

"Introduction"

Generation Change

The Transformation of Japanese Life in the 1990s and Beyond

(very tentative book title)

Michael Smitka

Professor of Economics

Williams School of Commerce

Washington and Lee University

Lexington, VA 24450

MSmitka@wlu.edu

(540) 458-8625

jidoshasangyo (*skype*)

Introduction: Changing Japan

The breakfast buffet in the Imperial Hotel was posh, as to be expected.¹ Chefs in their white hats and aprons supervised an array of breads and pastries and yoghurt and fruits, and a separate spread of fish and pickled vegetables. It was my first visit to Japan in several years, and I was looking forward to eating a traditional breakfast, grilled fish and pickles, and a raw egg scrambled over rice. In that I was partially disappointed. Not only was the Japanese portion of the breakfast buffet at the Imperial Hotel modest, but there were no raw eggs to be had. I consoled myself that perhaps one didn't go to a luxury hotel to get the same food as at home, but how many people are up to gourmet eating early in the morning? Don't you want familiar food, but with a bit of unobtrusive service?

I returned to Japan the next summer for a month,² and for much of my visit I stayed in a decidedly downscale business hotel, where I was often the only foreign guest. It too had a breakfast buffet, and to my surprise I observed the same thing: people, men and women alike, were choosing the western breakfast of rolls and salad and scrambled eggs. Had Japan really changed to the point that rice was no longer the preferred dish? And what about eggs?

I thus began thinking about change in Japan in a broad sense, though as an economist that is from a social science perspective. The prevailing image of Japan over the past 20 years is one of stagnation.³ A huge real estate and stock market built up from 1987, driving up housing and office prices throughout Japan, and leading to a frenzy of speculative investment. That bubble burst in 1991; stock prices bottomed at a quarter of peak, and in parts of Japan real estate prices are still falling over 15 years later. In the dozen years that followed the end of the bubble, the economy was hit by 3 recessions, and accompanying high unemployment and corporate distress. Per capita growth for the economy as a whole fell from an average of 3.4% in the 1980s, the highest in the OECD, to 0.7% in the 1990s, the lowest.⁴ Commentators began to refer to the 1990s as the “lost decade” (*ushinawareta 10 nen*, or even “the lost 15 years”). No growth, stagnation, meant no change.

Yet as I began to think about what I saw around me in the early 2000s I was struck by how different things were from my experiences of Japan during periods of extended residence, during 1976-77 and again during 1982 and 1983-85. There was still much continuity with what I saw during my next extended stay, in 1991-92. Thereafter I observed an increasing number of changes. Across a range of features, from daily life—what people consumed, where they shopped, where they worked—

¹ November 2002, as part of a small group of academics sponsored by the Keizai Koho Center, a subsidiary of Keidanren, the largest business lobby in Japan. I thank Arthur Alexander, the group's facilitator, for inviting me to participate; he thus had an indirect hand in launching this project.

² Thanks to a short-term research grant from the Japan Foundation.

³ One of many possible examples of the use of the term "stagnation" is Hutchison, M. M. and F. Westermann, Eds. (2006). *Japan's great stagnation: financial and monetary policy lessons for advanced economies*. Cambridge, MA, The MIT Press. The title of at least 3 more books on my shelves convey a similar message, as does a vast outpouring of academic papers and journalist writing.

⁴ The Organization for Economic Co-Operation and Development, based in Paris, began in 1961 with 20 members; Japan became the 21st member in 1964. Its 30 current members share “a commitment to democratic government and the market economy.” See <http://www.oecd.org/>.

to the role of women and career paths within firms—things were different. Today's generation is growing up in a very different world, and their world will keep changing. Japan began the postwar era with a population that was 50% rural and poor; now 25% of the population lives in the Tokyo metropolitan area, and nearly half in the 3 largest urban agglomerations. Their grandparents thus were from the countryside. They had migrated to Tokyo or another large city at age 15, after finishing middle school, or at age 18 after high school, living in dormitories or boarding houses, and otherwise fending for themselves from an early age.⁵ Their parents were the first generation born in Tokyo or Osaka, and lived at home while graduating from high school or even college. They grew up thinking of themselves as the "new middle class," but still lived in very modest housing, rode their bicycles to the train and to shop, and ate modestly. Today's young are thus the first generation to grow up in a solidly middle class environment, far removed from the extreme poverty and harsh working conditions of the immediate postwar period, and the still rugged but increasingly prosperous growth period of the late 1950s and 1960s. Social and economic adjustment to those underlying transitions is slow, but inexorable. And for all the discussion of the "lost decade," slow growth does not mean no growth: per capita GDP still rose 17% in the dozen post-bubble years of comparative stagnation.

The world of today's young will continue to evolve, but in ways that have no historical precedent. In particular, the immediate post-WWII "boomer" generation, the *dankai setai* (団塊世帯), will retire over the next half-dozen years.⁶ Because fertility fell as incomes rose, something common across a wide range of countries, the "*dankai junior*" generation is smaller in numbers than that of their elders, and their own children are yet fewer. Many societies have seen their population decline—or disappeared altogether—as a result of war, famine or pestilence. In contrast, Japan is the first society in history to face a natural population decline, and an accompanying unprecedented increase in the share of the elderly in the population. (Increased longevity contributes; at age 65, a man faces 18-plus years of retirement.) This long-term shift in the age structure and growth of the population has had its own impact, and will be a major factor affecting Japan's future.⁷

Analyzing change is hard. Since at some level almost nothing is static, some method is required to select what to analyze. Second, some method is needed for discussing change, a framework is required, a means for organizing and describing change. Finally, it is important to motivate the analysis, or at least engage the reader, by an artful telling. Those three tasks are interdependent.

⁵ I know of no study specifically of this phenomenon. It is however the stuff of the coming-of-age novels of the 1970s, such as the famous six-volume series, Itsumi Hiroyuki, *Seishun no Mon: Chikuho* (1-2), *Jiritsu* (3-4), *Horo* (5-6). (*Passing through Youth: Chikuho, Independence, Rootless*). 1972-, Kodansha Bunko, which follows a young man from the coal fields of northern Kyushu to Tokyo and subsequent wandering without direction. In English, vignettes of dorm life appear in Rohlen, Thomas P. *For Harmony and Strength: Japanese White Collar Organization*. Berkeley: University of California Press, 1974 and in Lo, Jeannie. *Office Ladies / Factory Women: Live and Work at a Japanese Company*. Armonk, NY: M.E. Sharpe, 1990. I myself lived in a boardinghouse for a year in 1976-77, which at that time was a common experience for a young man.

⁶ Given high participation rates in the 65+ age bracket, that is not wholly accurate; by the time this material is revised and published, in (?) 2008 or 2009, it will be.

⁷ With a lag, other societies from Italy and Spain to Korea and China will undergo similar demographic change. That makes the study of Japan far more interesting than might otherwise be the case.

Ideally, this might be done in a careful comparative manner. Is Japan unusual or different, or could some other society be chosen in place of "Japan" without adjusting the fundamental story? That would require writing at least two books, since few of us are really familiar with what has happened over time in our own societies. It would however help counter the natural tendency to view Japan (and for Japanese to view us) as "other." To some extent the reader will need to rely on my own judgement and wisdom in picking and choosing appropriate examples, things that are neither trivial nor unrepresentative. The analytics I employ can balance that, by providing a sense of why I chose certain items, and in indicating what the limitations of those examples might be. I return to these general issues briefly at the end of the book; further discussion would at this point not be very meaningful. Similarly, whether the examples I choose are interesting can only be judged by sampling them. I can however sketch analytic approaches in advance, and turn now to that task.

Models of change

I employ four different models for discussing change: normal change, policy-constrained change, technology-enabled change, and induced institutional change. These are all unduly simple—I use the term "model" quite deliberately—and overlap at least in part. Policy does not come out of a vacuum; new technologies are developed with potential markets in mind; various flavors of institutions coexist, and provide the workaday world in which much of our decisions about consumption and production take place. Nevertheless, these help us to focus upon different components of change, and hence give shape and direction to the telling. After a quick overview, I will provide a sample application or two of each model.

In general I will avoid using the term "culture." For me, it is much more a description of the impact of the economic environment on daily life, than an independent factor. Culture is mutable, when viewed over the course of a generation, at least when it comes to family structure, consumption patterns, and the work experience.⁸ Patterns of socialization, values and religion, and other facets may exhibit continuity, but are also a step removed from the features of life that I address here. There are also many decisions that are "arbitrary," in the sense that the environment provides little impetus for specific choices. That clothing and other elements of fashion matter in human society is a universal; which fashion predominates when is relatively arbitrary, and surely reflects the visual culture that consumers (and the creators of fashion) inherit from the past. Indeed, because of its very arbitrariness, it may exhibit greater continuity than in more mundane areas, such that some components of a "Japanese" aesthetic may be traced across centuries. Cricket has never caught on in Japan; sumo is not popular elsewhere (with the possible exception of Mongolia), nor does high school baseball generate similar levels of passion in the US.⁹

⁸ I have watched the delight of a small child upon finding that they have McDonald's in the US, too; it was an inseparable part of her culture!

⁹ I have no knowledge of baseball in its Cuban, Dominican and other flavors.

Normal change

I refer to the adaptation to shifting prices and incomes as normal shifts. This is familiar to anyone who has taken an introductory economic "Principles" course. People respond to relative prices, in the canonical case increasing consumption when prices fall and decreasing their purchases of "inferior" goods when incomes rise, to give a small example of the relevant jargon. Yet at the same time economists avoid discussing change *per se*. Instead we engage in "comparative statics," positing an (equilibrium) base case and a new post-change equilibrium. In doing so we finesse the messy details of what happens in between, of how long such hidden processes take, and of whether intervening factors are likely to swamp the putative effects of the case at hand. I will apply these tools to look at rice consumption, which will introduce the additional issue of finding data to match an initial observation. As that discussion will illustrate, moving from casual to careful empiricism is difficult. Such normal shifts in consumption describe many other facets of life, including the core decisions of women such as when to marry and how many (or, perhaps more accurately) how few children to have.

Policy-constrained change

Policy (when effective!) constrains behavior, and shifts in regulatory, tax and other measures matter.¹⁰ Specific policies may also provide a distinctive character to consumption patterns; that Japanese aren't litigious and drive small cars is a function of the domestic legal and tax structures, and such behaviors are quickly shed overseas. The cumulative impact changes enabled by at times seemingly small shifts in regulations contributed to a rhythm of life that is today quite different from that of 25 years ago.

A feature of "traditional" Japan were the shopping streets (*shotengai*), lined with butchers and bakers and fishmongers, daily visits to which were part of the rhythm of daily life as recently as two decades ago. Regulation helped support that. Until the mid-1990s floor-size restrictions inhibited the development of large-format retailers; car ownership remained low. Higher incomes have changed the latter; since 1994, after the collapse of the bubble economy and amidst multiple recessions, the ownership of both regular cars and "kei" (minicars) in suburban Chiba roughly tripled. A liberalization of the licensing process for retailers, aided by a decline in land prices, drove the latter. Today young Japanese frequent large-format retailers and shopping malls with parking for thousands of cars.¹¹ Gone are the shopping streets and food stalls that once flavored Japanese life. But there are many other examples, including changes in drinking habits from beer and sake to shochu and beer-like beverages, and the rise of convenience stores.

¹⁰ Of course policymaking does not occur in a vacuum, and may be responding to changes the economic environment. But that process is complicated and may occur in a different time frame. It is also largely beyond my capabilities as an economist to "step behind" the process in search of a deeper level of causation.

¹¹ At least in Chiba, their parents have made the same shift, giving rise to "shaataa-gai" (rows of shuttered shops).

Technology-enabled change

Third, technology-enabled change is pervasive. For example, Japanese under age 25 now have no real memory of life without cell phones, possession of which for them began in middle school. Regulatory change is part of the story; slight variations in the telecommunication policy led to a preference for text over voice, and for using cell phones for internet access rather than computers. "Texting" is hardly unique to Japan, and is probably more distinctive from my standpoint than that of my children, but it would never occur to them to surf the web much less shop online from their phones. Younger Japanese also differ from their parents, who likewise are seldom without their cell phones.¹² There are many other examples of new patterns of consumption enabled by technical change. But it is easy to forget how novel many of the components of daily consumption are. A quick litmus test comes from a sequence of 3 numbers: 78, 45 and 33⅓.¹³ Japanese life may not have changed at a different pace than that in the US—and may have evolved slowly from the perspective of Chinese. Nevertheless, change across generations is striking.

Induced institutional innovation

Fourth, over time the evolving economic environment induces changes in institutions. Much is lost in speaking of "Japanese" management, which varies tremendously across industries and firms, and likewise of labor relations or many other aspects of society to which the label "Japanese" might be attached. After all, there is tremendous geographic variation with a prosperous, highly diversified economy and a population of 127 million, greater than that of Portugal, Spain and France combined. Nevertheless there are broad patterns that sometimes "frame" perceptions, such as "lifetime employment system" and bank-based "convoy" capitalism. Such patterns do not change readily. At one level, necessity is the mother of invention; because change is costly and the outcome is uncertain, firms for example tend to keep their organizational form and patterns of operation absent a perceived need to restructure. Such efforts can vary, absent a "model" that nudges restructuring in a similar direction. Finally, even if there is change, absent a new set of terminology and concepts, the new is likely to be interpreted and described in terms of the old. "Revolutions" are less about practice than perceptions.¹⁴

¹² See Ito, Mizuko, Daisuke Okabe, and Misa Matsuda. *Personal, Portable, Pedestrian: Mobile Phones in Japanese Life*. Cambridge, MA: MIT Press, 2005. More recent sources are available in Japanese.

¹³ None of my students recognize this sequence as the playing speeds of (vinyl) records; all of their parents and grandparents do.

¹⁴ This point is expressed cynically by *The Who's* song, "Won't Get Fooled Again." (*Who's Next*, 1971).

Institutional innovation in substance but not in name

An example is the "lifetime employment system," which arose in large firms during the course of the 1950s, and was first described by James Abegglen in 1958.¹⁵ During the prewar period there were many patterns for labor relations, such that there was probably no dominant pattern. After 1945, however, various factors converged to help "select" this model. Postwar unions formed through a grass-roots movement, encouraged by Douglas MacArthur during the U.S. Occupation. Establishment-based unions coalesced into enterprise ones, and while they were certainly concerned with wages, in the frequent sharp downturns of the 1950s and 1960s, their greater focus was on job security. Firms also turned to new school leavers, and adopted a promote-from-within policy, both helping to limit turnover and facilitate training in new skills. To provide incentives, pay rose with seniority, and workers were generally willing to stick out their initial poorly-paid years with an employer in return for comparatively high pay later on. Low quit rates of course in turn reinforced the willingness of firms to invest in training their workers. Firms though needed to limit the downside of too many highly paid workers, and so made retirement mandatory (at age 55, rising to age 60 in the 1990s with a change in benefits legislation).¹⁶

In terms of labor markets, the "lifetime employment system" would seem to depend critically on continuous economic growth and on a growing population. Workers were underpaid while they were young, and overpaid while older. The incentives rising pay provides strengthen that tendency. Promotion into management around age 40 resulted in a boost to income through a special manager's stipend, and an eventual boost to retirement benefits. This "tournament" encouraged workers to keep in the game and continue working hard, as those who exerted a modicum of effort had some assurance of promotion, helped as they were by the sheer expansion of the enterprises for which they labored during the high growth that lasted into the early 1970s. As long as firms kept growing, younger workers provided a cross-subsidy to cover the "excess" pay of their superiors.

The "lifetime employment system" thus seems to have some elements of a Ponzi scheme, depending on a steadily expanding base of young and comparatively inexpensive workers to support their seniors. As such, it would seem fundamentally unstable; indeed, I have heard pronouncements of its imminent collapse since I first took a course on Japan over 35 years ago. Yet there were several margins of adjustment. Attrition could help balance things out, though as far as I know, we have no detailed empirical work with firm-level data to help detail who left over time.¹⁷ Firms were, however, active in transferring workers into subsidiaries and even *en masse* to unrelated firms (a practice

¹⁵ Abegglen, James C. *The Japanese Factory: Aspects of Its Social Organization*. Glencoe, Ill: The Free Press, 1958. The standard terminology in Japanese is a back-translation of the terms he used; see 加護野忠雄. "故アベグレン氏と日本の経営、年功序列・終身雇用に着目：経済教室." May 15 2007, 25.

¹⁶ *I need to check the specific timing.*

¹⁷ Comparatively high rates of unemployment and lowered labor force participation among men in this age bracket suggest from a different direction that firms may not in fact keep as many workers as long as the model implies. Nevertheless concern over the fate of the *dankai setai* ("baby boomers") in the business press seems to echo the belief that firms have a surfeit of workers in their 50s.

known as *shukko*). Firms also employed women, who were typically not offered promotion-track jobs, leading to high turnover; some firms, particularly in manufacturing, now make heavy use of immigrants, including those of Japanese ancestry from Brazil. They, too, are unable to climb onto the stage that leads to gradual promotion and pay increases. In the high growth era, firms would recruit seasonal workers from agricultural regions; today, the use of students working irregular hours (*arubaito*), dispatched workers (*haken shain*) and part-time workers (*paato*) offers additional flexibility.¹⁸ Over time wage profiles flattened; semiannual bonuses accounted for about a quarter of pay and could be cut; overtime could also be increased or decreased. In addition, those who refused transfers away from home can be removed from the group eligible for promotion, and the distinction between line and staff extended. Setting the boundaries of what was done inside the firm, versus tasks handled by other firms (subsidiaries or otherwise) allowed tasks to be contracted out that best be handled by workers under different pay systems. Finally, firms can and do solicit early retirements, with varying degrees of voluntarism. In other words, the number of margins of adjustment is large, and provides for great heterogeneity despite the common use of jargon.

Firms that offered "lifetime" employment have always been a distinct minority; including civil servants and teachers, such jobs never accounted for more than about a quarter of the workforce. During the past 15 years, many large firms have seen at best slow growth and for those with debt accumulated during the bubble, financial pressures. The erosion of the "lifetime employment system" certainly accelerated, most visible statistically in poor employment opportunities for new college graduates, who had long been able to count on some sort of "proper" job. The growth of part-time and contract employees among young men, and not just women, is clearly incompatible with any attempt to use the model of large-firm employment practices to predict the structure of labor markets as a whole.

Yet the model persists. One answer is that, despite reality, the cultural conceptualization of labor markets has not been replaced by an alternative; models are an approach to reality, not a reflection of reality. From the viewpoint of young Japanese, the work environment they face has changed measurably over the past 20 years. Enabled in part by looser regulation of labor markets, the segment of "temporary" and dispatched workers has grown from (5%) to (20%) of employment. Not all of this is due to the downturn in the market for "permanent" employees at large firms. On the retail front, the growth of franchised restaurants and convenience stores has opened up jobs that can be learned quickly, compared to the need for prior cooking skills to run the stand-alone "mom-and-pop" restaurants that once predominated. In addition, more young women are now in 4-year colleges than in junior colleges, and they are far less likely to marry at an early age, or to stop working upon marriage. A later chapter will detail that transformation.

¹⁸ In contrast to *arubaito*, an amorphous category that often implies short and irregular hours in low-skill tasks, *paato* work regular schedules but with less than 40 hours and may spend many years at the same firm. Primarily women, short hours (for example to match the school day), firms can offer them fewer benefits. *Haken shain* are under fixed-length contracts that in principle cannot be renewed; while they may work the same hours as regular "lifetime" employees they are precluded from advancement.

Institutional innovation as a gradual process

Another possibility is that, at the level of individual firms, change has in fact been very slow in coming. In the auto industry, it took over a decade for employment to adjust to the 25% decline in sales following the collapse of the bubble; firms were also slow to make qualitative changes, such as eliminating brands and exiting unprofitable segments. That has now changed, with both Nissan and Mitsubishi Motors trimming employment by openly soliciting candidates for early retirement. Mergers and acquisitions have cut the number of firms; Toyota has taken over Daihatsu ("kei" minicar production) and Hino and Isuzu (both truck makers) and recently purchased a large stake in Fuji Heavy Industries (Subaru) from GM and is now integrating their operations. Nissan of course was acquired by Renault, and Nissan Diesel by Volvo (Truck); the truck operations of Mitsubishi are now owned by Daimler. Parts of the supplier sector have likewise restructured. But all this took time.

Institutional innovation in name but not in substance

The same is true of banks, and the financial sector more generally. By the end of the Occupation, US-style regulation placed banks in segmented markets. With competition muted, administrative structures and business models adapted to that situation. In addition, in the high growth period they faced consistent excess demand for loans, and could ration funds to large firms while demanding collateral from smaller ones. They had no need to develop credit analysis skills, or to offer services to retail customers; in bank branches, the work flow looks much the same as in the days when the only piece of technology available was a printing calculator. When the rapid growth era came to an end, their large-firm customers needed less funds, and other changes allowed them to tap stock and bond markets rather than banks. The banks' initial reaction, however, was to seek new customers – real estate developers and small businesses – but to use their existing structures, lending against collateral. In the context of accommodative monetary policy, they built up a vast portfolio of what proved to be dud loans. The collapse of several large banks, and consolidation of the sector into 3 large megabanks, followed. However, as of late 2007 internal restructuring is slow; data suggest progress neither in branch consolidation nor in bringing common software systems online nor in thinning of redundant staff. It is not that it cannot be done, as reforms at Shinsei Bank and at Sumitomo Mitsui Bank suggest.¹⁹ Lending based on credit analysis requires greater availability of financial statements from borrowers. Fee-earning business requires new types of operations unfamiliar to existing management. Consumer lending likewise is a new business to the banks, and requires the support of sophisticated information processing tools and careful pricing. Which direction to turn is less than obvious.

Finance within firms reflects similar tensions. The excesses of the "bubble" clearly reflected the inadequacy of received rules-of-thumb for making investment decisions. At the start of the high growth era firms were small and many focused on a single product line. Such firms did not need

¹⁹ On Shinsei Bank see Tett, Gillian. *Saving the Sun: How Wall Street Mavericks Shook up Japan's Financial World and Made Billions*. New York: HarperBusiness, 2003. The title is slightly different in England. For Sumitomo Mitsui FG, see materials from a press conference of the CEO at the Foreign Correspondents Club of Japan, January 16, 2007. I met periodically with employees of Mitsubishi UFJ Financial Group, and followed press accounts of numerous problems at Mizuho FG.

sophisticated financial controls; they could focus on market share, sales growth and on the cost side, physical measures of productivity. Over time, however, once narrowly-oriented firms grew and moved into new product lines; they ceased to be simple operations. Consumer electronics producers such as Matsushita and Toshiba, for example, made products from heavy electrical goods to semiconductors to computers to appliances, becoming highly diversified.²⁰ Slower growth, faster product cycles, and competition from imports affected one or another product line. Managerial systems, based on market share, rates of new product introduction and physical productivity at the divisional or even factory level, proved unable to capture the impact of this on profitability. The high liquidity and low nominal interest rates of the late 1980s and the 1990s helped hide problems; when interest rates are virtually zero, any investment that eventually generated a positive cash flow seemed to make sense. Return on investment and similar financial management tools developed in the US over the last 80 years offered a clear model for that. It is however also a set of skills foreign to most current managers.

How to model

As these examples suggest, understanding change at this level is not straightforward. I present two simple models below, which posit one of two extremes: totally inflexible and perfectly flexible institutions. There likely is no single model that captures the complexity that lies between these extremes. I offer a framework of my own that provides a richer set of categories, but is not amenable to testing. Instead it is a set of typologies that help organize information and provide a small measure of order. Such theory is therefore useful as an expository tool, and may suggest additional questions, but is poorly suited for testing; it is more useful for a book than for an academic paper.

Two simple "received" models

The management literature offers two simple, albeit stark models of institutional change. One of these is the Carroll and Hannan model of organizational ecology; the other is the resource dependency theory associated with Pfeffer. Both offer clarity of structure. Carroll and Hannan posit that once born, organizations are unable to change their fundamental attributes, so that industries change through exit and new entry, not through corporate-level restructuring. Pfeffer in contrast views institutions as highly malleable, so that they adapt continuously to their environment.²¹ On the surface we have seen exit in various forms in Japan – most of Japan's auto assemblers are now controlled by other firms, and the city banks, big steel, petrochemicals, textile makers, paper makers and others have consolidated into a smaller set of firms. Yet new entry is sparse and at the margins, via imports and firms operating in new market segments; however haltingly, a range of firms are shifting in response to an environment of slow economic growth, new technology and regulatory change, with winners

²⁰ For Toshiba, see Mark Fruin's study.

²¹ I have not kept up with this literature, and my reading of it antedates using a computer for notes. I also associate the names Powell and Scott with the resource dependency approach. The following appears to be a useful reference, but I have not yet looked at it: Sanidas, Elias. 2005. *Organizational innovations and economic growth*. Edward Elgar.

and losers apparent in the auto industry, among others. This result is commensurate with neither of the received models of institutional change.

Towards a nuanced model: technical change as an analog for organizational change

As a starting point I approach organizations as technologies, and apply a set of typologies used to understand technical change to organizations. The simple framework I draw upon categorizes technical change into 3 or 4 types; it also suggests flows among these, though that is not the focus here. The labels are of my choosing, since the jargon is only partially standardized:

- basic science
- invention
- development
- refinement²²

An example of *basic science* is Albert Einstein jotting down the theory of the photoelectric effect²³ during his lunch hours while working in the Swiss patent office. It is in general low in cost, but in advance it is uncertain whether a particular line of research will generate results, much less whether they will be useful.

Invention consists of realizing that the photoelectric effect can create a pattern of static charge on the proper metal film. That insight, combined with the knowledge of static adhesion, allowed an inventor working in his wife's kitchen in Queens, New York to demonstrate that particles of sulfur could be made to adhere to the reflection of a text image and then transferred to a piece of paper. This effort cost the inventor, one Chester Carlson, his accumulated savings and his marriage, and it was still unclear that this patent would lead to a practical device. But the inventor had sufficient reason to believe that the basic principle could be made to work, and eventually turned out the single fuzzy image of text needed to procure his 1942 patent for an "electrophotography" process. Many attempts at invention surely hit a dead end, and perforce leave little or no trace; in any case, such efforts are undertaken with a strong sense that something is at least conceptually feasible. However, few patents lead to commercial projects; most lie unused, impractical in one or another aspect, or superseded by other inventions.

The actual *development* stage to commercialize an invention is much more predictable, particularly when it is an extension of known technologies, but it is much more costly. It can entail not merely the time-consuming details of product design but also developing or modifying production processes. Commercializing likewise may require significant marketing. To turn Carlson's kitchen demonstration into the initial commercial prototype of a xerox machine took 10 years of further work. Development required devising optics, paper handling, a workable toner and a heating process to fix the pigment to paper. The initial machines were leased by a dedicated sales force, and needed trained operators – and came with an attached fire extinguisher, as paper jammed under the heater tended to burst into flames. In current terms, the development step entailed over \$100 million.

²² These latter two vary; in some sources they are respectively "commercialization" and "innovation."

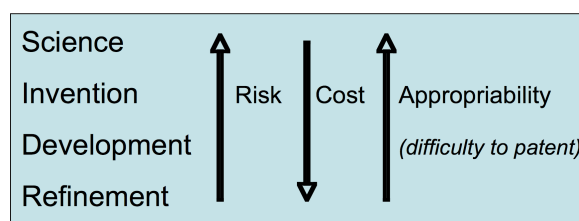
²³ His Nobel Prize was for analyzing how light can generate electrical charge, not for the theory of relativity.

Further *refinements* and innovations become more predictable. For example, having commercialized "xerography" using a flat plate, the advantages of using a rolling drum were obvious; printing presses with rotating platens and paper feeding had been around for two centuries, providing a starting point. However, it took a full decade – from 1949 to 1959 – to go from the initial xerox model to one with a rotating drum and automated paper feeding mechanism that could be operated without extensive training. More time and resources were spent refining the initial xerox machine than in the initial science, invention and development processes combined, on the order of \$600 million. Since then many billions of dollars have been invested in developing xerox-friendly papers, paper handling mechanisms, toners, optics and more recently digitization. Typically, each of these many increments represented a concrete engineering problem, and could be approached with a rough budget, time frame and expectation of success.

In sum, as technology moves from science to refinement, risks shift from being high and unknown to predictable and low, while at the same time costs shift from small amounts to ones that are in the aggregate very large. The net combination means that basic science is almost never undertaken by commercial enterprises (with the occasional exception of large monopolistic firms); instead it is publicly funded. In contrast, the refinement stage is almost entirely a commercial undertaking; at least in the U.S., government programs (such as the various FreedomCar projects) are explicitly limited to pre-commercial demonstration of technological feasibility.²⁴

Figure 1

All of this comes together in the induced innovation model. Given that technical change is costly, it ought to respond to expected profits rather than to blind chance or some unfathomable process of scientific progress. It is



all too easy to focus on the textbook images of Edison intently staring at his first working light bulb, with the slightly disheveled look that we associate with genius. However, his New Jersey laboratory was the prototype for the modern commercial R&D lab. He evinced little interest in science; most of his work relied on applying well-known principles, and ascribed only 1% of his vast inventive outpouring to inspiration. The other 99% was due to perspiration, and he was determined to see that his hard work paid off financially. For that to happen, he had to be sensitive to risks, balancing the likelihood of success against the avoidance of losses. Of course not all innovation is driven by the profit motive; when it comes to new weapons, militaries are more concerned with the occasional success than with the many failures. It should thus not be surprising that historically many advances sprang from the military sector. Profit is nice, but we need to remember the aphorism that necessity is the mother of invention.

²⁴ The limitations of intellectual property protection overlap. It is very difficult to prevent the flow of ideas in science, while the uncertainty about commercial value means that it is almost impossible to "sell" such information. Refinements in contrast are the focus of the patent system, and are undertaken with the hope of attaining clear commercial objectives.

Management as technology: analogs to technical change

This categorization of technological change offers a potential framework for organizing issues of institutional change in a richer manner than the received models of organizational ecology and resource dependency, but with a corresponding loss in tractability. The goal is to illuminate why certain types of change seem to occur readily and routinely, and why others seem to be so difficult, and suggesting that there should be a large middle ground where, with appropriate incentives and a strategic commitment to face costs and risks, change can occur, but where otherwise the status quo will continue. The following sketches preliminary correspondences between managerial or strategic issues and the typologies outlined above.

At the refinement end of the spectrum, organizations and managers are constantly tinkering with operating routines and daily structures, at least if they are operating in a market-oriented context.²⁵ In a retail operation, certain products will be slow moving, new products need prominent display and so on. It is also possible to observe rivals, and notice that they are stressing certain products, or discounting others. Of course, large operations rely on standardization, and so restrict discretion. It is however possible to build in a tolerance for, or even an expectation of, certain types of adaptation. In the auto industry, monitoring many dimensions of quality and productivity is straightforward. It is then possible to budget engineering and administrative time to improving those areas, and to carry it out in a systematic manner. Combined with the slow but gradual evolution of components and production technologies, the cumulative impact on final product quality and cost has been substantial. Offhand I know of no measures of total expenditure, but after several decades, with many man-hours per year per factory, the aggregate opportunity cost is surely many times in excess of the development costs of a new vehicle.

The details in a specific production context are often buried within the physical configuration of sensors and check gauges, and the standardization of work flows that seek to avoid error and waste. At that level, they are very difficult to appropriate. At the same time, the overall process by which incremental quality and productivity improvements can be obtained is the matter of textbooks and can be supplemented through consultants. Competition means that such methodologies are widely diffused; even poorly managed firms understand that such routinized change is necessary. There is relatively little difference in performance among firms destined for bankruptcy, such as Ford, and industry leaders such as Toyota.

At the opposite end of the spectrum, the basic strategic positioning of a firm is quite resistant to change. Restaurants can tinker with their menu, but it is more difficult to change the layout of their work areas and customer space, or their physical location. Deliberate, unforced exit followed by *de novo* entry is possible, indeed occurs with some frequency, but the benefits are highly uncertain; forced exit and unsuccessful entry are all too common. This seems to match the basic science end of

²⁵ Government bureaucracies have less incentive to adapt, and because they are producing products that are not or cannot be sold, have a difficult time evaluating their performance.

the technology spectrum; new ideas abound in marketing and the retail sector, but implementing them is risky, and successful concepts are often the result of many iterations, backed by a measure of good luck.

In a somewhat similar vein, perhaps it is possible to view spin-offs and acquisitions as akin to invention. Changes in the inner workings of underlying divisions are not key to the process; investment banks and conglomerate executives avoid the rough work of development and refinement. Failure rates, however, are high; the ebb and flow of deals is subject to fads and finance, when money is easy and optimism runs rampant about the ability to develop a business into a real money maker.²⁶

One example might be the "Big Three" auto firms in the US after 1986, when they were flush with cash but did not believe investment in automotive operations made sense. All bought aerospace companies, rental car companies and extended their finance operations by buying banks (and at GM, the computer services company EDS). In most cases these operations did not contribute to the core automotive business, though that was often the putative intent of the ventures. All were eventually unwound (though in some instances the selling prices were higher than the acquisition costs). This process was repeated during the late 1990s "dot com" bubble, when Ford and GM were again flush with cash, but skeptical of the future profitability of the passenger vehicle market.²⁷

Change in Japan

Can this loose model help us organize thinking about change? In terms of the employment relation, adjustment at the margins in the face of business downturn can take place via attrition—in particular less new hires—changes in bonuses and restrictions on overtime. This will require corresponding minor adjustments elsewhere in the organization, at least initially, with fewer incoming workers to take over the work that the previous year's cohort had done. This perhaps is analogous to the *refinement* of routines. Greater pressure can lead to an extension of these margins. Early retirements or, if the downturn is specific to an individual firm or narrow industry, greater use of *shukko*, can speed attrition of expensive older workers; such measures may require negotiations with the union, and threaten colleagues of senior managers, if not the managers themselves. The firm can in addition attempt to contract out specific tasks to other firms with younger workforces, and can make more aggressive use of women and contract workers. This however is likely to require the development of new patterns of organization, so that tasks once reserved for "regular" workers can be

²⁶ A cynical interpretation is that in such an environment greater fools can be handed the risks, and the early entrants and transactions specialists can pick up profits and fees; the more inventive the deal, the better!

²⁷ The second time around, however, the companies lost most of their investments, and suffered the additional cost of the diversion of the attention of senior executives away from the firms' core automotive businesses. Neither GM nor Ford have recovered from the poor product mix that came out of that era. Surely they should have understood that, with a high fixed cost structure relative to new entrants due to legacy costs, they could not afford to lose market share and "top line" revenue?

assigned to others.²⁸ This is a more difficult set of adjustments, threatens more vested interests inside the political structure of the firm, and may not solve the underlying problem.

More inventive methods are available. In the new megabanks, the old internal promotion ladder is giving way to a sharper distinction between line and staff. The former now receive little in the way of increased pay for tenure; staff resemble more closely the salarymen of old.²⁹ Conceptually this will require the creation of new incentive mechanisms, ways to motivate those who have little apparent chance of promotion and who are not offered steady pay increases if they toe the line and put forth what is viewed as a good effort. Instead it is a potentially a much purer form of pay for performance, but again conceptually that will require a clearer statement of job expectations and other "objective" means of evaluating work. Accompanying this would be a diminished weight for the periodic job rotations of the received system, and of the personnel department, historically a power center within bureaucratic "lifetime employment" firms, with the head of personnel advancing to a senior executive position or, in a significant fraction of large firms, to the post of CEO.

A final basic change is potentially available, that would require dispensing altogether with the promote-from-within, hire-from-school patterns. At present that would be a major leap. For one thing, the career path of the typical salaryman is to a set of posts, and not to a set of discrete jobs.³⁰ It is thus very difficult for an outsider to evaluate what skills a particular individual might have; simply because they were the manager of a technically-oriented unit may not mean that they themselves had technical skills. One of the difficulties job placement offices have found with those who have retired early is that they are unable to write a resume. Moving entirely away from the status quo would thus likely entail a fundamental restructuring of internal personnel policies, and probably could not be done in isolation as movements among firms would require that this be done widely, rather than on an isolated basis. There are small movements in this direction; headhunting firms now find more clients, while those whom they approach readily return their calls.³¹ Those obtaining professional qualifications of one or another sort (MBAs, CPAs) are on the rise. This is thus an approach that might help large firms avoid the rigidities of their lifetime employment systems, but at the same time faces risks from partial implementation, potentially costly disruption and demoralization, for benefits that rest primarily on claims of its effectiveness in other economies.

This set of parallels is quite loose, but does at least give a sense of a hierarchy of possible adjustment mechanisms, and the need to think in terms of the risks and returns that they involve. A

²⁸ Gaston, Noel, and Tomoko Kishi. "Part-Time Workers Doing Full-Time Work in Japan." *Journal of the Japanese and International Economies* forthcoming (2007).

²⁹ Interviews with former banking colleagues suggest this transition started around 2000 at Mitsubishi UFJ Financial Group; it however required grandfathering older workers. They believed this pattern was prevalent but I have no direct reports of practices at other firms to corroborate.

³⁰ This is truer in fact than in principle in the US; see the description for one large US firm of the high proportion of promotions and transfers to newly created posts, which then disappear when their occupant shifts elsewhere. Rosenbaum, James E. *Career Mobility in a Corporate Hierarchy*. Orlando, FL: Academic Press, Inc. (Harcourt Brace Jovanovich, Publishers), 1984.

³¹ Comments of Sakie Fukushima, chief headhunter for Bain in Japan.

fuller development requires laying out the stimuli for change more carefully – if necessity is the mother of invention, what creates the perception of necessity, and why this invention? It does provide one approach for thinking about how organizations might change, short of *de novo* creation of new organizations (and the simultaneous death of the old) of the population ecology approach, and yet remain more constrained than the perfect flexibility assumed in the resource dependency models.

Normal change: consumption

With shifting incomes and the availability of new products, many facets of consumption changed. Before returning to the opening topics of rice and eggs, I note the very different array of consumer durables that fill Japanese apartments and houses today. The advent of DVDs, for example is still within recent memory; videocassettes are still around. Diffusion was rapid; in 2001 they were virtually unknown, by 2006 at least 60% of households owned one. But there are many more commonplace items that were not widely diffused until the 1970s. Of course color TVs did not exist until the second half of the 1960s, and in 1968 just 5% of households owned one; by 1975 over 90% of households had bought one, and today each family on average owns 2.5 TVs. (The newest generation of cell phones in Japan, launched at end-2006, come equipped with a TV!) Microwave ovens are another example; a new good in 1970 (at least from the standpoint of statisticians bothering to track them), it took until 1987 before half of households had one. Some 97% of households now own one, and that is reflected in the array of frozen foods and other ready-to-heat items (include fancy rice mixtures) available in supermarkets. Other changes have been more gradual. Less than one in six Japanese slept in beds in 1965; today two-thirds do so. For younger Japanese, sleeping on a *futon* on a *tatami*-mat floor is something that they've done only on school outings and family ski trips. (Changes in housing will be traced later.)

Finally, car ownership spread. In 1971, a quarter of Japanese households owned a vehicle. They were most prevalent in rural areas, where distances were greater and buses infrequent. Only in 1983 did three-quarters of households own a car. Ownership now hovers around 85%, in part because of the large number of single-person households of young (college-aged) and elderly.³² However, two out of three households that have a car now have more than one. As will be detailed later, public transport in suburban and rural areas has been cut back sharply; a car is a near-necessity. In contrast, in central Tokyo parking is still scarce, and congestion unending. New condominium developments nevertheless come with parking, and owners of older houses typically add a garage when they renovate. The diffusion of car ownership is a normal response to rising incomes. It does however lead eventually to complementary changes in location and transportation that reinforce the underlying desire for personal mobility.

³² Unlike the US, in Japan 18 is the minimum age for a driving license. Many colleges are in urban centers; virtually none have parking for students. Indeed, one of the few drawing points for Kyoto Gakuen University, a 3rd-tier school in Kameoka outside of Kyoto proper, is that students can drive to school.

Rice

What of rice? In European and American culture, few of us eat boiled potatoes or grain porridges, or bake our own bread and biscuits. With higher incomes comes a move away from starches processed lightly at home to prepared foods, store-bought bread and frozen "steak fries" or even pre-made sandwiches and pasta meals. We are accustomed to more variety in our diet, instead of relying upon a single staple. Porridges and boiled potatoes also strike us as bland. Finally, it takes time to prepare them (though microwaves now allow potatoes to be cooked rapidly). Compared to our grandparents day, our time is more valuable, while technology has kept the price of processed foods low. Why should Japan be otherwise?

Let me then proceed in the manner of the typical economist, checking my initial observation against data. For consumption, most developed countries undertake regular of household consumption and expenditures, in which a large set of randomly chosen families keep a diary of what they purchase.³³ Japan is no exception, and later I will look at changes in categories, as new ones are added (pet food, DVD recorders) and old ones dropped (sewing machines, kotatsu,³⁴ public baths, multiple types of sake and whiskey³⁵), as one way to gain insight in changes in lifestyle. Here I focus narrowly on the consumption of grains, which is divided into three categories, rice, bread and noodles.

The data show large changes, occurring in two waves: a steady decline in rice consumption as a share of cereals from the early 1960s through 1974, during which consumption fell by more than half; a decade during which there were no changes, ending around 1986; and gradual declines through the present. In 1963, rice accounted for 18.5% of food expenditures; by 2005 this had fallen to 3.6%. Consumption of other grains, in the form of bread and noodles, remained steady (2% of consumption for noodles) or gradually rose (from 2% to 3% for bread).

Detailed data show sharper trends; rice consumption is greatest in rural areas, and is far greater among those over age 60 (and moreso for older women) than for other demographics. The expenditures of urban households on rice averaged 30%; for rural areas, 40%. Likewise consumption of rice is greater among poorer households (data provide a breakdown into five income brackets or quintiles); since many older Japanese have low incomes, this is probably reflecting the same underlying generational gap. In contrast, 50% of the expenditures on cereals of the highest income bracket were on bread, and only 26% on rice. But it is the behavior of younger age brackets that stands out. Some 55% of the purchase of those age 34 and under are for bread, and over 20% for

³³ Among other things, the underlying data are used to provide a reference point for calculating inflation. Of course they are also of interest to marketers and many others.

³⁴ Kotatsu were low tables with an electric heater underneath; before heating and insulation became more common, and tatami mats less so, you would spend much of the winter underneath.

³⁵ I saw no one drink *mizuwari* (scotch and water) during my year in Japan; it was once the standard drink. Changes in regulation eliminated the old *sake* grades; now there is a range of *jizake* (local vintages), beer-like beverages (differing from true lager beer in composition if not taste to take advantage of differentials in taxation) and mixed drinks based on *shochu*, Japanese-style vodka made from varying mixes of rice, barley and potatoes or other Asian tubers.

noodles; rice now ranks third, at 15% for men and 19% for women. Diets have changed in many ways, of which this is only one.

But is this really true? A parallel change is the increase of both purchases of prepared food and of eating out. In 2006 the highest income quintile spent ¥2,000 a month on cereals, but ¥7,350 on cooked food of which ¥4,620 was cooked with "rice, bread or noodles." They also spent ¥33,930 on eating out. So one possibility is that rice consumption has not fallen, but is consumed either as part of processed foods or over lunches and dinners eaten outside the house. Two other sources provide data on consumption that is gathered in different manner: one is the Health and Welfare Survey, one component of which asks people to record what they actually eat over a specified period of time; the other is the production and use data collected by the Ministry of Agriculture, Forestry and Fisheries. They show the same overall trend, but indicate a less extreme change. In the production data, apparent consumption was 110 kg per person in 1961; by 2002 the level had fallen almost by half, to just under 60 kg per person.³⁶ The nutrition survey showed consumption of rice, directly and in other products, of 360 grams per day in 1960; by 2000 that had fallen to 160 grams per person, or 44% of the earlier level. The same source shows wheat consumption, including via noodles, increasing from 65 grams per day in 1960 to 94 grams in 2000, an increase of 44%. In these data, rice remains the staple, unlike in the household consumption data.

The change is thus not an artificial result from the choice of data source—but is a reminder that data need to be interpreted thoughtfully. What of other factors, such as prices? While I have not done a formal statistical analysis, data suggest no change in the relative price of rice to bread. On average prices relative to income have fallen, particularly over the past decade of deflation. In the case of rice, the abolition of the system of controlled distribution, which at one time meant consumers had to go to a local rice shop and not a grocery store, meant an absolute drop in prices. The formal price series suggests a 56% drop in price between 1996 and 2006; assuming that the changeover exaggerated this shift, and looking at only the changes within the old series plus those within the post-deregulation series still leaves an 18% drop in prices. Meanwhile the price index for bread fell a mere 1% and that for noodles actually rose a suspiciously large 67%. Other data series show very little change in rice prices between 1956 and 1985, and little change for bread as well. The only real difference is when prices in the 1930s are compared to postwar prices, during which the price of bread relative to rice fell by 50%. That however was a one-time shift long predated the decline in rice consumption. This furthermore is in the midst of a long-term decline in the share of food in consumption, a regularity noted long ago by the 19th century economist, Ernst Engel. In 1963 food was 37% of household budgets; in 2006 it was 22%.³⁷ Rice prices were not a serious budget constraint.

³⁶ The chart I append is from a slightly different source; the qualitative story is the same.

³⁷ Clothing is another category where import competition and the retail revolution has had a big impact on prices; expenditures in that category declined from 11% to 5%. From this perspective, the residents Japan (as well as other developed countries) can readily afford the occasional gourmet meal or even Louis Vuitton bag.

One final cost of rice consumption is time. This is hardly a novel observation. The well-known literature specialist, Donald Keene, encountered this as early as 1953, when he first lived in Kyoto. Enthusiastic about the experience, he requested "only Japanese food" of his hostess. She however eventually persuaded him to accept toast for breakfast. As he put it, "I had not realized how much time and trouble it was to prepare a Japanese breakfast. Naturally, I agreed."³⁸ While digitally-controlled electric rice cookers in principle allow consumers to have rice steamed and waiting when they come home, and *musen-mai*³⁹ cuts preparation time, it is still viewed as more time intensive than bread, both for preparation and for cleanup. Perhaps a closer examination of the timing of diffusion of electric rice cookers, and of the participation of (urban) women in the labor market, would fit the data.

Eggs

What of eggs? Until fairly recent times, eggs were but an occasional part of diets; the egg-on-rice mixture was invented, or at least popularized, only in the late 19th century, and eggs remained a sideline production of households.⁴⁰ While they were not luxuries before WWII, neither were they an item of daily consumption. In contrast, in the initial decade following the war, eggs were scarce and expensive; in 1946 a kilogram of eggs cost twice more than a 10 kilo bag of rice. A single egg was a good present to take to someone who was sick—high in nutrition, easy to digest, and an item they would likely not purchase for themselves. Prices however fell rapidly, to half a bag of rice by 1950, and 30% of a bag by 1955. Even then production remained low; in 1955 total egg output, including that used in baking and other indirect uses, was 71 eggs per person. As modern "factory" production of eggs took root in the early 1960s, the price of eggs plummeted, and they became a regular item of consumption; by 1965 the level rose to 221 eggs per person.⁴¹ By the time I first arrived in Japan eggs were therefore a normal item of consumption.

Why then could I not find an egg for my Imperial Hotel breakfast? The answer turned out to be very simple: salmonella. An outbreak earlier that fall had consumers afraid, and restaurants (including that at the hotel) wanted to avoid incidents and demands for monetary compensation. That fear passed, and by 2006 raw eggs were again available.

Summary: Models and Generational Change

Economic models work with averages, and are best suited to pick up broad trends that are based on shifts in price, income and other environmental issues. They cannot predict permanent shifts, much less fads, whether based in popular culture or (perhaps justifiable) health concerns. Careful use of

³⁸ Keene, Donald. *On Familiar Terms: A Journey across Cultures*. Kodansha International, 1994, p. 136.

³⁹ "No-wash" rice, popularized through a new 2005 trademarked brand. This saves a couple minutes of washing the rice grains prior to adding water for cooking.

⁴⁰ Japanese wikipedia lists Kishida Ginko, Japan's first war correspondent and a peddler of traditional Chinese medicines, as the popularizer.

⁴¹ For 1965, the first year for which I found data, direct consumption accounted for 65% of total production. On that basis, 1955 consumption comes to 51 per person or less than 1 egg per week. In the last two decades direct consumption averaged about 3.4 eggs per person per week, and indirect consumption of about the same.

models will always bump up against puzzles such as these, sometimes minor, sometimes completely baffling; any model complex enough to catch the nuances of behavior will either be very application-specific, or too complicated to be useful. On occasion the "real" explanation will be missed because other variables seem to offer an adequate explanation. But as here, they can also provide the impetus for further detective work, which sometimes will find other, compelling answers. Or, as here, they may leave a puzzle. The Japanese diet changed markedly over the last century; sushi of course is dependent on refrigerated transport. Curry rice was popularized by the Japanese navy in the 1910s; ramen got its biggest push from a shop outside the gates of Hokkaido University in Sapporo in the 1920s, and instant ramen was invented in 1958.⁴² Food culture seems to be tremendously mutable. Certainly it is closely tied to the rise in incomes of the postwar period; urbanization and technical change made their contributions. In the end my personal belief is that it is best viewed as an example of generational change, most of which occurred within living memory, and much in the past couple decades.

⁴² Cwiertka, Katarzyna. *Modern Japanese Cuisine: Food, Power and National Identity*. London: Reaktion Books Ltd, 2006.