



**The double helix:  
Entrepreneurship  
and private equity**

**Future trends  
in private equity  
investment  
worldwide**



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## INTRODUCTION

2002 marks our 30th anniversary. It is tempting to look backwards. The growth of the private equity industry has been extraordinary. Entrepreneurship has blossomed. We have seen two cycles of creative destruction in information technology and are experiencing the beginning of a third—advances in digital technology and the genomics revolution will have far-reaching implications.

It is our business to think ahead, and this report looks forward—to the environment in which entrepreneurs, our partners, will operate; to the future of the private equity industry itself; to the technology revolution, and where it will take us in telecommunications, information technology and biotechnology; to growth stockmarkets; and to social investment.

Technology is driving the globalisation of business and information. It is not always possible to predict which technologies will triumph. We live in an age in which, in the developed world at least, change is a constant. Success lies in the ability to capture the opportunities created by change.

## EXECUTIVE SUMMARY



Entrepreneurs create jobs and stimulate growth but they cannot succeed in a vacuum. They need a hospitable environment in which to operate—a kind of ecosystem in which capital, universities, companies large and small, growth stock exchanges, competition policy, laws and infrastructure all foster entrepreneurial ideas and bring them to commercial fruition.

Capital is the lifeblood of entrepreneurial innovation. That usually means private equity in the form of venture capital. This intimate and fruitful relationship between the private equity industry and the entrepreneur forms the double helix of this report's title.

The report has six sections. The first four sections broadly follow the entrepreneur from the birth of an innovative idea to the creation of a public company. The fifth section, on social investment, shows how the private equity industry is using its skills for social as well as financial objectives. The sixth section presents the personal conclusions of Sir Ronald Cohen, Chairman of Apax Partners Holdings. These are our main findings:

### 1 ENTREPRENEURSHIP

The correlation between entrepreneurship, job creation and economic growth has been firmly established. Governments everywhere have absorbed this message and many of them are now moving to encourage start-ups and new businesses. According to a forward-looking index produced by the Economist Intelligence Unit for this report, north European countries will provide the most hospitable framework for entrepreneurs globally, with the Netherlands, Denmark and the United Kingdom filling the top three positions. But around the world government policy, the availability of finance and increased entrepreneurial experience are all helping to make the prospects for entrepreneurs brighter than ever before.

### 2 TECHNOLOGY

The technology achievements of the past 20 years will be rivalled by those of the next 20. These are not the easiest times to finance innovative technologies. But the role of innovation and the venture-backed entrepreneur is as important as ever. In IT, entrepreneurial activity will focus on the trend towards mass customisation, from reprogrammable chips to the personalisation of entertainment and educational experiences. In telecoms, smaller innovative service companies will work alongside large network operators. And in biotechnology, the technological advantages of the biotech firms will confirm their dominant role in delivering the next generation of drugs for large pharmaceutical companies.

### 3 PRIVATE EQUITY

The private equity industry is set for rapid growth over the next ten years, with pension funds in the United States and Europe likely to double their allocation to the asset class. Growth will be driven by a narrowing in the perceived risk differential between private and public equity portfolios, easier access to private equity funds for investors, better exit opportunities through the financial markets and continued outperformance by private equity in terms of returns. Within the industry, scale will be increasingly important for funds in order to spot trends and deliver value to companies and investors.

## 4

### CAPITAL MARKETS

Growth stockmarkets, with their shorter reporting-history requirements, are critical in enabling new businesses to expand. There is pressure on European national exchanges to consolidate into regional and even global exchanges, but politics and local interests are delaying progress towards a pan-European capital market. The costs of continued fragmentation in Europe are reflected in a lower level of early-stage investment than the United States, which is already threatening Europe's lead in mobile telecoms.

## 5

### SOCIAL INVESTMENT

Private equity and social investment—financial transactions intended both to achieve social objectives and deliver financial returns to investors—make an odd-looking couple. But social private equity offers a sustainable and profitable model of capital allocation to “under-invested” communities, and is already creating jobs and entrepreneurial role models in the United States. With the launch of the United Kingdom's first community development venture fund in May 2002, social private equity is positioned to evolve into a new segment of the venture capital industry.

## 6

### IN CONCLUSION

Despite its extraordinary success over the past 30 years, private equity is still an industry in its infancy. If the sector has grown tenfold over the past decade, it is likely to do the same again in the coming ten years. That growth will help drive greater dynamism in the economy as a whole—there is almost no limit to what can be achieved by new companies in new sectors with high growth prospects. But with success comes responsibility. We all have to be very conscious of widening disparities in wealth, and of the scope for creative economic development in areas that have not attracted investment in the past.

# 1

## ENTREPRENEURSHIP



—  
New research shows that north European countries will compete head-on with the United States to be the natural home of the entrepreneur

—  
The environment for entrepreneurs is improving globally  
—



Schumpeter was saying it in the early 20th century. The epochal achievements of Alexander Graham Bell, Henry Ford, Bill Gates and others attest to it. And research has proved it. Entrepreneurship and innovation lead to job creation, which in turn produces economic activity, and together they serve as a catalyst for economic growth.

A 2001 study by Harvard Business School on behalf of the National Commission on Entrepreneurship (NCOE) showed that of the 1997 *Fortune* 200, America's 200 largest corporations in that year, the majority were directly founded by one or more entrepreneurs<sup>1</sup>. A secondary level of analysis into the origins of the constituent parts of the remaining firms—those whose origins rested in mergers, spin-offs and amalgamations—showed that almost all of them began with one or more entrepreneurs. In total,

197 of the 1997 *Fortune* 200, which in that year accounted for 1.3m jobs and over \$400bn in revenues, could be traced back to entrepreneurial origins.

Other studies have found a direct correlation between entrepreneurial activity and economic growth. The 2000 and 2001 Global Entrepreneurship Monitor (GEM)<sup>2</sup> studies conclude that there is a strong association between entrepreneurship and GDP expansion. According to the GEM 2000 report, about half the difference in levels of economic growth between countries can be explained by the presence, or lack, of entrepreneurial activity. A study produced for Indiana University's Institute for Development Strategies<sup>3</sup> corroborates the GEM reports' conclusions and finds that high economic growth rates in turn stimulate further entrepreneurship, creating a chain reaction of innovation and entrepreneurship.

### Entrepreneurial Framework Index (rankings out of 60 countries)

	2002-06 rank	1997-2001 score	2002-06 rank	1997-2001 score		2002-06 rank	1997-2001 score	2002-06 rank	1997-2001 score
Netherlands	1	8.44	4	8.32	Japan	21	7.04	21	6.91
Denmark	2	8.39	5	8.04	Chile	22	7.02	22	6.53
UK	3	8.39	1	8.34	Spain	23	7.00	25	6.28
US	4	8.34	3	8.32	Italy	24	6.99	24	6.36
Switzerland	5	8.34	2	8.34	Portugal	25	6.89	27	5.96
Finland	6	8.21	7	7.89	South Korea	26	6.82	23	6.38
Canada	7	8.01	6	7.96	Hungary	27	6.40	26	6.03
Sweden	8	7.98	8	7.76	Czech Republic	28	6.33	29	5.68
Israel	9	7.92	19	7.06	Poland	29	6.31	30	5.65
Germany	10	7.92	12	7.52	Greece	30	6.01	33	5.18
France	11	7.87	16	7.32	Slovakia	31	6.00	32	5.41
Singapore	12	7.76	14	7.41	Malaysia	32	5.68	31	5.46
New Zealand	13	7.75	9	7.73	Mexico	33	5.39	40	4.64
Belgium	14	7.75	13	7.45	Bulgaria	34	5.39	37	4.79
Ireland	15	7.74	18	7.28	Saudi Arabia	35	5.38	42	4.57
Norway	16	7.73	11	7.52	Peru	36	5.37	38	4.79
Taiwan	17	7.56	20	6.96	Philippines	37	5.36	36	4.92
Australia	18	7.54	15	7.38	Argentina	38	5.31	28	5.74
Austria	19	7.54	17	7.31	Colombia	39	5.28	34	5.10
Hong Kong	20	7.26	10	7.59	Sri Lanka	40	5.27	39	4.70
					South Africa	41	5.10	46	4.38
					Turkey	42	5.10	48	4.28
					Thailand	43	5.09	35	5.01
					Egypt	44	5.07	45	4.43
					Brazil	45	5.06	41	4.62
					India	46	5.05	49	4.27
					Russia	47	5.04	50	4.17
					Romania	48	4.84	43	4.46
					Venezuela	49	4.62	44	4.44
					China	50	4.41	54	3.64
					Ecuador	51	4.40	51	4.12
					Pakistan	52	4.38	53	3.64
					Vietnam	53	4.36	52	3.79
					Indonesia	54	4.35	47	4.31
					Azerbaijan	55	4.35	58	3.23
					Iran	56	4.28	60	2.81
					Kazakhstan	57	4.28	56	3.40
					Ukraine	58	4.15	57	3.33
					Algeria	59	4.05	55	3.61
					Nigeria	60	3.57	59	3.09

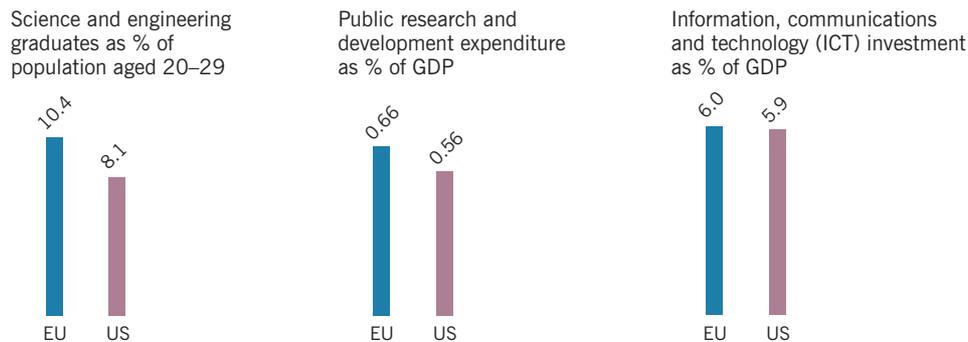
Source: Economist Intelligence Unit

<sup>1</sup> *From the Garage to the Boardroom: The Entrepreneurial Roots of America's Largest Corporations*, National Commission on Entrepreneurship, August 2001.

<sup>2</sup> *Global Entrepreneurship Monitor 2000*, Paul D. Reynolds, Michael Hay, William D. Bygrave, Erko Autio and the Kauffman Center for Entrepreneurial Leadership at the Ewing Marion Kauffman Foundation, 2000; *Global Entrepreneurship Monitor 2001*, Paul D. Reynolds, S. Michael Camp, William D. Bygrave, Erko Autio, Michael Hay, 2001.

<sup>3</sup> *Entrepreneurship and Economic Growth: An Obvious Conjunction?*, Indiana University, Institute for Development Strategies, 2000.

**Europe's emerging strengths (2001)**



Source: European Commission

**New research shows that north European countries will compete head-on with the United States to be the natural home of the entrepreneur**

Until recently, the United States was the undisputed home of the entrepreneur. Few European and Asian governments were attuned to entrepreneurs' needs, local finance for new business ideas tended to be risk-averse, and tax and labour regimes often stymied rather than stimulated start-ups. Faced with this imbalance, frustrated entrepreneurs carried their ideas to Silicon Valley, Boston and other US centres for high technology and new business development. As a result, says the NCOE, the United States controls some 70% of venture capital worldwide.

But things have changed. A new global index produced by the Economist Intelligence Unit specially for this report ranks 60 countries worldwide by the quality of the framework they offer entrepreneurs, and shows that Europe is increasingly competitive.

The Entrepreneurial Framework Index rewards countries that are low on red tape, friendly to private enterprise, have an equitable tax regime, an open and well-developed financing system, flexible labour markets and a modern, networked infrastructure. The rankings are both historical (covering 1997-2001) and forward-looking (covering expectations for 2002-06), allowing an assessment of trends over time. They produce some striking results:

**European excellence.** The index shows three north European countries—the Netherlands, Denmark and the United Kingdom—clustering at the top of the global ladder over the next five years. In total, seven out of the top ten places are filled by European countries, with France in 11th spot. That's not unexpected in itself—in a global ranking, it would be surprising if Europe's stable and sophisticated business environment did not propel it to the top. And a lead in the policy, institutional and infrastructure framework for entrepreneurs does not alone guarantee greater entrepreneurial activity: other

factors—market size, demographics, tolerance of income differentials, culture—also play a part. But the index results show that Europe's top performers can now compete head-on with the United States.

Europeans can excel at innovation too. A new European Commission assessment, *2001 Innovation Scoreboard*, has found that the United Kingdom, Ireland and France are now producing more science and engineering graduates per head than the United States or Japan, and that Finland, the Netherlands and Sweden are world leaders in R&D investment as a percentage of GDP<sup>4</sup>. Home Internet access in the Netherlands, Sweden and Denmark also outstrips the United States. According to a Boston Consulting Group study<sup>5</sup>, Europe's most innovative new companies are producing remarkable annual returns to shareholders—the top ten listed companies in the E500, an annual list of the continent's most entrepreneurial companies from the Growth Plus organisation, generated an annual average shareholder return of more than 100% between 1995 and 1999.

Europe's entrepreneurial high-flyers cluster in Scandinavia and northern Europe. Countries such as France, Germany and Italy (which ranks a lowly 24th in the index) still tend to ascribe higher social status to managers of large, established companies, and as a result, their finance, tax and legal systems are geared to favour them over the upstart. According to a recent survey in *Stern* magazine<sup>6</sup>, more than 10% of Germans want to set up their own firms but many say they are prevented from doing so by government red tape. Moreover, as discussed in the fourth section of this report, continued fragmentation of Europe's stockmarkets is exacting a high price across the EU in terms of efficiency and cost.

But the United States, powerhouse of the global venture capital industry though it is, can no longer assume it is the automatic choice of the entrepreneur. The US is

<sup>4</sup> *The European Innovation Scoreboard*, Community Research and Development Information Service, Enterprise Directorate-General, European Commission, October 2001.

<sup>5</sup> *What Goliath can Learn from David: The Hidden Role Models in Value Creation and Entrepreneurship*, Boston Consulting Group, April 2000.

<sup>6</sup> *Stern*, March 27th 2002.

## Methodology

This is how the Entrepreneurial Framework Index was calculated. The starting-point was the Economist Intelligence Unit's Business Environment Rankings, which measure the quality and attractiveness of the business environment in 60 countries over the periods 1997-2001 and 2002-06. The index covers 70 qualitative and quantitative indicators grouped in ten separate categories.

The Business Environment Rankings are geared primarily to the concerns of foreign direct investors. Analysts from the Economist Intelligence Unit therefore adapted the index to focus on the policy, institutional and infrastructure variables that foster domestic entrepreneurship. These variables were divided into a series of weighted categories, with the weightings being derived from prior research in the Global Entrepreneurship Monitor reports, as follows:

- political effectiveness, comprising measures assessing government policy, government efficiency, red tape,

bureaucracy, the legal system, corruption and crime;

- policy towards private enterprise, comprising measures assessing protection of private property, government regulation, freedom to compete, competition policy, protection of intellectual property, price controls, lobbying and state controls;

- the tax regime, comprising measures assessing corporate tax, marginal tax, value-added tax, compulsory social security contributions, fiscal incentives for investment and the fairness of the tax system;

- financing, comprising measures assessing the openness of the banking sector, the quality of the financial regulatory system and access to medium-term finance for investment;

- labour market and skills, comprising measures of industrial disputes, mean years of schooling, labour flexibility, restrictiveness of the labour laws, extent of wage regulation and the cost of living; and

- infrastructure, measuring telephone density, phone faults, the dis-

tribution infrastructure, stocks of PCs, the share of expenditure on research and development as a proportion of GDP, and office rents.

To test the validity of the Entrepreneurial Framework Index, the Economist Intelligence Unit regressed it against three variables—the percentage of people between the ages of 20 and 40, an index of the macroeconomic environment and the median household income level—which help explain the GEM 2000 report's Total Entrepreneurial Activity (TEA) Index. This TEA Index measures the proportion of the adult population in each country that was engaged in the process of creating a nascent business, and the proportion of adults involved in operating a business that is less than 42 months old.

The Economist Intelligence Unit's Entrepreneurial Framework Index had a statistically significant positive correlation with the TEA Index—the overall model explains 40% of the cross-country variations in the TEA Index.

pushed off the top spot in the index because of a comparatively weaker performance on tax, red tape and crime. As Europe's governments beat the entrepreneurial drum with increasing vigour, competition between the two sides of the Atlantic will only intensify.

**Asian underperformance.** By contrast with Europe, Asia's showing is relatively disappointing—Singapore and New Zealand are the region's top performers in the index, sitting in 12th and 13th place respectively. Japan's stagnant economy and rigid tax and labour regimes push it down to 21st. Regulatory burdens, labour-market pressures and shallow financing environments all contribute to Asia's patchy performance.

But if the region's governments can address these issues, particularly in Asia's most populous markets, the potential gains are immense. China ranks 45th in the index because of bureaucratic and regulatory burdens, but the past two decades of powerful growth have already proved what the country can achieve if its creative energies are unfettered. China, and India too, remain markets for venture capitalists to keep a very careful eye on.

**Israeli ambitions.** If there's one stand-out country in the top ten, it's Israel. Israeli early-stage entrepreneurs have found fertile ground in a society with unique conditions. Israel may yet become Europe's Silicon Valley if political tensions in the Middle East (a variable excluded from the index) can be contained. An immigrant culture, an inflow of Russians highly educated in the life sciences and electronics, a strong defence industry, and government support for innovation and new businesses have all enabled entrepreneurship to flourish in Israel. About 25 active private equity and venture capital funds put some \$2bn into start-ups last year.

The index results underline the fact that favourable entrepreneurial environments are no longer confined to one or two time zones—from the Netherlands to New Zealand, from Canada to Chile, countries around the world offer entrepreneurially-minded people a framework which helps them to start and run new businesses. Compare the scores for 2002-06 with those for 1997-2001: 57 out of the 60 countries show an improvement. The culture of entrepreneurship is blossoming almost everywhere, thanks to a vector of converging forces:

**Government support.** Governments everywhere are recognising the vital role of nascent businesses in their efforts to achieve economic growth and create new

jobs. The entrepreneur is in favour in most of the major economies. In parallel, a broad consensus has emerged in Eastern Europe and Asia championing the open market over the command economy and cutting back the role of the state.

Vigorous pro-entrepreneurship actions in the past three years have brought tax breaks in Australia, a package of small-business incentives in Brazil, a new loan-guarantee fund for entrepreneurs in Denmark, an "Enterprise 2010" programme for entrepreneurs in Ireland, tax incentives in Japan, and actions in favour of better business education, easier regulation and lower taxation for entrepreneurs in Singapore. The latest UK budget, unveiled in April 2002, announced cuts in corporate tax and a simplification of the VAT regime for small businesses. And in emerging markets, a new economic orthodoxy based around the small and medium-sized enterprise is increasingly embraced by multilateral organisations such as the World Bank.

Of course, governments don't get everything right. Sometimes policy takes two steps forward and one step back. In Germany, for example, the capital-gains tax was reduced in 2002 from 56% to 25% and the government has created an American-style "Green Card" to make it easier for foreigners, including entrepreneurs, to work there—yet at the same time venture capital funds are being scrutinised by the Ministry of Finance for heavier taxation. Looking ahead, there is a risk that the European Union's proposed Pensions Directive will impose quantitative limits on investments by pension funds in private equity, potentially jeopardising the flow of capital to new businesses in some member states. But in general, governments around the world are doing more to foster entrepreneurship than ever before.

**Availability of finance.** Investors worldwide are allocating more money to entrepreneurial ventures. The latest data compiled by the European Venture Capital Association (EVCA) indicate a leap in the number of private equity and venture capital houses operating in Europe from 831 to 1,320 in just four years, with 2001 investments (including buyouts) totalling \$23bn. The dotcom bust may have punctured some of the euphoria surrounding entrepreneurship but it will not slow the momentum built up over the past decade. As this report argues later in section three, venture capital and private equity are poised for significant growth over the coming decade.

The expansion of private equity and venture capital investment is happening in tandem with the consolidation of stockmarkets and a gradual liberalisation of

The environment for entrepreneurs is improving globally

banking regimes. The flow of investment capital across borders, notably in Europe, is increasing as a result. EVCA has found that the majority of private equity and venture capital firms operating in Europe invest in more than one European country. The introduction of the euro is accelerating this trend.

And as the size of the private equity asset class grows, so does its political influence. For example, private equity groups are pressing their governments for ever more favourable tax treatment of capital gains on investments in unquoted growth companies.

**Education and experience.** The dotcom era taught many people some salutary lessons, but its most lasting legacy may be the fact that, in its aftermath, more people have been exposed to entrepreneurialism and entrepreneurs than ever before. Many employees of large companies who left to join start-ups have returned to the fold, but they have learned skills and gained experience they may draw on again.

There is increasing evidence of a reverse brain drain, or so-called brain circulation, from the developed to the developing world as immigrants to entrepreneurial centres in the West transfer capital and expertise back to their countries of origin. An April 2002 survey, commissioned by the Public Policy Institute of California<sup>7</sup>, of 2,300 skilled immigrants to Silicon Valley—most of them Chinese and Indian—found that 18% of those surveyed had invested in start-ups or venture funds in their native countries. According to the survey, 76% of Indian immigrants and 73% of Chinese immigrants would consider starting ventures back home.

Furthermore, there has been a general rise in pub-

lic awareness of entrepreneurs—from Bill Gates to Michael Dell, leading entrepreneurs regularly feature on the covers of business magazines. More than 30 countries now offer a local version of “Entrepreneur of the Year” awards, casting the winners as heroes and heroines of the local economy. A “World Entrepreneur of the Year” is then voted as the “best of the best”.

The addition of stock options to executive remuneration has also underlined the rewards of ownership and entrepreneurship. And although some entrepreneurs believe their skills cannot be taught, entrepreneurship is becoming a core component of business education courses in the United States, the United Kingdom, France, Switzerland and Spain. *US News and World Report* magazine makes much of its annual ranking of US undergraduate programmes in entrepreneurship, this year citing Babson College as No. 1, followed by the University of Pennsylvania and the Massachusetts Institute of Technology<sup>8</sup>.

#### Age of the entrepreneur

Business cultures everywhere are opening up and tax and regulatory regimes are restructuring to release the power of private initiative. Apax expects entrepreneurial activity to recover quickly from the 2001–02 dip, as successful new enterprises in Europe and to a lesser extent, Asia replicate the drive and spirit that have long helped sustain US innovation.

The question is not so much whether entrepreneurs have a bright future—they do. Rather it is where their energies will be concentrated (the topic of the next section), and how the private equity industry will evolve in response to these opportunities, a subject tackled in the third section of this report. ■

<sup>7</sup> *Local and Global Networks of Immigrant Professionals in Silicon Valley*, Public Policy Institute of California, April 2002.

<sup>8</sup> <http://www.usnews.com/usnews/edu/college/rankings/business/entrep.htm>, *US News and World Report* website.

# 2

## TECHNOLOGY



IT innovation will cluster around mass customisation, technology that allows companies to respond to customers' needs much more effectively



The telecoms industry will divide into large network operators and customer-focused smaller players



Biotechnology companies will dominate the introduction of new drugs over the coming decade

**E**ntrepreneurship is nothing without innovative ideas. And innovative ideas are nothing without a route to market. To have a commercial future, innovation must above all be market-driven. The key to this linkage is the “innovation ecosystem”, of which private equity and venture capital are major components.

Of course technology-driven research should not be underestimated. Important innovations have famously emerged from the lab, as in the case of Alexander Fleming’s discovery of penicillin. And enabling technologies such as the telegraph, telephone, radio and computer set the stage for the Internet, an unprecedented integration of capabilities.

However, in terms of market acceptance and profits, technology-driven innovation has traditionally failed to deliver. McKenna Group research indicates that only 8% of R&D from corporate research labs is ever commercialised. And studies by Professor Eric von Hippel of MIT’s Sloan School of Management show that 67% of innovations on semiconductor and printed circuit board processes were developed by or around users, as opposed to only 23% from the manufacturers’ R&D centres and 10% from suppliers.

### The innovation ecosystem

A creative idea becomes a market-driven innovation only when it is supported by the fundamental constituencies of the innovation ecosystem—entrepreneurs themselves; capital, of which venture capital and IPOs are an important part; competition, which increases the incentives to innovate; research institutions, including academia, corporate labs and government-funded research; and a pro-entrepreneurship business environment, be it the national regulatory framework or a local technology cluster such as a high-tech business park.

Although public markets are often best suited to

financing innovation in large listed companies, private equity in the form of venture capital is usually more appropriate to entrepreneurs. The decisive role of venture capitalists is often to identify the best ideas, and then to help create and support the management team needed to develop them into real products or services. Ideas may flow freely from laboratories but those with market potential will survive only with a fine balance of commercial judgment, adequate capital and rigorous management. Venture capitalists have been and will remain a strong catalyst to innovation. No industries prove these points better than information technology (IT), telecommunications and biotechnology.

## Information technology

Information technology started as just that: technology to manage the burgeoning quantities of data that governments and companies gathered and therefore had to sort, file and analyse. The electro-mechanical punchcard emerged in the 1880s and the phenomenon that is now called IT began to build. From 1880 to the 1940s the proportion of the US workforce in the information sector rose from one-tenth to one-quarter.

Following its concentration on military applications in the aftermath of World War II, commercial R&D took off, and IT came to market with greatly simplified systems. The 1970s saw Intel’s microprocessors, Apple’s computers and Compaq’s innovations in IBM-compatible hardware standards reach businesses and homes. In the marketing and manufacturing of desktop PCs for business, there were Microsoft’s operating systems, Oracle’s databases and SAP’s enterprise resource planning software.

**IT innovation will cluster around mass customisation**

### Ventured, gained

All but SAP and Microsoft were venture-backed. Venture capital learned to provide the catalyst that clusters of engineers and companies had lacked. It became clear that each major innovation (mainframe, micro-processor, PC) triggered a further cycle of innovation. As each cycle began, its emergence was recognised faster, standards were set earlier and innovation based on them was accelerated. Venture capital fuelled this dizzying process, and entrepreneurs swiftly created companies to compete with entrenched IT vendors.

This accelerating momentum helps explain why in a remarkably short period of time, the Internet has changed the way companies operate and people communicate. The near-universal ability to collaborate and inform via the Internet took place on the back of innovators such as early networking companies Synoptics and Wellfleet; core Internet hardware platforms from Cisco, 3Com, Juniper Networks and Ciena; and the efforts of marketeers such as AOL, Yahoo! and eBay, which created mass markets for networked communities. The marriage of IT innovation and the Internet reached a logical conclusion with the Open Source movement, which required innovators to stabilise and market Linux. Again, all of these companies were venture-backed.

The news has not been all good, of course. Over-optimism led directly to the high-tech bubble of the late 1990s. Business failures soared and enterprise buyers bought solutions that have either not delivered or not even been implemented. Since then, selling innovative products has become a tough proposition.

### Data gold-mining

But IT innovation has not yet run its course—not by a long shot. It is still very much needed as companies strive to compete in today's tight markets. A common theme in IT innovation today is cost-efficient solutions to the complex problem of accessing data across different devices and technologies:

- Large enterprises need to integrate the many software applications they have deployed to harness the business intelligence in their systems, staff and partners. Integration software will reduce the skilled human intervention required to make best-of-breed products work together. Process automation software companies continue to emerge in data-intensive areas, for processes common across all industries (Streamserve in output management), or for vertical industry-specific processes (Retek in retail supply-chain management).
- Data management is increasingly required across and outside the organisation and therefore across

sites, networks and hardware platforms. Access is typically needed in real time, from multiple locations, and from multiple devices. Managing this complex and distributed architecture with specialised IT staff is expensive and unwieldy. Technologies that enable centralised management now offer solutions—such as BlueArc's for storage networks, Micromuse's for enterprise networks and Red-M's for wireless networks.

- The “design gap” generated by the increasing complexity of integrated circuits, and pressure to shorten time-to-market, needs to be bridged by technologies that can deliver complex solutions fast. Hence the value of companies such as ARM, ARC or Parthus, which produce re-usable intellectual property (IP) cores that can be bundled together to deliver systems-on-a-chip applications. Further, the increased complexity in design creates opportunities for companies such as Cadence or Synopsis, which develop tools that help design, simulate and test processes of complex integrated circuits.

### Mass service

Looking ahead, the main trend is towards mass customisation. This is already happening on the hardware level with Dell, where during the order process the purchaser configures PCs and servers as required, down to component specifications. It is starting to happen with software too. Standards-based web services will manage the interface between multiple applications that interact via the Internet. This will radically lower the costs of integration projects in an enterprise, efficiently utilise legacy applications and data, and multiply the effective applications available for a business user.

On the components side, reconfigurable and reprogrammable chips, and the systems-on-a-chip intellectual property (IP) model, will enable companies to reduce design cycles and increase their ability to adapt their offerings to customer needs cheaply. Similar flexibility will evolve as the areas of entertainment, education and technology merge. Users will select combinations of scenarios, merge games, tailor courses and interact with films via broadband networks.

Promising developments that have yet to make an impact on the market include nanotechnology, fuel cells, biometrics and robotics. New human-computer interface models (using speech, vision and touch in tandem with new voice and eye recognition, screen and plastics technologies) could in turn allow us to embed computing anywhere—in clothes, in paper, and so forth. But the nature of these potentially dis-

ruptive technologies is such that it is difficult to predict whether they will deliver innovation cycles that drive market adoption.

## Telecommunications

The frenzy over global communications was intense. Millions of pounds of investment were gambled on wiring the world. Entrepreneurs and their bankers came forward with innovations and financing but sceptics worried that instant communications would benefit criminals more than anyone else.

It sounds familiar, but this was the unstable world of telecommunications in 1870. The great trans-Atlantic market was at stake and the telephone was emerging in the laboratory. By 1875, Alexander Graham Bell had shouted into his mouthpiece, "Watson, come here. I want you!" to his assistant in the next room. The patent for the telephone was his reward, and the revolution on which we continue to build was well and truly under way.

### Dial C for competition

We can look back and laugh today at the Victorian network, the data speeds of the Morse Code and Graham Bell's seemingly ambitious hope one day to see a telephone in every major American city. But the primitive systems of the 19th and early 20th centuries were actually the industry's biggest breakthroughs, and they found their market. In 1930 users with urgent needs were willing to pay \$300 (at today's prices) for a three-minute London-New York phone call. Perhaps the best indication of the progress we have made through digitisation and deregulation of telecommunications is that today the same call costs under 10 cents.

Costs to consumers edged downward for decades but they plunged more dramatically after a wave of privatisation began in the 1980s, breaking up state monopolies and introducing long-overdue competition in most of the major markets. Combined with technological progress in digital switching, productivity per employee soared. Thousands of staff trained to maintain and operate the old Strowger electromechanical equipment had to go, along with the equipment.

Competition spawned a generation of service providers that quickly learned to use the infrastructure of the former monopolies. Content entrepreneurs, makers of new network and user equipment sprang up over Europe, Asia and the United States. Ericsson, Cisco, Nokia and others had bursts of success in pro-

viding network equipment to newcomers. At one point, the city of Berlin had 40 network service providers, but market pressures have reduced that number by half today.

In this new world, customer acquisition became the primary business objective, setting the stage for a long period of tension, which continues still, between the big engineering-driven incumbent operators and their new customer-facing rivals.

### Telephonic turmoil

Counting incumbents, equipment suppliers and new entrants, more than 500,000 jobs have gone in telecoms worldwide since January 2001. This second shake-out in the telecoms industry has been costly for everyone. The industry still lives with the consequences. Many of the big mergers and joint ventures have soured, including Sprint's deal with France Télécom and Deutsche Telekom, and British Telecom's Concert combination with AT&T. Others that survived have performed poorly as they struggle under debt burdens.

The highest-profile problem is that of third-generation (3G) debt and potential technical delays of 3G service rollout well into 2004. Over \$100bn in licence fees has been paid out against expected future revenues. But 3G is only part of the story: companies have also heavily overinvested as a result of unrealistic expectations for the volume of fixed as well as mobile communications.

The moral of the industry's current predicament is that telecoms strategy should be based on two simple truths: access to customers and concentration of traffic. Access to customers requires brand-building, understanding of users' requirements and the ability to deliver services to the customers themselves. Concentration of traffic is the driver of all telecoms investment because of economies of scale: the more traffic you have, the cheaper the cost per bit carried.

### Lumbering or nimble

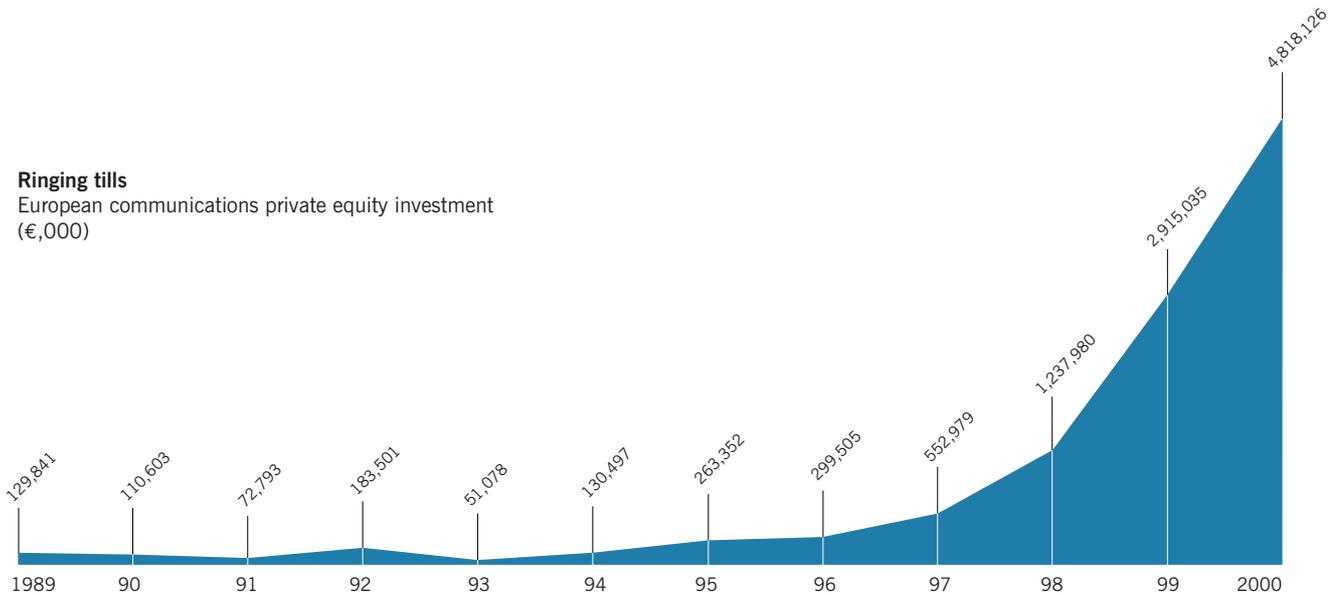
The evidence suggests that the big operators run good networks but have been slow to grasp customers' needs. Smaller companies with no telecoms background have meanwhile proven they can clean up, as in the creative business of ringtone downloading, now a billion-dollar-plus industry. And private users and advertisers have surprised telcos with their heavy usage of the short message service (SMS) in the mobile phone business. Worldwide, an estimated 400bn text messages were sent in 2001.

Large companies have also created telecoms businesses to capitalise on the new opportunity to attract

The telecoms industry will divide into large network operators and customer-focused smaller players

**Ringling tills**

European communications private equity investment (€,000)



Source:EVCA

customers via better service. Centrica, formerly British Gas, acquired One.tel in the United Kingdom, for example, to bring customer-focused telephone services to private homes via the BT network.

In response, private equity and venture capital have flooded into telecoms start-ups and buyouts. Private equity funding of communications in Europe in 2000 reached a record total of €4.8bn before dropping back last year. Beneficiaries included firms such as the former Ericsson Enterprise Solutions firm Damovo, the mobile location-based platform Webraska Mobile Technology and Germany’s CLEC Tropolys.

It will be 2003 before the telecoms sector gets back on course and demand and supply come back into balance. Further consolidation lies ahead. Re-emergence of the basic rules and economics of telecommunications will be the most significant feature of the next two years or so.

Some specific predictions:

- In fixed networks, margins will come under less pressure. Telecoms traffic, now mainly data, will still be expanding at double-digit rates, and so growth in demand will eventually soak up capacity and consolidation will reduce competition. However in the mobile market competition will intensify as 3G is eventually launched, and regulators will increase pressure to reduce charges for some services.
- Overall, turnover will grow and start to return to the long-term trend of 5-6% growth per year.
- Debt will continue to be reduced. In the short term, telcos will focus on consolidating their position in their domestic market, before turning again to international expansion.
- Employment will continue to fall. Part of this will be due to the reverberations from 2001, part will be because the initial investment phase for many

new entrants is over, and part will be because there will not be enough growth in demand to offset gains from productivity and economies of scale. Direct employment in telecoms will also fall because of outsourcing: many telcos will begin to follow this route. Overall, this downward trend is likely to persist for some time.

Ultimately, success for telecoms firms will lie in defining markets and market segments and ensuring that costs are low, channels are efficient and brand is strong. Picking the right platform—the mixture of technology, services and operations, and support systems—will be critical.

**Netcos v Servcos**

The implications for the future development of the industry are immense. Purveyors of services will split into Netcos and Servcos, with the large operators (the Netcos) providing the network, and service-orientated companies (the Servcos) finding and serving their customers over the network. Some of the more innovative operators, including BT, may be setting the direction for the future with their internal reorganisations to split the functions.

Content-specific networks, such as voice or video, may exist for a long time yet, but their ultimate demise is certain: the days are gone when economies of scale could best be achieved by having specific networks for specific services. A platform such as Internet Protocol over Ethernet can cope with most services and applications, even if it is not optimised for any one of them. This potentially opens up a new industry structure.

Over such a platform many service and application providers could flourish. The provision of that platform would lead to (and ultimately require) huge economies of scale. One implication of this could be the emer-

gence of “dumb” networks, operated independently of any services or applications. An interim step will be technology and applications providing intelligence and high-speed broadband connectivity to the end-user.

## Biotechnology

When James Watson and Francis Crick unravelled the double helix structure of DNA in 1953, the seeds of the biotechnology revolution were sown. But it was the discovery of restriction endonucleases, DNA ligases and the other basic tools of recombinant DNA technology around 30 years ago that made a new revolution in industrial biology a reality.

Herb Boyer at UCSF and Stanley Cohen at Stanford University in California created recombinant *Escherichia coli* in 1973, a genetic engineering breakthrough that had immediate practical implications. Stanford patented the technology and a Silicon Valley venture capitalist, Bob Swanson, spotted the business potential. Negotiating an exclusive licence from Stanford, Swanson and Boyer founded Genentech, the first recombinant DNA company, in 1976.

Genentech’s model for the development of biotechnology remains wholly valid: patented technical developments and products are the key tangible assets that biotechnology businesses use to develop breakthrough business, typically backed by investment from venture capital and public capital markets.

This and other innovations have totally transformed the drug industry. The biotechnology industry has now grown to approximately 4,000 firms worldwide, employing more than 250,000 people and generating more than \$30bn in revenues. These young firms are

responsible for 25-30% of new drug applications to the US Food and Drug Administration (FDA), a figure that could rise to 50% by the end of 2002. Sales of the leading 25 biotech drugs topped \$21bn in 2001. Over the coming decade, biotechnology companies will continue to dominate the introduction of new drugs by providing the technical advances that accelerate the efficiency of pharmaceutical development.

### Clinical efficiency

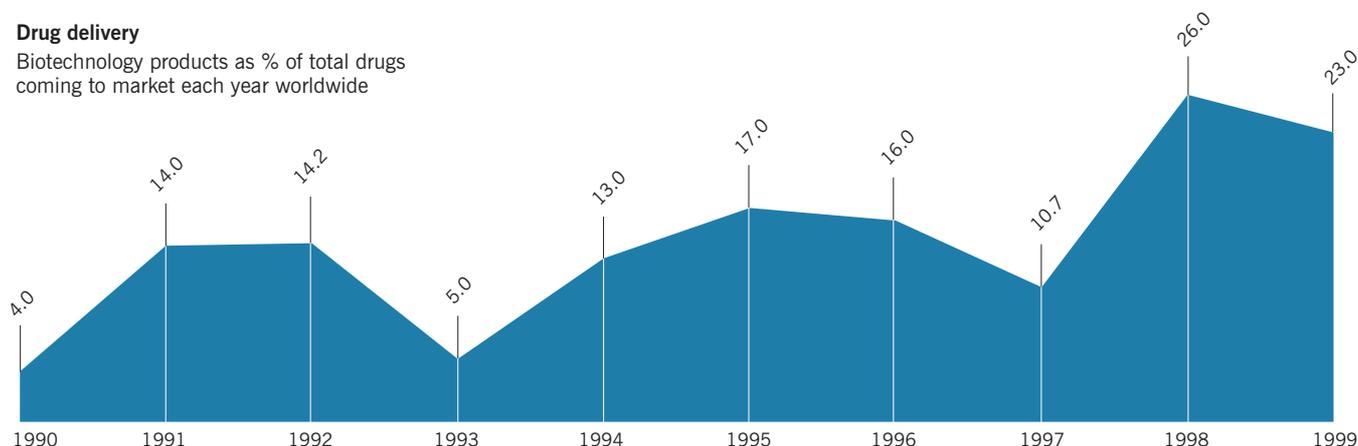
One of the key outcomes of the genomics revolution is the huge increase in the number of potential drug targets. Biotechnology companies are providing the novel technologies for identifying and validating these new targets. They, not the pharmaceutical companies, will take the lead in the next five years in discovering and developing the drug molecules that interact with these targets.

Furthermore, the high-throughput screening approach pioneered within the biotechnology sector is generating most of the compounds heading for approval in the next five years as well as the vast majority of new small-molecule drugs entering clinical trials. Combinatorial biochemistry and chemistry companies are generating libraries of millions of new compounds that have drug-like characteristics. A high proportion of compounds still fail in early clinical trials because the early laboratory and preclinical studies do not predict how they will behave in patients. The way a compound is absorbed, distributed, metabolised and excreted by the body, and the extent to which it has side-effects, are precisely those properties that make a chemical a drug. Innovative companies are now developing advanced *in silico* and *in vitro* methods to predict those effects. This will eliminate inappropriate compounds well before expensive clinical trials and, in

**Biotechnology companies will dominate the introduction of new drugs over the coming decade**

### Drug delivery

Biotechnology products as % of total drugs coming to market each year worldwide



Source: EFPIA/CMR International

many cases, even before a compound is synthesised.

The integration of information technology with biotechnology will be pivotal. Computers are being extensively used in drug discovery to garner, store and analyse terabytes of data emerging from academic and industrial research. Bioinformatics companies are converging with major IT providers to develop integrated data management and decision-support systems for drug companies, a move that is expected to cut the drug discovery and development bill significantly over the coming years.

The genomics-driven rise in peptide and protein drugs will intensify the need to find ways of delivering such compounds efficiently to the disease target site. Slow release formulations—where drugs are encased in degradable polymers—are already available, and we expect to see considerable innovation in this area over the coming decade.

Drug delivery is just one of the areas where we expect to see some benefit from the fusion of drug development, biological materials science and electronics. A new generation of drug delivery systems, for example, could be based on biologically responsive implantable microchips that not only serve as medicine repositories but also dispense the drugs in a manner that mimics the body’s natural production of chemicals.

**Outsourcing is in**

The evolving shape of the pharmaceuticals industry will only serve to reinforce the importance of biotechnology companies. Rising regulatory standards and the increasing leverage of healthcare payers are forcing the drug industry to cut costs and seek more innovative, efficacious and cheaper new pharmaceuticals.

**Top biotechnology drugs (2001 sales, \$m)**

Drug	Company	Sales
Erythropoietin	Amgen/J&J	5,540
Insulin	Novo/Eli Lilly	2,458
Beta interferon	Biogen/Schering/Serono	1,958
Alpha interferon	Schering-Plough	1,447
GCSF	Amgen	1,347
Leuprotein	Abbott/TAP	987
Rituximab	Genentech	819
Etanercept	Immunex	755
Infliximab	J&J	721
Alglucerase	Genzyme	570
Palivizumab	Abbott/MedImmune	543
Abciximab	Eli Lilly/Centocor	431

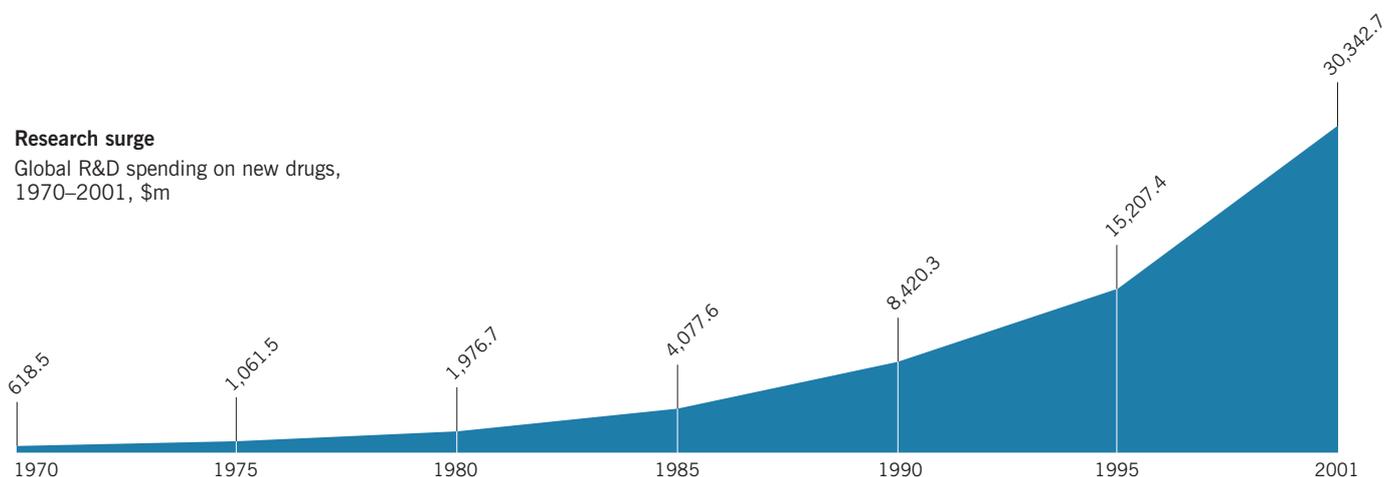
Source: Various, Apax Partners

This has been one driving force behind a decade of pharmaceutical mergers that have consolidated and globalised the industry. The behemoths find themselves trapped by the logic of their massive R&D budgets, now starting to exceed 25% of sales, which can only be justified if they launch between two and five blockbuster products per year to maintain their growth. This creates major opportunities for innovative and fast-moving biotechnology firms.

A substantial share of those R&D budgets—as much as 40% in the case of discovery research budgets—are now being spent on outsourced R&D; that is, on services provided by new biotechnology companies. Products licensed from outside firms now account for more than 40% of the pipelines of nine of the world’s ten largest pharmaceutical companies. We expect this trend to continue.

**Research surge**

Global R&D spending on new drugs, 1970–2001, \$m



Source: Pharmaceutical Research & Manufacturers of America membership survey

But biotechnology companies are no longer financially dependent on large pharmaceutical companies. Continuous technological and commercial successes have kept investor enthusiasm buoyant for a decade. The sector has been able to raise \$100bn over the past ten years, around \$50bn of it in 2000 and 2001, according to data from BioCentury.

This influx of capital has allowed biotechnology firms to take their innovative compounds much further into clinical development and to retain much broader rights. Armed now both with valuable intellectual property and substantial independent development budgets, companies such as Millennium, Vertex and ImClone have been able to negotiate as equals with pharmaceutical partners, striking very large development deals.

#### Attention to prevention

The advances in biological understanding and technical capability open new vistas for future healthcare. Given the right technology—and the approval of society—problems could be identified and treated preventively through medicinal and lifestyle interventions years in advance of any overt disease. For example, monitoring technologies might be used to track key indicators of an individual's biological status and immediate health prospects.

The move towards full understanding of the molecular pathobiology of diseases could also mean that medical indications would be subdivided, almost to an infinite degree, with direct implications for treatment. Rather than treating the palpable physical symptoms of, say, rheumatoid arthritis, future therapies might comprise a customised cocktail of pharmacological components designed to restore a patient's normal

metabolism.

Healthcare based on predisposition and risk avoidance, or on intensive monitoring and pharmacological adjustment, would require very different institutions, modes of administration and payment systems than the present practice of crisis remediation. What is certain is that as more knowledge moves into the hands of patients and primary care providers, healthcare systems will evolve focusing more on the prevention of disease. Any company hoping to supply future health needs will have to evolve with them.

Current economic pressures on healthcare systems highlight concerns about inequality of provision. High technology solutions may widen the gap between those who can afford the best care and those who cannot. In Apax's view, however, much of the fundamental importance of biotechnology resides in its dual ability to give individuals information about their own health and to allow them to avoid or substantially delay the onset of the kind of severe health problems that require expensive interventions. It will be increasingly apparent to payers, including governments, that biotechnology is a route not only to better healthcare but also to cost-effective prevention.

Investing successfully in biotechnology requires a long-range vision that brings understanding of how healthcare must and will change. But it also requires an understanding of the short-term drivers—resource constraints, competing scientific and technological approaches, the regulatory environment, and the power and phases of the market—of any investment opportunity. Biotechnology will change healthcare practices in an increasingly radical manner, but a high premium will be placed on market-driven insight and scientific knowledge in making investment decisions. ■

# 3

## PRIVATE EQUITY



Private equity is primed for rapid growth

Top-quartile private equity firms will keep producing superior returns

Scale is essential to success and will change the shape of the industry

It is a central theme of this report that entrepreneurs are an integral part of innovation, but that capital is also vital. Venture capital and other forms of angel investing are essential to entrepreneurs and small companies. For established companies too, capital in the form of buyouts is often the key to unlocking creative potential that is otherwise stifled.

In the United Kingdom, the most developed market outside the United States, some 87% of managers backed by private equity say their firms would have grown more slowly or would not have existed at all without the stimulus of such funding. And the British Venture Capital Association (BVCA) calculates that firms backed by private equity account for 2.7m jobs, or 15% of the UK workforce.

Despite the gloom spread by the bursting dotcom bubble, private equity is well placed for brisk growth over the next decade. The global entrepreneurial environment has never looked more receptive, and the prospects for market-driven innovation are similarly favourable. True, many investors were badly burned by the correction in 2000-01, and there is a substantial overhang of money raised before equity markets headed south. But most investors will be quick to put the past behind them and position themselves for the attractive returns that the next IPO boom will bring. That could come in 2003, 2004 or 2005, assuming a sustained global economic recovery (see box on next page).

Many pension funds, insurance companies, endowments, corporations, high-net-worth individuals and funds of funds will raise allocations to private equity funds as they reach for higher returns and as they become more familiar with the sector's risk profile. Even large banks will provide a growing source of capital for private equity by investing more of their asset-management clients' money.

Pension funds especially are going to need high returns if they are to pay for the growing retirement needs of fast-ageing populations. Apax expects public and private pension funds, the largest contributors to private equity, to double their average allocation to about 15% of total funds in the United States and about 7% in Europe over the next ten years.

This would add an extra \$75bn or so to US commitments and \$22bn (€25bn) to European commitments over ten years, were the amount of pension funds under management to remain stable. The effect would be even greater if pension funds under management grow. These numbers compare with an estimated \$150bn raised globally by all investor types in 2001 and a record \$250bn haul the year before.

Even with that sharp drop last year, private equity retains the energy of the last decade, in which commitments rose fifteenfold in the United States and ninefold in Europe, because the underlying drivers of growth not only remain in place but are gaining momentum. These drivers include an improved perception of the risk of owning private equity; the emergence of new vehicles for participation; and better entry and exit opportunities:

**Risk differentiation is blurring.** For many big investors, risk distinctions between public and private equity are starting to blur especially given private equity's rising diversification, increasing transparency, and strong focus on due diligence and performance. Moreover, the use of sophisticated risk modelling will push allocations higher, particularly for top-quartile performers, as investors realise that adding a chunk of private equity to a stock portfolio can reduce overall volatility while increasing returns.

**Private equity is becoming easier to buy and sell.** Funds of funds will multiply, giving a more appealing

Private equity  
is primed for  
rapid growth

entrée into the asset class for smaller institutional investors and high-net-worth individuals. These funds allow more modest investments in diversified portfolios. Expansion of this market will further pry open the class to wealthy individuals and others, who will increasingly be able to trade the instruments as they would any security.

**Entry and exit opportunities are improving.** As outlined in the first section, the prognosis for global entrepreneurial activity is excellent, thanks to a number of factors such as government support, rising research and development activity, and the high public profile of entrepreneurs. Investment in early-stage venture capital and later-stage buyouts will continue to vary with the IPO cycle and debt availability, but venture capital is expected to increase in Europe, which is currently buyout-biased. Exiting private equity invest-

ments should also become simpler, thanks to the accelerating development and integration of national, regional and global growth exchanges especially in Europe and Asia. More robust small-company markets such as AIM should also provide greater liquidity.

**Clouds on the horizon**

This rosy picture should not obscure the fact that there are obstacles to growth which the private equity industry must strive to overcome. In the short term, there is reluctance on the part of some investors, who were burned in 1999-2001, to reinvest. Similarly, investment could slow while the overhang of money raised before the stockmarket correction but not yet invested is absorbed and as adjustments are made to temporary over-allocations caused by the drop in value of public equities in many institutional portfolios.

More worrisome over the long run are several

**Bouncy**

The global economy is recovering more quickly than many expected following its sharp slowdown in 2001. Driven by a strong rebound in the United States, the Economist Intelligence Unit expects global growth to average 3.1% in 2002, compared with an increase of 2.4% last year. The world economy will improve further during 2003, expanding by 4.2%, and growth of this order will be maintained over the medium term.

The US economy is now well into a recovery. Data revisions show that output was expanding at a respectable pace even in the final

quarter of 2001. Growth in the first three months of 2002 was extremely strong, as firms started to ramp up production in order to stem the continued decline in their inventory levels. In addition, consumer spending looks to have been fairly strong and even investment spending appears to have reached a low point. The heady pace of growth in the first quarter will not be maintained during the rest of the year, however; some special factors pushed growth up and it is already clear that the second quarter will be significantly weaker. But even softer growth during the summer sets

the stage for reasonable GDP growth in 2002 as a whole, and gradually accelerating consumption and investment will support strong growth in 2003.

The United States may be in the lead, but other key drivers of the world economy are also showing signs of life. The euro zone seems to be improving, with business surveys suggesting greater confidence and that weak growth has already resumed. Even in Japan, there are signs that the economy is picking up, on the back of a turn in the inventory cycle and stronger export growth.

**Real GDP growth forecasts (% real change)**

	2000	2001	2002	2003	2004	2005	2006
United States	4.1	1.2	3.0	3.5	3.4	3.2	3.0
Japan	2.2	-0.4	-0.7	1.5	1.2	0.9	0.9
Euro zone	3.4	1.5	1.6	2.7	2.5	2.5	2.4
World <sup>a</sup>	4.7	2.4	3.1	4.2	4.2	4.2	4.2

<sup>a</sup> At purchasing power exchange rates. Source: Economist Intelligence Unit

**Momentum maintained**

Private equity\* funds raised and invested (US\$bn)



\* Includes all private equity – both venture capital and management buyouts. Sources: NVCA, EVCA, IVA, Initiative Europe, Thomson Financial, AVCI and Economist Intelligence Unit estimates

retirement-related trends. The spectre of more people retiring sooner could limit appetite for illiquid investments, despite the compensating impact on the needs of pension funds to achieve higher returns which has already been discussed.

In Europe there are also fears that the EU's proposed Pensions Directive, which EU leaders want to see agreed by the end of 2002, will impose quantitative limits on the investment allocation that pension funds can make to private equity in order to reduce risk. EVCA has warned the EU that this could lead to "massive divestments from private equity and venture capital" in countries such as the United Kingdom where no quantitative limits currently apply<sup>9</sup>. On the upside, however, limits would enable pension funds to start making such allocations in EU countries where investment in private equity is currently not permitted.

Of greater concern is the fact that defined benefit plans, the mainstay of private equity, are losing ground to defined contribution plans around the world, led by the United States. There, from 1985 to 2001, defined benefit plans shrank from 65% to 44% of total pension assets, according to the Federal Reserve. Defined contribution plans are managed by each indi-

vidual rather than being pooled; this makes it more difficult to meet the minimum amounts most private equity funds require before anyone can invest. Transparency and ease-of-access concerns also make it less likely that individuals will turn to private equity in a very significant way.

But none of these challenges is insurmountable. The forces favouring growth are simply too strong. From 1996 to the end of 2001, over \$600bn in private equity was raised in the United States and another \$145bn in Europe. Asia, since 1999, has added some \$30bn more. A decade from now, those numbers could well look modest.

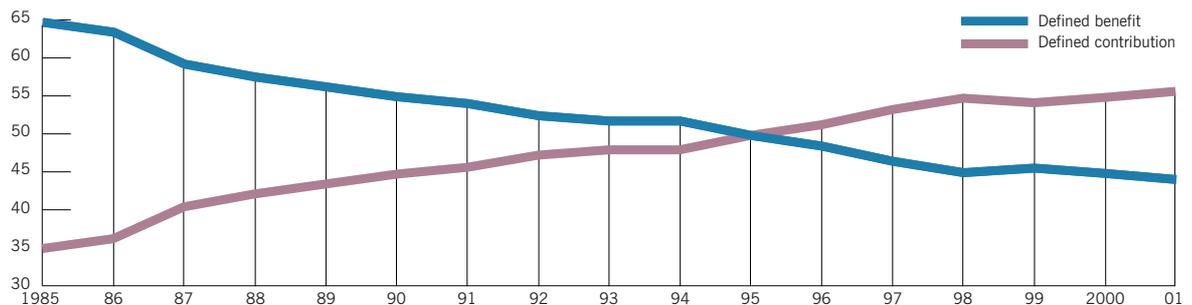
Underlying the growth in allocations to private equity by investors, of course, is the asset class's superior performance, particularly on the part of the top performers. Private equity returned 17.4% on an annualised basis over the past ten years in the United States, compared with 16.3% in Europe, according to Thomson Financial Venture Economics and the National Venture Capital Association (NVCA). Early-stage returns led the field in the United States for the ten-year period, garnering returns of 32.5%, while in Europe, buyouts out-

<sup>9</sup> Proposal for a Directive on the Activities of Institutions for Occupation Retirement Provision (Pension Funds): EVCA comments on discussions regarding a "Prudent Person Rule Plus", EVCA, April 10th 2002.

**Top-quartile private equity firms will keep producing superior returns**

**Changing places**

% of total US pension fund financial assets



Sources: Federal Reserve Flow of Funds Accounts (revised)

**Scale is essential to success and will change the shape of the industry**

performed other stages, delivering returns of 18.2%.

Picking the top quartile of performers made a huge difference in good years and bad. Take the 2000 vintage. So far, the top quartile in the United States has lost 1.5% on average versus the bottom quartile’s loss of 31.4%, while in Europe the best earned 0.1% and the worst lost 18.4%, according to Thomson Financial Venture Economics and NVCA. The gap is equally obvious in a good year. For this take the 1994 vintage. In the United States the top quartile has so far gained 19.7% on average versus the bottom’s loss of 12%, while in Europe the best earned 16.4% and the worst lost 1.3%.

In the short term, returns and valuations could be hurt by the \$231bn overhang of money raised from 1996-2001 that is waiting to be invested in Europe and the United States. More important, the growing size of private equity funds increases the challenge of outperforming the industry. It is harder to earn the same high returns off a larger base, and more players can bid up prices to unrealistic heights.

Even so, returns will still outperform the public market. Venture capital funds invest in smaller companies that, if well picked, should grow faster and return more than a larger public company. On the buyout side, returns should also be higher since, optimally, assets are bought in a downturn, management have value-driven incentives and the company is then floated or sold at a higher price. Top-quartile firms in particular should find it possible to return the 5-8% premium above public equity returns over the long term that investors have come to expect for taking on greater illiquidity or risk.

Scale will be an inevitable and essential component of success in the private equity industry. A growing preference by large investors for bigger stakes in fewer diversified funds along with rising allocations is driving the evolution of larger funds. Entrepreneurs are also attracted to larger branded funds because they know they can expect more support and better access to the capital markets.

Scale, by supporting greater diversity by industry, geography and stage, will also enable private equity to deliver the consistent returns demanded by investors. Broad, global networks will give private equity houses the reach to seek and analyse opportunities worldwide—as the Economist Intelligence Unit’s Entrepreneurial Framework Index showed in the first section of this report, many countries around the world now offer go-getters a developed framework for innovation. A wide network will improve the quality of advice to portfolio companies and give them easier access to customers, suppliers and overseas markets.

Huge amounts of money are needed to launch technologies quickly onto global markets. Witness the growth in the amount of US venture capital invested over the past decade, which has mushroomed from \$2.3bn in 1991 to a peak of \$99.6bn in 2000, and a lower, but still sizeable, \$36.5bn last year, according to Thomson Financial Venture Economics and NVCA. Buyout investments can require even more daunting sums.

Scale brings its own problems, of course. Large firms will have to be managed more professionally—how to control without quashing entrepreneurial spirit

will be a central challenge, and resolving this tension will determine who succeeds. A decentralised approach that allows a firm to “think globally but act locally” is likely to be most effective. Companies that succeed are set to maintain discipline, not lowering IRR expectations in the face of competition.

### The crystal ball

The importance of scale also implies a shake-out in the structure of the industry over the next decade. Many funds that arose during the Internet boom will be casualties of the bust—exiting as poor performance and short histories make it tough to raise additional funds. New entrants will find higher barriers in their path.

The result will be a highly competitive bipolar global landscape, with less than a dozen global private equity firms at one end of the market and hundreds of small,

entrepreneurial boutiques with a specialised venture capital focus at the other. A median tier of mid-sized and national firms will come under pressure to evolve as they find it increasingly hard to raise funds, offering neither global coverage nor fleet-footed specialisation.

In an industry where culture is all important and mergers offer little in the way of synergies or cost savings, organic growth will be the most cost-effective means to achieve global reach and to access sectoral expertise. As the industry draws closer to the mainstream, there will also be more publicly listed funds of funds and a small number of quoted private equity firms. Private firms will continue to dominate, given the industry’s long-term investment horizons, the cyclicity of returns, the judgment involved in valuing portfolio companies and its compensation structures, with pay powerfully linked to fund performance. ■

# 4

## CAPITAL MARKETS



A pan-European stockmarket is likely but is threatened by severe delay

After losing out to the United States on the PC and Internet booms, Europe's wireless lead may be at risk

**G**rowth stockmarkets, which allow new companies with short histories to raise money, are critical in enabling new businesses to expand. At the point that growth companies need more capital than private equity firms can provide, they go public. This drives a cycle of private equity firms exiting old investments and reinvesting in new companies. The deeper and more liquid the market, the greater the opportunities to exit, and the more money is allocated to private equity investment in early-stage entrepreneurial companies.

Europe's fragmented stockmarkets remain a stumbling block to economic expansion and job creation, placing the region at a competitive disadvantage in this respect to the United States. Without change, European private equity growth will continue to fall short of its potential.

The pressures on European stockmarkets to consolidate are immense. First, there are the demands of a European investing public which, recent stockmarket corrections notwithstanding, is on a trend towards greater share ownership. A combination of privatisation and restructuring, demographic pressures, tax incentives and low interest rates is increasing the amount of European capital seeking equity opportunities.

Second, the arrival of the euro, by removing currency risk and increasing transparency in trading costs and share prices across borders, has removed a huge barrier to capital-market integration. Investment along national, rather than sectoral lines, is increasingly anachronistic.

Third, competition has intensified. Even before reports surfaced about its possible interest in bidding for the London Stock Exchange (LSE), Nasdaq has been positioning itself to be the lowest-cost global

exchange of choice for the next IPO uptick by expanding operations in Europe and Japan. Hence Nasdaq Europe's plan to offer a single trans-Atlantic IPO, a single trading platform, rule book, and settlement and clearing system across the euro zone. Its systems aim to make the cost of clearing a stock across borders the same as that of national trading on a local market. This means that if a British investor wanted to buy a German stock, clearing costs on the deal would be 85% less on Nasdaq Europe than on the German Exchange.

Faced with these pressures to consolidate, European exchanges, including the LSE, have so far responded with a series of largely abortive efforts to merge. Only the Paris, Amsterdam, Brussels and Lisbon bourses, which recently merged to create cross-border Euronext, have made real progress. Turf wars have previously scuppered more ambitious plans to link up the Frankfurt exchange and the LSE. It doesn't help that the recent downturn in the IPO market has muted the urgency of the case for greater efficiency, or that investment banks have not so far been particularly forceful in pushing for regional markets, which threaten to change the dynamics of competition for their business.

The European Commission's so-called group of wise men, led by Alexandre Lamfalussy, a Belgian central banker, has proposed ways to speed the adoption of a pan-European market. The group has stressed the need for the region to develop a deeper pool of liquidity, a common prospectus to help in crossborder capital raising and common listing and accounting standards. But once again, national interests are proving obdurate, Germany's rejection of a single EU takeover code being the outstanding recent example. As a result of such episodes, the wise men's initial target date for a single capital market of 2003 has been put off until 2005 at the earliest.

**A pan-European stockmarket is likely but is threatened by severe delay**

**Are Europe's growth markets falling short?**  
(2001)



\*AIM, Nouveau Marché, Neuer Markt, Nasdaq Europe in Europe, Nasdaq in the US. Source: The Economist Intelligence Unit

A pan-European capital market will arrive eventually. The exchanges know it—that's why they've all been talking. Forces are converging to produce pan-European growth and large-cap exchanges, say, by 2010 at the latest. By then, national exchanges will almost certainly have disappeared. But that day is still a long way off, and in the meantime vested interests keep prolonging Europe's disadvantage relative to the United States.

pan-European growth stockmarket could be as big as that of the United States. That would represent huge growth in market capitalisation. At the end of 2001, the 1,168 companies listed on Europe's main growth markets—AIM, the Nouveau Marché, the Neuer Markt and Nasdaq Europe—were dwarfed by the 4,109 companies listed on Nasdaq. The European exchanges' \$84bn combined market capitalisation represented a paltry 3% of Nasdaq's \$2.9trn.

**After losing out to the United States on the PC and Internet booms, Europe's wireless lead may be at risk**

Does it matter if growth stockmarkets remain fragmented? It's a reasonable question. Europe's stockmarkets are clearly strong enough to support a bigger proportion of the world's largest listed companies.

But problems start when a smaller company, which cannot achieve a large-cap European exchange or US listing, decides it wants access to a broader pool of capital, particularly in Europe. It then must approach many listing departments, rule-setting authorities, and clearing, settlement and depository institutions and counterparties—each with its own requirements and technology platforms. These overlapping procedures and IT systems send time and costs rocketing.

Market participants too find the current situation cumbersome. Traders trying to buy and sell growth stocks across Europe would find it simpler to interact with one exchange with one engine room. For investors, allocating and reallocating portfolios across Europe is hard to do systematically. A US pension fund wanting to own pan-European growth shares in a particular industry sector has to buy into more than one regulatory regime. It might invest more if it was easier and cheaper.

Quantifying the potential gains from a fully integrated European stockmarket isn't easy, but in theory, a

More importantly, a single securities market would mean a significant reduction in trading costs. A November 2001 report for the European Commission on crossborder clearing and settlement by the Giovannini Group<sup>10</sup> concludes that barriers between national exchanges add enormously to transaction costs for investors. Crossborder settlement, even via international depositories such as Clearstream and Euroclear, costs around ten times more than domestic settlement, according to some estimates.

The London Stock Exchange recently estimated that such inefficiencies add 20 to 30 basis points to the cost of capital for a European company over US levels, and that users in Europe pay on average around six times per transaction more for clearing and settlement services than in the United States. According to the LSE<sup>11</sup>, these differences arise from two sources: higher operating costs per transaction—around two-thirds of the total additional cost; and higher margins—in Europe currently an average of 29% compared with 0% on the part of the not-for-profit Depository Trust & Clearing Corporation (DTCC) in the United States.

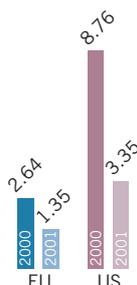
One pan-European central counterparty, by cutting the number of settlements through netting and by

<sup>10</sup> Cross-Border Clearing and Settlement Arrangements in the European Union, The Giovannini Group, November 2001.

<sup>11</sup> Response to the First Report of the Giovannini Group, London Stock Exchange, February 7th 2002.

### Westward ho

Wireless venture capital  
by geography (\$bn)



Source: Rutberg and Company

merging settlement systems, would save market participants €1bn a year, according to the LSE. What's more, eliminating the duplication of IT systems at each of the national exchanges would result in further cost reductions for investors, as would lower headcounts across the exchanges.

A pan-European growth capital market with considerably lower costs and greater liquidity would in turn mean more investment in more entrepreneurial enterprises. Vibrant growth stock exchanges like Nasdaq improve the risk profits of early-stage investment for venture capitalists by increasing the chances of raising substantial capital through an IPO. In this sense the venture capital market is driven by the public equity market. According to Thomson Financial Venture Economics and NVCA, US investors invested a record \$99.6bn in venture capital in 2000, representing 61% of total US private equity. By contrast, EVCA put European seed and start-ups at €6.7bn, or just 19% of the European private equity total, which slows the continent's ability to create as many successful innovative companies.

A well-developed growth market gave the United States most of the spoils from the personal computer

and Internet revolutions. Now wireless telecommunications is the prize at stake. So far, Europe has the lead in developing mobile technology. But if innovative wireless companies can't raise adequate funding to support growth in Europe, once the industry recovers its equilibrium it will migrate to the United States along with potentially huge job creation and capital formation. Europe may already have dithered too long. Since the start of 2000, private equity investments in North American wireless start-ups have been three times higher than in the equivalent European companies, according to calculations by Rutberg & Company in San Francisco.

The message to regulators and exchanges is clear. A European growth stockmarket will be a huge driver of growth for private equity and new businesses in Europe. This in turn will boost the number of new companies funded by venture capitalists and others coming to market, stimulating economic growth and job creation. The PC and Internet revolutions were both US-centred not least because Nasdaq is a larger, integrated growth stockmarket. Without a pan-European growth stock exchange, Europe risks losing out to the United States again on the mobile revolution. ■

# 5

## SOCIAL INVESTMENT



A sustainable model of investment in disadvantaged communities is needed

Social private equity investment is more relevant than ever before



This report has argued that the environment for entrepreneurs and for private equity will be extremely positive over the next decade. There are still areas of concern, of course—among them the fragmentation of European stockmarkets and an overhang of money raised before the dotcom crash—but the prognosis for growth and returns is excellent. Proponents of social private equity investment, the subject of this section, believe that the benefits of this coming prosperity can be spread more widely than they now are.

Private equity and social investment—financial transactions intended both to achieve social objectives and deliver financial returns to investors—make an odd-looking couple. After all, how can an industry prized for its superior returns be harnessed successfully to investment in depressed areas with scant history of generating growth and little access to funding?

Yet many investors were similarly sceptical about mainstream private equity when it began 30 years ago. That business is now huge. There is no reason for

social private equity not to develop into a similarly vibrant, profitable and sustainable sector over the next decade or two.

A dose of realism is in order. Social private equity may never post returns as high as its mainstream cousin. But its returns can still be attractive to many investors, especially as the asset class matures. It may take a bit more time to find the right business models and companies, to groom less experienced entrepreneurs, and to help steer smaller, less high-tech businesses to success. But it can—and should—be done.

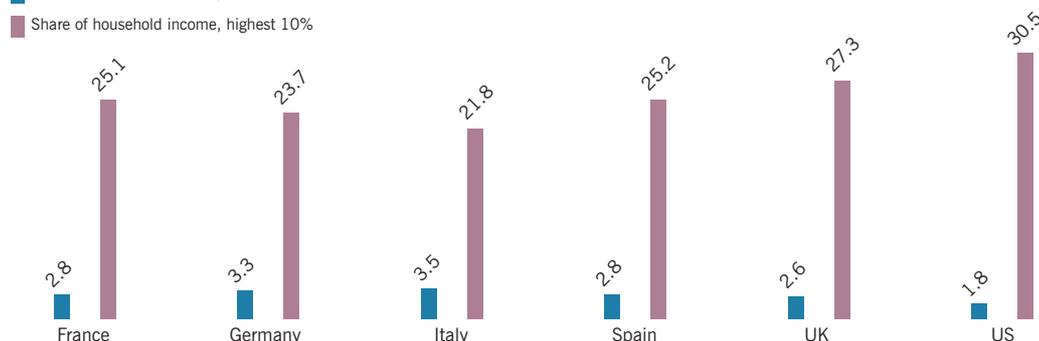
The roaring 1990s created tremendous wealth for many executives, entrepreneurs, venture capitalists and investors. Corporations became more powerful than ever with the top six companies on the *Fortune* Global 500 list posting revenues in 2000 of a thumping \$1.1trn. At the same time, governments the world over have reduced personal and corporate tax rates in order to boost entrepreneurship.

A sustainable model of investment in disadvantaged communities is needed

**For richer, for poorer**

Income distribution, selected countries (%)

■ Share of household income, lowest 10%  
 ■ Share of household income, highest 10%



Source: World Bank

## Can social investment work?

Social investment has explicit social objectives. Foreign direct investment (FDI) does not. But to the extent that much FDI represents the flow of private money from developed economies to developing ones, there is value in asking what benefits this flow brings to investor and host.

This isn't the place for a proper survey on globalisation, its benefits and its ills. But historic assessments of FDI projects<sup>12</sup> in emerging markets have found that a majority of the projects have had a positive impact

on the host country's national income through increased competitiveness, job creation and the transfer of technology and know-how. Sceptics argue that this income benefit comes at the cost of exploited labour, but again the evidence shows that workers employed by foreign investors in developing countries tend to be paid high wages relative to workers employed by domestic investors in those countries<sup>13</sup>. As for the foreign investors themselves, the correlation between the FDI stock

and the output of foreign-controlled enterprises in a country—so if the former doubles, the latter does too—is a strong one.

There is a precedent therefore for the market-driven flow of private capital—which now accounts for more than four-fifths of the total inflows of capital to developing economies—to relatively disadvantaged areas, with benefits to investor and host alike. It is just this precedent that social private equity investors are trying to replicate within borders.

<sup>12</sup> *Foreign Direct Investment and Development*, Theodore H Moran, Institute for International Economics.

<sup>13</sup> *Fighting the Wrong Enemy*, Edward M Graham, Institute for International Economics.

As companies and their teams have become wealthier and taxes have fallen, however, the gap between rich and poor has grown. In the United States between 1979 and 1997 the average income of the richest fifth of the population jumped from nine times the income of the poorest fifth to around 15 times. In 1999 British income inequality reached its widest level in 40 years. The poorest communities remain shackled by elevated mortality rates, unemployment and crime. The cost is enormous: lower productivity, slower economic expansion and a growing number of disenfranchised communities liable to turn to violence.

It is in the interests of all for these problems to be resolved. But how? Philanthropy isn't very effective—it does not encourage self-reliance. Government programmes mean higher taxes, and often create attitudes of dependence on welfare, undermining the very entrepreneurs they are designed to help. What is needed is a sustainable model of capital allocation, which benefits both the recipients and the investors. Social private equity offers just this model.

Social private equity, however, is not just about trying to avoid harmful investments. It takes the process a step further by actively generating healthy businesses in distressed areas.

Already banks, state and federal governments, corporations, foundations, high-net-worth individuals and even some pension funds have begun placing bets on social private equity. This includes the United States's biggest public pension fund, the California Public Employees' Retirement System (CalPERS). A year ago it set up an initiative to invest \$475m over time at attractive risk-adjusted returns in social private equity funds with a California focus.

CalPERS is not alone. At the end of 2001 there were over 60 community-development private equity funds and funds in formation which had raised over \$400m in assets in the United States, with 15 funds outside the United States managing at least \$250m more, according to the Community Development Venture Capital Alliance (CDVCA). In the United States, the asset class has received a boost from the federal Community Reinvestment Act, which mandates targets for commercial banks' community investment. Indeed, at the end of 2000, banks had provided 58% of the total capital invested in US community-development private equity funds, according to CDVCA.

In the United Kingdom, community investment, including private equity, will be spurred by the implementation in the April 2002 Budget of recommendations by the UK Social Investment Task Force. These include a tax credit to support private investment in

**Social private equity investment is more relevant than ever before**

Increasingly firms are reporting their impact on the community, the environment and employees. At the same time, socially responsible investment (SRI) in publicly traded stocks has taken off. At the end of 2001, SRI funds totalled \$2.34trn or 12% of all funds under management in the United States, while 5% of UK funds fell in this category, according to Oxford Analytica. Several SRI indices have been established to track returns.

community development, increased backing for community development financial institutions and matched government funding for community-development venture funds.

The first UK initiative, the £40m (\$60m) Bridges Community Development Venture Funds, was launched in May 2002. Half of the funds' capital is from the UK government with the rest from entrepreneurs, venture capitalists, banks, pension funds and companies. Government participation will help attain a targeted 10-15% IRR over the ten-year life of the funds, although the hope is that they do so well that another, private-sector-only fund can be raised in three to four years.

While \$60m might seem small, compared with the \$142m that Venture Economics and the NVCA cite as the average mainstream venture capital fund size in 2001, CDVCA reckons that most social investment funds are under \$20m. Bridges is big enough to invest between \$150,000 and \$3m in companies across England and reach sufficient diversification to achieve desired returns. The concept is to see what works, create a best-practice model and then scale up.

Challenges will abound for Bridges, and other social private equity funds, since community-development private equity has its own distinct profile and needs. Management takes more time and requires special skills. Operational costs are higher than the 1.5–2.5% norm for mainstream funds. It can also take longer to pick winners among companies that usually lack history, track records and established processes. Bridges plans to take up to five years to make investments, compared with regular private equity funds' three-year timescale.

Sceptics are likely to remain vocal until social private equity can prove that it is a solid investment proposition. Some pension funds will have fiduciary hurdles to consider. But perceptible progress is now being made. By 2000, 25 US community-development venture capital funds had made investments in businesses that had created nearly 12,000 new jobs. Private equity is already beginning to create jobs and spark economic growth in distressed areas, just as it has in the economy at large. For investors, venture capitalists and entrepreneurs alike, the reasons to take up the challenge are compelling. ■

# 6

## IN CONCLUSION

A personal view from Sir Ronald Cohen, Chairman of Apax Partners Holdings



A great deal has changed in the private equity industry since we started 30 years ago. Its scale has expanded dramatically. Starting from privately financed funds in the United States, we now have an institutionally backed industry, which has already moved beyond the national to the regional and now the global level. And yet I think we are still only seeing an industry in its infancy.

The distinction between private and public equity has begun to narrow. The best private equity firms have delivered consistently high returns over many years. Investors are beginning to ask themselves: why should we view this asset class as a higher risk than public equities? If you have a diversified portfolio, sector expertise and a director on the board of a business in which you have a significant stake, why shouldn't you capture a much better return by buying a private company on a long-term basis than by buying large public company stocks?

Given the long track records of the private equity industry leaders there is no reason why institutional investors should not substantially increase their allocation to private equity in the future. It may seem far-fetched after the downward slide in the last couple of years, but over time they could easily be putting 15% or 20% of their assets into private equity—more than twice the proportion that they do today in the United States.

What are the constraints? One is illiquidity. Another could be the number of attractive opportunities that will be available for private equity funds. But what we have seen over the years is that as the industry has increased its size of funds, so the range of investments it can make has also increased hugely. Only a couple of years ago it would have been unthinkable that a private equity group could acquire a company worth over €3bn. And institutions with long-term liabilities will not find the longer time frame of private equity worrying.

Looking forward, private equity will be established in many more countries than it is now—certainly India, China, Japan and South Korea. If peace comes to the Middle East, Israel could well develop its position as the Silicon Valley of Europe. The sector has grown tenfold over the past decade; it is likely to do the same again in the coming ten years.

Entrepreneurship is at the heart of everything we do. What the United States has shown in comparison with Europe over the last quarter of a century is the massive power of entrepreneurship as a growth engine. Vast numbers of new jobs have been created in new areas of technology like the semiconductor, the PC and biotech industries, and the competitive position of whole countries has been greatly enhanced.

Politicians across Europe have noticed this. The message is that if you break down monopolies, encourage the entrepreneurial sector and reduce the role of the state in the economy, you will create greater wealth all round. But more needs to be done—you can't develop a really dynamic economy just by cutting tax rates. You also need to develop pools of capital, you need centres of excellence in research and development, big companies and universities that are ready to invest in new ideas, and technology clusters which bring all these different elements together.

Most important, you need capital markets. Think about the PC revolution. In the mid-1980s, Microsoft, Oracle, Sun and Cisco all went public in the United States, and all raised around \$50m each. In those days in the United Kingdom you would have been lucky to raise £3m on the stockmarket for an unproven company.

Growth stockmarkets are crucial to early-stage investing. This is still a major challenge for Europe. Unless we are able to develop a much more efficient stockmarket for growth companies across the whole region, we will be rather like a racing car with a tiny

fuel pump trying to compete with a Formula One machine in the shape of the United States. Things are better than they were, thanks to the development of EASDAQ, the Neuer Markt, the Nouveau Marché, and now the arrival of Nasdaq Europe—their creation has been one of the main reasons that early-stage investment in Europe has risen in recent years. But if we don't want to lose out in the technology race with the United States, we have got to get these markets into the right shape.

Early-stage investment in Europe takes a much smaller share of private equity investment than it does in the United States. With a deeper and more liquid capital market for growth companies, the proportion could double and help to make the whole European economy more dynamic. There is almost no limit to what can be achieved by new companies in new sectors with high growth prospects. Intel, Oracle, Cisco and Sun have all made it into the top 100 companies in the world within the space of 25 years. That's our double helix at work—the coming together of entrepreneurs and private equity to produce wealth, jobs and growth.

Of course, the technology sector has turned down recently, but I am sure that there are great opportunities still to come. Another revolution has taken place

in telecommunications—wireless mobility has enabled us to transform the way we stay in touch and have access to information. There will also be enormous progress in biotech, allowing us to screen genes to discover the propensity to certain illnesses and to act in order to avoid them. One result will be even greater differences in life expectancy that will add to the stresses between poorer nations and the developed world.

The power of entrepreneurship is also a potential force for change within disadvantaged communities. We all have to be very conscious of widening disparities in wealth, and of the scope for creative economic development in areas which are not attracting investment. Unless we as entrepreneurs, companies, bankers and venture capitalists act responsibly in this regard, then sooner rather than later governments must resort once again to redistributing income and wealth through the tax system.

Over the past 30 years much effort has been made to achieve the growth and success of the private equity industry. In the future, the global economy as a whole will be shaped by entrepreneurship, innovation and private equity to an even greater extent than it is today. With success comes responsibility. We will need to ensure that our efforts address the risks of our age. ■

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