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Bank of Japan

Hysteresis and Sluggish Growth in Wages and Prices: The Case Study of Japan

Presented at the 30th Villa Mondragone International Economic Seminar in Rome

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(The views expressed here, as well as any remaining errors, are those of the authors and should not be ascribed to the Bank of Japan.)

Abstract

Despite the recent strong economic recovery, growth in wages and prices has been sluggish across the globe. Japan has come to face this issue ahead of any others. The policy authorities of each economy could learn something from the case study of Japan. This article will examine some factors that have restrained growth in wages and prices in Japan, and discuss the desired policy responses to address this issue.

In relation to the theme of this session – inequality, wages, and growth – factors responsible for this curb on growth in wages and prices can be divided primarily into two categories. One is "hysteresis" brought about by past serious economic downturns. Serious economic downturns have left persistent damage to the supply side of the economy through various channels, including an increase in the number of "discouraged workers" and "involuntary non-regular employees," a slowdown in (human) capital accumulation, and the inefficient business processes that took root under excessive competition. This damage has created the slack that is easing the upward pressure on prices that has come from an expansion in demand. Besides this hysteresis, the second category includes factors of a more structural nature that reduce upward pressure on wages amid an increase in labor demand. These factors include: an increase in labor participation of women and the elderly, whose wages are relatively low; firms' and households' anxiety for the future; and technological innovation in the IT industry, such as robotic process automation (RPA) and artificial intelligence (AI).

If the supply-demand conditions continue to tighten, the factors in the former category will eventually mitigate with hysteresis reversing. Moreover, the reversal of hysteresis is a desirable change, in that it can enrich people's lives. To bring this about, the Bank is expected to continue to maintain the adequate level of tightening of supply-demand conditions, thereby supporting the reversal of hysteresis. Given that it could take some time to reverse hysteresis, the Bank needs to conduct monetary policy while closely monitoring the economic and financial conditions so that no severe distortion will be created under the prolonged accommodative financial condition. Meanwhile, factors in the latter category need to be addressed in a more structural way. Monetary policy and structural policy must

nonetheless address the issue interactively, since these factors are somewhat related to each other.

This article consists of three sections. Sections I and II are assessments of the factors responsible for sluggish growth in wages and prices, jointly written by Makoto Sakurai and Masahiko Kataoka. Section III is a personal assessment by Makoto Sakurai of the current situation and what policy responses should be made.

I. Reversal of Hysteresis

Serious economic downturns create persistent damage to the economy.[1] Since the 1990s, the growth trend in Japan's economy marked a significant fall following each serious economic downturn. This is attributable to persistent damage to the supply side of the economy through various factors such as an increase in the number of "discouraged workers," who are deterred from seeking employment despite wanting to work, and "involuntary non-regular employees," who reluctantly accept employment as non-regular employees, together with a slowdown in (human) capital accumulation, and the inefficient business processes that took root under excessive competition. While an economic downturn is fundamentally assumed to be a cyclical, or demand-side, phenomenon, the mechanism by which it influences the medium- to long-term growth trend through damage to the supply capacity is referred to as "hysteresis."

It has also been pointed out that hysteresis that arose in earlier periods can be reversed to a certain degree amid robust aggregate demand.[2] In Japan, the uptrend in economic growth has been increasing recently in a situation where aggregate demand has continued to increase strongly, and the aforementioned damage to the supply side of the economy is also being mitigated. Under the circumstances, growth in wages and prices has been contained. Specifically, the expansion of the supply side of the economy due to the reversal of hysteresis eases the upward pressure on wages and prices that has come from an increase in aggregate demand. In other words, hysteresis that arose in earlier periods has created the slack that is easing the tightening of supply-demand conditions. Past economic downturns in Japan have been more serious, and even more frequent, than in other advanced economies. Against this background, the hysteresis in Japan might remain relatively deep-rooted (Chart 1).

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[1] For example, Cerra and Saxena (2008) conducted an empirical analysis of past financial and political crises and found that, in many serious crises, the adverse impact on the growth rate persisted even after a decade.

[2] For example, Ball (2015) states that past damage to the supply capacity can be reversed under a "high-pressure economy" -- that is, a continued expansion of the economy -- and that the Federal Reserve might be justified in maintaining a low-interest rate environment for a longer period, as long as inflation expectations are anchored. Yellen (2016) argues that, although this point deserves consideration, the risk of an accumulation of financial imbalances and price instability warrants attention.

In what follows, the changes that have taken place in Japan's supply capacity since the 1990s will be discussed by focusing on hysteresis associated with labor input and labor productivity.

A. Labor Input

1. Decline in the labor force participation rate

A decline in the labor force participation rate is one of the channels through which hysteresis associated with labor input occurs. There are a number of reasons why people find it increasingly difficult to get a job as their period of unemployment becomes longer: for example, their abilities diminish relatively since they are unable to enhance their practical skills through work experience, and prolonged unemployment becomes a stigma in their career.[3] Consequently, some of those who are unemployed for a prolonged period will give up seeking employment and become discouraged workers, who are regarded as being excluded from the labor force population. In fact, after the bursting of the asset bubble in the early 1990s, the labor force participation rate in Japan turned down sharply, and the labor force population also started to decline.

However, the labor force participation rate has recently turned to an uptrend amid the long period of continued economic expansion. As news reports about labor shortages increase and firms dig deeper into the labor market by, for example, relaxing their recruitment criteria, people who once gave up seeking employment have now started to participate in the labor market again. Reflecting these developments, the number of discouraged workers is declining (Chart 2). Along with the factors which have led to labor participation of women and the elderly as mentioned later, the size of labor force has increased by 2.21 million in the six years since the beginning of 2012, and this accounts for nearly two thirds of the 3.34 million increase in the number of employed persons.

[3] Referring to firms' reactions to job applicants' résumés, Kroft and Lange (2012) showed that, if unemployment exceeds a certain period of time, this will make it harder for the applicant to find employment because of stigmatization and other factors.

2. Increase in involuntary non-regular employees

Another channel through which hysteresis is generated is the increase in the number of involuntary non-regular employees, who, despite wanting to become regular employees, reluctantly accept employment as non-regular employees, due mainly to "the absence of firms that will employ them as regular employees." Job offers for regular employees decrease and the number of involuntary non-regular employees increases when firms shift to hiring non-regular employees to cut labor costs and secure employment flexibility in response to an economic downturn. It has been pointed out that if someone begins working as a non-regular employee upon graduation, they are subsequently less likely to be employed as a regular employee.[4] Since working hours for non-regular employees are relatively short, an increase in the number of involuntary non-regular employees leads to a decline in labor input. Since the 1990s, the number of involuntary non-regular employees has increased substantially in Japan, as firms have sought to benefit from employing non-regular employees.

That being said, the number of involuntary non-regular employees has recently begun to decline amid an increase in labor demand. With a view to securing additional labor force and retaining existing human resources, firms are increasing the recruitment of regular employees and converting non-regular employees into regular employees. While the number of involuntary non-regular employees has decreased by 0.85 million in the five years since early 2013, the number of regular employees has increased by 1.35 million (Chart 3).

B. Labor Productivity

1. Sluggishness in business fixed investment

Sluggishness in business fixed investment can be cited as one of the channels through which hysteresis associated with labor productivity is generated. Such sluggishness leads to

[4] Genda *et al*. (2010) examined changes in type of employment by analyzing the data of labor statistics. The results showed that the type of employment upon graduation, especially for those with lower education, has an effect on future employment prospects. The following were given as reasons: non-regular employees do not have adequate chance of being trained; and the lack of experience in being employed as a regular employee could be viewed in a negative light by recruiters.

a deceleration in capital accumulation. An increase in aging capital stock and delays in the introduction of new technology contributes to a sluggish rise in total factor productivity (TFP).[5] Since the bursting of the asset bubble in the early 1990s, Japanese firms have reined in fixed investment as they have been burdened with excess production capacity and excess debt, with the banking sector tightening their lending attitudes. Since then, business fixed investment has been contained within the scope of depreciation expenses over the years. As a consequence, aging capital stock has increased and the introduction of new technology has tended to be delayed (Chart 4).

2. Reduction in the cost of education and training

Firms' attempts to cut costs by reducing spending on education and training leads to a deceleration in the accumulation of human capital and a sluggish rise in labor productivity. This is related to the aforementioned increase in the number of involuntary non-regular employees. While firms address skills development for regular employees through systematic on-the-job training (OJT) and other programs, both on-site and off-site, they tend to avoid proactive investment in the training of non-regular employees, who are not intended to be employed for a long period in the first place. Since the 1990s, Japanese firms have shifted to hiring temporary workers rather than regular employees and have endeavored to minimize the cost of education and training against the background of labor costs being a burden on corporate profits due to excessive employment (Chart 5).

3. Excessive competition among firms

Excessive competition among firms stemming from protracted deficient demand may also have contributed to the decline in labor productivity. Since the 1990s, many Japanese firms have been drawn into fierce competition, cutting excessively the price of their products and providing extravagant services. As a result, inefficient work practices and the provision of excessively high-quality services for their prices have been seen in some industries. For example, the proportion of businesses in the wholesale and retail industries operating 24 hours a day increased rapidly from 1.6 percent in 1994 to 5.5 percent in 2014. A questionnaire survey conducted on people who have resided in both Japan and the United States shows that a large number of services in Japan are regarded as lower in price for the

[5] For example, see Haltmaier (2012).

quality (Chart 6).

Japan's labor productivity appears to have declined through the various channels mentioned earlier. It is often pointed out that labor productivity in Japan is lower than in other advanced economies. For example, Jorgenson *et al.* (2016) made a comparison between Japan and the United States in the levels of labor productivity, showing that productivity in Japan was around 40 percent lower than in the United States in 2012.

However, factors that had lowered labor productivity are now being addressed. As supply-side constraints materialize in tandem with labor shortages, firms are proactively making fixed investment aimed at saving labor and increasing production capacity as well as addressing the training of employees. Firms are also streamlining inefficient business processes such as unrequested re-delivery services and late-night services where sales are low. According to the OECD, Japan's labor productivity, though remaining at a low level, has recently been improving at a relatively fast pace by catching up with that of other economies (Chart 7).

II. Factors of a More Structural Nature

Sluggish growth in wages and prices is also attributable to factors of a more structural nature. The following section will consider some examples, since these factors are also important from the viewpoint of the theme of today's session.

A. Labor Force Participation of Women and the Elderly

In Japan, where the population is rapidly aging and the birthrate is dropping sharply, the government and firms have been promoting the active participation of women and the elderly in the labor market. For example, steady progress has been made in increasing the number of nursery schools and nursing homes as well as moves to extend or abolish the mandatory retirement age (Chart 8). As a result, the number of women and the elderly participating in the labor force has been increasing. The aging of baby boomers has also contributed to the rise in the ratio of the elderly to the overall workforce. Since wages for women and the elderly have tended thus far to be relatively low, these changes provide firms facing labor shortages with low-cost labor, thereby easing upward pressure on wages

(Chart 9).

Besides, although most women used to engage in jobs with simple and routine tasks, an increasing number of talented women have shifted to more professional occupations, leading to an increase in productivity. It has been noted that the easing of labor market conditions is also brought about by the diminishing of slack in terms of quality.

B. Future Anxiety

A possible decline in long-term growth potential of the economy and anxiety over future income in anticipation, for example, of cuts in pensions, results in a rise in firms' and households' reserve savings. Such anxieties also exert downward pressure on wages and prices by restraining spending. The hardships that people suffered in past serious economic downturns might also be exacerbating their anxieties. Japanese firms lack confidence in their long-term profit growth and are thus cautious about raising wages -- particularly, base pay -- that can lead to a rise in fixed costs (Chart 10). In addition, an increasing number of households are anxious about their future income and life plans, with the number of such households remaining at a high level since a surge in the 1990s. Their propensity to save money seems to have exacerbated price competition among firms, bringing about downward pressure on prices (Chart 11).

C. Technological Innovation

Advances in information technology such as RPA and AI might also be contributing to a curb on growth in wages and prices. These technologies can contribute to improving the value added and raising sales through, for example, the development of new products and services; they are not simply a means to push down wages and prices. However, few Japanese firms nowadays consider these technologies to be the key to expanding business opportunities in the market; rather, most firms tend to regard them as a means to enhance operational efficiency and cut costs (Chart 12). This tendency seems to lead to the easing of labor market conditions and downward pressure on wages and prices. Still fresh in our minds are the announcements made in 2017 by each of Japan's three major banks of their decisions to reduce the work load that corresponds to a total of 33,000 employees within the next ten years through the use of information technology.

The widespread use of smartphones and the expansion of e-commerce are also contributing to sluggish price rises. Consumers can now easily refer to and compare a broad range of information on prices at the press of a button, and purchase goods and services even from a distance. It seems that these changes have increased consumers' responsiveness to prices, consequently somewhat accelerating price competition among firms.

D. Factors Specific to Particular Industries

In some industries, downward pressure on wages and prices is brought about by specific factors. For example, although the medical and nursing care industries are expanding rapidly amid advanced population aging, service prices in these industries are controlled under the remuneration systems for medical treatment and nursing care. Thus, wage growth in these industries has been sluggish despite high demand in the labor force, the tightening of labor market conditions, and the remarkable increase in the number of employees (Chart 13).

III. Framework of Monetary Policy

As discussed thus far, it seems that both the reversal of hysteresis and the factors of a more structural nature have been constraining growth in wages and prices. With a focus on the reversal of hysteresis, which seems to be the more important factor for the time being, this is perhaps the place for a personal assessment of the current situation and what policy responses should be made to address the issue.

A. Assessment of the Current Situation and Monetary Policy for the Time Being

To reiterate the impact of hysteresis, the expansion of the supply side of the economy associated with the reversal of hysteresis seems to be restraining the upward pressure on prices exerted by an increase in demand. The active job openings-to-applicants ratio and the unemployment rate have been hovering at levels close to or above the peak level observed during the asset bubble period of the early 1990s, but the output gap has remained at a relatively low level. The aforementioned increase in labor input and labor productivity seems to have been easing the tightening of the output gap (Chart 14).

However, there is no need to be unduly pessimistic about the situation. There are two reasons why. First, the expansion of the economy's supply capacity associated with the reversal of hysteresis will not last forever. There are limits to the extent of such changes as participation of discouraged workers in the labor market, conversion of involuntary non-regular employees into regular employees, and streamlining of inefficient business processes. The accumulation of (human) capital is also expected to decelerate as firms approach the frontiers of technology and skills through the course of the replacement of aging capital stock and improvements in the education and training of employees. From a somewhat longer-term perspective, the effects of a curb on growth in wages and prices through the expansion of supply capacity are expected to wane in due course. If a rising trend in prices strengthens, inflation is expected to accelerate gradually toward the 2 percent that the Bank is committed to achieving, accompanied by a rise in the public's inflation expectations brought about through the adaptive formation mechanism.

Second, the reversal of hysteresis is itself a desirable change for people's lives. An increasing number of people are participating in the labor market in ways that meet their wishes, and firms are promoting a shift to more efficient and less wasteful working practices. Firms and employees are raising their competitiveness on the back of the introduction of new fixed investment and the development of employees' skills. Through these changes, the long-term growth potential of Japan's economy, which declined substantially in the past, is gradually strengthening again.

Although price rises are being constrained at present, the momentum toward achieving the price stability target is being maintained. Furthermore, changes that will lead to improving people's lives and strengthening the economy's competitiveness are progressing steadily. It can be said that price rises are being restrained only temporarily as a side effect of such positive changes. In fact, amid the ongoing reversal of hysteresis, Japan's economy seems to be in a very favorable condition on the whole. It is essential, therefore, for the Bank to continue to conduct monetary policy under the current framework for the time being to maintain accommodative financial conditions, so that it can also continue to support the reversal of hysteresis.

B. Future Policy Conduct in the Longer Run

The next issue is a longer-term perspective; how monetary policy should be conducted in the future. The reversal of hysteresis might take some time. The supply side of Japan's economy may still be fairly subdued as a result of past successive serious economic downturns. Meanwhile, changes in the supply side of economy -- that is, the reversal of hysteresis -- proceed at a slow pace by nature. There is no consensus in academic or other circles regarding the extent to which and the time required for hysteresis to be eliminated. However, experts have argued that, under continued strong economic expansion, much of the hysteresis can be reversed, given time.[6]

As for the outlook, the accommodative monetary policy might be maintained over a longer period, since the reversal of hysteresis could take a long time. In that case, it will be necessary to monitor the situation carefully to avoid any serious distortion in the economic and financial environment under prolonged accommodative financial conditions. The following two factors particularly warrant attention.

First, it is necessary to keep a careful watch to prevent any significant supply-demand imbalance. Changes in the economy's supply capacity proceed at a relatively slow pace. An excessive increase in supply-side constraints under prolonged accommodative financial conditions is undesirable. If economic swings amplify significantly, there could be adverse effects, such as inefficient resource allocation. The Bank may then be rushed into tightening its monetary policy, possibly resulting in an interruption in the course of the reversal of hysteresis. In this situation, prices might rise in the short run, but this will not be stable over the long run. In realizing the reversal of hysteresis, focus should not be placed solely on tightening the output gap, but rather on maintaining moderately tight supply-demand conditions for as long as possible.

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[6] Hall (2014) expresses the view that the extent to which and the time required for hysteresis to be dissipated differs for each element of the supply side of the economy, whether it is TFP, capital accumulation, unemployment, or the labor force participation rate. Kocherlakota (2014) -- expressing agreement with Hall's view -- notes that much of the hysteresis can be reversed ultimately, referring to the fact that hysteresis resulting from the Great Depression was eliminated under vigorous demand during World War II.

Second, it is also necessary to pay due attention to the stability of the financial system. In an environment where accommodative financial conditions have been maintained over a long period, the risk of an accumulation of financial imbalances will be heightened. According to the Bank's assessment presented in the April 2018 *Financial System Report*, although Japan's financial system as a whole is not showing any signs of overheating, some indicators, such as the lending attitudes of financial institutions, are very close to a state of overheating. Furthermore, if the low interest rate environment continues and downward pressure on financial institutions' profits becomes prolonged, the functioning of financial intermediation may be undermined.

Under the "yield curve control," which the Bank adopts as one of its policy tools, as inflation expectations rise and the long-term growth potential of the economy strengthens in accordance with the reversal of hysteresis, monetary easing effects will be enhanced through a rise in the natural rate of interest and a decline in real interest rates.[7] When conducting monetary policy in the future, the Bank -- while taking account of the changes in the external environment -- should consider without prejudgment the most appropriate policy so as to avoid any serious distortion in the economic and financial environment.

Upward pressure on wages and prices can be increased by appropriately addressing the factors of a more structural nature mentioned in Section II. In fact, wages for women are increasing steadily on the back of efforts by the government and firms to eliminate the wage gap between men and women. In addition, with the assumption of a further decline in population, the government is aiming to boost the number of foreign visitors and workers in order to raise the long-term growth potential of Japan's economy (Chart 15). It is also working toward developing IT-oriented human resources that are expected to create new value rather than simply raise efficiency and cut costs, so that IT-related technological innovation can be used for more creative and innovative economic activities. To raise the wages for nursing care workers, the government plans to make special and temporary

[7] Under the "yield curve control," the Bank facilitates the formation of short- and long-term interest rates that are considered most appropriate in light of the 2 percent price stability target. In the Bank's current guideline for market operations, the short-term policy interest rate is set at minus 0.1 percent and the target level for yields on 10-year Japanese government bonds is set at around 0 percent.

revisions to regulations on the remuneration system for nursing care in fiscal 2019.[8] Even more of these proactive initiatives and efforts are expected to be made by the government and the private sector. Yet, as hysteresis and the factors of a more structural nature that have been discussed thus far cannot, by their very nature, be distinguished explicitly, monetary policy and structural policy should address these challenges interactively.

[8] The Cabinet decided that the projected tax gains accrued from the consumption tax hike scheduled to take place in October 2019 will in part be used to raise monthly wages for nursing care workers who have been in service for more than 10 years by an equivalent of 80 thousand yen on average.

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June 25, 2018

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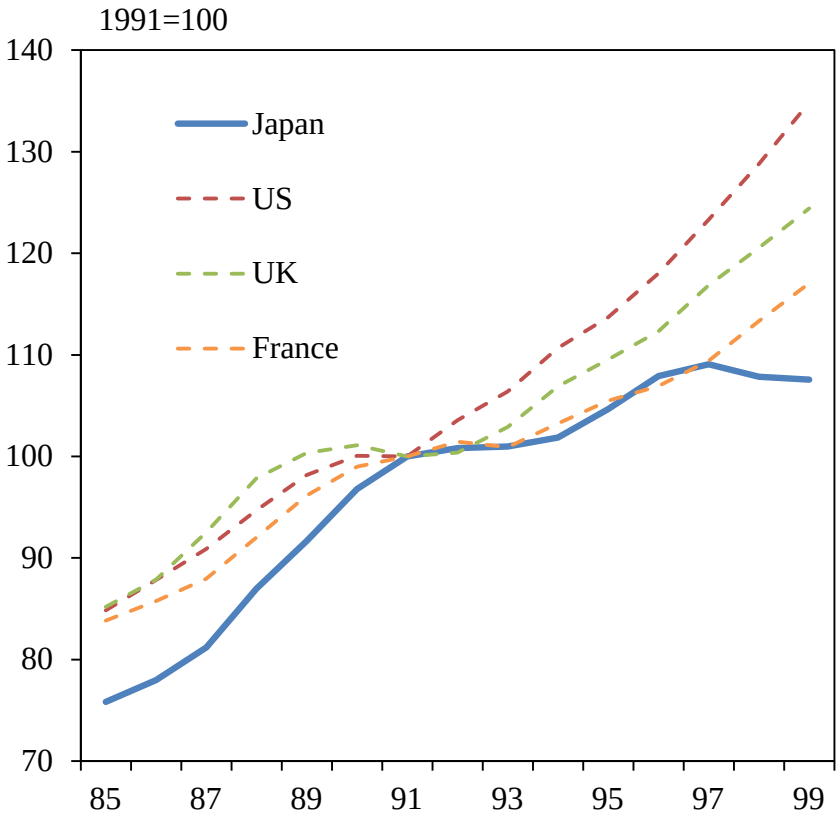
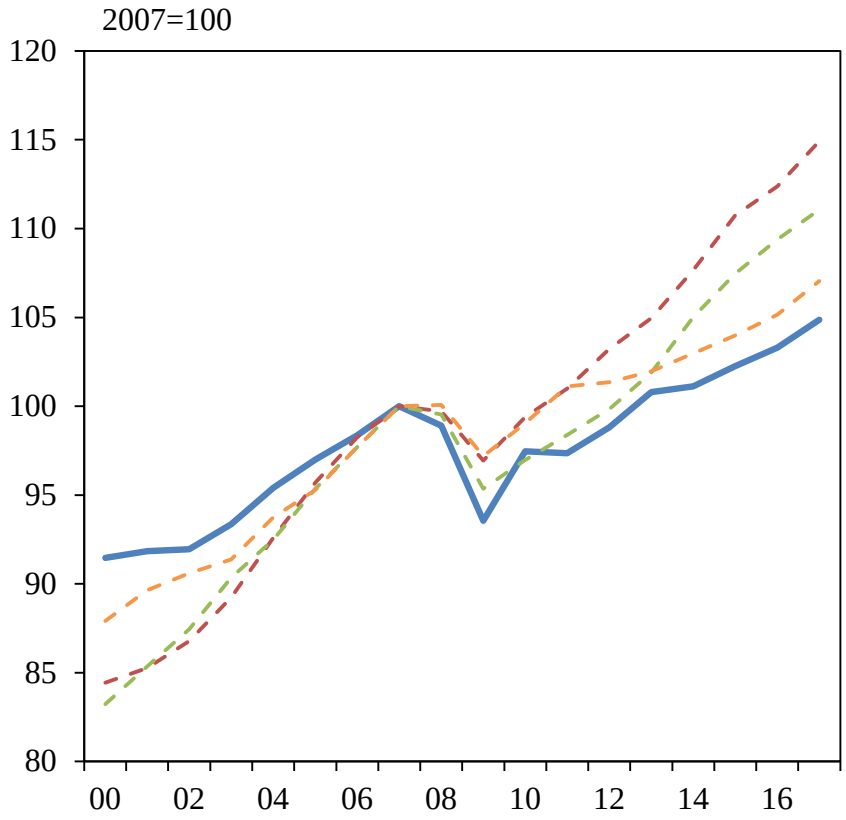
Real GDP Growth

1985-1999



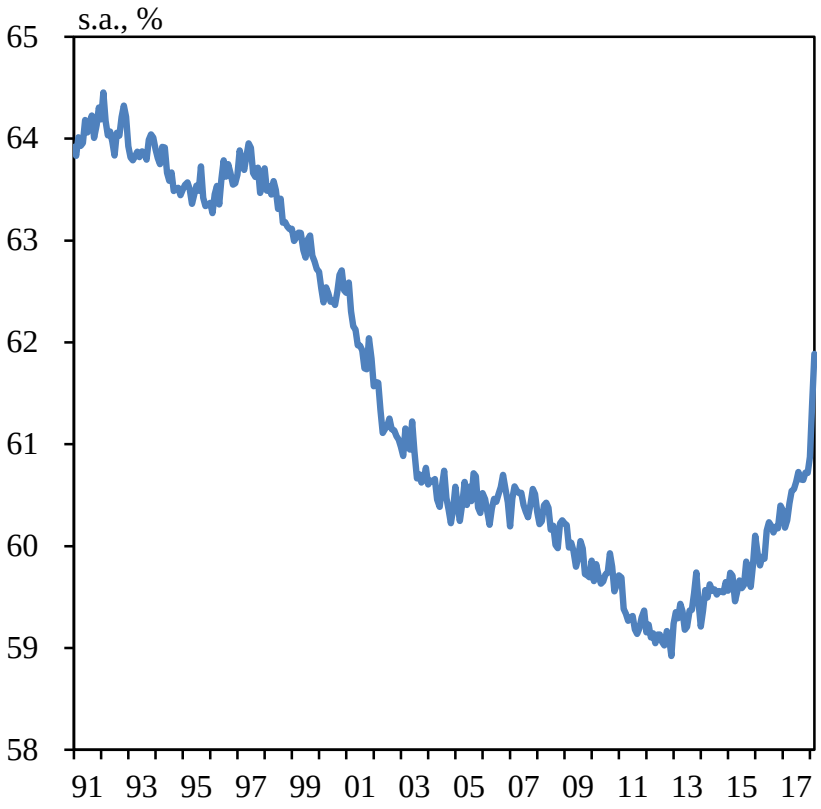
2000-2017



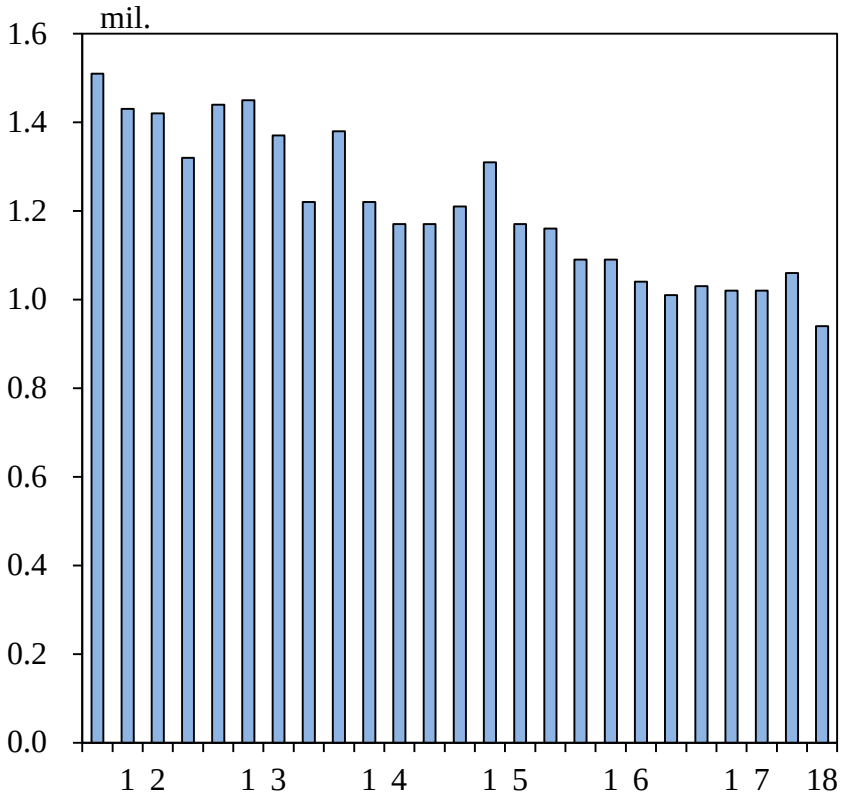
Source: OECD.

Labor Force Participation Rate

Labor Force Participation Rate



Discouraged Workers

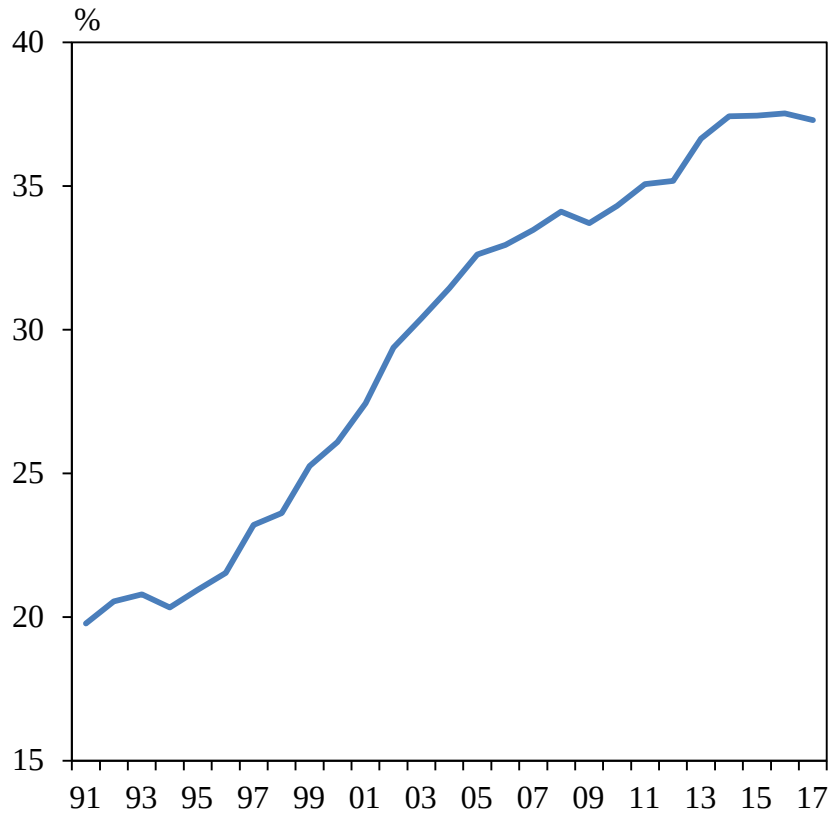


Note: Discouraged workers are people who are not seeking employment because they feel that they have no prospect of finding a suitable job.

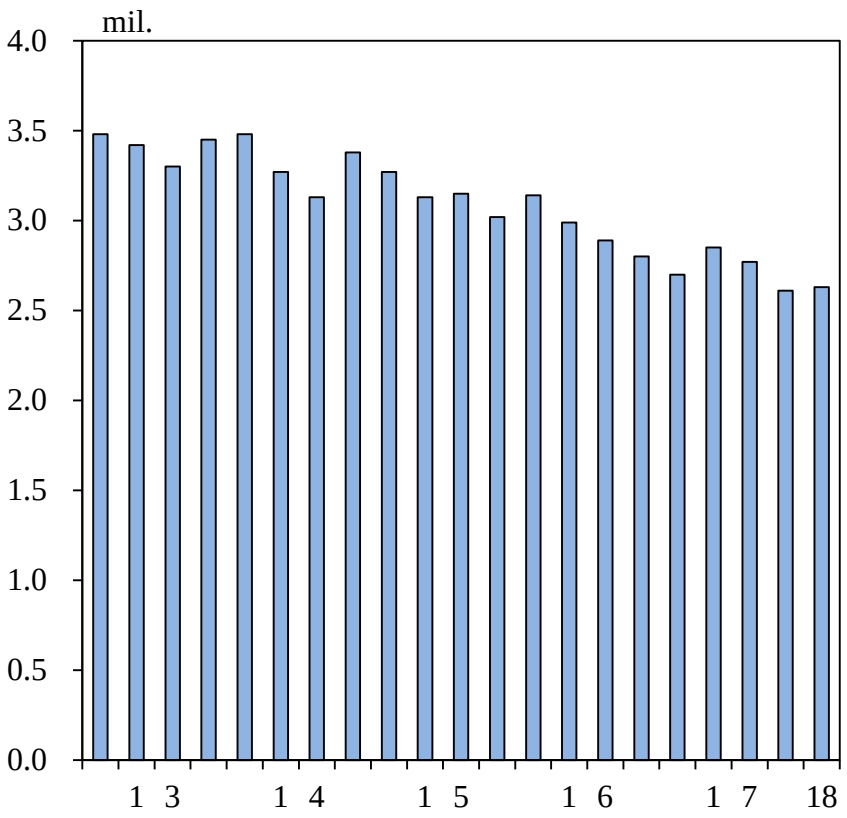
Source: Ministry of Health, Labour and Welfare.

Non-Regular Employment

Non-Regular Employment Ratio[1]



Non-Regular Employment due to Economic Reasons[2]

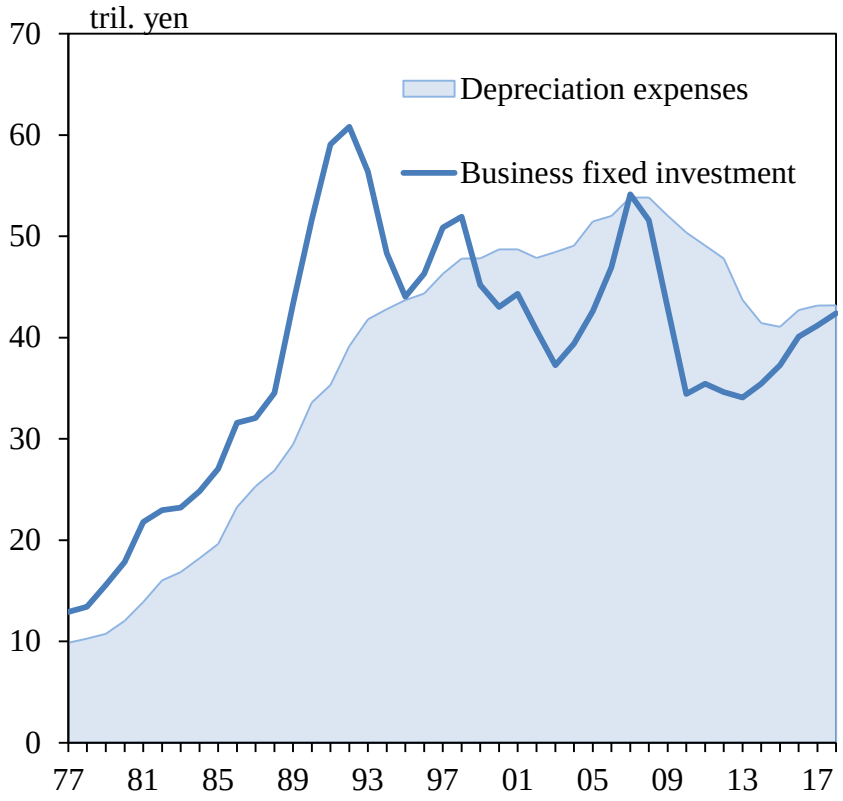


Notes: 1. The ratio of non-regular employment to total employment excluding executives of a company or corporation.
2. The number of those who work as non-regular employees due to the absence of firms that will employ them as regular employees.

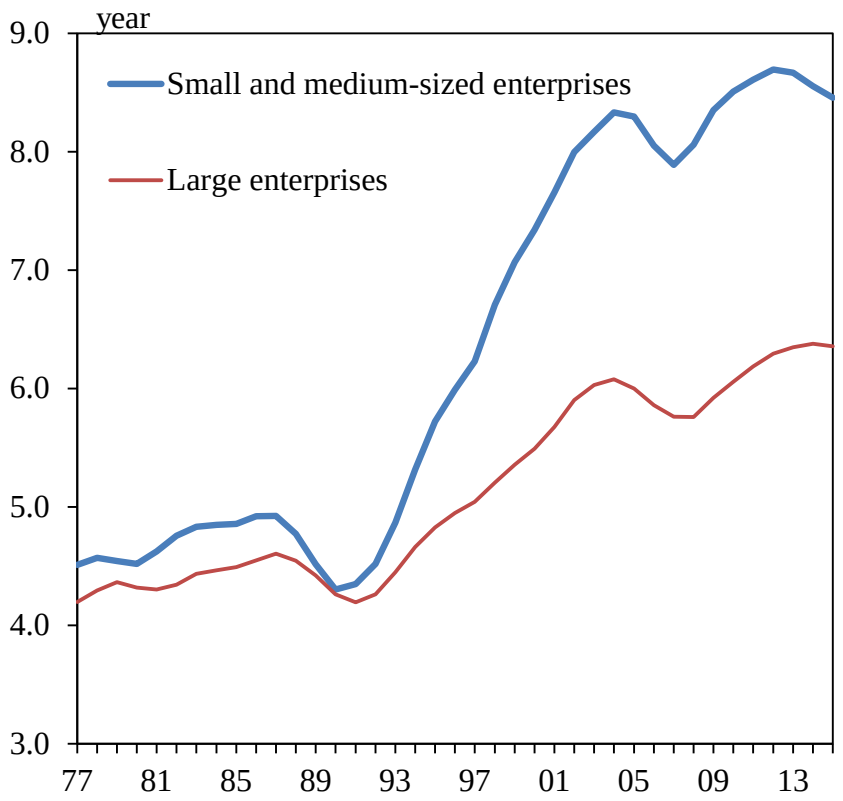
Source: Ministry of Health, Labour and Welfare.

Business Fixed Investment

Business Fixed Investment



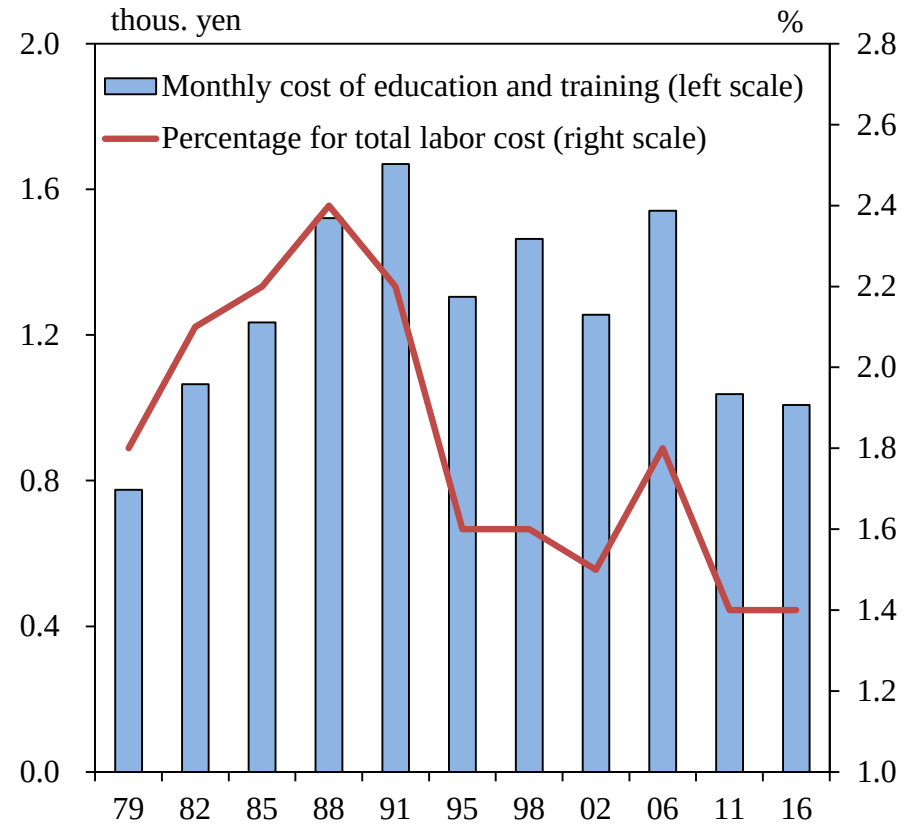
Vintage Year



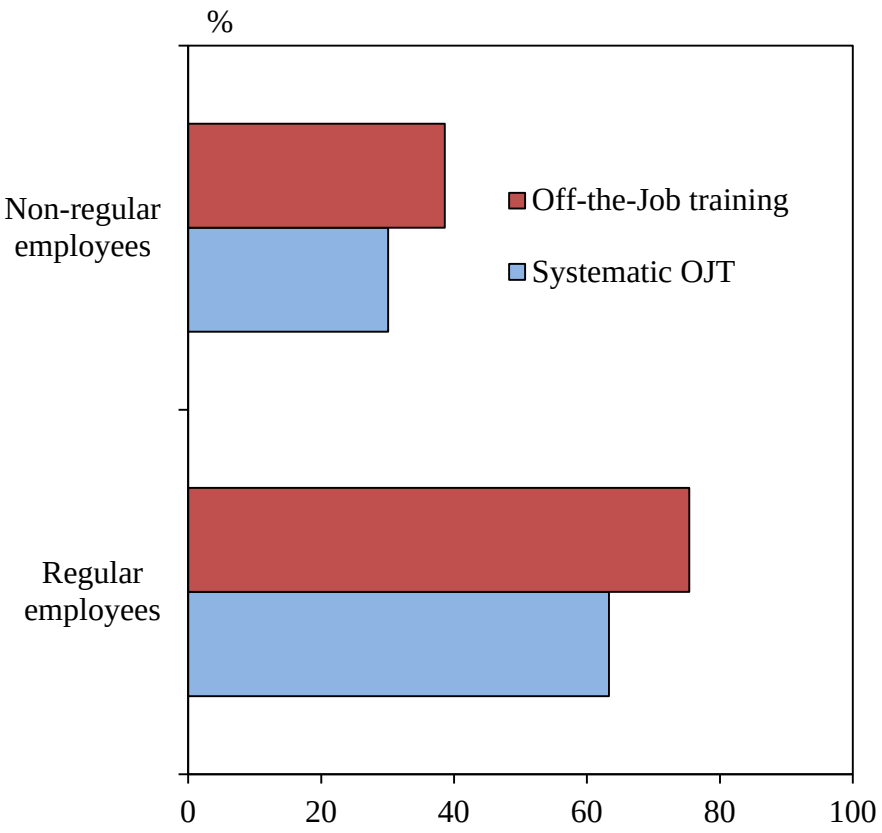
Sources: Ministry of Finance; The Small and Medium Enterprise Agency.

Education and Training

Cost of Education and Training



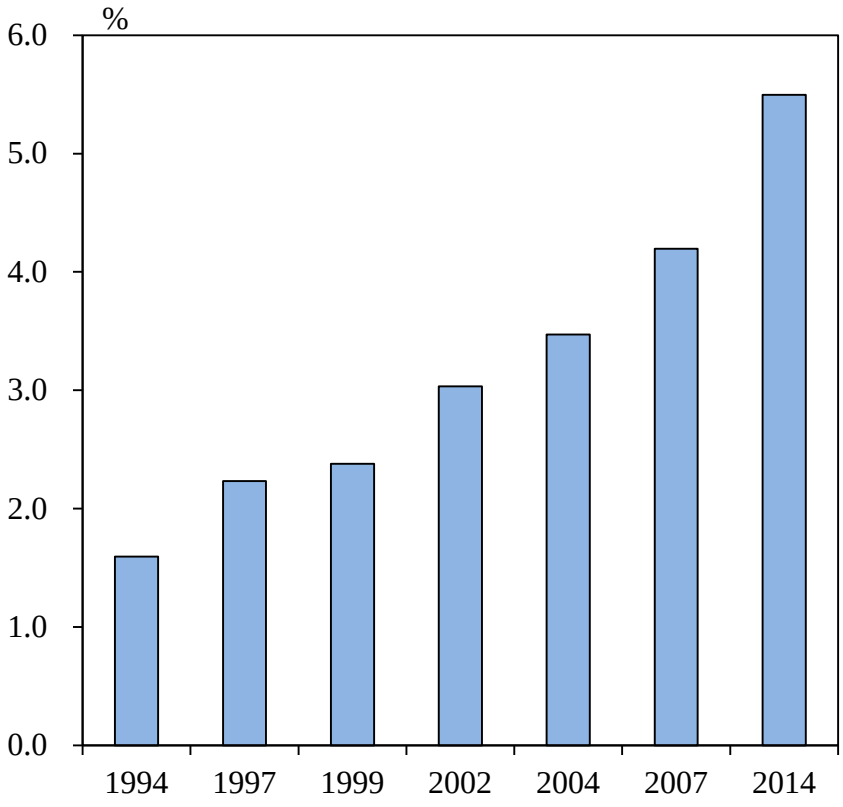
Implementation of Job Training



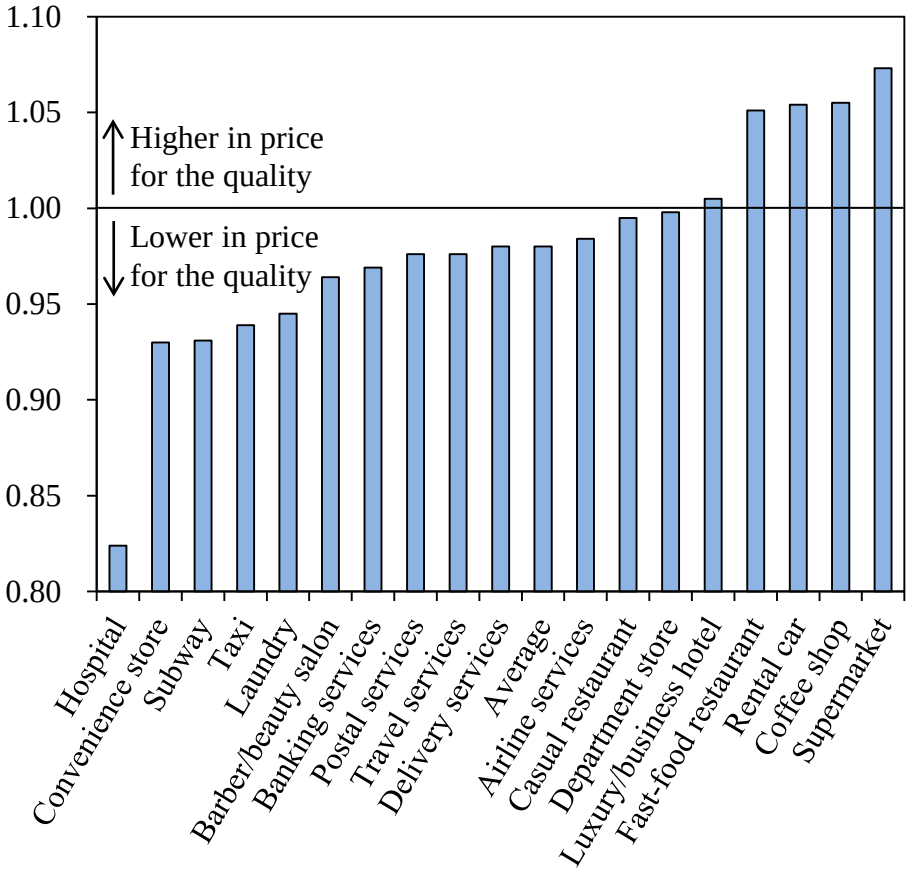
Source: Ministry of Health, Labour and Welfare.

Extravagant Services

Proportion of 24-hour Stores



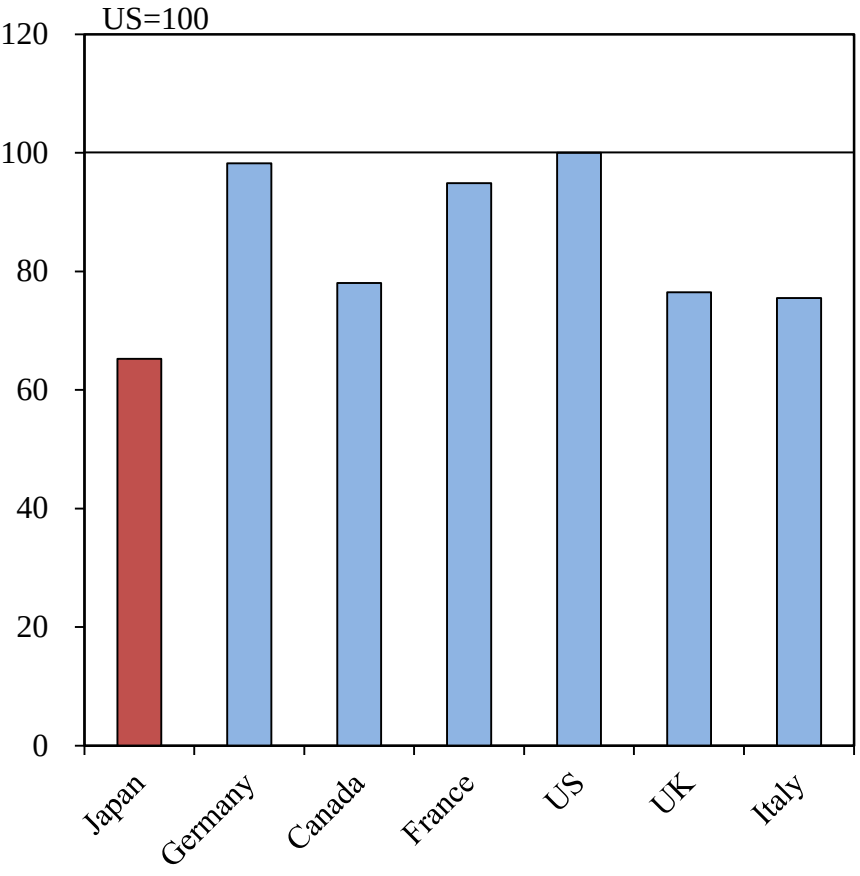
Services in Japan Higher/Lower in Price for the Quality (Comparison with the U.S.)



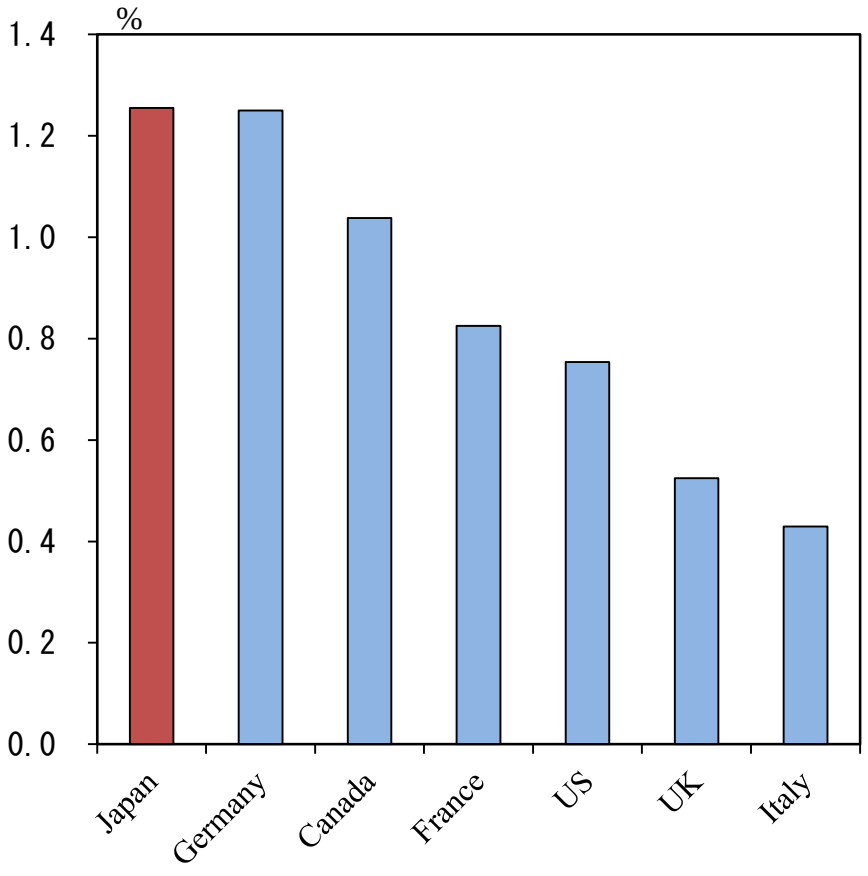
Sources: Ministry of Economy, Trade and Industry; Japan Productivity Center.

Labor Productivity per Hour Worked

Labor Productivity in 2017



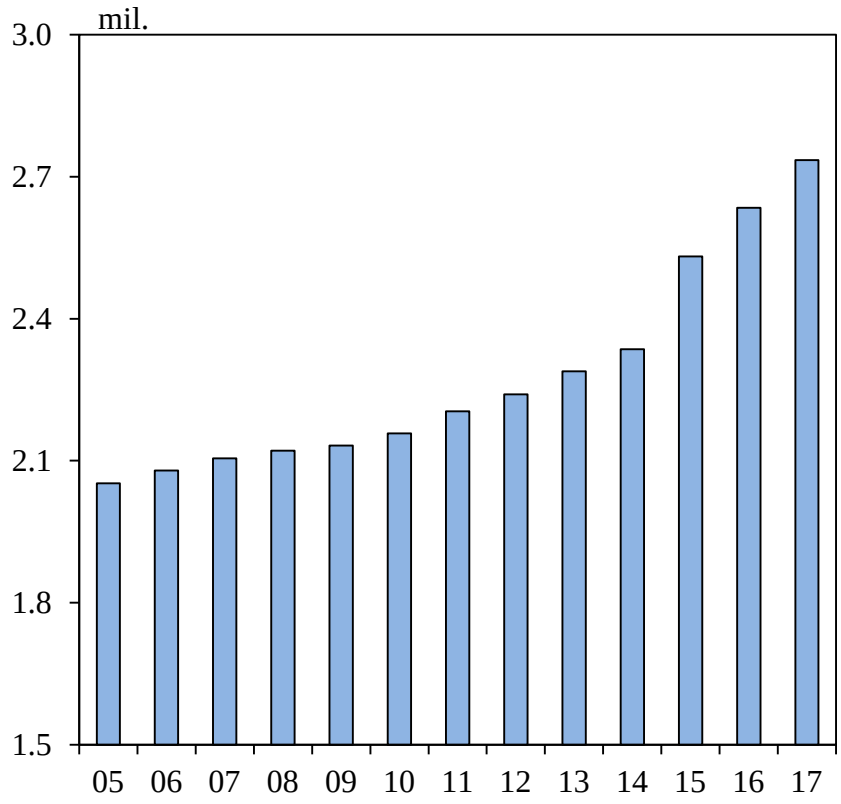
Productivity Growth (2010-2017)



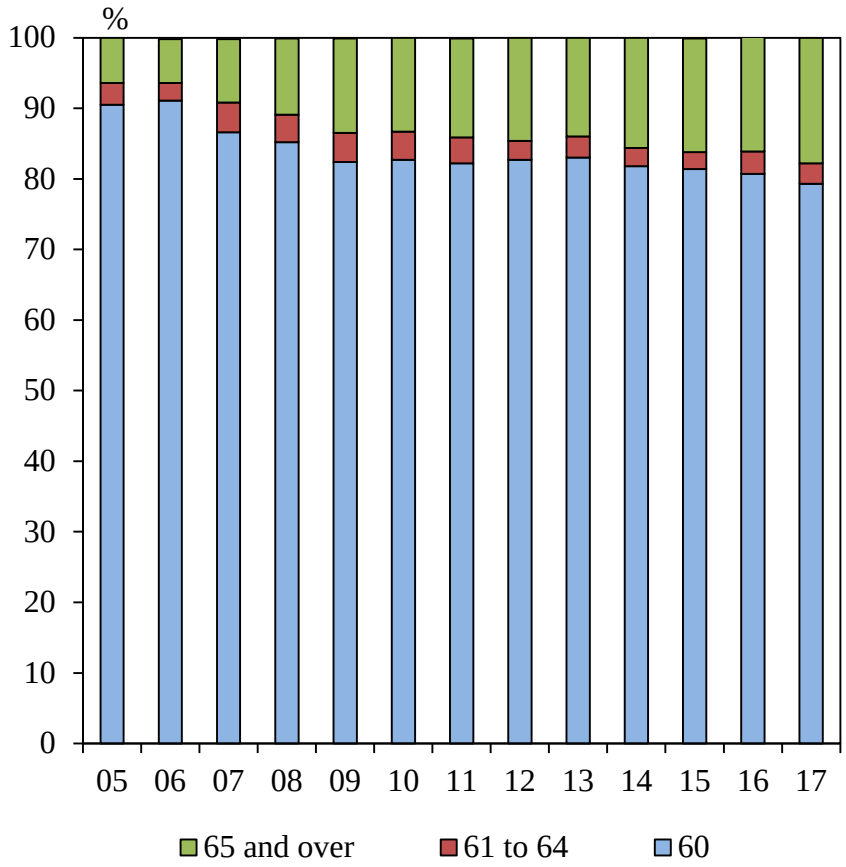
Source: OECD.

Women and Elderly Labor Force Participation

Capacity in Nursery Schools



Mandatory Retirement Age



Source: Ministry of Health, Labour and Welfare.

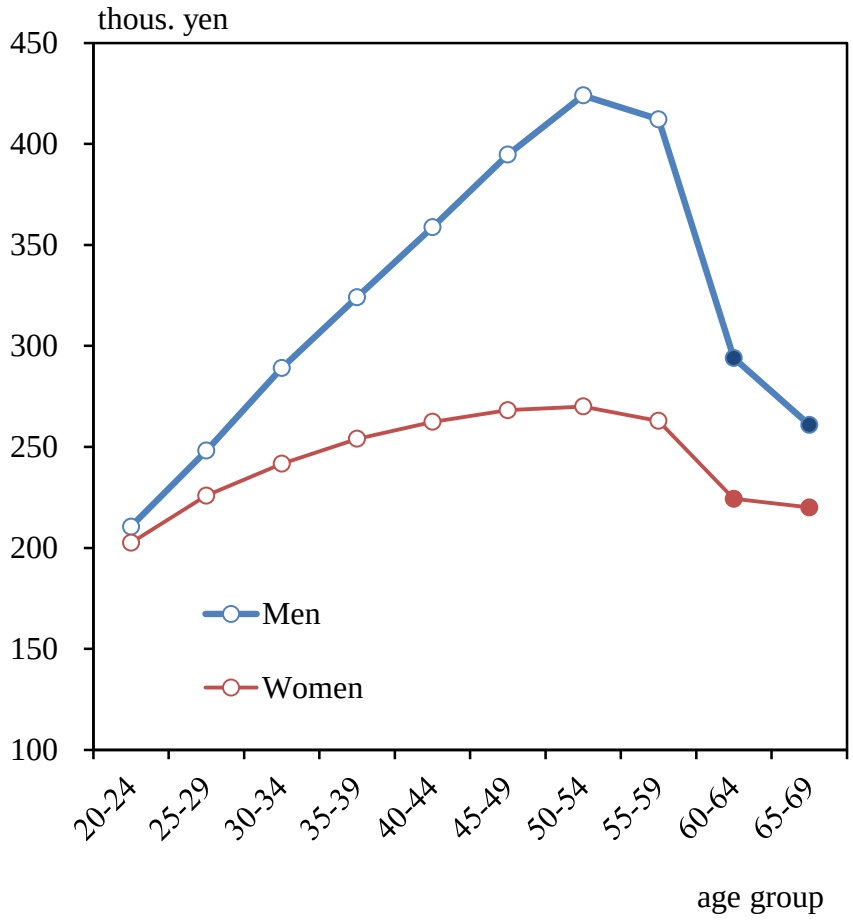
Employment and Wage Structure

Share and Number of Employees

10 thous.

		2007	2017	Difference
Men	Under 60	48.7% (3,133)	44.1% (2,881)	-4.6%p (-252)
	60 and over	9.8% (628)	12.1% (790)	+2.3%p (+162)
Women	Under 60	35.6% (2,288)	35.6% (2,322)	+0.0%p (+34)
	60 and over	5.9% (378)	8.2% (538)	+2.4%p (+104)

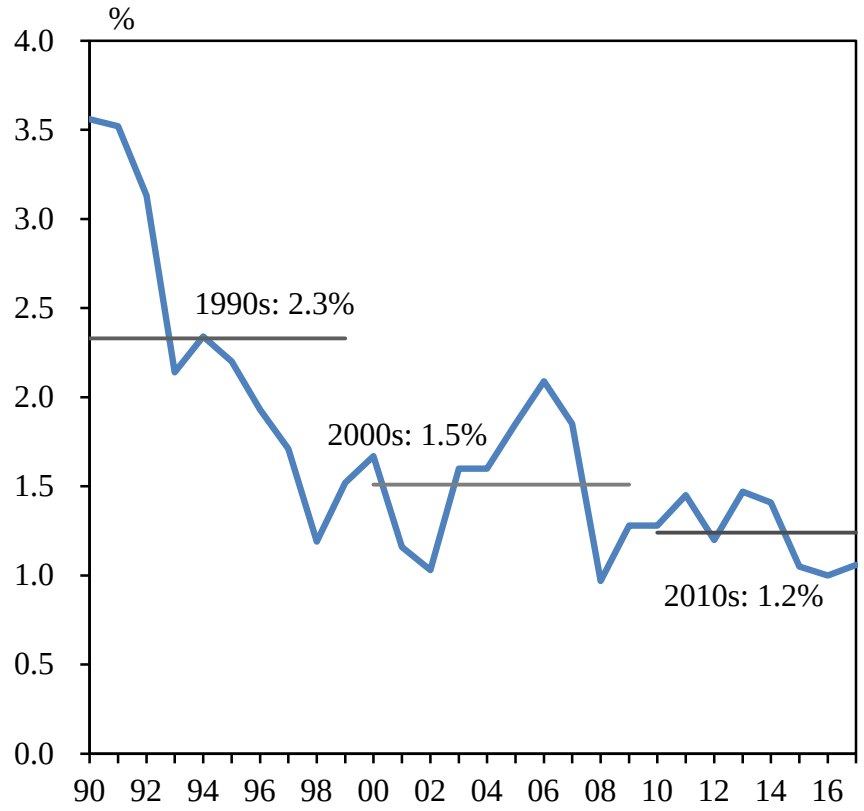
Wage Structure



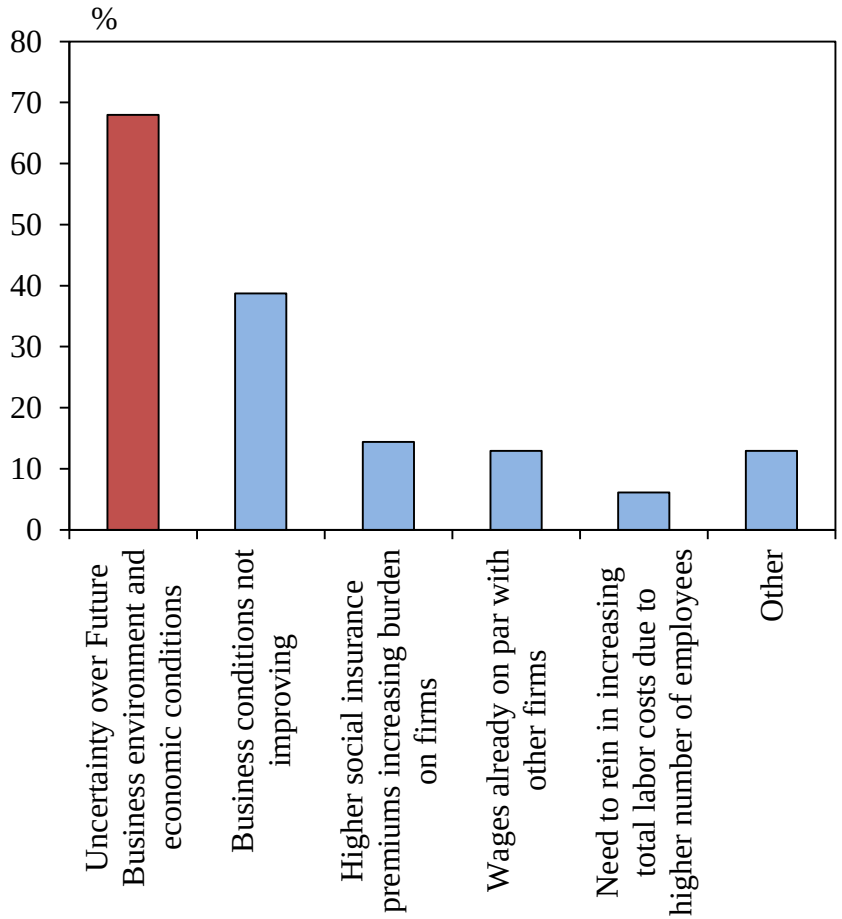
Source: Ministry of Health, Labour and Welfare.

Business Confidence and Wage Increase

Firms' Forecast on the Real Growth Rate for the Next 5 Years



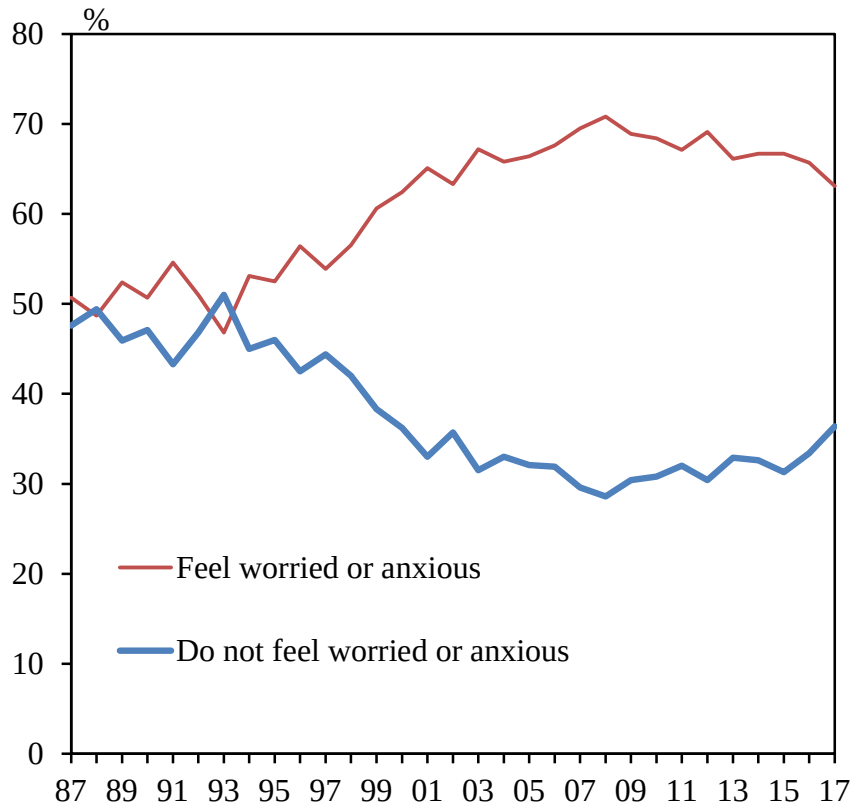
Reasons Firms Are Passing Over/ Undecided on Wage Increases



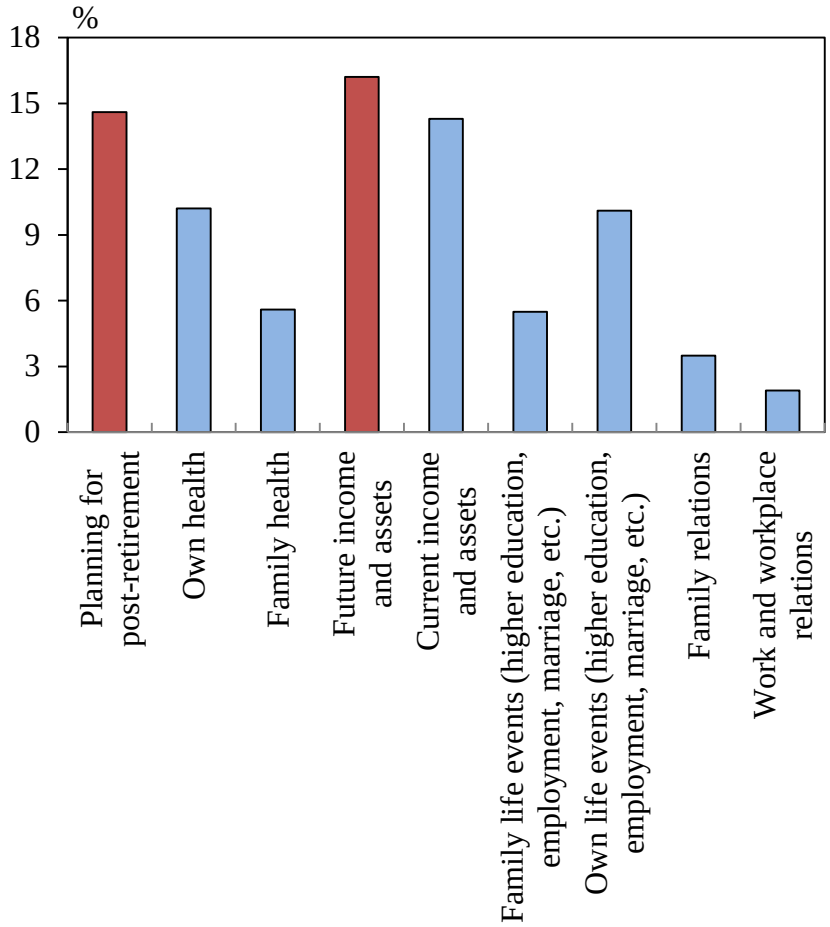
Sources: Cabinet Office; The Japan Chamber of Commerce and Industry.

Anxiety of Households

Worries or Anxieties in Everyday Life

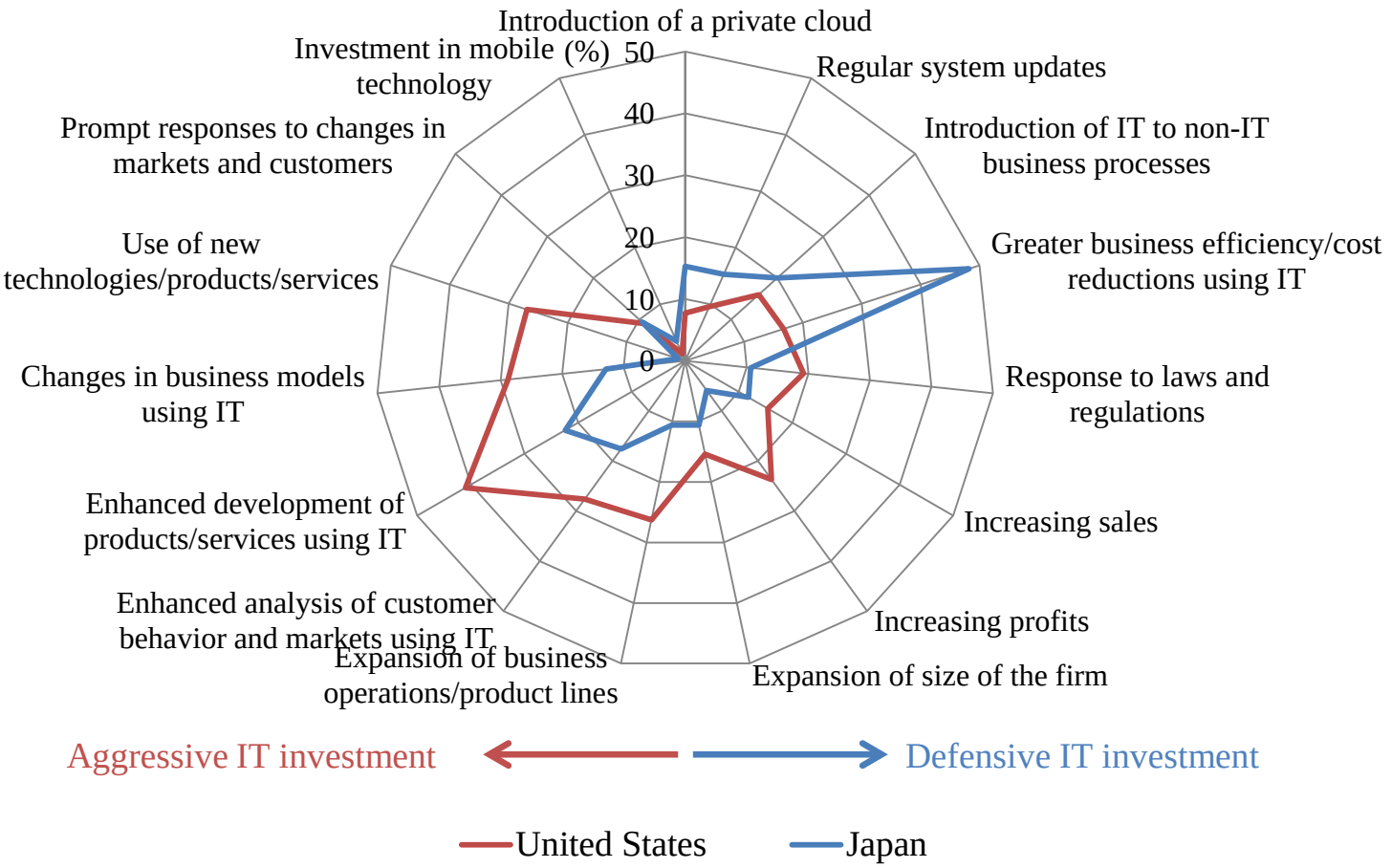


Causes of Worries or Anxieties (Changes between 1992 and 2017)



Source: Cabinet Office.

Purpose of Increasing IT Budgets

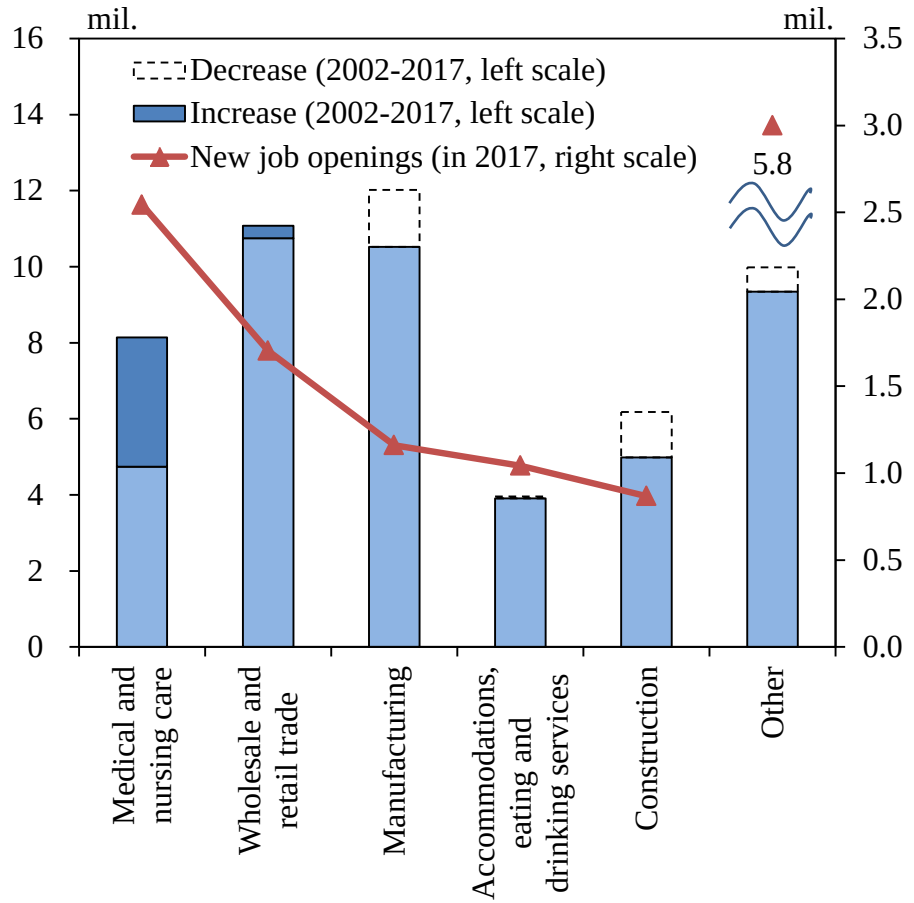


Note: 85 Japanese firms and 156 U.S. firms answered to the questionnaire. Figures in the chart indicate the proportion of firms that selected each choice. Since this was a multiple-choice questionnaire, the sum of figures exceeds 100%.

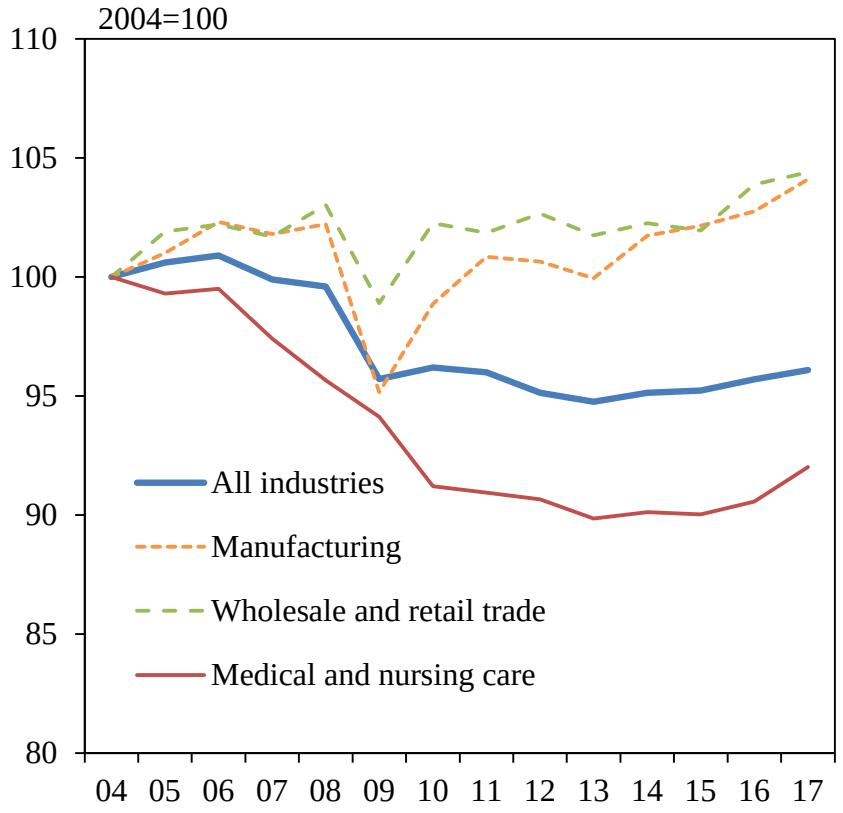
Source: JEITA.

Demand for Labor and Wages

Change in Number of Employees and New Job Openings



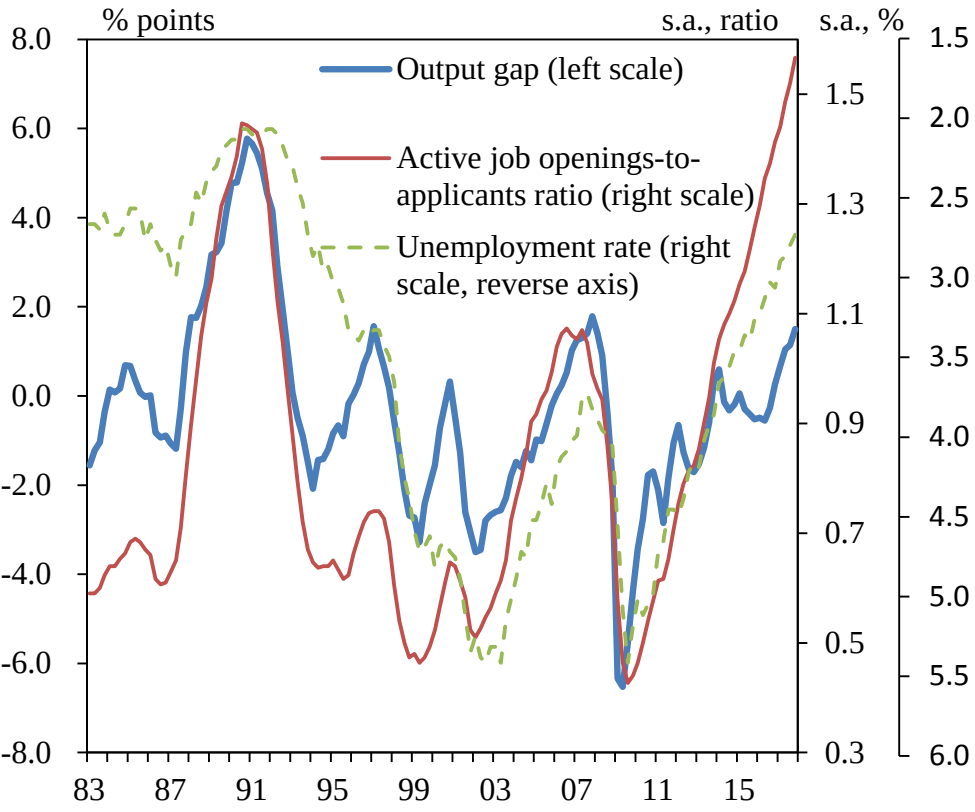
Change in Wages



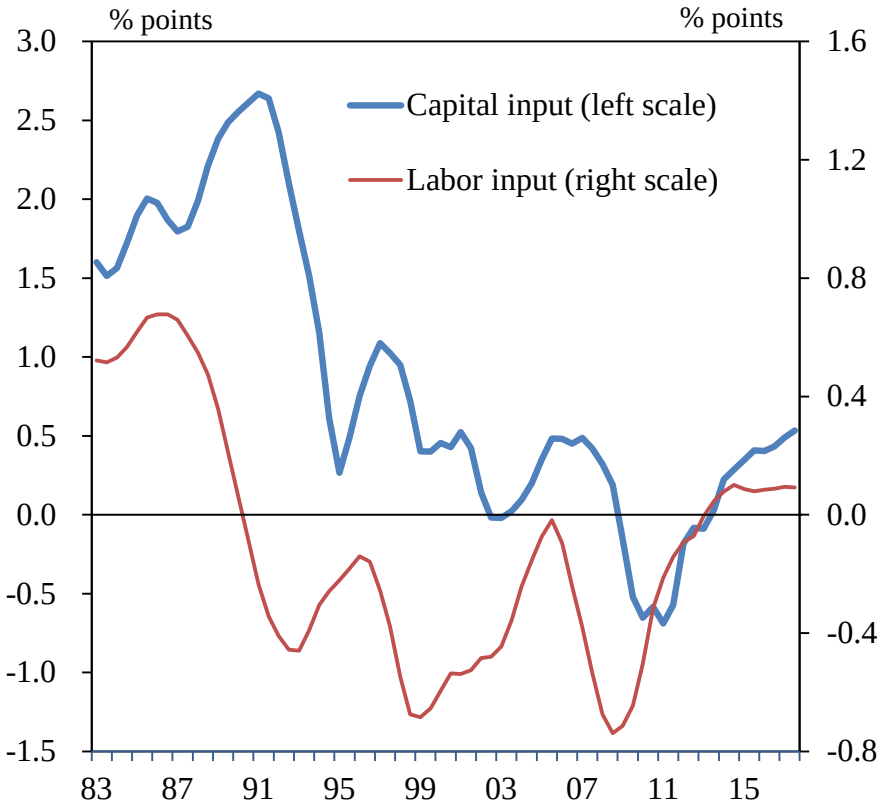
Source: Ministry of Health, Labour and Welfare.

Output Gap and Changes in Supply Capacity

Output Gap and Labor Market Tightness



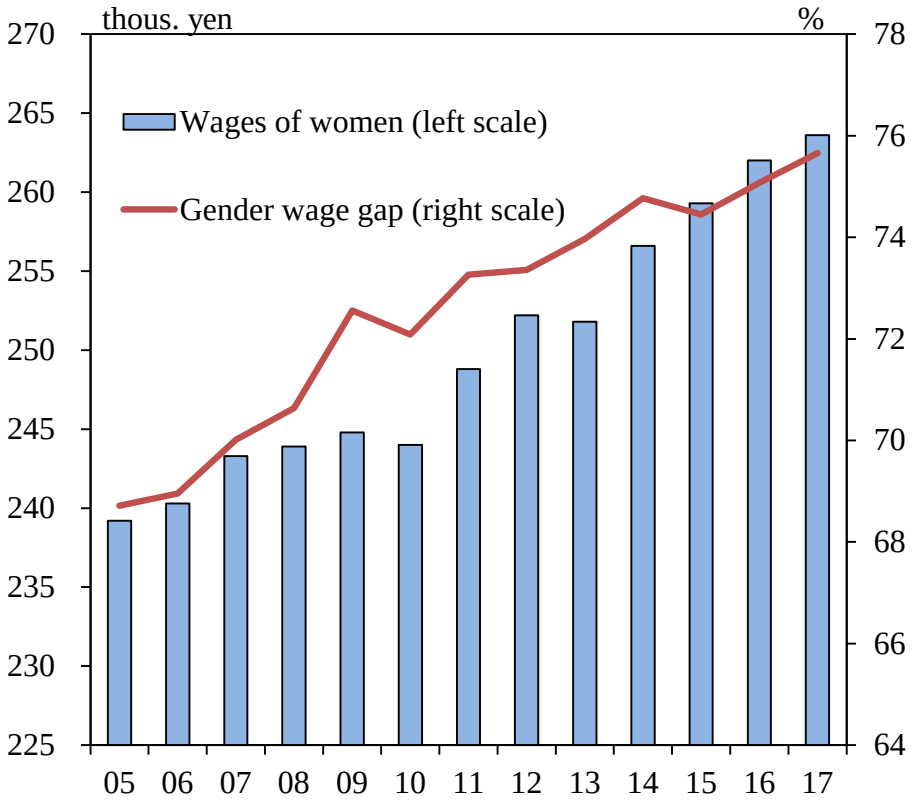
Capital and Labor Input Growth (Contribution to the Potential Output)



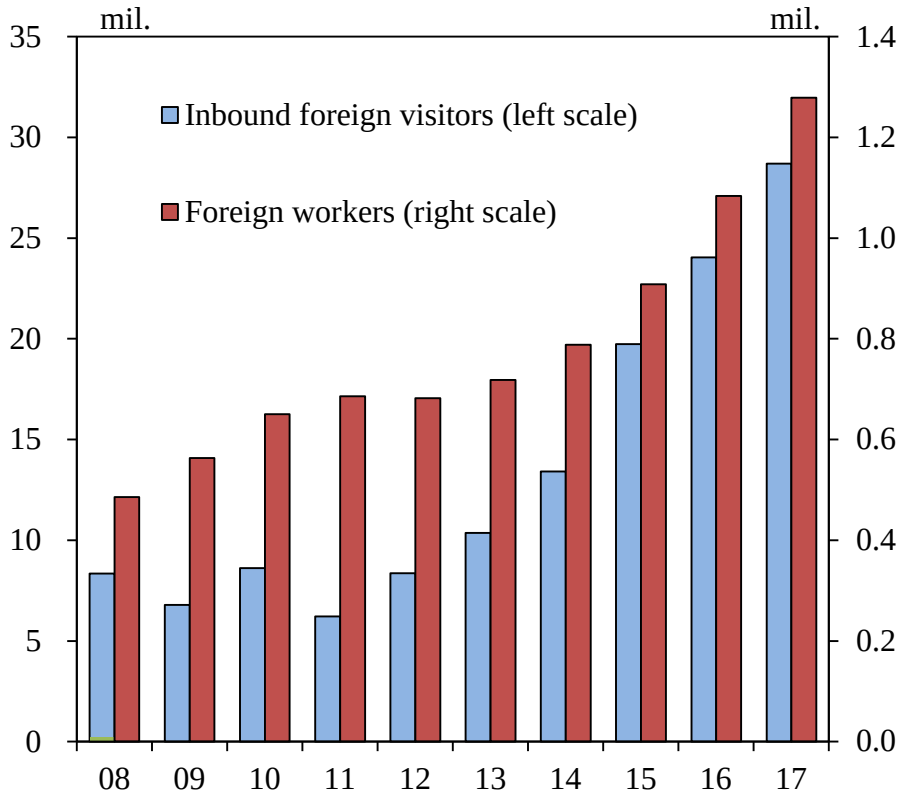
Sources: Ministry of Health, Labour and Welfare; Bank of Japan.

Structural Reform

Wage Gap



Foreign Visitors and Workers



Sources: Ministry of Health, Labour and Welfare; Ministry of Land, Infrastructure, Transport and Tourism.