tax rates. The *NASDAQ* secondary stock market, established in 1971, provided profitable exit options for venture capitalists. Investments by individuals (business angels) and corporations were also substantial.

Other OECD countries are trying to emulate the venture capital success story of the United States. In addition to an entrepreneurial and risk-taking culture, US firms benefit from a continuum of finance provided by pension funds and corporations stimulated by liberal investing rules and fiscal incentives, active business angel networks, government funds, and well functioning second-tier stock markets. However, the cyclical aspects of the equity market coupled with investor exuberance lead to high market volatility and difficult conditions for small firms trying to grow and survive over the long term. Venture capital programs at federal and state level should be re-evaluated to better assess their role in volatile markets. A summary of progress and recommendations concerning US venture capital policies is given in **Table 1**.

Table 1. Progress and recommendations on US venture capital policies

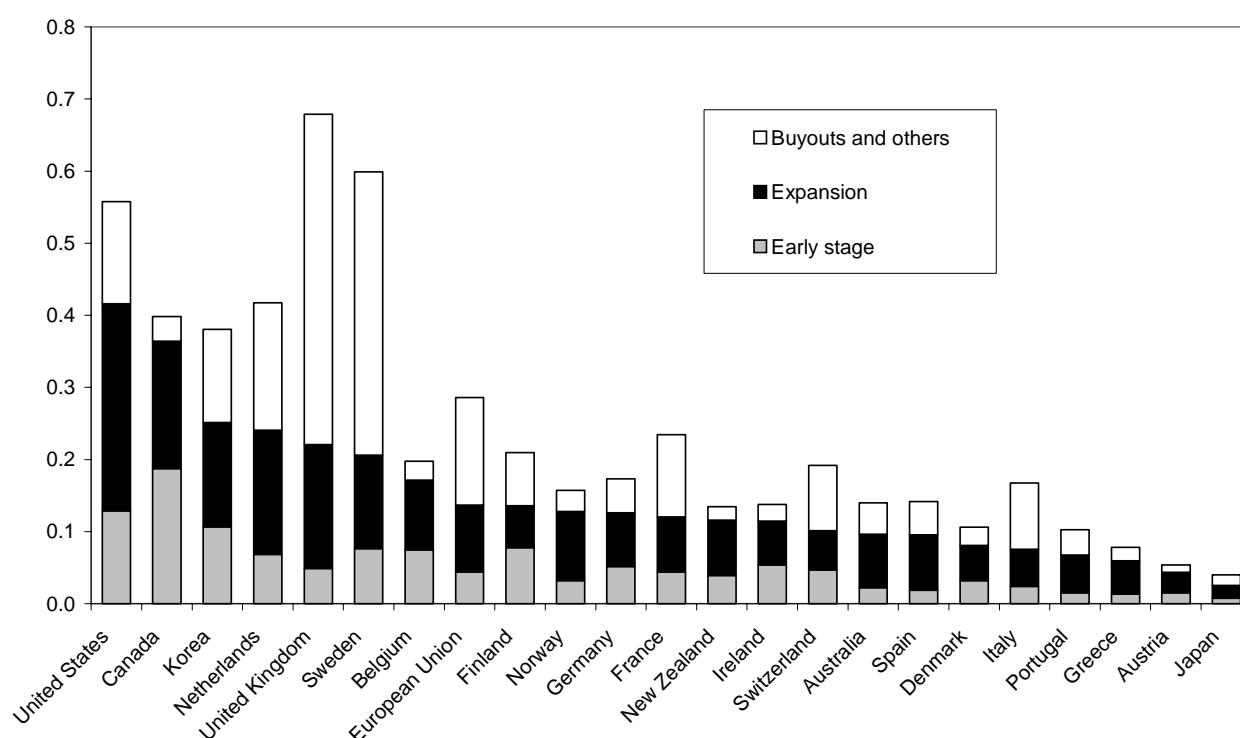
Area	Recent/planned action	Recommendations
Investment regulations	<i>ERISA</i> rules for pension fund investments maintained and restrictions on other institutional investors further eased in 1999.	Develop industry-wide performance measures and accounting standards to maintain level of institutional investments in venture capital.
Tax incentives	Generous incentives provided through <i>New Market Tax Credits</i> at federal level and <i>CAPCO</i> measures at state level.	Evaluate costs and benefits of these fiscal measures vs. other types of incentives.
Equity programs	Investments continue to be made through the <i>Small Business Investment Company</i> (SBIC) program, technology development schemes as well as state funds.	Evaluate costs and benefits of SBIC program with a view to redirecting federal investments. Encourage states to evaluate effects of their equity schemes.
Business angel networks	Government previously ran Angel Capital Network (<i>ACE-Net</i>) and now runs Technology Network (<i>TECH-Net</i>) to match angel investors and small firms.	Disseminate information about and co-ordinate public and private angel networks and do more to strengthen linkages at local levels.
Second-tier stock markets	<i>The Sarbanes-Oxley Act of 2002</i> introduced stricter disclosure rules for publicly traded stocks.	Increase transparency and accountability on secondary stock markets.

TRENDS IN VENTURE CAPITAL MARKETS

Overview

The US venture capital market is the most developed in the OECD in terms of age, size and depth. As a share of GDP in the period 1998-2001, venture capital investments reached over 0.55% including later-stage deals. The United States has consistently ranked first overall in the OECD in terms of early and expansion stage placements as a share of GDP (**Figure 1**). Venture capital activity, however, has been quite cyclical. It increased dramatically in the late 1970s and 1980s, when venture capitalists backed several successful high-technology companies (*e.g.* Apple Computer, Cisco Systems, Microsoft) as well as companies in the service sector (*e.g.* Staples, Starbucks, Federal Express). The sudden growth in flow of funds, however, led to overinvestment in certain sectors and induced entry by new venture companies with less experienced managers. From the mid-1980s to the early 1990s, fundraising and investment activity steadily declined in the United States as market returns fell.

Figure 1. OECD venture capital investment by stages as a percentage of GDP, 1998-2001



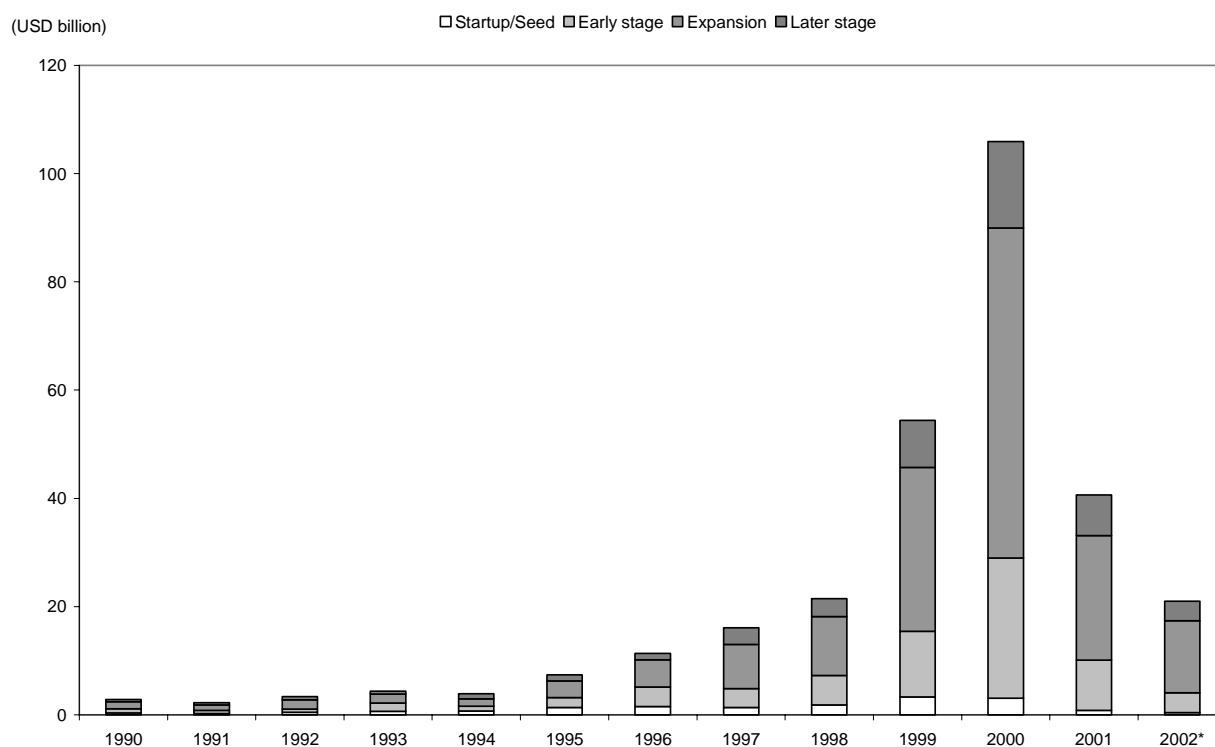
Note: The definition of private equity/venture capital tends to vary by country.

Source: OECD venture capital database, 2002.

Venture capital investments then remained stable, averaging around USD 4 billion per year in the first half of the 1990s. This was followed by an unprecedented 25-fold increase in venture investing, driven by large returns, to about USD 105 billion in 2000 (**Figure 2**). But this surge, featuring primarily investments in telecommunications and the Internet, was not sustainable. Starting in mid-2000, technology firms suffered from declining domestic and international demand for their products, negative corporate earnings affected stock markets, equity valuations plummeted and initial public offerings (IPO) nearly ceased. New commitments to venture capital remained weak in anticipation of lower returns. By 2002, venture capital investments had regressed to the 1998 pre-bubble level. Venture-backed companies received around USD 21 billion, approximately half the 2001 amount and 80% lower than the 2000 peak, but still above the historic averages of the 1985 to 1995 period (NVCA, 2003).

Global economic uncertainty and volatility in stock markets has continued to put pressure on US venture capital activity. Reduction in the size of the industry has accelerated as unprofitable venture funds exit through selling their holdings and closing. While such cyclical adjustments are not new, the severity of the latest downturn could lead to more fundamental structural change in the market. New fundraising and investment methods are being debated which could enhance industry resilience in speculative periods and reduce longer-term market inefficiencies. It is important to understand the evolution and operation of the US venture capital industry, which has tended to be a model for other OECD countries.

Figure 2. US venture capital investment by financing stage, 1990-2002*



Estimates for 2002.

Source: NVCA, 2003.

Investment by stage and deal size

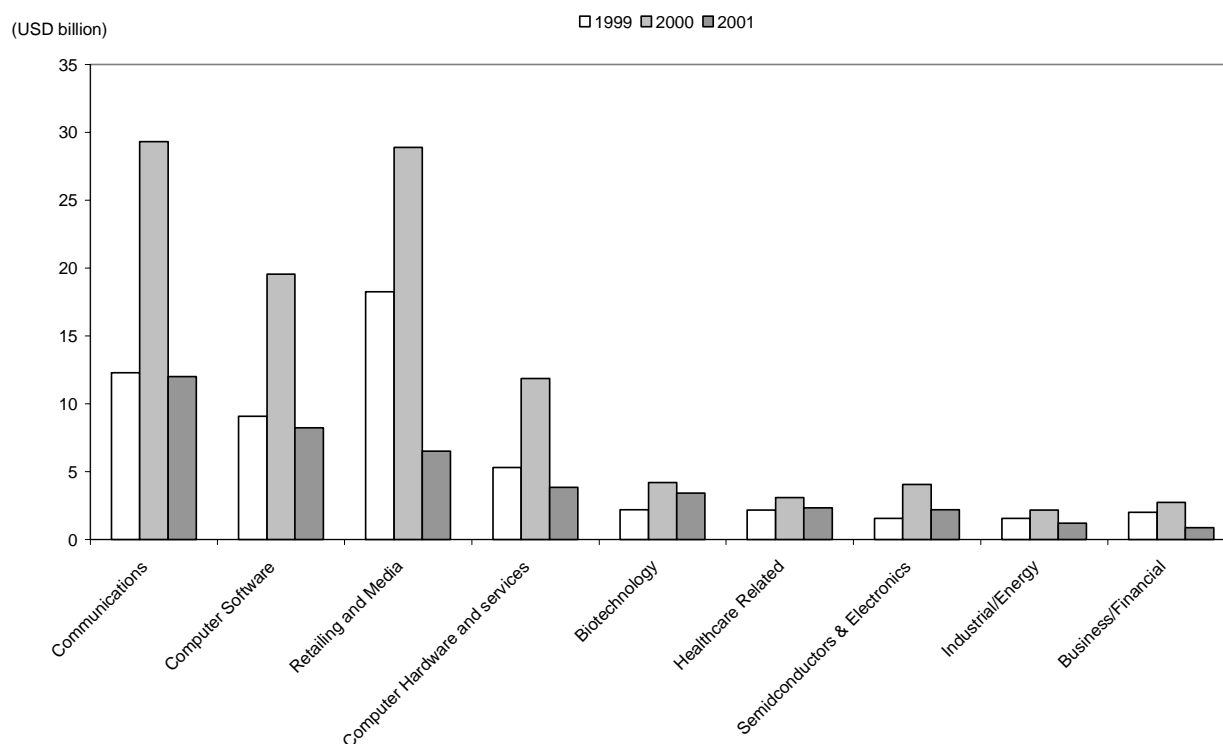
The US venture market has consistently been oriented to the early and expansion stages of firms (**Figure 2**). On average, around 1 000 firms per year received venture financing in 1985-1995, while over 6 000 firms were venture-backed in 2000, half of which received first-round financing. The median amount invested per round of financing increased from USD 5 million in 1998 to USD 11 million in 2000. Investment patterns in the late 1990s were marked by record levels of new commitments as well as initial public offerings (IPOs), which allowed limited partners to re-invest their proceeds further fuelling the market. By 2002, 2 500 firms received investments of which 23% received first-round investment.

A similar fundraising and investment cycle had occurred in the late 1980s with negative consequences for early-stage firms. More cash was poured into the market than experienced venture capital companies were able to absorb, leading to certain inefficiencies. New venture funds proliferated and there was an over concentration of risky deals in particular firms and sectors. That expansionary cycle ended with the stock market crash of 1987 and was followed by a slowdown in the IPO market. The correction that has been taking place since mid-2000 is much more pronounced. In 2001, investments in early-stage firms were the most affected with a decline of 73% from the previous year. The number of venture-backed firms overall regressed by 40%. In the near-term, most US funds are expected to focus on existing portfolio firms and follow-on financing thus reducing the availability of funding for start-ups.

Investment by sector

The US venture capital market is concentrated in high-technology sectors, particularly computers and communications, followed by health care and biotechnology. Between 1995 and 2000, around USD 145 billion was invested in Internet-related applications. Investments in the on-line industry constituted 61% of the total in 2000. Communications companies ranked first in terms of average investment per company at over USD 31 million. In 2001, these Internet-related investments decreased by 60% or more. Other sectors, including biotechnology and health, were not as affected and investments remained slightly over their 1999 levels (**Figure 3**).

The collapse of many Internet-related businesses and the increasing debt burden of telecommunication firms has raised concern about US investment patterns which tend not to be sufficiently diversified. In the early 1980s, for example, the growth in the computer industry led to large venture investments in disk drives, which was followed by an industry shake-out and bankruptcy for many of these firms (Sahlman and Stevenson, 1985). A similar trend was observed in the biotechnology sector in the early 1990s. Sectoral over concentration of venture investments leaves both early-stage firms and venture funds more vulnerable to cyclical downturns.

Figure 3. US venture capital investment by sector, 1999-2001

Source: NVCA , 2002.

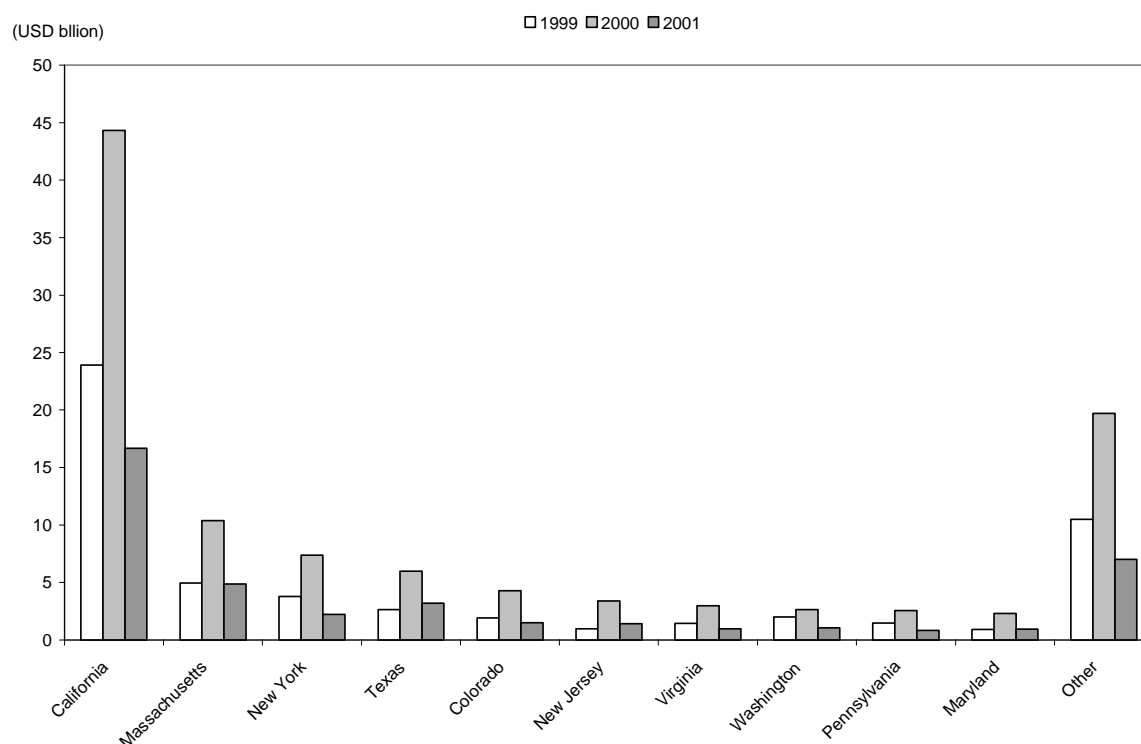
Investment by region

As in all OECD countries, US venture capital activity has been traditionally centred in a few key regions (**Figure 4**). Regional concentration is driven by a number of factors, including skilled human resources and the availability of academic institutions and infrastructure. Silicon Valley (California) and to a lesser extent the Boston area (Massachusetts) have attracted the highest levels of venture capital, both in terms of value and deals, in the last two decades. From 1980 to 2000, California and Massachusetts were the top two states in venture investments in high-technology sectors, including those relating to information and communications technology (ICT) and health/biotechnology, building on the industrial clusters created around universities and high-technology research institutions. The existence of complementary professional services, such as specialised law and accounting firms, helped reduce transaction costs for starting up and financing new firms in these states. In the late 1990s, US venture investments started to spread geographically as new hot spots emerged in places such as Colorado, Maryland and North Carolina. Venture capital firms from California, New York and Massachusetts diversified their investments to over 40 different states in 2000.

In 2001, investments in California, Massachusetts and New York decreased by 60%, 50% and 70% respectively from their 2000 levels. Although investment levels declined across the country, the trend towards regional diversification continued. But many funds had difficulty finding attractive investments to absorb all of the funds raised during the bubble and had more than USD 100 billion in uninvested capital at the end of 2001. To minimise adverse effects from this overhang, part of the capital was returned to limited partners.

US venture capitalists have long invested abroad (Baygan and Freudenberg, 2000). During the 1990s, they influenced the development of venture capital markets in several countries, particularly Canada, the United Kingdom and Israel. Recently, they have moved venture funding even further offshore to countries such as Sweden, Denmark, Hungary, India and China, although on a relatively small scale (Kenney *et al.*, 2002). This trend is expected to grow as venture capital markets in other countries mature and co-investment opportunities multiply.

Figure 4. US venture capital investments by state, 1999-2001



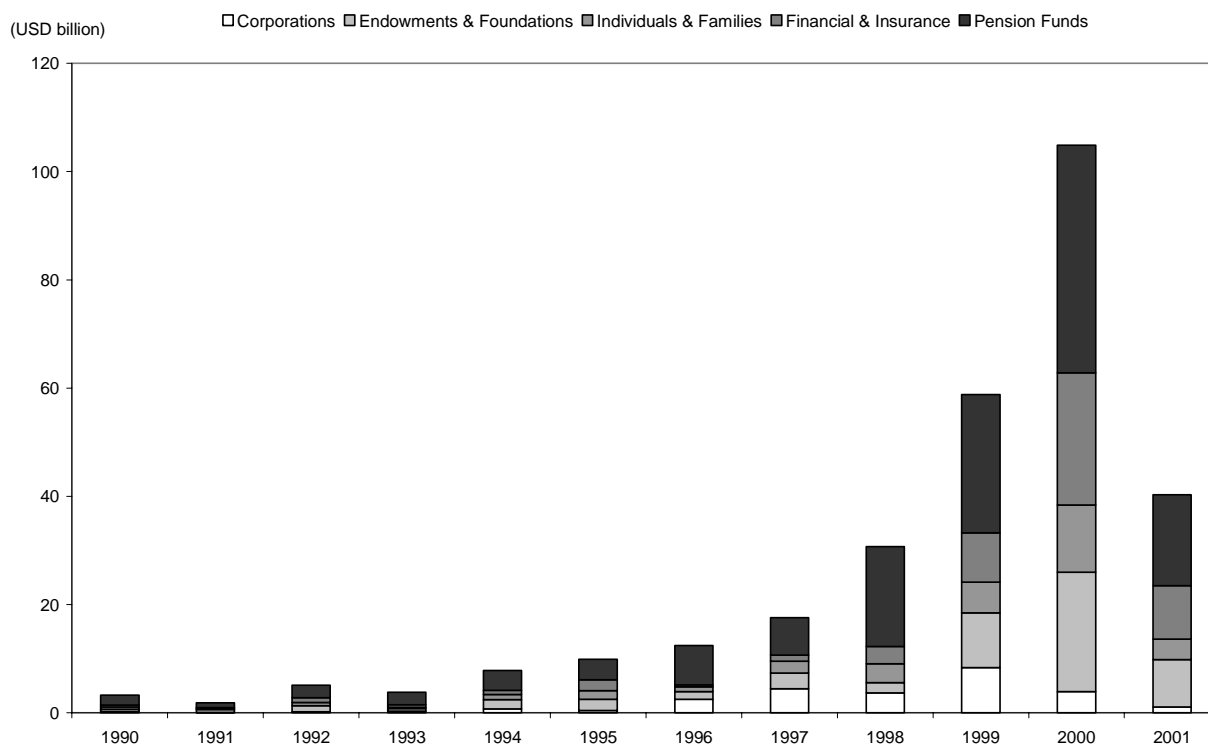
Source: NVCA, 2002.

Funds raised by source

Institutional investors are the main source of venture capital in the United States, traditionally contributing more than 80% of the total, far more than in other OECD countries (**Figure 5**). The outstanding returns to venture capital in the second half of the 1990s contributed to unprecedented growth of capital commitments by financial institutions. In 2000, 614 funds raised over USD 104 billion in venture capital, a 78% increase from 1999. Private and public pension funds were the main drivers behind this growth, contributing 40% of the total, followed by financial and insurance companies (23%), and endowments and foundations (21%). Corporations also became more active players, investing indirectly through independent partnerships or directly in firms, mostly in the expansion stage of ICT-based industries. As a share of disbursements, direct investments by corporations grew from 5% in 1995 to over 16% in 1999. Individual investors or business angels have also been highly active, investing significant amounts outside of institutional funds, primarily to young firms in seed and start-up stages.

In 2001, although they retained their average share of the total, financial institutions reduced their venture capital commitments by 60%. There has been an even larger decline in venture investing by corporations. Corporate venturing has tended to rise and fall with booms and busts. Some corporate fund managers have been criticised as inexperienced, being reluctant to write-off unsuccessful ventures, and unwisely merging strategic and financial objectives in the quest for consistently high returns (Gompers and Lerner, 1998). In general, institutional investors are more likely than either individuals or corporations to take a longer-term view and continue venture inflows in depressed markets. Historically and in general, corporations and governments are not well-suited to fill the role of venture capitalists, but more to serve as institutional investors.

Figure 5. US funds raised by source, 1990-2001



Source: NVCA , 2002.

VENTURE CAPITAL POLICIES AND PROGRAMS

Overview

The origins of the US venture capital industry can be traced to the creation of *American Research and Development* (ARD) in 1946. ARD was a publicly traded, closed-end company investing in high-risk small firms that commercialised technologies developed for World War II. Although the limited partnership organisational structure emerged in the United States in 1958, the pool of investors that could invest in risky assets was highly restricted. During the 1960s, venture capitalists raised funds mainly through closed-end companies such as ARD as well as the government *Small Business Investment Company* (SBIC) program which provided equity financing to new high-growth firms (Gompers and Lerner, 2001).

In the 1970s, venture capital activity was depressed by a weak stock market, high taxation of capital gains and a global economic recession. To revitalise the venture capital industry, the US government undertook regulatory and tax changes. Capital gains tax rates were reduced. The clarification of the Employee Retirement Income Security Act's (ERISA) "prudent man" rule allowed pension funds to allocate a small portion of assets to high-risk investments. These changes unlocked new capital sources for venture capital funds. To attract the growing national venture capital pool during the last two decades, several states have also provided generous fiscal incentives and created venture capital programs, with varying degrees of success. Despite boom and bust periods in US venture capital markets, these federal and state programs have largely been maintained at their original levels.

Investment regulations

US government policies played a key role in inducing high levels of institutional investment in private equity and in spurring the growth of the venture capital market. More than 7% of institutional investment assets (*e.g.* pension and insurance funds) in the United States are allocated to all forms of private equity (including buyouts) compared to less than 1% in other OECD countries with similar financial market profiles, *e.g.*, the United Kingdom and Canada. Until 1978, the venture contributions of institutional investors were limited, with individuals accounting for the largest share of funds raised. A milestone in venture investing was the clarification of the *Employee Retirement Income Security Act's* (ERISA) "prudent man" rule in 1978, which allowed pension funds to allocate part of their resources to risky investments (**Box 1**).

Box 1. “Prudent man” rule of ERISA

The US **Employee Retirement Income Security Act** (ERISA) regulates the administration, investment, and risk management policies of pension (defined benefit) and profit-sharing (defined contribution) employee benefit plans. In the United States and many OECD countries, pension plans were traditionally prohibited from making risky investments or they are subject to quantitative ceilings on these investments in order to protect beneficiaries.

In 1978, US legislation loosened these restrictions in applying a revised and restated version of the “prudent man” rule to pension plans. Pension funds could invest in new companies and venture capital funds, and fund managers did not assume fiduciary responsibility for these investment decisions. According to the new rule, investments would be managed “*with the care, skill, prudence and diligence under the circumstances then prevailing, that a prudent man acting in a like capacity and familiar with such matters would use in the conduct of an enterprise of a like character and with like aims*”. This suggested that an investment position imprudent in isolation may be acceptable in a portfolio context. In 1980, changes were made to the ERISA “safe harbor” rule to define pension funds legally as limited partnerships, further reducing the legal oversight and potential liabilities of venture capitalists.

Investment rules for other financial institutions were eased in 1999. The *Financial Modernisation Act* (also known as the *Gramm-Leach-Bliley Act*) attempted to align the regulatory framework with recent developments in the financial services industry. The Act allowed banks, insurance companies and securities firms to affiliate and sell each other’s investment products. It also sought to address inefficiencies in the existing multi-state insurance regulatory system by requiring states to unify laws governing insurance providers.

There is some concern that the liberal US investment rules for financial institutions have contributed to instabilities in venture capital markets. In line with calls for improved corporate governance, some see the need for improved disclosure standards and more transparency in venture investing. The present opacity of venture capital funds is partly due to the lack of standard approaches for calculating internal rates of return and valuing private equity investments. The existence of reliable performance measures and accounting standards would help sustain private equity commitments by institutional investors and perhaps help moderate cyclical downturns.

Tax incentives

Venture capital investment in the United States has been stimulated by both low capital gains tax rates and targeted tax incentives. The reduction in the capital gains tax rate -- from a high of 49% in 1978 to a low of 20% between 1981 and 1986 -- was one influence on the development of the US venture capital industry. The potential impacts of further increases or decreases in capital gains taxes on venture investing in the United States are not clear. The increase in the capital gains tax rates embodied in the 1986 *Tax Reform Act*, for example, did not have a negative effect on new capital commitments to venture capital funds (Poterba, 1989). On the other hand, the prospect of higher capital gains taxes in 1996 led to fewer companies being traded on the secondary stock exchanges.

Specific fiscal incentives for venture investments have been more common at the state than the federal level. For example, Maine and Ohio offer tax credits to business angel investors. Indiana, Vermont and West Virginia give tax credits to investors in qualifying venture capital partnerships, ranging from 20% to 30% of the amount invested. The most generous tax breaks are given to insurance companies which receive tax credits equal to 100% to 120% of the amount they invest in entities designated “*certified capital companies*”(CAPCOs). A CAPCO is a for-profit business organised to provide venture capital funds to “qualified” local businesses (whose definition differs by state) in the attempt to create new local

employment opportunities. This program originated in Louisiana, but other states including Colorado, Florida, Louisiana, Missouri, New York and Wisconsin have similar schemes, which are perhaps the most generous fiscal incentives to venture investing in the OECD area. To date, the positive impact of these measures has been hard to quantify.

At the federal level, the *New Market Tax Credit* (NMTC) program of 2000 is intended to facilitate economic development and employment creation in disadvantaged areas. NMTC permits taxpayers to receive a credit against their federal income taxes for making qualified equity investments in “community development entities”, which in turn invest in low-income communities. The credit to the taxpayer totals 39% of the investment and is claimed over a seven-year period. The federal tax expenditure for this program is estimated at USD 15 billion per year. These state and federal tax incentives are quite costly, and their usefulness in a venture capital market as mature and sizeable as that of the United States should be reconsidered.

Equity programs

The *Small Business Investment Company* (SBIC) program, created in 1958, was the first direct initiative by the federal government to encourage the development of the venture capital industry (**Box 2**). In the 1960s, the SBIC program channelled around USD 3 billion to young firms, more than three times the total private investments made during that period (Lerner, 1996). SBICs also served as a vehicle for training venture managers and set the grounds for the development of private funds. However, the program suffered from design problems and several SBICs collapsed in the 1970s and 1980s. In 1992, the *Small Business Equity Enhancement Act* overhauled the program and directed it away from lending to equity-based financing. This removed the tax liability for normally exempt institutional investors, and allowed the government, through the Small Business Administration (SBA), to take an economic participation in the program’s risks and benefits. As private equity markets matured, the top-performing companies withdrew from the program and its government oversight which was deemed overly bureaucratic.

In the mid-1990s, more targeted programs were developed for socially or economically disadvantaged groups, including the *Specialised Small Business Investment Company* (SSBIC) scheme, with disappointing results. As part of the *Small Business Improvement Act* of 1996, all new SSBIC licences ceased. Recently, the SBA initiated equity programs targeted at low-income regions and women entrepreneurs. In addition, there are government technology programs providing seed funding to small firms to commercialise their innovations, mostly from public research, notably the *Small Business Innovative Research* (SBIR) scheme and the *Small Business Technology Transfer* (STTR) program (**Box 3**). The development of US high-risk capital markets is not totally independent from innovation policies targeted to small firms (Branscomb and Auerswald, 2002).

SBIC equity investments in small firms continue to be substantial (**Table 2**). In 2001, there were 331 SBIC licensees who invested around USD 4.5 billion in small firms. Approximately 72% of these investments were pure equity and 58% were in firms that were in business three years or less. SBIC investments have increased along with private sector placements, often targeting the same market segments. They have accounted for 12%-15% of total US venture investments in non-boom years. In this, SBIC investments are not addressing gaps in the private funding process, such as industrial segments or firms neglected by financiers, and may be contributing to over-funding of particular sectors. SBICs, which are protected at the expense of their rivals during market downturns, are proliferating and potentially crowding out purely private funds. Some suggest that these federal schemes are exacerbating the cyclical nature of the US venture capital market (Lerner, 2002). The US government should evaluate the SBIC program for its continued relevance in the domestic venture capital arena as well as the financial impact of small firm technology schemes.

Box 2. Small Business Investment Company (SBIC) program

The **Small Business Investment Company** (SBIC) program was established in 1958 to enlarge the capital pool available for small businesses. SBICs, licensed by the Small Business Administration (SBA), are privately owned and managed investment firms. They can be organised as a corporation, limited partnership or limited liability company. Banks, which may be otherwise prohibited by banking laws and regulations from investing in small firms, can invest up to 5% of their capital in a partially or wholly-owned SBIC. Using funds borrowed at favourable rates from the federal government and their own capital, SBICs make equity investments in small businesses, extend long-term loans and provide managerial assistance.

For SBIC investments, the SBA requires a minimum private capital input of USD 5 million, public leverage up to 300% of private capital, with an upper limit of USD 108.8 million. To obtain leverage, SBICs issue debentures, which are guaranteed by the SBA. The debentures have a term of 10 years and provide for semi-annual interest payments and a lump sum principal payment at maturity. SBICs are required to have qualified management, with a number of years of successful experience investing in small businesses and a well-structured business plan which specifies types of investments, industries, geographic locations, etc. SBICs also face strict financial reporting requirements and biennial onsite compliance examinations by the SBA.

The SBIC has recently a more targeted program. The *New Markets Venture Capital* (NMVC) program aims to facilitate economic development and employment creation in specific rural and low-income areas. SBA supplements NMVC capital through guarantees of debentures issued by the company up to 1.5 times its capital. NMVC companies, which are designated through a competitive selection process and privately managed for-profit entities, also qualify investors for the *New Markets Tax Credit* (NMTC). In addition, the *Women's Growth Capital Fund* is an SBIC licensed fund established in 1997 to make equity investments primarily in early and expansion stage women-owned and/or managed businesses. It is one of three women-focused funds licensed as a SBIC by the SBA.

Table 2. SBIC financing for small firms, 1995-2001

Year	Number of SBIC program licensees	Number of deals		Value of financing (in billions of USD)		
		Total	% of initial financing	Total	% of equity only	by age of business % < 3 Years
1995	208	2221	60	1.25	51	56
1996	209	2107	54	1.62	55	54
1997	208	2731	50	2.37	58	50
1998	233	3456	50	3.24	67	55
1999	244	3096	45	4.22	72	53
2000	304	4639	49	5.47	74	63
2001	331	4277	35	4.45	72	58

Source: SBA (2002).

Box 3. US technology development programs

The **Small Business Innovation Research (SBIR)** program was established under the Small Business Innovation Development Act of 1982 to facilitate active participation from small businesses in federal research and development (R&D). All Federal agencies with an annual extramural R&D budget exceeding USD 100 million are required to take part in SBIR. Ten federal agencies allocate 2.5% of their R&D budget to be distributed as grants to small businesses. Each year over USD 1 billion is given to small firms to research high-risk innovations.

The **Small Business Technology Transfer (STTR)**, established by the Small Business Technology Transfer Act of 1992, aims to enhance public/private research partnerships. Five federal agencies reserve a portion of their R&D funds with awards to small firms of up to USD 100 000 for technology feasibility studies and up to USD 500 000 for subsequent research.

The **Advanced Technology Program (ATP)**, established in 1988 by the National Institute of Standards and Technology (NIST), funds high-risk R&D performed by partnerships. Between 1990 and 2002, the ATP awarded USD 1.96 billion, around half of which went to small firms, and which was matched by private funds.

In addition to these federal programs, several states have created venture capital funds to facilitate the development of local businesses (**Box 4**). Some programs are funded and managed purely by the state as in Utah, Arkansas and Iowa. There are also quasi-public programs, receiving capital from private investors in addition to public funds, as in Oklahoma, Louisiana, New Hampshire, Hawaii, Pennsylvania and Texas. Most state funds are driven by returns from pension fund investments rather than the success of portfolio companies. Some state programs were terminated or phased out as their long-run contribution to local economic activity proved limited. Programs which lacked political support, could not attract experienced fund managers or had sufficient deal flow to effectively spread risk were also short-lived. Successful public programs, on the other hand, benefited from political and business support as well as existing clusters of high-technology firms (Heard and Sibert, 2000). These state programs may be contributing to regional imbalances in venture investing, and the expansion of some state programs during the recent boom may have exacerbated overinvestment. Equity programs at the state level as well as federal should be reassessed to determine their long-term role in filling financing gaps with respect to underfunded stages of investment, sectors and regions.

Box 4. State-sponsored venture capital funds

The **Massachusetts Technology Development Corporation** (MTDC) was created in 1978 to help create employment in technology-based industries in the state. It is the oldest state program that combines equity and long-term debt instruments. It targets early-stage capital, technology commercialisation and mezzanine investments, typically in the USD 250 000 to USD 500 000 range. Portfolio companies are expected to exit after 7-10 years through IPOs or M&As. From 1980 to mid-2001, investments totalled over USD 57 million in 109 companies. There are matching funds requirements with participation of private funds in each investment, on average 4.5 times the amount invested by the state.

The **California Emerging Ventures** (CEV) program was founded in 1998 by the *California Public Employees' Retirement System* (CalPERS), the largest public pension fund in the United States. CEV is structured as a fund-of-funds and has invested over USD 2 billion in early-stage companies. CalPERS also created the *California Biotechnology Program*, with an initial allocation of USD 500 million. The *California Technology Investment Partnership* (CalTIP) also provides grants to technology companies. CalTIP grants provide up to USD 250 000 in targeted support to California companies that receive competitively awarded federal research and development grants.

The **New York State Venture Capital Investment** program, initiated in 1999, is part of New York State's *Common Retirement Fund* (CRF), which is the second largest US public pension fund with USD 127 billion in assets. CRF enters into partnership agreements private individuals or funds which also are required to make substantial investments. The *Small Business Technology Investment Fund* (SBTIF) makes early-stage equity investments in companies that have developed innovative products or services. The fund also offers technical and managerial services, and requires 3:1 matching funds that may include backing from private sector firms, private investors, federal sources or other public sources outside New York State. Typical investments range from USD 50 000 to USD 500 000. The *Emerging Industries Fund* was created in 1999 as a USD 25 million fund to provide equity and/or debt financing for small, fast growing companies in New York City. The fund focuses on companies seeking first round investment in the Internet, biotechnology, software and telecommunications industries. The New York City Economic Development Corporation is responsible for reviewing the business plans of eligible companies and selecting appropriate candidates.

Business angel networks

While it is difficult to establish the size of the US angel market due to its informal nature, the SBA estimates there are 250 000 angels in the United States committing USD 20 billion each year to over 30 000 private companies. Compared to the formal venture capital industry, business angels invest smaller amounts, in the range of USD 200 000 to USD 1.5 million in early-stage companies preferably within geographic proximity (SBA, 2000). In the mid-1990s, informal networks of angel investors started to assemble, such as the *Band of Angels* in Silicon Valley and the *Dinner Clubs* in the mid-Atlantic region. This was followed by for-profit entities which provide matching services for entrepreneurs and angel investors mostly through the Internet, including the *American Venture Capital Exchange*, *Capital Matchmaker*, *FinanceHub*, *MoneyHunter* and *Venture Capital Report* (Lerner, 1997). However, by 2002, many of these no longer existed.

In 1995, the SBA introduced the Angel Capital Network or *ACE-Net*, which linked individual investors, SBICs and institutional venture capitalists with small firms through an Internet database. Mentoring services for entrepreneurs and investors are also provided through regional *ACE-Net* operators. In 2001, *ACE-Net* was privatised as the government's role had been accomplished. Recently, the SBA developed the Technology Network or *TECH-Net*, a search engine for information and resources concerning small high-technology businesses.

Along with the United Kingdom, the United States has the most developed web of business angel networks. Still, studies indicate that most angel investors do not seek out investments, but act on proposals filtered through trusted channels, using local ties and informal connections. Some angel networks operate as “side funds” to larger venture capital firms or business incubators (Allen *et al.*, 1999). There are more than 150 “structured angel groups” organised by the government, but information on these networks needs to be disseminated to entrepreneurs (May and Simmons, 2001). To complement informal networks, public initiatives need to be more than a listing service and should facilitate person-to-person contacts. Locally-oriented networking programs tend to be successful, particularly if tailored according to local strengths and weaknesses as in the *Canadian Community Investment Plan*. The United States needs to publicise and coordinate public and private angel networks at local, regional and national levels to prevent duplication and information gaps, but also build more on local linkages.

Second-tier stock markets

Another strength of the US venture capital market has been the existence of well-functioning exit mechanisms, particularly in the form of initial public offerings (IPOs) on second-tier stock exchanges. Since its creation in 1971 as the first electronic network, the National Association of Securities Dealers Automated Quotation (*NASDAQ*) has outpaced all other US markets in IPO listings. The *NASDAQ SmallCap Market* was introduced in 1992 to handle even smaller IPOs. New portfolios of products and services keep down trading costs and risk spread, enhancing *NASDAQ*'s competitiveness vis-à-vis other domestic and international stock exchanges. *NASDAQ* is by far the most successful secondary market in the OECD with nearly 5 000 firms and market capitalisation of over 50% of GDP at its height in 1999 (**Table 3**). In 2002, this fell to around 3 800 firms and 17% of GDP, but still outpaced the performance of secondary stock exchanges in most other OECD countries. Another important source of small firm exits are tax-free mergers with large companies, which has been key to encouraging investment and growth.

US stock markets have not been completely sheltered from speculative surges and volatility. During the second half of the 1990s, market valuations, especially for technology-based stocks, increased exponentially. A number of young high-technology firms went public with spectacular equity valuations, inciting several venture capital funds to bring their portfolio firms public at faster rates, often prematurely. International capital flows accelerated, and several foreign firms chose to go public on the *NASDAQ*. In 2000, venture-backed IPOs accounted for more than 50% of the total, compared to 20% in 1998. The value of IPOs at USD 22 billion in 2000 was more than five times that of 1998. About a quarter of firms were Internet companies, followed by those in computer software and biotechnology.

Starting in mid-2000, the global economic slowdown and deterioration in corporate earnings and investor sentiments led the major indices of technology stocks to decline by 60% to 70% from their earlier peaks. IPOs on *NASDAQ* dropped by half while venture-backed IPOs fell over 80% to a total of 37 in 2001. The heightened activity in mergers and acquisitions, however, helped venture capitalists seeking exits and immediate liquidity. More than 320 venture-backed firms were acquired in 2001, an 8% increase from the previous year (NVCA, 2002).

On the *NASDAQ* and other US secondary markets, an increase in IPO activity has usually been followed by an increase in venture capital fundraising. During boom periods, this has exacerbated over-investment in selected technology sectors, while in downturns, this has led to precipitous declines in fundraising which have squeezed out promising firms. High volatility and uncertainty on secondary markets makes it harder for capital to be allocated efficiently, adversely affecting the pace and direction of innovation and firm dynamism (Gompers, 1998). In response to these concerns, listing requirements on the New York Stock Exchange and *NASDAQ* are currently being amended in line with the *Sarbanes-Oxley Act of 2002*, which introduces stricter standards and disclosure rules for publicly traded stocks and IPOs.

Further efforts to increase transparency and accountability on secondary stock markets should be made in line with overall US efforts to enhance corporate governance.

Table 3. Second-tier stock markets in OECD countries

Country (stock market)	Year of creation	Number of initial public offers (IPOs)				Number of quoted companies				Market capitalisation (% GDP)			
		1999	2000	2001	2002	1999	2000	2001	2002	1999	2000	2001	2002
Sweden (O-List)	1988	..	..	24	9	150	228	240	235	28.3	24.0	23.3	18.5
United States (NASDAQ)	1971	485	397	63	40 ⁽¹⁾	4 829	4 734	4 109	3 725 ⁽¹⁾	56.5	36.9	28.9	16.5
Canada (Canadian Venture Exchange) ⁽²⁾	1999	2 425	403	330	122	2 358	2 598	2 688	2 504	1.7	10.2	12.7	9.7
Korea (KOSDAQ)	1996	160	250	181	176	453	604	721	843	22.0	5.6	9.5	5.0
Norway (SMB List)	1992	3	7	7	3	78	77	79	79	4.2	1.8	1.5	1.2
United Kingdom (AIM)	1995	67	203	109	78	347	524	629	704	1.5	1.6	1.2	1.0
Ireland (ITEQ)	2000	---	..	..	..	---	7	8	8	---	3.6	1.7	0.7
Italy (Nuovo Mercato)	1999	6	32	5	0	6	40	45	45	0.6	2.2	1.2	0.6
Germany (Neuer Markt) ⁽³⁾	1997	132	132	11	1	201	338	326	240	5.7	6.0	2.4	0.5
France (Nouveau marché)	1996	32	52	9	2	111	158	164	154	1.1	1.7	1.0	0.5
Switzerland (SWX New Market)	1999	6	11	1	0	6	17	15	9	..	3.0	0.9	0.2
Finland (NM List)	1999	..	..	..	..	..	17	16	15	..	0.7	0.3	0.2
Denmark (Dansk AMP)	2000	3	0	1	3	3	3	4	7	0.1	0.1	0.1	0.1
Spain (Nuevo Mercado)	2000	---	..	..	..	---	12	..	14	---	3.4	..	..
Japan (Mothers in Tokyo)	1999	2	27	7	8	2	29	..	..	0.2	0.1	..	..
Japan (Hercules in Osaka)	2000	---	..	43	..	---	..	32	..	..	..	0.3	..
Netherlands (EURO.NM Amsterdam)	1997	1	2	---	---	13	15	---	---	0.3	0.2	---	---
Belgium (EURO.NM Belgium)	1997	6	3	---	---	13	16	---	---	0.2	0.2	---	---
Europe (EASDAQ)	1996	..	..	---	---	56	62	---	---	---	---	---	---
NASDAQ Europe ⁽⁵⁾	2001	---	---	..	..	---	---	49	43	---	---	---	---
Austria (Austrian Growth Market) ⁽⁶⁾	1999	..	..	---	---	2	2	---	---	0.01	0.01	---	---

Notes:

⁽¹⁾ End of October.

⁽²⁾ Data includes both high-growth firms' shares and shares of investment funds.

⁽³⁾ The Neuer Markt segment will be discontinued after a transition period at the end of 2003.

⁽⁴⁾ Previously NASDAQ Japan.

⁽⁵⁾ In 2001, NASDAQ Europe acquired majority ownership in Easdaq.

⁽⁶⁾ On April 2001, the two stocks in the AGM segment were transferred to the Specialist Segment of Wiener Börse.

Source: Compiled by OECD Secretariat from national sources.

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