1 Introduction

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JAPAN is often described as a society of loyal company men and bureaucrats in blue suits, working for a single organization for a lifetime. In this picture of the Japanese system, incremental innovations are rewarded with incremental seniority-based wages eked out over decades of service.[1] This is indeed the story for about 1% of the biggest firms and about 25% of its workforce – at least until the economic collapse of the 1990s.

Japan is also chock full of stories of entrepreneurial struggles. These struggles are not limited to market competition. In fact, the fiercest battles are often waged against the institutional hierarchies of the Japanese national system of production and innovation. The entrepreneurial mavericks at the helm of small and medium-sized enterprises (SMEs) that populate the base of the Japanese production pyramid are the narrators of this struggle.[2] This book explores the way the Japanese system is experienced by those entrepreneurs and workers comprising the 99% of firms and 75% of its working people – a critical source of new business and employment.

Until now, the story about high technology industry Japan has been told from the perspective of the top of the production pyramid (see figures 1.1 and 1.2). That is, most research about the Japanese political economy is conducted in and around the corporate headquarters of Japanese conglomerates (keiretsu groups). These headquarters are in turn situated often a stone's throw from powerful key Japanese ministries in Tokyo charged with industrial policy: the Ministry of Finance (MOF) and the Ministry of Economy, Trade, and Industry (METI). In these circles company men interact with like-minded bureaucrats. At the same time, the foundation of the Japanese economy abounds with the stories of entrepreneurial mavericks.

This book explores the entrepreneurial stories at the base of the pyramid – of those enterprises that are the foundation of the Japanese

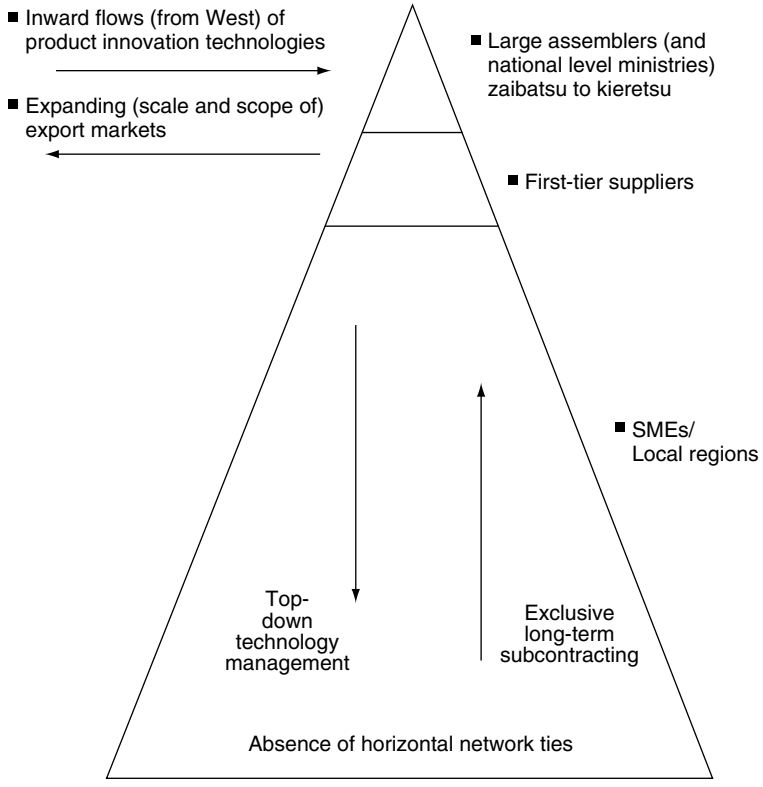

Figure 1.1. Rise of Japan as a model economy, 1946–1970s

political economy – and how these firms have struggled to survive and prosper, particularly since the collapse of the "bubble economy" in the early 1990s. This focus can shed light not only on the sources of the collapse of the Japanese system – but also on the sources of innovation and opportunity that persist.[3] The stories of Samco and Ikeda offer several insights.

1.2 Two stories: Samco and Ikeda

Samco in Kyoto

In the early 1970s Osamu Tsuji, a young Japanese chemist, worked at Kyoto University as a plasma chemistry researcher. He considered

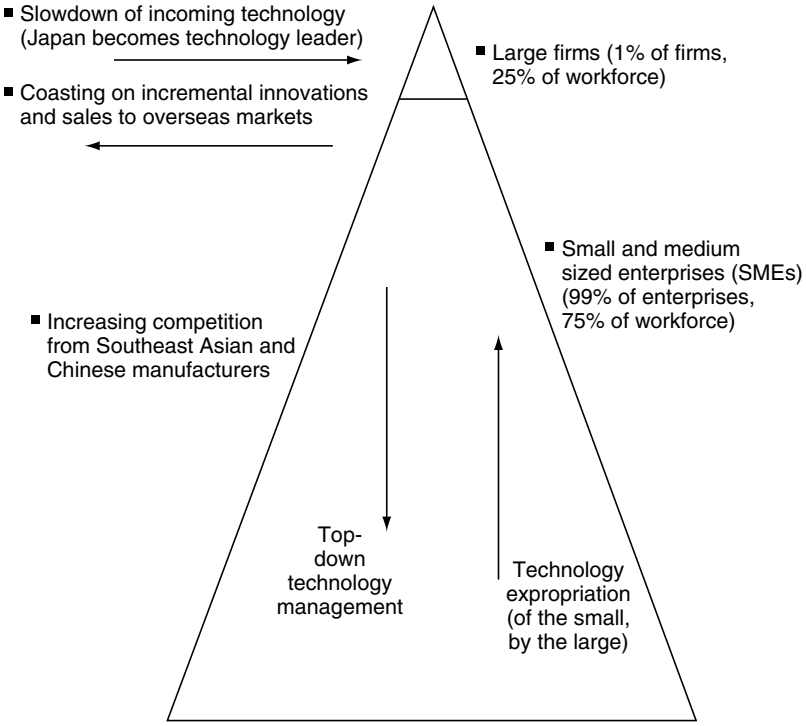

Figure 1.2. Japan's model matures, 1980s

pursuing his doctorate at Kyoto University for a while, but after a few years became bored with the stuffy "ivory tower" atmosphere and left.

By leaving this prestigious national university Tsuji eschewed the accepted career path of the best and brightest scientists and engineers in Japan. The "best and brightest" generally obtain graduate degrees from national universities and go on to work for a lifetime in a single keiretsu conglomerate. Tsuji chose the path less traveled by his Japanese compatriots. Instead, in 1976 Tsuji began work in the United States for NASA and was soon asked to join its Ames Research Center in Silicon Valley.

In 1978, a homesick Tsuji returned to Kyoto. At first, he could not find work. Hiring managers at big Japanese firms were cautious about taking on such an unproven commodity – in other words, Tsuji lacked the pedigree of a graduate degree from a prestigious Japanese national university. Fortunately, Tsuji had kept in touch with a number of

graduate school buddies – those that stuck with the Japanese program and were now working for keiretsu firms.

A friend of Tsuji's – a researcher at Sanyo Electric, asked Tsuji to help him with his ideas for thin-film technology development. The two decided that this new technology could be a great opportunity to branch out on their own. Soon they started a firm they called "Samco" (an acronym for "semiconductor materials company") in Tsuji's garage with little by way of equipment. Through his personal friendships with other engineering and science researchers Samco forged strong relationships with several universities (in Tokyo, Kyoto, and Nagoya). Samco was able to utilize the machinery at these universities and obtain assistance from students so that initially little capital was needed get his company off the ground. Within a year they had developed thin film application machinery for use in semiconductor production.

Tsuji had hoped that Sanyo would be Samco's first customer but was disappointed. Sanyo purchasing managers were wary of buying a product from a vendor outside the Sanyo group. The 1970s and 1980s were the heyday of so-called "exclusive relational contracting" in Japan. In this system, buying from unaffiliated suppliers was too risky for purchasing managers. If anything went wrong with a purchase, blame would be leveled squarely on the purchasing manager's shoulders (rather than spread between the in-group buyer and suppliers).

Tsuji decided that he had to look outside Japan for customers. In 1980 he left Japan on a $300 air ticket to Los Angeles and came back a few weeks later with a purchase order and a down payment of 50% in his pocket from Arco (a US petrochemical producer). Tsuji was elated. Samco was soon selling products to US firms such as IBM and National Semiconductor. Samco was finally able, years later, to sell to Japanese firms. These firms, however, rarely pay on time. Instead large Japanese firms "pay" with promissory notes (*tegata*), effectively putting off cash payment for 60–120 days *after* delivery. Cash flow problems caused by chronic late payments from Japanese buyers as well as his early experience with their conservative purchasing managers have put Tsuji off the idea of ever becoming an exclusive subcontractor to Japanese conglomerates.

By 2003, twenty-four years after its foundation, Samco under Tsuji's stewardship had grown into an internationally renowned thin-film

technology producer with its own research institutes in Silicon Valley, Cambridge UK, and Japan. A recent joint venture (JV) formalized in 2003 with Kirin Beer to provide protective coating for the inside of plastic bottles was forecast to surpass the core business in terms of revenue by 2006.[4]

Ikeda in Tokyo

Koichi Ikeda's experiences provide another insight into Japan's struggling entrepreneurs. Ikeda was a talented young engineer in the late 1960s. After graduating from a national university he decided to try his luck at starting a firm that would apply protective thin films to machinery components. He started Ikeda Manufacturing in 1969 in Ota Ward in South Eastern Tokyo and soon found himself an exclusive contractor for the NEC group. Exclusive subcontracting ("relational subcontracting") subjected Ikeda to two downsides of the Japanese production system: cash flow problems (caused by chronic late payments by buyers) and monopsony exploitation (for example, "cost down" of supplier prices (see below) and so called just-in-time (JIT) production deadlines).[5]

Things went well for a number of years, though Ikeda often had cash flow problems because of slow payment from his top two buyers. Nevertheless, he was able to obtain a patent on his ion plating machinery and this helped to stabilize the business in the 1970s. He had a number of other ideas for developing more advanced machinery, but could never quite muster enough funds to put serious effort into research and development (R&D).

Cash flow problems were exacerbated by "cost-down" measures by his top customer. In cost down, large Japanese firms use their monopsony leverage over suppliers by unilaterally reducing supplier prices usually once a year. Since the economic decline in the early 1990s, cost-down demands on exclusive subcontractors have accelerated to even a quarterly basis. Another Tokyo entrepreneur echoes Ikeda's sentiment:

> I have learned from the mistakes made by other firms around me. Large assemblers come in and make an order for a few thousand pieces. Several months later, they ask for more and more, paying on time at first. Then, before you know it, their orders take up most of your production time. That is when they stop paying [on time], when they know you have no choice. Then they start with "cost down," and again you have no choice, because

they know that they have become your primary customer. [A large assembler] tried it with me, but I wouldn't let them put me in that position. It was difficult at first, but we have survived and done well (H 1998)

Cost down is often used in tandem with JIT by large firms to squeeze their suppliers. JIT involves the placement of orders by large assemblers to their suppliers, with 24–48-hour lead time to expected delivery.

Like most of the other entrepreneurs in this study from Ota, Ikeda laughs with derision when asked about how JIT (much-lauded in international circles) has helped increase efficiency in Japan's relational contracting. He recounted how in reality, JIT was all about exporting the cost of holding inventories out of large firms into small firms. In a typical JIT scenario, suppliers employ delivery trucks – full of products they have already produced in anticipation of an order – to park near the docking bays of buyer warehouses. When the order finally comes, the truck delivers the product "just-in-time" for assembly by the buyer. Payment for these goods inevitably arrives months later – limiting the chances that already slim profits can be re-invested in a timely fashion.

Ikeda has tried over the years to get local manufacturers together, but fierce competition over dwindling orders from keiretsu giants exacerbated the barriers already imposed by vertically integrated and insular keiretsu-led production networks. Ikeda was able to establish a collaborative manufacturing network with other local producers. Unfortunately, the seemingly unending wave of local bankruptcies since the 1990s took out several members of the network leaving remaining members in trouble.

Ikeda also tried his luck at drawing on government funds. Though the position has changed since the revision to the SME Basic Law in 1999, Ikeda has found that the supposed "windows" to SME finance are really only windows for the largest of the medium-sized firms – not really small manufacturers. He has seen small manufacturers such as his own firm – led by hardworking folk with solid technology and good management – go under because the banks are not lending to the firms that really need it. Instead, the banks continue avoid risk by lending to medium-sized firms that do not have cash flow problems. Ikeda has tried several times to talk with representatives of various SME finance and other agencies but finds the relationship unchanged at the local level, despite the new laws: "They just give us lip service and in the end nothing is done."

Ikeda also anticipates that lack of coordination among local firms in the face of stiff price competition from Chinese small manufacturers will soon turn to price *and* competition pressure based on higher technology. For Ikeda, this likely scenario will be the death knell for Ota as a manufacturing centre.

In 1998 Ikeda was struggling, with the help of his eldest son, to make new production deadlines while cutting costs – imposed by the second "cost down" in as many quarters. By 2000 company profits had dropped by nearly 50%. In 2003 Ikeda was barely surviving, and his son had taken a job cleaning up after hours (and after working a full day at his father's plant) at a local pachinko parlor to help offset the firm's growing debt. His son is not alone; Ikeda estimates that 90% of the small manufacturers in Ota have at least one family member working on two jobs in this way.

1.3 Regional variations in Japan's national innovation system

These two stories – Samco in Kyoto and Ikeda in the Ota Ward of Tokyo – are illustrative not because they are so different, but because they are representative of the regional differences within Japan's national innovation system. Tsuji and Ikeda's experiences are just two examples of the forty-three firm-level cases in this book that shed light on the reality of the Japanese national innovation system as it is experienced by entrepreneurial start-ups over time.

I followed these firms struggling to become innovative, stay innovative and expand over the course of seven years – and witnessed some succeed. Others, though they started out with seemingly similar technological strengths, failed. I came to realize that the local political economy surrounding these struggling entrepreneurs – and how these entrepreneurs connected with it – has a much greater impact on the firm's ability to innovate than the national-level system that I had been trained as a graduate student to view as the most important.

This book is not, however, an exposé of national-level policy failures and institutional barriers to innovation in Japan.[6] Instead, this book aims to elucidate the puzzle about why, despite widespread national-level failures, clusters of new product and new business innovation persist. Why is it that new clusters emerge irrespective of national-level targeting? In answering this question, this book provides insights into the people and institutions that provide the critical support system

for struggling new businesses. These dynamics or synergies somehow turn the raw materials of a region's economy into innovative communities of firms. Unfortunately, few studies attempt to draw inferences about the national- and local-level dynamics through in-depth local case studies.[7] This book also corrects a number of failings in existing interpretations of national innovation systems, in Japan and elsewhere.

Standard explanations in innovation theory, based on structural and institutional factors such as the presence of research universities, large corporations and the like (i.e. the basic ingredients for innovation), for example, would predict that Tokyo would provide Japan with its success stories in the 2000s. Instead, Kyoto is the star. Kyoto city and its environs has emerged since 1990 to become a vibrant high technology cluster of small start-up firms with creative links to area universities that are plugged into the long-term development interests of the community as a whole. What, if any comparative lessons can be drawn from this region in the centre of Japan? These issues will be explored in chapters 6 and 7. At this point, it might be useful to situate the seemingly anecdotal stories of Samco and Ikeda in a broader context. In short, what do these stories, and the others in this book, tell us about the nature of innovation at the firm and local community level?

In today's global political economy, local communities are at once more exposed to international market fluctuations than ever before, and concomitantly challenged to keep pace with rapid transformations in communications and other technology. Current debates about innovation among policy analysts and in the field of political economy are dominated by national-level approaches to studying the challenges of fostering innovation at the local level (Berger and Dore 1996; OECD 1999; Streeck and Yamamura 2001). Characterizations of national innovation systems (NIS) (Nelson 1993) provide broad, aggregate descriptions of innovative trends across national contexts, but lack specific, tangible and proven local-level policy prescriptions.

Consequently, while local-level community and industry leaders are best positioned (spatially) to be potential sources of innovative community building, they are (in contrast to their national-level counterparts) often the least experienced in the policy design capacity that facilitates new business creation, retention and innovation in general (Pages *et al*. 2003). The civic engagement of entrepreneurs and other community leaders in linking the strategic interests of firms to larger issues of community-wide development is an important factor in

explaining the sustainability of innovative communities in the long term (Ayuzawa 1995; Mitsubishi Research Institute (MRI) 1996; Storper 1997; Edgington 1999; Sellers 2002).

1.4 Innovative communities: basic ingredients and sufficient conditions

Much has been said about the so-called "supportive socio-political milieu," or "habitat" around innovative firms, but not much has been analyzed in-depth *vis-à-vis* what it is about community-level organizations and networks that make them such critical supports for sustained economic development (Grabher 1993; Omae 1995; Simmie 1997; Storper 1997; Pages *et al.* 2003). Basic ingredients, or necessary conditions, for product innovation and new business creation include: infrastructure (transportation, communications, utilities); research universities, undergraduate colleges and technical schools; the presence of large corporations (with R&D operations); stable and strong local governments; established service industries (legal, financial, consulting); venture capital infrastructure; and amenities (e.g. cultural) attractive to potential (educated, high-skill) residents (Nelson 1993; Porter 1998; Hertog, *et al.* 2001; *The Global Competitiveness Report 2001–2002* 2002). Having these basic ingredients is often insufficient, however, in fostering innovation in a critical mass of local firms (Florida 2002; Takeda 2002; Takeda 2003a, 2003b).[8]

Standard works, while effective at developing a snapshot of institutions and network structures, are at the same time weak in explaining how people forge ties, translate vision into practice and maintain cohesion within developmental coalitions (cross-cutting groups of people with a shared goal of improving the economic situation of their communities) (Berger and Dore 1996; Porter 1998; Dore 2000; Porter *et al.* 2000; Culpepper 2001; Hall and Soskice 2001). But how do you measure these informal, intangible assets of a region? I and others have found that in successful regions a large part of the observed economic process (new product and business creation) is in fact, socially and politically driven (Imai 1998c, 2004; Saxenian 1998b; Ibata-Arens 2004). This book aims to provide practical policy prescriptions as well as advance theory through examining how informal networks, civic leadership, and political "savvy" relate to innovative developmental outcomes. Innovative outcomes at the community level are measured by sales

generated by new (tradable) products and new business creation. "Tradable products" are those sold outside the region, with the bulk of product revenue returning to the region.

This regional perspective is useful in identifying certain patterns of social and political "embeddedness" (how enterprise is situated within complex socio-political institutions) that might transcend national–cultural environments (Granovetter 1985; Kumon 1992; Grabher 1993; Uzzi 1996, 1997; Oguri 1998). In other words, understanding enterprise embeddedness can help explain how complex political, social, and cultural contingencies affect economic outcomes that may in turn yield practical policy prescriptions.

1.5 The book's argument: local political economy of innovative communities

The most innovative communities identified in this book comprise particular synergies of *institutions and people*. These communities are more than merely a spatial cluster (agglomeration) of competitive enterprises. Rather, these communities are a geographic concentration (city, region) of like-minded stakeholders (e.g. enterprise mavericks) in the economic outcomes of local enterprises (entrepreneurs, workers, residents, government officials). Community members identify with the shared goals of creating new products in growth sectors. Innovative communities also appear to be infused with a certain civic consciousness. The fact that these communities are populated by entrepreneurial mavericks enhances competition between community members, further stimulating innovation. These communities over time become *sustainable innovative communities* – or innovative communities that adapt over time to externalities (e.g. international market competition) to exit maturing sectors and enter new ones. Kyoto's transition from a traditional silk and pottery center to high (nano, ceramic, thin-film) technology goods is a primary example of this sustained community-level innovation.

"Enterprise mavericks" are entrepreneurs who stake out new business territory on their own (usually through a new product that they have invented, designed, and created themselves). These entrepreneurs identify and capitalize on the interstices of opportunity in creating new products, accessing inter-firm networks, and utilizing policy at a number of levels. These interstices have been alluded to in other terms such