

## **Structural Change and Adaptation**

### **Myths and Realities**

A common myth about Japan is that its labor force is immobile and its industry inert. The assertion that Japan's economy is less dynamic than that of the United States appears on the surface to be indisputable. Boggled down by slow growth or outright recession in the 1990s, the Japanese economy frequently is characterized as mature, if not downright decrepit. The American economy, in contrast, has been lauded for innovations in finance and retailing and for new digital technologies. Japan more often than not is criticized (appropriately) for the overregulation, cartels, and collusion that are holding back its productivity. With conventional wisdom congealing in a negative assessment, it may be a good time to examine the overall dynamism of that aging creature, especially in comparison with the seemingly ever-youthful American counterpart.

One reason to explore this issue is that policymaking in Tokyo often is influenced by the belief that change is unacceptable to most citizens. Politicians' avoidance of hard-landing solutions to work out the country's problems is due in part to the desire to avoid large, visible disruptions. As will be discussed below, however, the Japanese economy has steadily absorbed structural changes that are at least of the same magnitude as those faced by the United States. The seemingly moribund Japan is more adaptive in several dimensions than its own citizens and leaders realize.

### Structural Dynamics: Changing Industry Shares

Economic flexibility requires, among other things, structural adaptation to technological change and to the shifting demands caused by rising income levels, demographic transitions, and changing tastes. The conversion from agriculture to manufacturing to services is the broad structural transformation usually associated with economic growth. With more detailed information than this familiar three-sector breakdown, it is possible to track the variations of employment and output over the years and to measure them comparatively.

One measure of structural transformation adds up the year-to-year changes in industry-specific shares of employment or gross domestic product. Consider a situation where employment in a specific industry (transportation equipment, for example) experienced a plunge in the number of employees that equaled 1 percent of the total labor force of the country; at the same time, the health-services business experienced an increase of the same magnitude. One measure of structural change adds together the values of the changes in both industries (ignoring, in this case, the minus sign in manufacturing). In this example, 1 percent of the work force crossed industry lines.<sup>1</sup> This measure of structural change at time period  $t$ ,  $S(t)$ , for employment, aggregated over the entire economy, is:

$$S(t) = 100/2 * \{|(E_i(t)/E(t) - (E_i(t-1)/E(t-1)))|\},$$

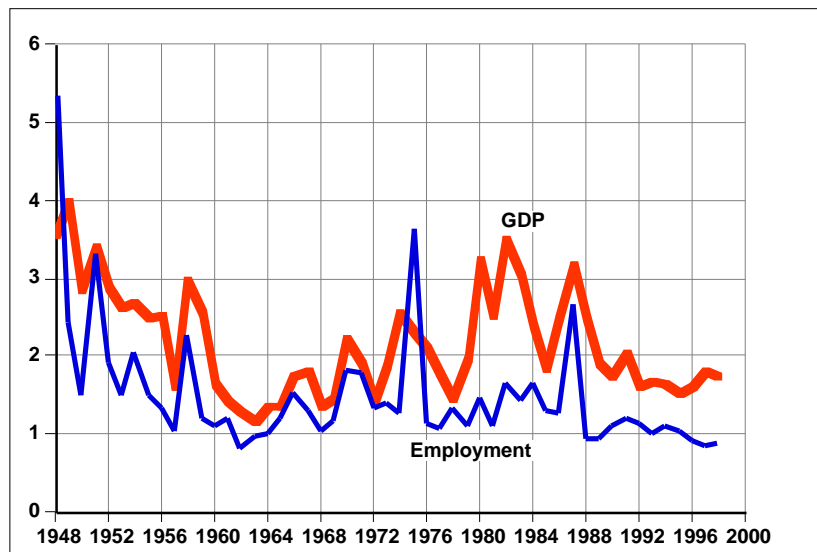
where  $S(t)$  is the sum of the absolute percentage changes in employment across all industries between time period  $t-1$  and  $t$ ,  $E_i$  is employment in industry  $i$ , and  $E$  is total economy-wide employment. The summation of absolute changes is taken across all industries for time period  $t$  and is divided by two to eliminate double-counting. Of course, (using the above example) individual workers in the transportation equipment industry would not necessarily have taken jobs in health services. Net transfers across industries plus people moving in and out of the work force would add up to the measured value. A similar calculation substitutes GDP by industry for employment in the above equation.

One problem with this measure is that it is sensitive to the level of detail in the data used to measure the structure of the economy. Narrower categories would produce a larger index of movement because a specific move more likely would be across industry lines. Therefore, in making

comparisons, it is important to use similar numbers of categories and industry definitions.

The U.S. Department of Commerce produces statistics on employment and GDP originating in sixty five industries. Figure 11.1 shows the structural shifts in the U.S. economy from 1948 through 1998 using the measure of change defined in the equation described above. Structural change was relatively high in the immediate post-World War II years as the economy adjusted to the accumulated effects of the depression and the war. Things quickly settled down, though. Since 1960 or thereabouts, employment has crossed industry borders at the rate of around 1 percent per year. GDP has followed the same general path, but that measure of structural change jumped to more than 3 percent in the 1980s, only to fall back to the 1.5 percent level in 1996. The 1990s do not indicate any speedup in change that may be associated with conjectures about a “new American economy.”

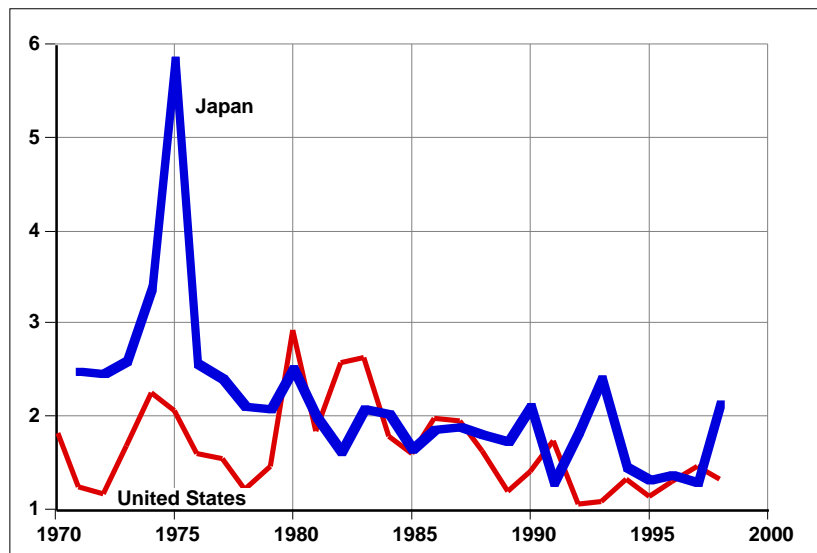
**Figure 11.1: Structural Change in the United States Measured Across Sixty Five Industries, 1948-1998**  
(annual aggregate percent change)



Source: United States, Department of Commerce

The categorization of Japan's GDP data is not as detailed as the U.S. breakdown: it covers forty industries versus the sixty five included in the Commerce Department series. In order to make country-to-country comparisons, the U.S. information was aggregated into forty industries based on the Japanese definitions. As expected, reducing the number of American groupings yielded slightly smaller measures of structural change, particularly in peak years. The average difference, though, was less than 0.5 percentage points. Figure 11.2 compares structural change in Japan and the United States based on GDP originating in the forty comparable industries. Except for a spike in 1975, which reflected the recession induced by the first oil shock, changes in Japan parallel the American experience. From 1980 on, in fact, the two curves are virtually indistinguishable. Those who believe that the economy of the United States is more dynamic than Japan's will have to look to other evidence for confirmation.

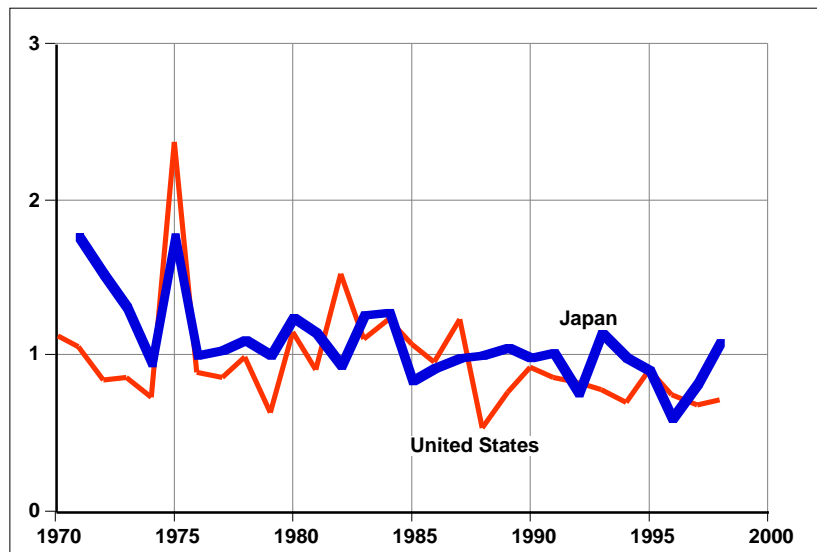
**Figure 11.2: Shifts of GDP Across Forty Industries,  
Japan and United States, 1970-1998  
(annual aggregate percent change)**



Source: United States, Department of Commerce;  
Japan: Economic Planning Agency

They will not find it in employment data. Employment curves for the two economies are shown in figure 11.3. Japan's employment data are broken down into 25 industries; the U.S. figures were reaggregated into the same number of categories. The employment curves lie even closer together than the GDP curves do, with the difference in their average values amounting to less than 0.1 percentage point. For both countries, the spike in 1975 again reflected the response to the 1973-1974 surge in international oil prices.

**Figure 11.3: Shifts of Employment Across Twenty Five Industries, Japan and United States, 1970-1998**



Source: United States, Department of Commerce;  
Japan: Economic Planning Agency

These findings are quite striking and surprising. They indicate a broad similarity in the aggregate pattern of structural change in Japan and the United States. Both economies responded to the immediate postwar environment with a considerable reshuffling of people and production resources and then adapted to the flux of economic life with the same magnitude of adjustment.

A look behind the aggregate pattern, however, reveals important differences among the two economies. Across the forty similarly defined

industries, the correlation between the changes in GDP of Japan and the United States over the 1970-1998 period is 0.55, indicating only a loose relationship between the gainers and the losers in each economy. The biggest outliers in the comparison include finance and health services, the GDP shares of which grew in the United States by 4 percentage points and 2.6 percentage points, respectively, but rose in Japan by only 0.7 and 0.6 percentage points.

The GDP share of general government (including national, state, and local governments) in the United States fell by 2.7 points over the 1970-1998 time frame compared with a gain of 0.9 point in Japan. Construction, an industry that in Japan is a noted beneficiary of political favors, jumped by 2.0 percent of GDP while falling 0.7 percent in the United States. Real estate in Japan vaulted by an astonishing 5.2 percent of GDP against a more modest U.S. increase of 0.9 percent. In the remaining industries, the movements were more alike. If the four industries with the greatest differences are dropped from the sample, the correlation between GDP changes on the two sides of the Pacific rises to 0.80, suggesting that Japan and the United States have undergone fairly similar structural changes over the past twenty five years or so for 90 percent of the industries.

The Japanese economy's sharp rise in 1975 was due mainly to an increase in construction activity as the government resorted to public works to stimulate the economy out of its first postwar recession. The small 1993 spurt in activity included positive increases in construction and personal services combined with losses in machinery production, wholesale trade, and finance. The rise in 1998 also was from a change in construction, but this time in a negative direction as government stimulus programs came to an end. These spikes reflect the use of public works in Japan as a major tool of fiscal policy.

A closer look at the U.S. economy using the full 65-industry breakdown reveals that employment by state and local government grew rapidly from the late 1940s to the 1980s. With the exception of times of military buildup, the number of people working for the federal government fell over most of the same period. By 1960, more people worked for state and local governments than for Washington. During the 1980s, though, state government's share of GDP declined. State and local government shares of GDP and employment were associated with the education demands of the baby boom and its movement through the educational system.

According to these measures of economic dynamism, the United States and Japan are not all that different. Although the growth paths of

several sectors diverge, for the most part, the development of the two economies since at least 1955 has been quite similar when measured by shifts in GDP and employment across the full range of industries.

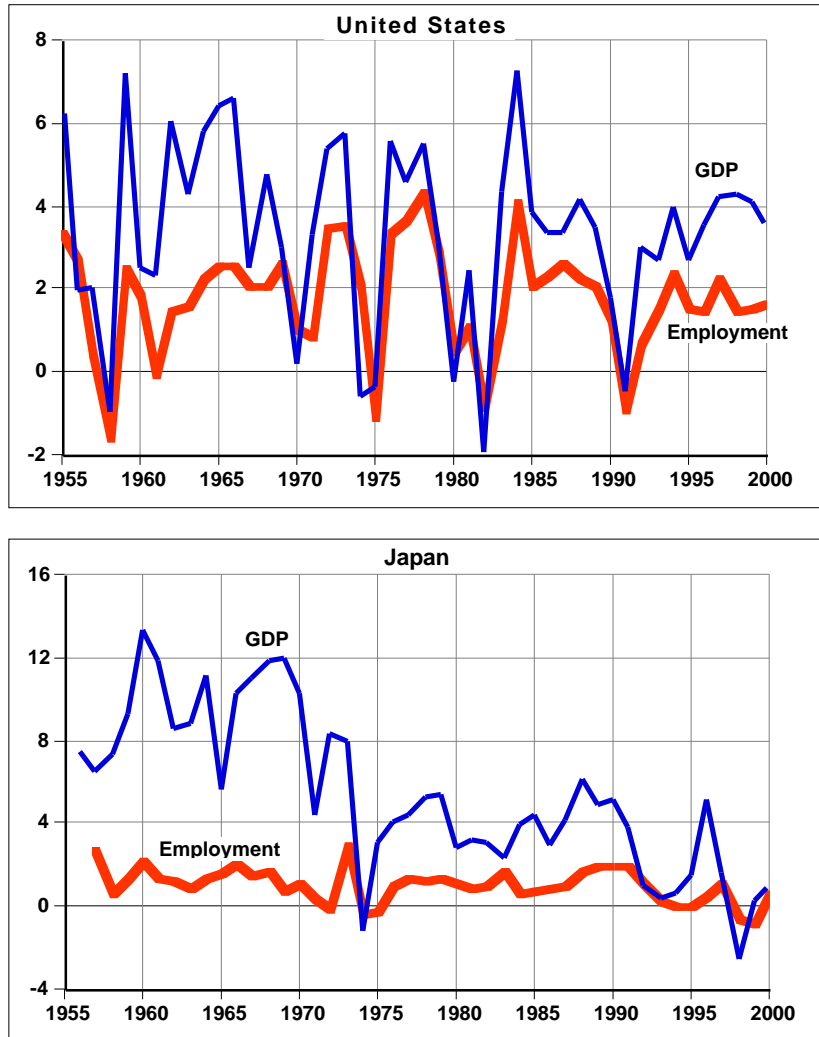
Perhaps the presumed greater dynamic quality of the American economy can be explained—despite its nonappearance in these calculations—by the argument that the industry classifications used in this analysis are too coarse to capture the mutations that occur. The presumed dynamic quality of the American economy may be among firms rather than industries. For example, American retailing is one of the more innovative sectors. Its continuous transformations are illustrated by the competitive dynamics of company sales rankings. A McKinsey Global Institute case study of the retail sector found more than 17,000 failures in the United States in 1994 versus 5,000 in Japan, despite the fact that there are many more smaller retail and wholesale establishments in Japan. An examination of the top 10 retailers in different market segments in 1982 and 1992 showed high turnover rates among the biggest U.S. department stores and discounters, with three new department stores and five different discount operations in the top ranks. In Japan, however, the same general merchandise retailers appeared in the top ten over the course of a decade; within the rankings, there were only two shifts of a single place between years.<sup>2</sup>

The long-term growth of income and productivity in Japan demonstrates that the country has adapted successfully to the never-ending shocks and forces impinging on any global economy. This responsiveness shows up at the industry level examined above. If there are basic differences, they must lie at the level of the firm or the individual.

### **Employment and Changes in GDP**

The responsiveness of employment to variations in economic output is one indicator frequently cited as proof of the relative adaptiveness of the American economy. This relationship is illustrated in the top and bottom panels of figure 11.4. The conventional wisdom correctly predicts the two different patterns observable in the figures: employment follows output more closely in the United States than it does in Japan. The elasticity of employment with respect to real GDP (the annual percent change in job numbers associated with a 1 percent change in output) is 0.53 in the United States, whereas the employment elasticity in Japan is only 0.19.

**Figure 11.4: Percentage Changes in GDP and Employment, United States and Japan, 1955-1999**



Sources: United States: Department of Commerce;  
 Japan: Economic Planning Agency; Statistics Bureau, Management and Coordination Agency



One reason for the stability of employment at the economy-wide level is that government acts indirectly as the employer of last resort through its public works program. Public works are important partly because of the weakness of automatic stabilizers in the Japanese public fiscal system. In many countries, particularly Canada, Germany and the United Kingdom, unemployment compensation and various welfare benefits rise automatically when the economy turns down. The movement of the government deficit responds quickly and without the need for explicit fiscal policies and decisions. In Japan, however, these automatic stabilizers are not well developed; they never had to be in the past since unemployment and a large welfare burden were not part of the economic structure. The need to use discretionary measures to react to recessionary strains puts greater weight on active fiscal policy and results in a bumpy adjustment process. Because of a political preference for public works and because they are relatively easy to implement quickly to get money into the hands of the public (and the construction companies), this tool has become a principal method for stimulation in times of slow-down.

As business turns down in recessions, construction spending increases. These complementary changes are one cause of the stable overall employment levels as well as of the bumps in the structural change curves seen in the figures above.

This evidence, though, points to only one aspect of employment flexibility. It says that American companies as a whole are more likely than Japanese firms to react to changes in demand by hiring and firing workers. However, there are other ways to respond to shifting output. Wage rates and hours also can be altered. A study by the Paris-based Organization for Economic Cooperation and Development is consistent with many others in finding that wages and hours in Japan are markedly more responsive to ups and downs in output than they are in Germany and the United States. From 1960 to 1991, wage rates in Japan were thirteen times more affected by employment conditions than was pay in the United States. Hours worked were some 17 percent more adaptive.<sup>3</sup>

Simple correlations between annual changes in real GDP and changes in total employment, average weekly hours worked, and average real hourly earnings lead to conclusions that are similar to those produced by the econometric models used in the OECD study. As shown in table 11.1, the relationship between GDP and employment is quite strong in the United States, with a correlation of 0.73 versus a 0.50 match in Ja-

pan. At the same time, neither hours nor earnings are closely related to changes in American output. In Japan, however, they are.

The conclusion that the U.S. labor market is more flexible and adaptive clearly depends on the measure being used. Nevertheless, the rapidity of employment change in the United States permits a faster response to shifts in demand. Wages and hours adjustments in Japan are constrained by legal restrictions and social norms from fully adapting to severe or prolonged declines in company fortunes. After bonuses and overtime hours are reduced, reductions in base salaries or the length of the work week are rarely contemplated. The reluctance to engage in layoffs without the compulsion of imminent business failure prolonged Japan's adjustment process in the 1990s.

**Table 11.1: Correlations between Annual Changes in Real GDP and Changes in Employment, Hours, and Real Earnings**

Variable	United States	Japan
Employment	0.73	0.50
Average Weekly Hours	0.07	0.40
Average Real Hourly Earnings	0.54	0.69

Notes: The years included in the correlations are: 1948-1997 for GDP and employment in the United States; 1964-1997 for U.S. earnings and hours; and 1955-1998 for Japan's GDP, employment, hours, and earnings. Weekly hours and hourly earnings (for the United States) were lagged one year.

The fact remains that not all companies in Japan are able to avoid layoffs or closure. During the 1990s shakeout, many establishments disappeared. According to the Establishment and Enterprise Census conducted by the Management and Coordination Agency, the number of establishments fell in 1996 for the first time since the original census was undertaken in 1947. The decline was 10 percent—a net loss of 86,000 production units—between 1991 and 1996. Employment in manufacturing contracted by 1.2 million, or 8.3 percent, over the same period. The net disappearance of almost ninety thousand manufacturing establishments suggests that the gross loss was considerably greater; the creation of new firms partly partially offset the number of closures in the reported net figures. Where did the people who had worked for these firms go? Many found jobs in the services sector, where total employment jumped by 2.4 million-plus from 1991 to 1996, according to the establishment census.

The apparent stability in the gross employment figures shown in figure 11.5 hides a good deal of churning occurring below the surface. In 1998, for example, total employment fell by almost a half million people (about 0.7 percent) from the year before, according to national income accounting definitions. However, not all industries lost workers. The official accounts break down employment for the entire economy into twenty five sectors (as shown in figure 11.3). Seven of these had job gains in 1998, three were stable, and fifteen lost employment. Although the net decline of employees across the entire economy was 465,000, the ups and downs across the twenty five sectors added up to 1,435,000 people, or more than three times the net flow, equal to 2 percent of total employment.

### **Political Implications**

The employment figures cited above indicate that the jobs situation in Japan is not as moribund as the popular myths and lifetime employment norms would lead one to expect. Although the slowdown of Japan's economy in the 1990s produced a good deal of political dither and muddle, most people who lost their jobs managed to find new ones. Remarkably, the Japanese media paid little attention to the structural changes going on in the economy, highlighted by the significant decline in the number of manufacturing establishments and the accompanying net loss of more than 1.2 million jobs between 1991 and 1996. Apparently, these indications of the economy's flexibility also have gone unrecognized by the public at large. Even people who have been forced to change jobs seem to believe that their personal history does not represent the more general experience.

The notion that people in Japan do not move from job to job or that industries and companies are static is belied by the evidence. More importantly, it restricts policy choices. In fact, the myth of a rigid economy may be the biggest barrier to political efforts to deregulate and open Japan to achieve more competition and raise productivity. Since these beliefs are so widely held, it may take some time for the reality of Japan's adaptability to reach a level of popular acceptance that could free up the political will to proceed vigorously with economic restructuring.

**Notes**

1. This measure was developed in Douglas Ostrom, "Postwar Japanese Industrial Policy and Changes in Industrial Structure" (Ph.D. diss., University of Michigan, 1984).
2. McKinsey Global Institute, *Capital Productivity* (Washington, D.C.: McKinsey Global Institute, June 1996).
3. Dave Turner, Pete Richardson and Sylvia Rauffet, *The Role of Real and Nominal Rigidities in Macroeconomic Adjustment: A Comparative Study of the G3 Economies* (OECD Economic Studies, 21) (Paris: Organization for Economic Cooperation and Development, Winter 1993), 97, 100.