

Twentieth century models for the twenty-first century: models of fast growing firms and industries in the twentieth century for fast growing firms and industries in the twenty-first century

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Abstract

Purpose – *This paper aims to present a general review of the circumstances of America and Japan's rapid corporate, economic and industrial development in the twentieth century.*

Design/methodology/approach – *The approach considered and evaluated how the circumstances of America and Japan's growth might apply to China and India, two of the fastest growing economies of the twenty-first century.*

Findings – *The findings suggest that both America and Japan might be considered exceptional cases and, as such, neither one might be regarded as a good model for emulation. However, the circumstances of Japan's rapid growth appear closer to those of contemporary China and India and on that basis the authors suggest that Japan might be a better model for emulation.*

Originality/value – *The American model is too novel and unlikely to be imitated, replicated or repeated whereas Japan's high population density, agrarian origins, state assisted and administered development, adaptation and hybridization of local and imported methods and technologies, kinship, pseudo-kinship and locality based business groupings, and rapid, come-from-behind charge toward industrialization, urbanization and international emergence, all suggest that Japan offers a more relevant and useful development model.*

Keywords *Rapid development, Late development, Economic development, Models of and models for development, American models of corporate, industrial and economic development, Japanese models of corporate, industrial and economic development, United States of America, Japan*

Paper type *General review*

Twentieth century models of firm and industry organization

During the twentieth century, two models of firm and industry organization associated with rapid economic growth emerged: a model based on the early to mid-century years of development in the US, and a model encompassing mid- to late-century growth in Japan. Both models sought to explain why firms and industries grew as fast as they did for as long as they did in America and Japan. More recently, both models have experienced reversals, Japan's in the 1990s and America's in the twenty-first century.

America's models of firm and industry organization were long considered canonical in academic and economic development circles while, at the same time, Japan's were seen as non-western, non-mainstream and, hence, short-lived. But now, firms and industries in Asia power three of the world's five largest economies and seven of the largest 12. A rethinking of

high growth models may be in order in light of Asia's fast growing economies. America's may not be so normative and Japan's so atypical.

The logic of models

All social science models are descriptive. Observe and generalize. In the doing so, it is necessary to be selective – selective as to the timings and places of observation. Some observations are recorded, the rest neglected, and then they are categorized, refined, and tested. The result is a shorthand version of reality – one that is much easier to manipulate than the messy world we began with.

There are dependent and independent variables in such models. In this paper, the dependent variable is why firms and industries grew as fast as they did, in the ways that they did, and for as long as they did. The independent variables are environmental and institutional factors. Firm and industry performance are predicated as outcomes influenced by environmental and institutional conditions.

In classic evolutionary theory, organizational performance is predicated on environmental factors. Lately, the importance of co-evolution – the mutual influence of actors on environments and environments on actors – has been recognized. However, when firms and industries are modeled *ex post facto*, as America and Japan's have been, emulation is never a case of co-evolution. The historical interactions of firms, industries and environments cannot be copied. Interrelationships may be structured a priori but interactions cannot be. Hence, in this paper, we follow the classic model of evolution wherein organizations respond to and are shaped by environmental factors.

Neither American nor Japanese models of firm and industry organization were built to predict the future – how firms and industries in China and India might benefit from their experiences, for example – but, inevitably, such interpretations arise. In our opinion, the hell-bent-for-leather, heavily agrarian, high population density, business group based, government involved, -funded and -administered, late development charges of China and India seem to reprise much of Japan's experiences. Japan's models may better predict what may happen in China and India.

To test this conjecture, descriptions of the circumstances of economic growth in America and Japan follow. In fact, both countries and their firm and industry trajectories may be considered outliers because the spectacular rates of growth realized in both countries hinge on highly unusual circumstances, making the case for emulation unlikely. Outliers are not good models. However, success stories are always emulated and copied, not stories of lackluster performance. Given that imitation will occur, which country's models are more replicable?

Firms and industries in America: big is beautiful

1. The North American continent was a huge, resource-rich, and largely undeveloped landmass where the rule of law was well developed and property rights (of white Europeans) were well enforced almost from the start. There was so much land for the taking that well into the nineteenth century in America and twentieth in Canada, homesteading was commonly practiced west of the Mississippi and north of the US-Canadian border, including Alaska. The westward movement of people, capital and technologies defines the meta-history of North American development.
2. Wave after wave of ambitious, hardworking immigrants from Europe and Asia fueled America's (and Canada's) agricultural, fishing, mining, transportation and manufacturing industries. As land was available for the taking, industries for resource extraction and conversion absorbed large numbers of immigrants. Fishing, lumber, mining, manufacturing and transportation industries were swelled by increasing workers, and a network of small, medium and large sized cities grew up around extraction, transportation and marketing activities.

3. In contrast to Europe and Asia, there were no pre-existing systems of economic and social class organization. There were no institutions and regulations defining how things should be done. Governments, from the outset, were local and rudimentary. There were few impediments to development, and few social, economic and political barriers to overcome. Good land was available; labor, capital, transportation and communication technologies were missing ingredients.

4. By the middle of the nineteenth century, as the American Civil War unfolded, labor, capital, transportation and communications technologies came together in a cataclysmic restructuring of the country. New states and lands were brought into the national fold. Manifest Destiny absorbed California, the Southwest and Northwest territories; Manifest Destiny defined relationships between a rapidly growing America and her neighbors to the north and south.

The consolidation of transportation and communications (railroads and telegraph/telephones) industries came before the appearance of big firms in manufacturing and sales in the US, and their consolidation aided the expansion of firms and industries tremendously. Once speedy transportation and reliable communication were in place, big business became synonymous with tremendous economies of scale and scope. Without these technologies and their consolidation, without immigration, without a Civil War stimulus across the country, big businesses would have been much less “big” in America.

5. Big business grew big by first expanding geographically. Geographical expansion encouraged horizontal consolidation within industries; horizontal consolidation preceded vertical integration for most firms in most industries.

Standard Oil, Carnegie Steel, American Tobacco and other companies used stock pooling and holding company structures to consolidate industry control. Enterprises (average firm size) grew bigger as industries consolidated. By the early twentieth century, American big businesses were the largest and most consolidated in the world (Chandler, Scale and Scope).

America’s size and untapped wealth allowed firms to invest in new technologies and to develop the knowledge and know-how needed to exploit those technologies. Steel, petroleum (energy), transportation and electrical equipment, chemicals, and electrical chemical industries were leading industries of the day. American firms excelled in developing and harnessing new technologies, thereby converting them into capital- and knowledge-intensive industries. In other words, US firms and industries converted extractive, primary metal and fabrication industries – often considered low tech industries – into knowledge intensive, high tech industries (for the day), earning the US a reputation for efficiency, innovation and technology leadership that was unrivaled in the world.

6. Once power was consolidated and wealth concentrated, firms began to explore other avenues for making money. Patterns of firm growth favored horizontal integration before vertical (backward and forward) integration. Backward integration to sources of supply, when it occurred, was greatly facilitated by the transportation and communications infrastructure already in place, while forward integration towards distribution, markets and sales was likewise facilitated by roads, railroads, telegraph and telephone communications.

The knitting together of America’s vast resources and the taking advantage of opportunities for expansion by larger and larger firms were unprecedented stories in the history of economic development. Eventually, marine and air transportation were linked to road, rail and canal routes underpinning America’s superb transportation, communications and coordination infrastructure; without these, firm and industry growth on such scale and with such speed would not have been possible.

7. By the early to mid-twentieth century, the pathways of large corporate growth were well established: horizontal consolidation, vertical integration and, eventually, as documented in Alfred D. Chandler’s many works, business diversification.

Multi-business firms became the norm among America's largest companies, and multi-business firms adopted a multi-divisional or M-Form firm model for combining and managing many business growth opportunities.

Multidivisional forms of organization spread overseas to Europe and Japan after the second world war. This way of organizing contrasted with holding company conglomerates, bank-centered business groupings, and technology-based sub-contracting and supplier networks which are common ways of business in the rest of the world. The American penchant for consolidating businesses and integrating sequential and related value-adding activities in large, managerial hierarchies appears atypical when viewed globally.

Three additional factors contributed greatly to the American model, as discussed below.

8. In reaction to numbers 2 through 7 above, and the rise of populism and populist economic thinking, anti-competition and antitrust sentiments ran unusually high in the US. The result was the passage of the Sherman and Clayton Anti-Trust laws, 1894-1895 and 1904-1905. While big businesses, concentrated industries, and diversified, multi-business firms came to characterize American economic life on one hand, on the other, they did not overwhelm a populist, rural and union oriented, small-is-beautiful ethic and local brand of politics.

American competition laws and policies are distinctive. They undoubtedly had something significant to do with the unusual features of firm and industry development found in North America; reread #2 through 7 above.

9. By the 1920s, a separation of ownership and control in large, public firms was the norm (Berle and Means, 1933), aided by Wall Street and the existence of other lesser financial markets as ready sources of funding. Nowhere else in the world have such ready sources of debt and equity funding, with the notable exception of the UK and its City of London financial center, been available. As a result, nowhere else have firms grown so fast and large, with such a pronounced separation of ownership and control.

In the US model, firms internalized growth, by taking advantage of communication and transportation technologies, by raising debt and equity capital in generous amounts, and by hiring cadres of ambitious, well educated managers who entered firms in large numbers without a need for long apprenticeship and training programs. Coordination via an internalized hierarchy was the American model.

10. A professionalized, highly educated managerial workforce was another hallmark of American leading firms. Getting a college degree and a graduate degree in business, engineering and law were well recognized pathways to high salaries, high status, and high power.

Firms cannot grow large unless size confers economic and organizational advantages. In the US, the advantages of size were construed as the minimization of coordination and transaction costs. Administrative efficiency, coordination and control were tasked to professional managers who were hired by the tens of thousands by America's *Fortune* 500 firms.

11. As a result of large firms going public and their reliance on debt and equity capital, American firms have placed unusual emphases on shareholder rights and property rights, relative to firms in much of the rest of the world. The professionalization of management contributed to this trend. Shareholder and property rights are enshrined as the cornerstones of corporate governance concerns in the US.
12. The first industrial revolution was a complex of radical, interrelated socioeconomic and technical changes that took place in England in the late eighteenth century when extensive mechanization in production and transportation systems resulted in a series of shifts from home-based, small scale, artisan based production to large-scale factory based manufacture.

Other complexes of radical social, economic and technological changes – other industrial revolutions, if you will – have followed the first. Industrial revolutions 2 through 6, as described below, have been centered in the US providing America with unusual opportunities for economic growth, organizational innovation and industry leadership. The spatial centeredness of industrial revolutions in America conferred immeasurable advantages to US firms and industries. Industrial clusters, both geographically and organizationally, have contributed notably to the American model of firm and industry organization.

Industrial revolutions have been centered, after the first, in the US, as seen below:

- (mid- to late eighteenth century England: low output steam engines; low thread count textiles; alcohol and brewing industries;
- mid- to late nineteenth century America: higher output steam engines as a primary source of motive power; telegraph-telephone centric advances in communications;
- late nineteenth to early twentieth century America: internal combustion engines; electric motors/electricity, electrical equipment, steel production, transportation equipment;
- early to mid-twentieth century America: petroleum based industries, electro-chemical industries, drug (penicillin) and synthetic chemical industries, airplanes;
- mid-twentieth century America: jets, antibiotics, petrochemicals, plastics; and
- late twentieth century America: semiconductors, computers, internet, microbiology, bio-engineering and bio-informatics.

At present, the seeds of another industrial revolution may be brewing in biotechnology, convergent IT, and nanotechnology. The location or co-location of industrial revolutions in the US has given US firms and industries unrivalled competitive and comparative advantages. First mover advantages are often hard to overcome. As technologies mature, however, they diffuse and in the course of their spread, opportunities for catch-up may appear.

13. During the last quarter of the twentieth century, consonant with the rise of Silicon Valley and the emergence of newer computer and communications based information technology (IT) industries, patterns of firm and industry organization in America evolved and changed. Now firms are commonly downsized and activities outsourced to home and overseas locations.

As a result, firms are less vertically integrated and diversified. Strategic outsourcing up and down the sequence of value adding activities has increased. As IT and other technologies have diffused, numbers of capable competitors have grown, especially on a worldwide basis; product and industry life cycles have shortened. Firms are flatter, faster, and more focused than before.

But, the administrative heritage of large American firms is clear: centralized, vertically integrated firms in older industries, and somewhat less centralized and integrated firms in newer industries. In either case, key decisions remain in the hands of professionalized, high level managers. Operational and strategic decisions are still made at the top of firms even though their execution may be pushed downward and outward.

Firms that rely heavily on outsourcing via supply chain management may engage in relational contracting, but such contracting relations are less dense, less intense, and of shorter duration than the relations found in business groups and interfirm networks in Japan (see the next section for a fuller description of such business group combinations and variations in Japan).

Business groups, defined as inter-industry groupings of firms, are not common in America. Highly diversified firms or conglomerates, analogous to inter-industry business groups, are a disfavored form of organization in America. On Wall Street, a

diversification discount of some 20-25 percent is typically levied against the market valuations of highly diversified firms.

While intra-industry groupings of firms have become more common in recent decades (in part, because of the Japanese example), US based intra-industry groupings have not acquired the enduring, dense and intense ties that are attributed to the Toyota groups of companies, for example. Nor are they likely to. Suppliers to US firms are often shed in relatively short periods of time, and strategic alliances, when entered into, are viewed as expedient, short-lived, and one-sided in terms of realized benefits. Such qualities are not likely to engender long-term, robust and mutually beneficial relations which are thought to be characteristic of interfirm relations in Japan.

Taken as a whole, items 1 through 13, and looking at the conditions and sequencing of firm and industry growth in America as outlined above, patterns of large firm development – in which industries, at what times, at what firm sizes, with what rates of growth, and with what sorts of managerial and organizational features – in the US are distinctive.

In particular, the undeveloped character of the North American continent before the arrival of Europeans, the lack of preexisting social, economic and political institutions that might retard or derail industrialization, the astonishing and rapid build-out of transportation and communications systems, the Wall Street engine of financial growth and backing of large firms, and the fortuitous, sequential location of industrial revolution after industrial revolution in the US – these are features of firm and industry development that are unlikely to be repeated, ever again.

Firms and Industries in Japan: late-comer and forerunner

Japan was the first Asian country to industrialize and develop a modern, diversified economy between two World Wars and after the Pacific War. Japan's patterns of firm and industry organization are distinctively different from those of America. Some highlights are:

1. The Japan islands have been long inhabited. Ceramic implements from 10,000 BC have been discovered, and a well developed, if geographically limited, Chinese-style government bureaucracy appeared as early as the sixth century AD.

More isolated than the UK from its continent, Japan's island population grew steadily as wet rice and mixed crop agricultural practices diffused from the southern islands northward. Three principal islands were well populated and developed by the fifteenth and sixteenth centuries. A national system of land registration and taxation was implemented in the seventeenth century; the economy became monetized, commercialized and surprisingly urbanized during the eighteenth century. Tokyo may have been the largest city in the world in 1725; no other country boasted Japan's high level of urbanization, at 22-25 percent of the total population. Moreover, about 40 percent of the population could read and write by the nineteenth century.

Handicraft industries in rural and urban fringe areas supplemented agricultural incomes, providing countryside and urban dwellers alike with the necessities of daily life. From 1603-1868, the so-called Tokugawa era, agricultural output doubled, handicraft industries flourished, people, products and capital circulated widely throughout the islands.

2. From about 1725 to the 1870s, the size of the national population did not grow much in the aggregate, from 25 million to 33 million, although national and household incomes rose and internal migration occurred at comparatively high levels. A national system of cities and large market towns emerged, and the country's economy became commercialized, monetized, and increasingly urbanized. In short, Japan's pre-industrial era was not one of Malthusian shocks, penury and internal disorder.

If one looked at a rank order size distribution of urban places in Tokugawa Japan, there are numerous moderate to small sized cities, unlike countries like England, Germany and France at the time where there were one or two big cities, like London, Frankfurt and

Paris, dominated but hardly any other cities of size were evident. In 1800, there were about 1 million people in Edo (Tokyo), 900,000 in Osaka and Kyoto, and 100,000 each in perhaps ten large castle towns.

Relative to the amount of arable land, the urban population density in Japan was perhaps the highest in the world. The size and density of the urban population plus the monetization of the economy, commercialization of agriculture and handicraft industries, and high levels of internal geographical mobility moved Japan towards a single, large, interconnected market – probably the largest such market in the world at the time (conversation with Akira Hayami, 6/17/10).

3. Looking at Japan before industrialization, the contrast with the US could not be stronger: population density was high; a well developed government bureaucracy, centralized as well as decentralized, extending into the countryside; a hereditary class system; a non-industrial, traditional but nevertheless well developed commercial economy; geographical mobility of labor and capital well developed; commodity and futures markets in place and robust, a well connected and well traveled country. Japan was Asia's most developed economy. Japan was well developed, but not industrialized. Some have characterized Japan's condition, as "developed before development".
4. Japan has few of the natural resources needed for an industrial economy. Wood was plentiful, but not so plentiful relative to the country's population size and degree of development. Coal in sufficient amounts to permit the early stages of industrialization was present, but not in sufficient quantities to sustain industrialization. Japan enjoyed no petroleum and iron ore reserves to speak of. There were no thundering and vast rivers, like the Colorado and Columbia, to generate hydroelectric power in large amounts. Japan produced hydro-electricity but not in the amounts generated in the US.

An underappreciated resource that was available for Japan's development during the Tokugawa era and later on was an ample supply of clean water. Water is essential for wet rice agriculture, of course, but it is also needed for all manner of artisan and handicraft industry production as well as industrial production, not to mention its importance in terms of hygiene and health.

5. Modern firms and industries were built on the preexisting substrates of Tokugawa Japan (1603-1868). When telegraphs, railroads, and steamships came to Japan, they came with the principal channels of transportation and communications already determined, with freight forwarders, lighters, storage facilities, transporters, and a commercial infrastructure already in place. Large amounts of agricultural and commercial goods were already being moved; freight forwarding, warehousing, storage and transportation services were abundantly available. New transportation and communications technologies were grafted onto preexisting systems.

As modern business organizations arose, they differed from America's firms in numerous ways, the most conspicuous and important of which were:

- Joint stock forms of commercial and industrial organization were not well developed; instead, Japan enjoyed commercial codes written around household based businesses; i.e. were stem family systems of asset inheritance and management. They were multi-generational vehicles for managing wealth. Primogeniture-like practices encouraged wealth accumulation rather than its division. Where suitable sons were not available to inherit or manage household resources, adoption was practiced; in addition, suitable sons-in-law were recruited to marry daughters.
- Nevertheless, Japan did not have the commercial legal codes and precedents that England and other European countries enjoyed; there were no joint stock companies. Although there were established means of adjudicating legal disputes, particularly land and small business disputes, adjudication processes were time consuming and costly. Adjudication was a last resort, rather than a first choice, for settling legal differences.

- About 85 percent of Japan is mountainous. Topographically and commercially, it was difficult to knit together large portions of Japan. The country was accustomed to decentralized, somewhat distinctive patterns of local production, consumption, distribution, and governance based on Tokugawa and pre-Tokugawa era practices.
- Given these patterns, Japan's firms did not pursue wholesale consolidation of industries like US firms did. Moreover, firms lacked the financial resources to do so; no Wall Street was willing and able to finance such expansion and consolidation.

When consolidations began to appear, during the interwar era, horizontal integration occurred regionally. Four main regional centers of population existed: northern Kyushu, around Fukuoka and Hakata; the Kansai area, around Osaka, Kobe, and Kyoto; the Nagoya area between Osaka and Tokyo; and the Kanto plain or greater Tokyo area.

6. Japan's earliest industrial ventures were small scale. Until the 1870s, experimental production facilities fashioned and formed in numerous small domains (*han*) predominated. The earliest efforts of the central Tokugawa bureaucracy and its principal sub units were larger but still limited in scale. Few of the initial efforts proved durable and efficient enough to survive even the first decade of industrialization.

On one hand, the continuity of legacy, pre-industrial systems was good. Japan did not have to re-invent systems of organization, transportation and communication. On the other hand, the maintenance of legacy systems of organization that were not capable of handling new levels of production and distribution resulted in sub-optimal linkages between old and new ways.

7. Once the country was unified under a new national government in 1868, it commenced efforts to industrialize and militarize the country and to build new roads, railroads and industries. To a considerable extent, the new government was successful, but at great cost (Westney, 1987).

Larger scale enterprises were established, hundreds of miles of modern rail lines were laid, banks were founded, new port and cargo handling facilities were built, armies and navies raised, and the beginnings of a modern industrial infrastructure and education system were laid. The new government went bankrupt on the scale, scope and speed of the effort.

Having established modern enterprises, the government abandoned them and auctioned them off to the highest bidders in the late 1880s. The divestiture of government backed ventures, called *sangyo haraisage*, represented a watershed in the fledgling government's nation building efforts: government finances were relieved, bankruptcy by-passed, and a host of newly founded ventures were transferred into private hands at low cost, accelerating processes of industrialization and administrative class formation.

The government efforts were impressive, given Japan's lack of capital for industrial and institutional investments; lack of scientific and engineering knowledge to serve as a basis for industrialization; lack of knowledge of accounting, administration, civil and structural engineering; lack of systems that advanced mobility and promotion on the basis of merit.

8. Modern firms and industries in Japan originated in very distinctive demographic, economic, social, institutional, legal, organizational, political and technical circumstances. Firms and industries were forged in those circumstances.

As a result, as outlined in *The Japanese Enterprise System* (1992), an industrial organization system appeared in Japan that was notably at odds with what was found in the US. The research for *The Japanese Enterprise System* was initiated in conjunction with Alfred D. Chandler, Jr's research for *Scale and Scope* (1990), and it is fair to say that finding different systems of firm and industry organization in Japan and the US were not initially envisioned.

Information for the 200 largest industrial firms in Japan was collected for five benchmark years, 1918, 1930, 1954, 1973 and 1987, and organized according to two and three digit SIC codes. Analyzing the data, three strong ways of organizing industrial activity appeared in twentieth century Japan; they were called: focal factories, strategic firms, and interfirm networks (Fruin, 1992):

- Focal factories are lead factories where capital, technical, managerial, organizational, and strategic resources are concentrated. Since many of Japan's early industrial firms were not large, there was little separation of operational and strategic management. Essentially, focal factories were levers of operational and strategic management.

As operational and strategic management were not well separated, know-how was accumulated in plant operations and learning by doing was the rule. Moreover, focal factories were likely to be located in or near cities, further reducing the separation of operations from head offices.

Given abundant ties to affiliate and related firms, focal factories were not required to integrate functional capabilities that were duplicated elsewhere, if they could be reliably (out)sourced. Capabilities could be "borrowed" from affiliated and related firms.

One Toshiba focal factory was found to be connected with dozens of Toshiba affiliates, 242 co-design and co-development suppliers of components and sub-assemblies, and about 500 off-the-shelf suppliers of parts and components (Fruin, 1997). That is, a single (Toshiba) focal factory was connected with 800 other businesses, and the ties and interrelations among them were dense and, most often, self-organized in the sense that local control, not head office direction, was the rule.

- *Strategic firms.* Strategic firms coordinate activities between focal factories and interfirm networks. Japanese firms are relatively small and focused, at least in comparison with comparable American firms (Fruin, 1992).

Historically, management coordination and decision making were pushed down to the operational level on one hand or pushed out to supporting and ancillary firms, on the other. With less coordination taking place at higher levels in the firm, Japan's firms were relatively streamlined and compact in comparison with American firms. Also, as a result of this focus, firms frequently excelled at what is commonly called functional level strategies. Companywide strategies of efficiency, quality, customer responsive-ness and innovation were conceived and carried out in smallish, focused firms; they could be smallish because their product and market scope was more narrowly focused.

The concentration of firm resources at the operations level, either in focal factories or through the coordinated activities with affiliated firms, is a distinguishing feature of Japan's modern firms. Small, focused, and with coordinated capabilities realized in long-term association with other firms make good economic and organizational sense, if transaction costs associated with interfirm coordination are not excessive.

There were a variety of interfirm coordination models in twentieth century Japan. On one hand, relations may involve straightforward, long-term contracting to purchase off-the-shelf parts and components; on the other hand, sophisticated and complex co-design and -development activities may be the content of interfirm interrelationships. Simpler forms of interfirm coordination may be easily copied while more complex forms, in particular those involving high asset specific investments and high levels of intergroup coordination, may not.

- *Interfirm networks.* Two broad categories of business group combinations appeared in the course of Japan's industrialization.

Inter-industry business groups are *kigyo shudan* and *kigyo gurupu* in Japanese. Such groups often had only one major firm in each SIC industry, and this model of organization has been called the "one set principle": one major firm in each major industry in a business group. The group was held together at the center by holding companies, trading companies, and large banks and manufacturing firms with moderate to high levels of intercompany shareholding and executive transfer, and low to moderate levels of business transactions among firms in a group (Lincoln and Gerlach, 2004).

Inter-industry combinations was spurred by the divestiture of government owned and backed enterprises. The better known inter-industry groups that appeared in Japan,

such as the Sumitomo, Mitsubishi, and Mitsui groups, were not conceived as inter-industry groups. But the sell off of government-backed enterprises was too good to pass up for family-based business groups in the late nineteenth century. In other words, nineteenth century inter-industry coalitions were formed without too much concern as to fit with other firms in the group.

The volume of transactions within inter-industry groups may not be especially high because group businesses are in disparate industries; coal mining companies and textile firms have little reason to trade, for example. Instead, other ties held member firms together: geography, ownership, invested capital and, quite often, kinship among principal investors and managers. In early twentieth century Japan, there were many such inter-industry groups, both rural and urban, such as Noda Soy Sauce in Noda City (later the Kikkoman Corporation) and Toyoda Loom in Nagoya. As industrialization advanced, business groups became more formalized in terms of capital sources, lending and investing arrangements, management policies and practices, and organizational relationships.

Intra-industry business groups – in Japanese, the term *keiretsu* is used to refer to intra-industry combinations. These combinations group together businesses in the same or closely related industries; outputs of one firm are, quite often, the inputs of another.

Intra-industry interfirm networks were and are motivated by vertical integration: when does it make sense, economically or managerially, to link upstream and downstream activities? Levels of ownership and control between firms in intra-industry groupings may be quite low, as vertical ties based on production and distribution may substitute for capital linkages. Hence, there are various ways in which companies in intra-industry groupings may be tied together, directly and indirectly (Shiomi and Wada, 1995).

For example, there are 3,271 firms in the Toyota group in Japan in 2008 (Toyota Motor Corporation, 2006). Of these, 55 percent do not share common ownership and 45 percent do. Of the 45 percent with Toyota investment, there are only 180 firms in which Toyota holds more than 50 percent control and another 1,282 firms where Toyota has less than 50 percent control. Nevertheless, Toyota is required to consolidate these holdings in its financial statements; Toyota's investment is categorized in two ways: less than 20 percent and less than 50 percent. There are another 1,809 firms classified as suppliers, and in Japan Toyota does not invest in its suppliers. Finally, all but a few of the 3,271 companies in the Toyota group fall into a limited number of related SIC categories.

Intra-industry businesses are linked together in various ways: first, there is a logic of technological interdependence associated with vertical integration. What one firm needs, another firm has. Second, as the Toyota example suggests, technology ties may be bolstered and buttressed by financial links. Not all firms need or desire financial help. Third, where technical and financial ties exist, commercial and managerial ties are likely to follow.

The points of this description of business groups and interfirm networks in Japan are:

- there are many sorts of business combinations in Japan; it is fair to say all firms of any size are connected to and situated in business groups/interfirm networks;
- there are two major types of business groups in Japan: inter-industry and intra-industry groupings;
- the two groupings are sometimes lumped together, but they should not be; they represent very different models of firm association and agglomeration; they were formed and they function for very different purposes; and
- inter-industry groups came first in Japan, and their origins were associated with the sell-off of government initiated enterprises in the 1880s; later, in the early twentieth century, intra-industry groupings appeared as industrialization

advanced. They are associated with the *shinko zaibatsu* or “new industrial groupings” that appeared during the interwar years.

The reasons for the emergence of each type of group should not be minimized for such circumstances frame the institutional environment, including public policy alternatives, that drive the formation and development of firms and industries. A complete listing of different categories of business groupings based on the Japanese experience is found at the end of the paper. In short, the organization of firms and industries in Japan differ markedly from the industrial organization of the US. Focal factories, strategic firms and interfirm networks emerged as indigenous models of how to organize and manage in Japan. The US model of horizontally consolidated, vertically integrated, and diversified firms is very different.

9. Japan's biggest firms were clustered in the textile, food and beverage, and primary metal industries; 109 of Japan's largest firms in 1918 were in these three categories alone, climbing to 115 out of 200 in 1930. There were additional concentrations in the electrical equipment and transportation industries (Fruin, 1992). Average firm size in these industries differed greatly from the average firm size in America in the same industries. America's top firms in rank size were found in petroleum, petro-chemicals, primary and fabricated metals, electrical and non-electric machinery industries. In both countries, large firms were found in the food and beverage industries although Japan's biggest firms were beer and sugar companies while in the US, they were cereal grain firms, tobacco and alcohol companies.

It is often said that the limit to firms is market size. Japan's population during the twentieth century was never more than half that of the US. Smaller markets, fewer sales and lesser firms were the result. In addition to national population size differences, overseas markets could make a difference but, as of this time, we are not able to hazard a guess of the effects of overseas demand on firm and industry formation in the US and Japan.

10. An important part of the late development story, in most versions, is the prominent role of government at many levels, including industry and other standards setting associations. Late development in Asia is almost always measured relative to the US and the series of industrial revolutions that have had their origins there (although the definitive late development story was based on a UK-Japan comparison; Dore, 1973). The original late development argument focused on Eastern Europe and Latin America (Gerschenkron, 1962). Another version of the late development story focusing on issues is institutional selection, adaptation and change is Westney (1987).

Late development involves:

- far more government involvement in selecting, backing, financing, and,
- on occasion, managing industrial developments;
- far less reliance on equity financing and more on credit financing;
- a desire to catch-up quickly and, if possible, to leapfrog technology pioneers;
- more “family” based firms and business groups because wealthy families are the main suppliers of capital, management, and their valuable names to many new ventures in emerging economies; there is not a large enough middle class to finance sufficient capital for new firm and industry formation; and
- more public-private cooperation in development and, thus, less American-styles of corporate governance wherein shareholders and stakeholders are expected to follow their self interest without much government involvement.

Models and environments: why do we care?

Two twentieth century examples of rapid firm and industry growth standout: America and Japan. Both were exceptional models. America was the richest, least developed country in the world; Japan was the richest, most developed country in Asia.

As economic growth in both countries was extraordinary, growth of their firms and industries have to be considered extraordinary as well. America's growth was extensive, driven by a continent rich in un-exploited opportunities, whereas Japan's was more intensive, extending existing opportunities and under-developed resources. Of the two, America's story is more extraordinary, we believe, and thus less likely to serve as a model for emulation.

America's model features centralized control of firms, coupled with dispersed ownership, driving economies of scale, scope and speed to serve the largest, richest and most rapidly growing market in the world. America's largest firms were much larger than Japan's and they appeared in somewhat different industries than Japan's. Agricultural and extractive industries lead the way followed by petroleum, petro-chemical, electrical and non-electrical equipment industries. Industrial and commercial goods were moved in huge amounts across vast distances interlaced by well developed communication and transportation systems and infrastructure.

Japan's model was more modulated. Japan's largest firms were smaller, more focused in business activities, more operationally decentralized, and more interconnected in durable and dense ways with scores, even hundreds, of other firms. Japan's government was more directly involved in industrial development, given a late development imperative, and while Japan's infrastructure was first rate for Asia, it was nothing on the scale and scope of America's.

Assessing models and fit

Exceptional features of the US experience:

1. A vast, rich and undeveloped landscape suitable for extensive agricultural, commercial and industrial development.
2. A well developed infrastructure of roads, railroads, harbors, and communications by the late nineteenth.
3. century to knitting together the country's markets and dispersed population.
4. Extremely large and well developed credit and equity markets, making the financing of industrial development by numerous banks and financial institutions more available. Wall Street funded America's economic development.
5. Technological leadership such that America led technology developments in most industries during the twentieth century. Since America was in the lead, American firms did the research and development on which industries depended. In such instances, it was not possible to ride on the technology coattails of others.
6. Government funded research. In most instances, government did not choose which industries developed, even if government funding via contracts frequently determined the course that companies and industries took. Government support of firms and industries has been enormous, and it would be a mistake to think that American firms and industries developed without government involvement.
7. Speed was important in both countries, but speed resulted in very different organizational outcomes. In America, companies internalized coordination and control capabilities and took firms to a scale hitherto unimaginable. The American pattern features:
 - less concentrated ownership, given a traditional reliance on equity funding; and
 - more centralized control, involving more professionalized management, horizontal and vertical integration, and business diversification within single firms.

The Japan difference

Speed meant something very different in Japan. Catching up with the west generally meant a narrowing and specializing of the foci of firm activities, associated with increasing investments in developing new technological capabilities, accepting what was available, mobilizing wherewithal by any means possible. Doing things quickly and well with available resources were by-words.

Speed and specialization encourage cooperation because firms do not have the resources to pursue multiple lines of development simultaneously. Instead, alliances were a means of securing access to resources without owning them, and coalitions of firms, organized on geographical, industrial and the name or reputation of great families pushed early efforts at industrializing, commercializing and linking late nineteenth and early twentieth century Japan.

Growth by horizontal consolidation and vertical integration were often not possible. Japanese firms did not have the financial and managerial resources to pursue such strategies. Instead, combinations of firms up and down the value chain and across business lines and fields appeared. These patterns of coordination (or cooperation, if you will) became institutionalized, and as they did, they became acceptable, even preferred, forms of organizational growth. In short, three principal constraints drove Japanese style development: a lack of financial resources; a shortage of industrial technologies; and an absence of managerial method and means that would allow American style consolidation and control to appear.

The Japan pattern was one of fairly concentrated ownership, with less reliance on equity financing and more on bank borrowing and cross-shareholding within business groups. Managerial and quite probably accounting control were less notable, with a small managerial class, less horizontal and vertical integration, and less business diversification within single firms. Control (management) was pushed down to the level of operations (factories) on one hand and pushed out to supporting and affiliate operations (firms) on the other. The two vectors became interrelated via an industrial structure that featured, focal factory, strategic firms and interfirm network organizational forms.

Japan was far less favored in terms of natural resources. For historical, institutional and spatial reasons, Japan's firms and industries were less able to realize economies of scale and scope. Japan's firms were also less capable – managerially, organizationally and technically. They were less well financed. The legal system was less well developed, property rights less secured. Periodically, the government stepped in to redress such shortcomings. At other times, a genuine state of *laissez-faire* in business and economic matters occurred. Government involvement in business markedly waxed and waned.

At the outset of industrialization, Japan faced obligatory trade and development constraints: *ad valorem* tariffs, unequal foreign exchange and most favored nation treaty terms, and unfavorable balances of trade. Foreign firms had superior technologies, better capabilities in accounting, financing and engineering, better trained and more experienced managers. The high volume, high speed operations, synonymous with the American model, were nowhere found in Japan.

Models of and models for

Descriptive models may become models of how things will work – predictive models. This occurs when cause and effect are demonstrated often and well, and models are legitimated by prominent persons and institutions. In such cases, models acquire a currency that elevates them above the usual skepticism. Models become predictive and, in some cases, prescriptive for how things will and should be done.

Our models of firm and industry organization in circumstances of rapid economic growth are descriptive. We are not asserting that one model is better than another or even more efficacious. However, we do hypothesize which model – the US or Japan's in the twentieth century – may better fit China and India's current developmental circumstances, assuming that similar (or somewhat similar) environments engender similar (or somewhat similar) organizations.

Concluding thoughts

Firms and industries evolve to fit environments. Given different environments and institutions, different models of firm and industry organization will emerge. Given the circumstances of rapid economic growth in twentieth century America and Japan,

distinctive sets of organizational patterns and practices emerged in both countries. They describe what may be called the American and Japanese models of firm and industry organization.

Having described these models, we hypothesize that one may be more appropriate than another as models of firm and industry organization in China and India's rapidly growing economies. However, having said so, it must be added that transferring national models of organization is problematic. In fact, organizational systems are never transferred as wholes, even when one country's experiences may appear to be more or less suitable for adoption than another's (Westney, 1987; Liker *et al.*, 1999). Transfer and adoption always involve imitation and adaptation.

Nevertheless, the power and utility of models cannot be denied. Models point the way, and they often lead directly to courses of action. Given the importance of models and their influence at policy, planning and practical levels, the Japanese model has more to recommend it than does the American model to contemporary China and India. There are six reasons for this:

- China and India are late developers, as Japan was. Late developers benefit from the development experiences of front runners.
- China and India boast large, dense populations, more agrarian than urban, with long histories of commercial and economic development, like Japan's. Population size, age and spatial distribution are major factors in economic development.
- China and India rely heavily on indigenous resources for industrialization, as Japan did, even though foreign direct investment and related technology transfer play a much part in China and India's development than they did in Japan's.
- Family ownership and control drive China and India's firms and industries, as they did Japan's early in industrialization. Indeed, even today, family based business groupings remain influential in Japan as they are likely to for years to come in China and India.
- Japan's ways of organizing, in particular its inter-industry and intra-industry organizational forms, seem more compatible with the existing business and economic groupings that already populate the industrial landscape in China and India. Outside of the Anglo-American world, business groups are perhaps the most common way of organizing expansions for multiple lines of business.
- Government's retreat from promoting key industries and companies, a prominent feature of development in late nineteenth and twentieth century Japan, is echoed by similar retreats from state owned enterprises in late twentieth century and twenty-first century China and India.

While the fit of Japan's twentieth century development model with China and India's needs in the twenty-first century is far from perfect, it has more to recommend it than does America's twentieth century model. Japan's twentieth century models of firm and industry organization appear a better fit for China and India in the twenty-first century.

Endnotes

By the Japanese model, we do not mean the Asian Development Model as described by Joseph Stiglitz and others (Stiglitz, 2002). In the Asian development model, government leads and at times manages industrialization by creating monetary, fiscal, trade and industrial policies that advance industrialization; employee and community welfare are taken seriously by firms.

Some features of the Asian development model may overlap with some aspects of the Japanese model, as described by us. However, we believe there was much more to Japan's industrialization than government's involvement and guidance. Millions of individuals, thousands of firms, in hundreds of towns and cities made decisions that cumulatively and successively powered Japan's industrialization. These combined with demographic,

economic, historical, institutional, organizational and technical factors to make up the Japanese model. It is much more of bottom-up than top-down model.

In our view, government's retirement from establishing, funding and running firms and industries in the late nineteenth century signaled a watershed in Japan's industrialization, along with other milestones, such as a relaxation of government controls several decades after the Pacific War, an upwelling of entrepreneurial vigor in the 1950s and 1960s, and a highly decentralized approach to firm and industry organization that emerged during the 1970s – these are key features of the Japanese model, as we see it, that are not included in the Asian development model.

Business group models

Five to six different sorts of business groups were evident in nineteenth and twentieth century Japan:

1. Pre-existing, stem family (*ie*) based business groups, like Mitsui and Sumitomo, that were closely associated with local administrative units (*daimyo* domains or *han*) or more centrally approved, *shogunate* commercial and extractive industries (e.g. Sumitomo's mining).
2. *Zaibatsu* groups which appeared once the central government started selling off government initiated enterprises in 1880s and 1890s. *Zaibatsu* are often characterized as family based groups, with pyramidal control mechanisms, such as holding companies, close ties to government, and unrelated diversification.
3. The new *shinko zaibatsu* which appear when heavy industrialization picks up early in the twentieth century; they rely on new sorts of financing and governance arrangements, such as the sale of equity shares, and they should be clearly distinguished from earlier *zaibatsu* groups, even though both sorts of groups appear within nearly the same time: the late nineteenth to early twentieth centuries. *Shinko zaibatsu* groups sought complementary resources and the benefits of vertical integration within their grouping of companies.
4. There are numerous local and regional “*zaibatsu*,” some of which were relatively major enterprises, like Kikkoman (Fruin, 1983). The Toyota group of companies in weaving and textiles could be categorized in the same way. These are family-based industrial groups unconnected to big city banks and national government before the 1930s.
5. Then, there are the postwar *kigyo gurupu* (enterprise groups) that were sometimes re-assembled and re-structured prewar groups, such as Mitsui, Mitsubishi, and Sumitomo, but were sometimes so restructured that you'd have to call them something rather new, even if they are still categorized as enterprise groups. The latter groupings would include the Fuji and Dai-ichi Kangin bank groups. The *kigyo gurupu* (or *kigyo shudan*) category of Japanese business groups has been the most researched.
6. The interfirm networks, like Toyota's group of vertical companies, rely on entirely different ownership and control mechanisms, like the Toyota Production System, an operations control system, supplier association governance, and division of labor agreements between buyers and sellers of similar technology-based parts, components and sub-systems. This is an eco-system based on extensive cooperative alliances among companies sharing the same or similar technologies. It is sometimes characterized as disvertical integration but this characterization is wrong, as it assumes vertical integration is the default mode of organizing.

To characterize all of these business groupings by pyramidal control, unrelated diversification, and family (sometimes government) ownership, as some authors do, does not accurately capture the variety in form and function of business groups in Japan.

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