

# The Making of Indian Immigrant Entrepreneurs in the US

ROLI VARMA, DAYA R VARMA

In 1867, Karl Marx proposed his thesis of  $M \rightarrow C \rightarrow M^1$ , where  $M^1$  (money as capital) is generated from  $M$  (money) through the exchange of  $C$  (commodity) and thereby the appropriation of unpaid wage labour. This paper examines the source of the initial  $M$  in the making of Indian immigrant entrepreneurs in the US, a disproportionately greater percentage of whom have trained in India's elite technical institutes. Given the leading role of technology in the world economy and the emergence of the information technology sector, specialised technical skills have assumed unique importance relative to other forms of labour. These skills are not acquired by the exclusive financial contribution of the family or the intellectual endeavour of the individual, but by the social capital and the cultural stimulus of the Indian society. In this specific context, the  $M$  in the  $M \rightarrow C \rightarrow M^1$  thesis of Marx could be defined as  $sc$ , which underlies the making of the Indian immigrant entrepreneurs in the US.

An analysis of "capital" was first presented by Karl Marx (1818-1883) in his celebrated work, *Das Kapital*. The first volume was published in 1867 and the subsequent two volumes after his death. His basic analysis of the origin and accumulation of capital has been unique in the discipline of political economy for nearly a century and half.

According to Marx (1867), the starting point of capital is the circulation of commodities ( $C$ ) – things which satisfy human needs and are then exchanged for something else. The end product of the circulation of commodities is money ( $M$ ). Based on the form of circulation, Marx made a distinction between money and money as capital. The first type of circulation is  $C \rightarrow M \rightarrow C$  (the conversion of commodities into money and then conversion of money back into commodities). Here the main objective is the "use value". The second type of circulation is  $M \rightarrow C \rightarrow M$  (the transformation of money into commodities and then transformation of commodities back into money). In this case, the main goal is the "exchange value". This suggests that money becomes capital. Money as capital keeps circulating and advancing without any limits. This process is depicted as  $M \rightarrow C \rightarrow M^1$ , where  $M^1 =$  the original money + increment. Marx called this increment over the original value "surplus value". Money is therefore capital if and only if it appropriates surplus value. For Marx, the primary and only source of surplus value is unpaid labour, that is, the wages to workers are less than the value of the commodity they generate. This formulation for capital is one of his important contributions.

In Marx's theory of the capitalist system, capitalists use their money to make more money. They buy the labour power of workers to carry out production for capitalists. The workers who are the actual producers of commodities do not work for themselves because either they do not own the means of production or their own means of production cannot successfully compete with that of the capitalists. As capital is centralised, a greater amount of capital investment is required to set up a factory which could successfully compete with the existing factories. In other words, it becomes harder and harder to become a successful independent capitalist. In fact, smaller capitalists continually get eliminated since they cannot compete with their bigger counterparts. In recent times, a large number of capitalists and capitalist enterprises have started in a way that has nothing to do with the classical manner of capital accumulation. Examined superficially, the  $M$  of  $M \rightarrow C \rightarrow M^1$  is not exactly the way Marx (1867) presented for capitalists to emerge and flourish. The financial ascendancy of people like Paul Allen and Bill Gates (co-founders of Microsoft),

This research was supported by a grant from the National Science Foundation (0136467).

Roli Varma ([varma@unm.edu](mailto:varma@unm.edu)) is with the School of Public Administration, University of New Mexico, US and Daya R Varma ([daya.varma@mcgill.ca](mailto:daya.varma@mcgill.ca)) is with the McGill University, Canada.

Sergey Brin and Larry Page (co-founders of Google), Larry Ellison (founder of Oracle), and Steven Jobs and Steve Wozniak (co-founders of Apple) in the us illustrates the non-classical path of capitalist development.

In this article, we illustrate the non-classical path of capital accumulation with samples of the financial successes of Indian immigrants in the us. We elaborate on what labour in the changing us economy is and what the source of the initial  $m$  is, primarily with respect to Indian immigrants. In this context, we propose another dimension of Marx's  $M \rightarrow C \rightarrow M'$  as  $SC \rightarrow C \rightarrow M'$  (social capital  $\rightarrow$  commodity  $\rightarrow$  money capital). We demonstrate this process with a case study of Indian immigrant entrepreneurs in the us for two reasons. First, the us has a high rate of entrepreneurship in "high-impact firms" that create value and stimulate growth by bringing new ideas to the market (Schramm 2004). Second, since the mid-1990s Indian immigrants have increased their percentage in starting engineering and technology companies (Wadhwa, Saxenian, Rissing and Gereffi 2007). This paper is based on secondary sources and primary data on Indian immigrants working in the us science and engineering institutions reported elsewhere (Varma 2006a).

### Making of a Professional

Since the industrial revolution in Europe, capital accumulation occurred through the appropriation of labour working in mines and manufacturing. A worker was therefore essentially an industrial worker even though many enterprises were still quite small. Manual labour was the primary form of labour. Marx viewed labour as a commodity that can be bought and sold depending on market demands. According to him, different forms of labour are equalised in the process of exchange since commodities exchange in proportion to the amount of time required for their replacement. Most importantly, the process of competitive accumulation of capital encourages deskilling and mechanisation of labour and the workers' craft-type knowledge is replaced by the capitalists' controlled general skills. For instance, automation replaces skilled labour once the job is routinised and simplified.

People who belong to occupations which demand highly specialised knowledge and skills acquired by prolonged formal education, are commonly known as professionals (Friedson 1986). Before the 19th century, professionals were few in numbers; their strength has expanded since then (Laslett 1971). Contemporary Marxist scholars have tried to locate the position of professionals in the class structure under monopoly capitalism. They view them as part of the working class since they possess no capital and work for others. For instance, Harry Braverman (1967) argued that professionals, like the working class, do not possess economic or occupational independence, and access to the labour process or the means of production outside their employment. Barbara Ehrenreich and John Ehrenreich (1977) claimed that the professional-managerial class is composed of salaried mental workers who do not own the means of production but exist in a mutually contradictory relationship with the working class by virtue of their role in reproducing capitalist culture. Charles Derber (1982) predicted that, eventually, professionals will wither away through the continual process of

proletarianisation like the independent artisans and craft workers at the turn of the century.

The contradiction between capital and professionals, however, does not seem to be applicable in today's economy. First, with the development of corporate capitalism, the individual capitalist is no longer the exclusive and formal owner of the means of production. Rather, ownership of a company is now fragmented and shared. Further, there is a separation between the real and legal ownership of the means of production (Carchedi 1975). With the development of public ownership through stocks and shares of private companies, it is the stockholders who are the legal owners of the means of production, even though they do not have a voice in any decision-making related to production. Those decisions are made by the chief executive officer (CEO) and top managers.

Second, many tasks require specialised skill, which can only be acquired with extensive education and training in a body of abstract knowledge. By virtue of their higher education and technical skills, professionals are involved in the mental work of production. Management allows professionals latitude in judgment because they possess specialised knowledge and skills. It is dependent on the expertise of these professionals for creation of new products or processes and improvement in the old ones (Varma 1997). On the mental side of work, professionals also perform supervisory and managerial functions which emerge as a result of their responsibilities in design, coordination, planning, organisation, and supervision; this contributes to their higher status in the organisation (Larson 1977). The Marxist scholar Paul A Baran (1957) has suggested that professionals, who are supported by the economic surplus generated under the capitalist system, have their own diverse interests, which might at times be at odds with those of the capitalists.

Finally, some of these professionals especially in the high-technology industry are using their initiative to emerge as future entrepreneurs. In contrast, a worker may rise in the hierarchy of different levels of work assignment but has little chance of becoming a capitalist through his/her occupation. Professionals, on the other hand, are integral to a political process, which allows them to gain greater control over their work (Johnson 1972). Their work is monopolistic because it is based on special knowledge valued by both the society and the elites (Friedson 2001). It is therefore no surprise that public money is spent in providing formal education and training to the group which will constitute the future professionals. In most developed countries, public education till high school is free and compulsory and though higher education is expensive, most universities and colleges provide financial aids and scholarships to students. Those who do not have financial support from universities and colleges can avail of grants and loans at a nominal interest rate to be paid over an extended period of time. In other words, public money has been central to generating highly trained individuals.

### Economic Rewards

According to contemporary economists, inventions and technical changes are the major driving forces of the economic growth. Marx stressed this argument over a century ago. Nobel Laureate

Robert M Solow (1957) separated the determinants of economic growth into increases in labour and capital and technical progress. The importance of technical changes for economic growth is seldom disputed by economists, policymakers, business leaders, or government officials. Since the beginning of the 20th century, much of the technical changes in developed economies have been a product of deliberate economic investment activity, research and development (R&D). Companies invest large amounts of money in R&D in order to constantly improve their products and services and invent new ones (Varma 2006b). In the US, investment in R&D by the business sector amounted to \$226.2 billion in 2005 and was expected to increase to \$242 billion in 2006 (National Science Board 2008). By investing in R&D as a functional activity within the organisation, companies protect themselves from the problem of external technological changes. Anyone hoping to compete with industrial giants must invest in R&D, and only a handful of companies possess the capital to do so.

Over the last 50 years, the global economy has changed dramatically. Many developed economies have experienced a structural shift from a manufacturing-based economy to an information-led and service-based one. Sociologist Daniel Bell (1973) has termed it a post-industrial society in which scientific knowledge, technology, and information are the major modes of commodity and technical elites who create, collect and disperse information are more valuable than manual labourers. In most developed economies, the service sector accounts for close to two-thirds of the gross domestic product (GDP), and in the US it has become the driver of the economy. With the rise in income, demand for luxury goods has gone up, which, in turn, has increased the demand for service output. While the employment in manufacturing is stable or falling, it is increasing in the service sector in developed economies (Andersen and Corley 2002). Alan Greenspan, the former chairman of the Federal Reserve Board, notes that the realm of physical production is characterised by increasing marginal cost since each additional unit of output is usually more costly to produce than the previous one. By contrast, in the realm of conceptual output, much of the production is characterised by constant, and perhaps even zero, marginal cost (Federal Reserve Board 2004). In other words, the economic product of the developed economies has become predominantly conceptual.

However, the ideas, though necessary, are not sufficient to generate capital; ideas have to be converted into products and/or services to generate capital. Although creative ideas might emerge from individuals, their implementation of creative ideas occurs in the organisational context mostly in large firms (Luecke and Katz 2003; Davila, Epstein and Shelton 2006). This is mostly because the transformation of a new idea into a new product requires money, skilled people, and resources for product design, engineering, manufacturing start-up, and marketing (Varma 2006b).

In the last two decades, many technical innovations in the US have occurred outside the formal organisations. Most importantly, people are using their own personal funds or borrowings from family members, friends, and colleagues for informal investment. The Global Entrepreneurship Monitor (2007) found that over 80% of America's 500 fastest growing private companies were launched without formal venture capital or angel investors.

It is partially because the computer-related services such as data processing, systems design, and software account for a growing part of innovation in the US and in many other countries (National Science Board 2008). Innovation in computer-related services is somewhat different from innovation in other technologies since it requires relatively low capital investment and there is no manufacturing phase of product development. However, the innovator of computer-related services must be educated and trained in computing systems and must be motivated and skilled enough to convert his/her inventions into innovations.

### Indian Immigrant Entrepreneurs

A recent study conducted by researchers at the Duke University showed that economic and intellectual contributions of immigrants in the engineering and technology sectors of the US have increased tremendously (Wadhwa et al 2007). The study found that immigrant-founded companies generated \$52 billion in sales in 2005 and employed 4,50,000 people. The researchers surveyed 2,054 engineering and technology companies which were founded between 1995 and 2005; 25.3% of these were founded by an immigrant. Immigrant-founded companies accounted for a large portion of the total in the key technology centres, namely, the Silicon Valley (52%), New York City (44%), and Chicago (36%). Almost 80% of immigrant-founded companies were within just two high-technology fields: software and innovation/manufacturing-related services.<sup>1</sup> Another study conducted by the researchers at the National Foundation for American Policy and the Content First found that over the past 15 years, immigrants have started 25% of US public companies that were venture-backed (Anderson and Platzer 2007). According to this study, most of these companies are concentrated in cutting edge sectors namely high-technology manufacturing, information technology, and life sciences.

Indian immigrants have become the most dominant ethnic group in founding companies in the high-technology sector in the US.<sup>2</sup> One study found that India ranks first as the country of origin for immigrant-founded venture-backed public companies, which account for 32 companies or 22% (Anderson and Platzer 2007). An earlier study of immigrant entrepreneurs in the Silicon Valley revealed that Indian immigrants held 7% of the technology businesses which started between 1980 and 1998 (Saxenian 1999). Since the mid-1990s, they have increased their percentage to 15.5% of all Silicon Valley start-ups. Nation-wide, Indian immigrants founded 26% of the engineering and technology companies that were founded by immigrants. They have founded more engineering and technology companies than immigrants from the UK, China, Taiwan, and Japan combined. Indian immigrants were heavily concentrated in the founding of the software companies (46%) and innovation/manufacturing-related service companies (44%); they were minimally represented in hardware-oriented sectors such as computers/communications (5%) and semiconductors (2%). Their companies tend to be dispersed around the country, though they have sizeable concentration in California (26%) and New Jersey (14%) (Wadhwa et al 2007).

The entrepreneurial capacity of Indian immigrants is notable when compared to the relatively small number of legal immigrants

in the us population. The 2000 us Census recorded about one million (foreign-born) citizens from India living in the country, which is less than 1% of the total population (Schmidley 2001). The important question is how have the Indian immigrant entrepreneurs succeeded in the us. There is no simple answer to this question because entrepreneurialism among Indian immigrants can take many forms depending on the context. Nonetheless, based on in-depth interviews conducted with Indian immigrant scientists and engineers (Varma 2006a) and synopsis of high-profile Indian immigrant entrepreneurs, certain features of the success in the science and engineering sectors in the us can be identified.

First, the us immigration selectivity brings the cream of the crop from India. Since 1965, us immigration has given preference to professionals, scientists, engineers, and skilled workers. Over one-half of the India-born immigrants are scientists and engineers (Kannankutty and Burrelli 2007). Most of them have been coming to the country as foreign students to pursue a graduate degree in science or engineering. Before coming to the us, they earn a bachelor's degree from the top Indian universities such as the Indian Institutes of Technology (IITs). They desire to go to the cutting-edge schools for graduate degrees and believe that the us offers the best education in the science and engineering fields. There, they graduate with masters and/or doctoral degrees from leading universities. After finishing their studies, they are offered jobs as faculty in academic institutions or as researchers in industrial and national laboratories; they get their student visas converted into permanent residents (Finn 2003). Consequently, the educational achievements of the India-born residents in the us are high. Out of 5,15,000 India-born scientists and engineers in 2003, 8.8% had a doctorate and 43.1% had done their masters (Kannankutty and Burrelli 2007). Indian immigrant scientists and engineers tend to be mathematically minded, analytical, good at diagnosing technical problems, and able to solve such problems very quickly (Varma 2006a).

Second, being raised in India, they acquire unique human skills which they take to their adopted country. They typically come from middle class families who ingrain in their children the idea that education is the only way to rise above poverty and hardship. Since India's education system relies heavily on rote-based teaching, children end up spending the majority of their time learning the sciences and mathematics. They also learn hard work. And the determination to overcome obstacles which society has created for them (Varma 2006a).

Third, though Indian immigrants do not face significant barriers when seeking science and engineering education and related occupations in the us, they face subtle obstacles when they approach higher-level management positions and feel frustrated at not being a part of the mainstream (Varma 2006a). There is a widely held perception among us managers that Indians are not suited for top decision-making positions. The latter know that they can rise to a chief-scientist's or a group leader's post, but they cannot become the head of a company. Often, frustration at being trapped on a lower rung of the promotion ladder, despite possessing managerial and entrepreneurial capacities, has compelled many Indian immigrant scientists and engineers to launch their own companies (Chang 2000).

Fourth, after working for a decade or so for renowned industrial R&D laboratories or top institutions of higher education, Indian immigrant scientists and engineers have begun to overcome their reluctance to launch and manage companies (Varma 2006a) although their main goal for coming to the us was to acquire knowledge, and not to start a business. They are confident about their scientific knowledge and technical skills, but lack confidence about gaining success in fields outside their expertise. Most importantly, then they lacked financial capital necessary to start a company. There were very few investors willing to give seed money to Indians for their business plans (Saxenian 1999; Chang 2000). Since the mid-1990s, however, there has been a sea change in the mindsets of Indian immigrant scientists and engineers and a new Indian entrepreneurial culture has emerged. As a result, successful Indian immigrant entrepreneurs have become role models and opened the doors for the next generation.

Fifth, they have been engaged in developing a strong community around entrepreneurship by forming business organisations. Indian immigrants in the us have a long history of forming social, cultural and religious organisations, but business organisations happened only in the late 1980s. For instance, the Silicon Valley Indian Professionals Association (SIPA) was founded in 1987 as a platform for young entrepreneurial expatriates to meet, exchange ideas and experiences, share solutions and expertise, and help each other in succeeding as leaders in the global companies leveraging technologies, services, and support (<http://www.sipa.org/index.php>). The Indus Entrepreneur (TIE) – also known as the Indian Mafia – was founded in 1992 to foster entrepreneurship among south Asians by providing mentorship and resources that would help them succeed abroad (<http://www.tie.org/>). With global membership of over 10,000 and 44 chapters in several countries, TIE has assisted in funding the start-ups of at least 300 companies including Brocade Communications, Exodus Communications, Juniper Networks, Cerent, and Versata. Such business networks are now playing a key role in the emergence of new entrepreneurial culture among Indian immigrants (Saxenian 2006). Through these associations, they are able to find investors and acquire resources that would otherwise be inaccessible.

Finally, Indian immigrants become quite ambitious when they realise that there are many more opportunities in the us than there are in India. The us was the first country to come out of colonial bondage with the effort of its emerging bourgeoisie which created conditions for speedy innovations in all fields of science and technology. This was facilitated by its constitution, which more than any other country's, encouraged private enterprise. Almost every scientific development was immediately transformed into use value, and the innovations were patented leading to immense accumulation of capital. Political stability, appropriate business policies including government support for new businesses, legal protection of intellectual property, easy access to financial and human capital, and support system for start-ups, create a relatively favourable context for fostering innovation in the us (Schramm 2004). Most importantly, Indian immigrants are impressed by the American entrepreneurial culture wherein successful high-technology companies have had start-ups in garages (e.g. Hewlett Packard and Google). They know that if they walk away from a secure job to

start a company, they are not taking a great risk like in India; they can find another job, if they are unsuccessful in business.

### Contributions of Social Capital

The important question then is: Why and how are the Indian immigrant entrepreneurs performing exceptionally well in the us high-technology sector? We argue that the first  $M$  of Marx's (1867)  $M \rightarrow C \rightarrow M'$  is the  $sc$  rather than the initial assets of the future entrepreneurs or their families in India. Without  $sc$ , they are unlikely to be professionals turning into entrepreneurs.

In the scholarly literature, the term  $sc$  has been defined and interpreted in numerous ways (Alder and Kwon 2002) and separated from other forms of capital, namely, economic capital (money, assets, resources, etc) and human capital (education, knowledge, skill, etc) (Portes 1998). For instance, Pierre Bourdieu (1986) has defined  $sc$  as the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalised relationships of mutual acquaintance and recognition. James Coleman (1988) has argued that  $sc$  is not a single entity or an attribute of individuals, but a context-dependent aspect of social structure. According to him, it is a community-level attribute and thus a public good. While Bourdieu's (1986) treatment of the  $sc$  is instrumental, Coleman's (1988) treatment of it is functional.

Even though there is little agreement on the definition of  $sc$ , the term remains popular among scholars partly because of its explanatory power. It has been argued that it contributes towards the economic development, growth and production at the national, regional, and local levels (Fine 1999; Day 2002). One study showed that it is an important element in educational attainment (Israel, Beaulier and Hartless 2001). Another study highlighted its role in public health (Subramanian, Lochner and Kawachi 2003). Yet another study proposed its positive contributions in community governance (Bowles and Gintis 2002).

We find  $sc$  a useful concept since it has both dimensions – capital and social. The term capital suggests economic aspects, namely, the production and distribution of goods and services whereas the term social suggests non-economic aspects which are outside the production and distribution of goods and services. Yet, both economic and non-economic aspects require investment of money, time, effort, and initiative by individuals and the society. Social capital does not exist independently of the society. Political system, economic conditions, social environment, and cultural norms all channel and influence it.

As shown in the previous section, after being successful as scientists or engineers in the us, Indian immigrant entrepreneurs have adopted the goals of establishing their own high-technology companies. They have uncompromisingly pursued new opportunities to achieve their goals and have engaged in a process of converting their intellectual ideas into innovations without being limited by financial resources. They have taken personal risks, worked with confidence to overcome financial and other obstacles and synthesised their ideas with commercial applications. By successfully transforming their inventions into innovation, they have defied the traditional capital accumulation process. Thus  $sc$  has contributed to the success of Indian immigrant entrepreneurs in the us.

Education, a key element of social capital in the making of Indian immigrant entrepreneurs, is heavily subsidised by the Indian government and by us institutions if Indian students obtain graduate degrees from there. The Indian government has made a constitutional commitment to provide free and compulsory education to all children up to the age of 14, though India falls short of meeting its goal of achieving 100% literacy. Secondary education, which provides a crucial link between elementary and higher education, is supported by tuition fees and government financial aid. Almost half of the total expenditure for higher education comes from the Indian government and the rest from private sources. However, only a small number of central institutions that cater to less than 2% of the students get 85% of central funding (Agarwal 2007). The IITs, where most of the Indian immigrant entrepreneurs in the us have received their education, are heavily subsidised by the Indian government since they are institutes of "national importance".

Even if we assume that a significant portion of money spent by IIT students is personal, the overall cost of attaining a degree at an IIT is far more than what is contributed by the students. For instance, if monies spent on the IITs are channelled into primary education, India is likely to see low fertility rates and improved healthcare (Murali 2003). Since significant official funding is going to very selective institutions of higher education, the poorer sections are being denied access to primary education. The government funding which is of immense benefit to the individual Indian immigrant entrepreneur also deprives a vast majority of Indians from receiving quality education and other social services such as reasonable healthcare. Also, the child of a poor labourer has almost zero possibility of admission to such elite institutions. This means that forces that lead to the division of rich and poor also decide better opportunities for the rich than for the poor.

India does not restrict migration out of the country. It did not do so even when skilled personnel were most needed in the immediate post-independence period. India may have legitimate reasons for restricting departure of its scientific and technical personnel because institutions of international quality training in engineering and technology were founded precisely to meet the domestic need. India's first Prime Minister Jawaharlal Nehru considered science and technology essential to the building of a modern country in every way. Indeed such restrictions on emigration existed in some countries. The result of this liberal policy of the Indian government resulted in what has been termed "brain-drain" (Gaillard 1991; Cohen 1997). It has been estimated that India loses approximately \$2 billion per year by supplying trained personnel, many of whom are IIT graduates, to the developed countries (Murali 2003). It is the social capital of India which has been helping the us in technological innovations. Ironically the  $sc$  that is shipped out of India to the us in the form of future Indian immigrant entrepreneurship is far greater than all the aid that country has given India since its independence in 1947.

### Conclusions

Though Marx (1867) introduced the concept of "technological change" in the theory of capitalist development, he did not discuss the role of entrepreneurs in converting scientific/technical

inventions into innovations. This is partly because Marx did not distinguish entrepreneurs (people who take risks have ideas, and explore the possibilities of converting them into innovations by combining labour and capital) from capitalists (who by virtue of owning means of production provide the way for investment in forces of production). Also, he did not distinguish between the two forms of labour that go into transformation of scientific/technical ideas into innovations – the mental labour of discovery and the actual construction of a product from that discovery. It is therefore no surprise that in Marx's theory of capitalist development, the entrepreneur bringing about technological changes is rarely mentioned. It should be noted that Marx wrote about capitalist development over 100 years ago when the engines of growth were manufacturing, construction, and mining. Today, the growth in services exceeds growth in every industrial sector in most developed economies, and the use of information technology is having a profound impact on globalisation.

In the era of information-led and service-based economy, capitalism has become vigorously dependent on the creative scientific/technical labour and entrepreneurs who can successfully integrate creativity into production. Nonetheless, the making of an individual into an entrepreneur in the high-technology sector is a complex process. It is much more than a bright student graduating from an elite institute through his/her efforts. An academic is the product of social contribution both financially and culturally. The presence of an Indian immigrant entrepreneur in the us high-technology sector has been made possible mostly because his/her education has been subsidised by the Indian government and the Indian value system which encourages that education is the only way to rise above economic hardship. Moreover the cultural heritage of India has served as a key motivating force in the genesis and fruition of his/her entrepreneurship. In the context of Marx's thesis of  $M \rightarrow C \rightarrow M'$ , an Indian immigrant entrepreneur in the us high-technology sector represents  $sc \rightarrow C \rightarrow M'$ , where M represents the sc (social capital).

## NOTES

- 1 The software field contains computer programming services, pre-packaged software, integrated system design, processing services and information retrieval companies. The field of innovation/manufacturing-related services includes a variety of electronics, computer and hardware design and service, engineering service, research and testing service companies.
- 2 Some high-profile Indian immigrants in the US with multimillions and some over billion assets (in alphabetical order) are: Naren Bakshi, founder of Versata; Narpat Bhandari, founder of Aspen Semiconductor; Sabeer Bhatia, co-founder of Hotmail; K B Chandrasekhar, co-founder of Exodus; Tushar Dave, founder of Armedia; H.K Desai, founder of QLogic; Gururaj Deshpande, co-founder of Sycamore; Vinod Dham, co-founder of NewPath Ventures; Subrah S Iyar, co-founder of WebEx Communications; Naveen Jain, founder of InfoSpace and co-founder of Intellius; Vinod Khosla, co-founder of Sun Microsystems; Vani Kola, co-founder of Rightworks; Sanjeev Kumar, founder of PortalPlayer; Shailesh Mehta, founder of Providian Financial Corporation; Dileep Nath, co-founder of Kanbay International; Suhas Patil, co-founder of Cirrus Logic; Sreekanth Ravi, founder of SonicWALL; Vivek Ranadive, founder of TIBCO Software; Kanwal Rekhi, founder of Excelan; Pradeep Sindhu, co-founder of Juniper Network; Rajivir Singh, co-founder of Siara Systems and Cerent Corporation; Rajendra Singh, founder of the Virginia-based Telcom Ventures; and Vivek Wadhwa, founder of Relativity Technologies.

## REFERENCES

- Adler, P S and S W Kwon (2002): "Social Capital: Prospects for a New Concept", *Academy of Management Review*, 27, 17-40.
- Agarwal, P (2007): "Higher Education in India: Growth, Concerns and Change Agenda", *Higher Education Quarterly*, 61, 197-207.
- Andersen, B and M Corley (2002): "The Theoretical, Conceptual and Empirical Impact of the Service Economy: A Critical Review", Conference on 'Industrial Dynamics of the New and Old Economy', Copenhagen.
- Anderson, S and M Platzer (2007): *American Made: The Impact of Immigrant Entrepreneurs and Professionals on US Competitiveness* (Arlington: National Venture Capital Association).
- Baran, P A (1957): *The Political Economy of Growth* (New York: Monthly Review Press).
- Bell, D (1973): *The Coming of Post-Industrial Society: A Venture in Social Forecasting* (New York: Basic Books).
- Bourdieu, P (1986): "The Forms of Capital" in J G Richardson (ed.), *Handbook of Theory and Research for the Sociology of Education* (New York: Greenwood Press), pp 241-58.
- Bowles, S and H Gintis (2002): "Social Capital and Community Governance", *Economic Journal*, 112, 419-36.
- Braverman, H (1867): *Labour and Monopoly Capital* (New York: Monthly Review Press).
- Carchedi, G (1975): "On the Economic Identification of the New Middle Class", *Economy and Society*, 4, 1-86.
- Chang, J (2000): "Indian Americans' Powerful Tech Presence", *Asian Week*, 21(34), 1-5.
- Cohen, R (1997): *Global Diasporas: An Introduction* (Seattle: University of Washington Press).
- Coleman, J S (1988): "Social Capital in the Creation of Human Capital", *American Journal of Sociology*, 94, S95-S120.
- Davila, T, M J Epstein and R Shelton (2006): *Making Innovation Work: How to Manage It, Measure It, and Profit from It* (Upper Saddle River: Wharton School Publishing).
- Day, R E (2002): "Social Capital, Value, and Measure", *Journal of the American Society for Information Science and Technology*, 53, 1074-82.
- Derber, C, ed., (1982): *Professionals as Workers: Mental Labour in Advanced Capitalism* (Boston: G K Hall).
- Ehrenreich, B and J Ehrenreich (1977): "The Professional-Managerial Class", *Radical America*, 11(2), 7-29.
- Federal Reserve Board (2004): *Remarks by Chairman Alan Greenspan: Intellectual Property Rights* (Stanford, California: Stanford Institute for Economic Policy Research Economic Summit), 27 February.
- Fine, B (1999): "The Developmental State Is Dead-Long Live Social Capital?", *Development and Change*, 30(1), 1-19.
- Finn, M G (2003): *Stay Rates of Foreign Doctorate Recipients from US Universities, 2001* (Oak Ridge: Oak Ridge Institute for Science and Education).
- Friedson, E (1986): *Professional Powers: A Study of the Institutionalisation of Formal Knowledge* (Chicago: University of Chicago Press).
- (2001): *Professionalism: The Third Logic* (Chicago: University of Chicago Press).
- Gaillard, J (1991): *Scientists in the Third World* (Lexington: Kentucky University Press).
- Global Entrepreneurship Monitor (2007): *The Definitive Study of Entrepreneurship in 2006* (London: London Business School).
- Israel, G, L Beaulieu and G Hartless (2001): "The Influence of Family and Community Social Capital on Educational Achievement", *Rural Sociology*, 66, 43-68.
- Johnson, T (1972): *Professions and Power* (London: Palgrave Macmillan).
- Kannankutty, N and J Burrelli (2007): "Why Did They Come to the United States? A Profile of Immigrant Scientists and Engineers", *Info Brief, NSF 07-324* (Arlington: National Science Foundation).
- Laslett, P (1971): *The World We Have Lost* (New York: Scribner).
- Larson, M S (1977): *The Rise of Professionalism* (Berkeley: University of California Press).
- Luecke, R and R Katz (2003): *Managing Creativity and Innovation* (Boston: Harvard Business School Press).
- Marx, K (1867): *Capital: Volume 1*, Trans Samuel Moore and Edward Aveling (New York: International Publishers), 1974.
- Murali, K (2003): "The IIT Story: Issues and Concerns" *Frontline*, 20(3), 1-20.
- National Science Board (2008): *Science and Engineering Indicators* (Arlington: National Science Foundation), NSB 08-01.
- Portes, A (1998): "Social Capital: Its Origins and Applications in Modern Sociology", *Annual Review of Sociology*, 24, 1-24.
- Saxenian, A L (1999): *Silicon Valley's New Immigrant Entrepreneurs* (Berkeley: Public Policy Institute of California).
- (2006): *The New Argonauts: Regional Advantage in a Global Economy* (Cambridge: Harvard University Press).
- Schmidley, A D (2001): *Profile of the Foreign-born Population in the US: 2000* (Washington DC: US Census Bureau, Current Population Reports), pp 23-206.
- Schramm, C J (2004): "Building Entrepreneurial Economies", *Foreign Affairs*, 83(4), 104-10.
- Solow, R M (1957): "Technical Change and the Aggregate Production Function", *Review of Economics and Statistics*, 39, 312-20.
- Subramanian, S V, K V Lochner and I Kawachi (2003): "Neighbourhood Differences in Social Capital: A Compositional Artifact or a Contextual Construct?" *Health and Place*, 9, 33-44.
- Varma, R (1997): "US Industrial Scientists: Alienation and Elitism", *Economic & Political Weekly*, 32, 1795-99.
- (2006a): *Harbingers of Global Change: India's Techno-Immigrants in the United States* (Maryland: Lexington).
- (2006b): *Managing Industrial Research Effectively* (Hyderabad: ICFAI University Press).
- Wadhwa, V, A L Saxenian, B Rissing G and Gereffi (2007): *America's New Immigrant Entrepreneurs* (Durham: School of Engineering, Duke University).