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Bank of Japan

Funding for Financing Economic Growth

A Schumpeterian Perspective

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I. Introduction: Beyond Standard Macroeconomics

Having experienced prolonged stagnation after the global financial crisis of 2008, economists, market participants, and policymakers alike have arrived at the painful recognition that per capita real output has a long path toward recovering its pre-crisis level. To tackle this stagnation, the standard macroeconomic prescription is simple and straightforward: the policymaker should conduct an expansionary policy to fill the gap between actual and potential GDP, treating potential GDP as exogenously given. Although it is difficult to tell in real time whether the observed weakness in economic recovery is cyclical or structural, it seems obvious that the current GDP gap is large no matter how one measures the potential. Under this prescription, and facing the zero bound on nominal interest rates, central banks in advanced countries are currently employing unconventional measures, such as large-scale asset purchase programs.

However, I believe we need to go beyond such a standard way of policy thinking in order to bring about effective policy in this slow growth environment. We should consider policies that influence the growth potential itself. In particular, I suggest that central banks should find tools to support the efforts to strengthen the foundation for economic growth. This may look even more unconventional than already unconventional asset purchase programs. But it should be noted that price stability, the goal of central banking, becomes difficult to achieve once growth expectations diminish and the economy becomes prone to hit the zero bound¹. Thus, it is absolutely necessary to raise growth expectations in order to alleviate the difficulty in maintaining price stability. And I presume that monetary policy can

¹ Persistent deflation found in Japan in the past decade was at least partly caused by recurrent negative shocks that caused continuously diminishing growth expectations. When a negative shock happens to diminish growth prospects, management refrains from engaging in capital investment and giving pay raises, and households cut consumption expenditures to increase savings for the future. If a fall in growth expectations were a one-off event, price levels would stabilize soon after necessary adjustments were made. However, when such a decline happens several times, a chronic demand shortfall would keep placing downward pressure on price levels and deflation would persist.

Persistent deflation may also have been caused by the following mechanism that operates through the price- and wage-setting behavior of firms. Japanese export firms dealt with the severe competition coming from low-cost emerging countries by cutting costs -- that is, cutting wages and delivery prices. This had a spillover effect on the non-manufacturing and public sectors in Japan, resulting in a fall in the general price level. This led to an appreciation of the Japanese yen through the purchasing power parity (PPP) mechanism. As this currency appreciation partly offsets the effects of initial cost cuts by export firms, the whole cycle starts once again, beginning with cost cuts by firms. Deflation persists in that process.

influence the growth potential over a long term, although such effects are uncertain and indirect.

Indeed, there have been several signs of these diminished growth expectations in many countries. The aftereffect of a financial crisis has been discussed extensively.² Population ageing is another factor that is already impacting advanced economies and coming soon to several emerging economies.³ A not-so-growth-friendly change in the current technological advancements is another element that deserves more extensive discussion, especially in terms of its impact on employment.⁴

In my remarks today, I explain my own view about the role of the central bank in a slow growth environment, which is distinctively Schumpeterian, and describe the policies adopted by the Bank of Japan from this viewpoint. But first, let me briefly review the development of the real growth rate in Japan and other advanced countries.

II. Evolution of Post-Crisis Economic Growth: Japan as a Spearhead of Change

Japan has an extraordinary history of real GDP growth over the past six decades, from the annual average of a roaring 9.7% in the 1960s to a meager 0.6% in the 2000s, as depicted in Chart 1. Chart 2 decomposes real GDP growth into the growth in labor productivity and that of labor inputs. Note that the peak of the Japanese property bubble is around 1990.

² See Reinhart and Rogoff (2012) and IMF (2009).

³ The impact of population ageing is multifaceted. Obviously, it creates the financial burden of supporting a larger older population with a smaller younger generation, leading to fiscal problems. The dominance of elderly consumers changes the demand structure and thus necessitates structural changes in corporate strategies. Moreover, coupled with the progress of information and communication technology (ICT), an ageing workforce may result in lower productivity. In Japan, the ageing workforce during the 1990s contributed to the deceleration in labor productivity growth, since ICT made obsolete the existing firm-specific know-how and human capital. See Minetaki and Nishimura (2010).

⁴ Gordon (2012) lucidly explains a changing, non-linear nature of technological progress and suggests that improvement may be reduced substantially in the near future. This is especially relevant with respect to profit prospects and employment generation. First, ICT widely reduces profits because more and more products are becoming digitized and these digitized products' prices are subject to constant downward pressure due to the fact that their reproduction costs are almost zero. Second, ICT replaces middle management both at the workshop and in the office, and thus reduces the number of relatively well-paid and career-oriented medium-skill jobs (Nishimura 2012).

Comparing pre-bubble growth (1980s) and post-bubble growth (1990s), we find that most of the change in growth is from the substantial slowdown in labor productivity growth.

There are several factors explaining this slowdown in labor productivity growth, which can further be decomposed into the growth of total factor productivity (TFP) and the contribution of the change in capital-labor ratio. Firstly, TFP growth slowed because technological catch-up opportunities were exhausted, the illusory TFP growth of the bubble period evaporated,⁵ and information and communication technology failed to improve the productivity of Japanese firms, unlike the case for firms in the United States.⁶ Secondly, and more importantly, the increase of the capital-to-labor ratio was reduced sharply because firms hesitated to invest in new projects or even to replace old equipment: the firms' top priority then was to "deleverage" -- namely, to reduce the excessive stock of capital and debt that had been built up during the bubble period.

Japan has faced a consecutive set of difficult problems during the last quarter century, starting with a property bubble of an unprecedented magnitude and its bursting, followed by financial crises in Asia and at home in the situation of a fast-paced population ageing and now declining population. However, the development of the global economy since the mid-2000s suggests that other advanced countries also face similar problems, making Japan look like a spearhead of change. Indeed, Chart 3 depicts the rolling ten-year average of per capita real GDP growth rate among advanced economies between 1971 and 2010, which in theory is closely related to the natural rate of interest. Since the financial crisis, this has fallen in the United States and Europe to a level similar to that in Japan. Thus, the issue of raising growth potential is likely to become a common policy challenge for advanced countries.

⁵ The best example may be the construction industry, where huge TFP gains are found in the bubble period, although construction is an industry of low TFP growth in many countries and many periods. In the bubble period, irrational exuberance or conspicuous purchasing behavior was often observed, in which the higher the price of the building, the quicker it was sold. See Minetaki and Nishimura (2010).

⁶ See footnote 4.

III. A Schumpeterian Perspective: Banks' Role in Innovation Dynamics

What should be done to lift the growth potential and thus growth expectations, especially in a time of population ageing? The key is to raise labor productivity -- that is, to increase the value-added generated by labor inputs. There are two ways to do this: cutting costs and creating new demand. Cost cuts are best fit to a growing population that is demanding more high-quality products at lower prices.⁷ However, when demand does not grow as the population matures, creating demand is much more important than cutting costs. It is all the more important to figure out the potential needs of the society and to provide those goods and services for which people are willing to pay.

When firms attempt to engage in demand-creating innovation, financial intermediaries should play the crucial role of supporting them financially. In the absence of active financial intermediations, high-risk but high-return projects may end up not being undertaken, the technology spillover may be severely limited, and the economy may fall into stagnation. Indeed, it is Schumpeter who emphasizes the role of the "banker," in addition to the role of the "entrepreneur" that carries out demand-creating innovation.⁸

Crucial role of the banker in the Schumpeterian creative destruction

Creative destruction, as Schumpeter defines it, starts from a phase of shaking up the existing market structure. At this phase, the "entrepreneur" brings in a new combination of technology and knowledge while the "banker" provides to the entrepreneur investment

⁷ The main strength of Japanese companies until the 1980s was their ability to manufacture and sell a large volume of high-quality products. That was made possible by product quality improvement as well as cost-cutting efforts that enhanced the operational quality and efficiency. A famous example is the "just-in-time" system for production and inventory management. There was a limit to maintaining this kind of "cost-cutting innovation," however: the room for further improvement gradually diminished. Furthermore, the rapid catch-up by emerging countries in Asia made it difficult for Japanese manufacturers to continue increasing profits through cost-cutting efforts since the 1990s: standardization based on information technology as well as globalization have enabled Asian emerging countries to combine technology and capital in advanced countries with the abundant labor available in their own countries to pursue international specialization that helps them to achieve an optimal production structure. To put it differently, the old business model that had supported the high growth of Japanese firms gradually became out of touch with the renewed economic environment characterized by advances in information technology and globalization. See Nishimura (2012).

⁸ See Schumpeter (1926).

funds, which are raised through the process of credit creation. Of course, the "banker" here is not limited to the bank as it literally means, and it also includes venture capitalists.

The banker plays two roles in this process. First, the banker screens prospective entrepreneurs and selects the most promising ones. This is often called the "expert eye" function of bankers. Second, and more important in practice, the banker often provides firms with information related to business matching and new markets, which helps to improve the recipient firms' performance even after the initiation of funding.⁹ A banker who selects successful entrepreneurs and provides appropriate advice to them at a lower cost than other bankers can earn steady profits from an ongoing relationship with them.¹⁰ Such long-term profit-maximizing behavior of the banker improves the efficiency of risk allocation evaluated at the macro level and leads to an endogenous increase in the economic growth rate through an expansion in the production possibility frontier.¹¹

Necessity of Schumpeterian banks, particularly in a recession

Innovation entails long-term investment in research and development (R&D), teaching workers new technologies, and the search for new markets. In what phase of the business cycle is such long-term investment stimulated? In theory, long-term investment such as R&D should gain momentum in a recession, when short-term investment to meet current demand decreases.¹² In reality, however, the opposite is true: innovation drops sharply in a recession.¹³ The reason the theory fails provides an important clue for policy.

The opportunity cost of long-term investment, which is the foregone profits of not

⁹ Although the second role is not explicitly examined by Schumpeter in his treatise, it becomes increasingly important in innovation as the economy enters the age of ICT. In the United States, for example, venture capital firms contributed to the product development of biotech firms, through both fund provision and other kinds of assistance (Michalopoulos et al. 2009). The latter includes the provision of information related to management and help in business contracts.

¹⁰ In fact, small and medium-sized enterprises often complain that, although this information-providing function is most demanded, Japanese banks unfortunately have failed to provide it adequately in post-crisis Japan.

¹¹ Michalopoulos et al. (2009) present an endogenous growth model that features the entrepreneur and the banker, and provide a theoretical perspective to Schumpeter's idea. However, the model focuses only on the "expert eye" function of the banker.

¹² See Aghion et al. (2005, 2010).

¹³ See, for example, Aghion et al. (2008) and Mannasoo and Merikull (2011).

undertaking a short-term investment that meets the current demand, decreases in a recession when the current demand is weak. Consequently, the theory predicts that the entrepreneur will find innovation to be more profitable in a recession.¹⁴ On the contrary, many empirical studies point out that long-term investment such as R&D may in fact be pro-cyclical, and drop in a recession. The most plausible explanation is that the theory implicitly assumes that firms are not subject to credit constraints, but this is not the case in practice. To use Schumpeter's terminology, the theory assumes that the "banker" is always willing to provide financial support to the innovative "entrepreneur." In reality, however, the "banker" is not willing to do so in a recession because credit constraints usually tighten due to firms' worsening balance sheet conditions and renewed concern about an uncertain return on R&D. The consequence is that the tone of firms' innovation activity as a whole becomes low, and the risk of impeding long-term growth potential becomes elevated.

Thus, from the Schumpeterian perspective, the monetary authority should make every effort to maintain stability in the financial environment, particularly in a recession, so that firms' innovative activity is not held back. Admittedly, this is a very subtle balancing act, since we should avoid bank loans from going bad and at the same time preserve efficiency in the allocation of funds.

Necessity to consider externality in innovation

Lastly, from the Schumpeterian perspective, the policymaker or the monetary authority should properly take into account "externality" in innovation when it seeks to support the innovative activity of entrepreneurs. To take as an example, R&D investment leading to the development of frontier technology has a clear positive externality: such investment has a social benefit, in that it encourages competition toward technology revolution, which eventually gives rise to a knowledge spillover. For each individual firm, however, the private return on such investment is not sufficiently high unless the society-wide spillover benefits are internalized.¹⁵ In fact, we often hear that firms actually give up many projects

¹⁴ This is the heart of the so-called "cleansing effect" of a recession: a recession stimulates innovation activity and rectifies inefficiencies in the economy. The word "cleansing effect" sometimes refers exclusively to efficiency gains from the exit of inefficient firms, but the innovation-induced mechanism should properly be taken into account.

¹⁵ Social return has the elements of both dynamic scale effect and learning effect. Specifically, although the initial investment is costly, the cost decreases as the scale of production increases: even

with high social return because of their low private return.¹⁶ To summarize, in the presence of externalities, long-term investment such as R&D is not carried out sufficiently from a social point of view, since each individual firm may not have enough incentive to do so.

Here, a Schumpeterian perspective of innovation becomes important. A standard policy tool to rectify this problem is the government subsidy or so-called Pigovian tax. However, such a direct intervention of public authority may severely undermine market efficiency because the authority does not have sufficient information and the monitoring ability to implement it. Then, it may be desirable to move indirectly toward using financial institutions' Schumpeterian role, stimulating firms' incentive for innovation while preserving efficiency at the same time. The policymaker provides funding for the bankers' support to promising innovations, counting on the bankers' ability to produce information; namely, the "expert eye" function and "opportunity provision" function. In other words, we need a social system to promote innovation, providing backing to private returns and shifting allocation of funds and resources toward investment projects with high social return. Having this kind of social system is particularly important when low private return prohibits firms from making an effort toward innovation that generates social benefits in terms of growth expectations and employment opportunities.

IV. Central Banking in the Post-Crisis World: Funding for Financing Economic Growth

Let me now explain the policy initiatives of the Bank of Japan, which specifically aim at raising the growth potential and thus growth expectations of firms and households. In June 2010, the Bank introduced the "fund provisioning measure to support strengthening

if the private return is low initially, the social return that takes into account the subsequent benefits may be high.

¹⁶ As one example, consider an anonymous manufacturer's plan to develop a mine detection robot. In this company, there were several research projects that had the objective of stimulating the R&D activity of the company. One of the projects was the R&D of a mine detection robot, which utilized the sensor technology owned by the company. The company eventually gave up on the project because, as a private company seeking profits, it was difficult to continue with a project that seemed to yield little return. The problem was that there was a lack of demand to properly reflect the social importance of the robot. See Nishimura (2004).

the foundations for economic growth," which I call the GFSF (Growth Foundation Strengthening Facility).¹⁷ In October 2012, the Bank announced the introduction of the "fund provisioning measure to stimulate bank lending," which at this moment is being carefully prepared. In a nutshell, we can combine both measures into "funding for financing economic growth."

These measures aim to contribute to lift the potential growth rate through financial intermediation. Specifically, they supply long-term funds at a very low interest rate against eligible collateral to financial institutions in order to encourage their lending and investment to businesses.

Chart 4 depicts steadily increasing GFSF loans provided to financial institutions by the Bank of Japan, which consist of the main-rule loans starting in September 2010 as well as three special-rule ones introduced afterward. Chart 5 shows the amount of financial institutions' loans to firms that the GFSF generated, categorized by growth-related business lines. Here, the "environment and energy business" accounts for the largest share, followed by the "medical, nursing cares, and other health-related business" and the "development and upgrading of social infrastructure." Indeed, the GFSF has induced sizable efforts by financial institutions to support strengthening the foundations for economic growth.

Let me point out three theoretical rationales of these fund-provisioning measures or facilities from the Schumpeterian perspective that I have explained. First, they make the most of the Schumpeterian bankers' informational capacity in screening innovative entrepreneurs and providing information valuable that will allow them to grow. The "expert eye" of the bankers plays a vital role in screening projects, and their good-advisor function substantially increases the value of innovation.¹⁸ Second, the policy measures try to counter the negative effect of a recession by providing financial support to the "banker"

¹⁷ See Nishimura (2010) for details. It also describes possible measures to strengthen the foundation for economic growth through financial intermediation.

¹⁸ Although it is not widely recognized, this good-advisor function is important in helping the entrepreneur grow. Unfortunately, Japanese financial institutions failed to act as good advisors in improving the performance of borrower firms (Fukao et al. 2005).

at a time of many headwinds to the economy. Third, the policy measures aim to act as a catalyst for financial institutions' lending and investment to businesses with high social return. By offering long-term funds at a very low interest rate, they supplement the low private return that mirrors the presence of externality in innovation.

The policy philosophy here is different from that of the Keynesian approach. These measures aim to improve financial intermediation's long-term efficiency in resource allocations, while the Keynesian approach endorses public spending to fill the short-run shortage in aggregate demand. It also differs from neoliberalism, which rests on the superiority of free and competitive markets and thus makes every effort to avoid public interventions.¹⁹ It is distinctively Schumpeterian, in that it has the aim of raising the growth potential or liveliness of the economy. For this very reason, one could say that it is unconventional in the domain of monetary policy design. I certainly do not dispute such claim. However, we should recognize that a secular decline in the real growth rate and sluggish growth expectations have plagued Japan in past decades. Thus, the Bank's indirect intervention through the financial system -- that is, the Bank of Japan's fund-provisioning measures -- is perfectly consistent with the principle of monetary policy stipulated by the Bank of Japan Act; namely, "currency and monetary control by the Bank of Japan shall be aimed at achieving price stability, thereby contributing to the sound development of the national economy."

V. Concluding Remarks: A Way Forward

Let me now conclude. Sluggish productivity growth reduces potential growth. It not only scales down the supply side but also places a negative impact on the demand side. This is because household consumption and corporate investment are held back once the households' income prospects and the firms' earnings forecasts are weakened. Both the supply and demand sides lose momentum due to productivity declines, resulting in a persistent fall in the natural rate of interest.

¹⁹ See Aghion (2012) for this classification. Aghion et al. (2012) claim with both theory and empirical evidence that monetary policy influences aggregate productivity through its impact on R&D investment by firms.

Deleveraging in the aftermath of the bubble bursting and the financial crisis reinforces the fall of the natural rate of interest, since the private sector reduces expenditures rapidly and by a large amount.²⁰ As the policy rate reaches the zero lower bound and room for further unconventional -- as well as conventional -- monetary easing diminishes, it becomes even more difficult for central banks to stabilize the economy and price levels. In such a situation, the central bank needs to shape policy frameworks so as to contribute to growth potential and thus growth expectations, and hence raise the natural rate of interest.

The situation I have described is no longer unique to Japan and rather common in other advanced economies, and even for some emerging economies facing population ageing in the near future. I believe that the seemingly unconventional activist policy of the Bank of Japan in funding for financing economic growth may be relevant for these economies as well in the coming years. My interpretation of the Funding for Lending Scheme in the United Kingdom is that it has similar Schumpeterian effects, although this scheme's origin may be different from those of the fund provisioning measures of the Bank of Japan.

²⁰ Guerrieri and Lorenzoni (2011) point out that an unanticipated tightening of borrowing constraints during a financial crisis leads to a fall in the natural rate of interest. First, borrowers facing financial constraints have to deleverage. Second, even lenders not facing financial constraints have to increase precautionary savings once they become aware of the risk that their constraints may bind in the future. Similarly, Eggertson and Krugman (2012) claim that the natural rate of interest declines and deflationary pressure becomes large during the deleveraging process, induced by a tightening in the financial constraints.

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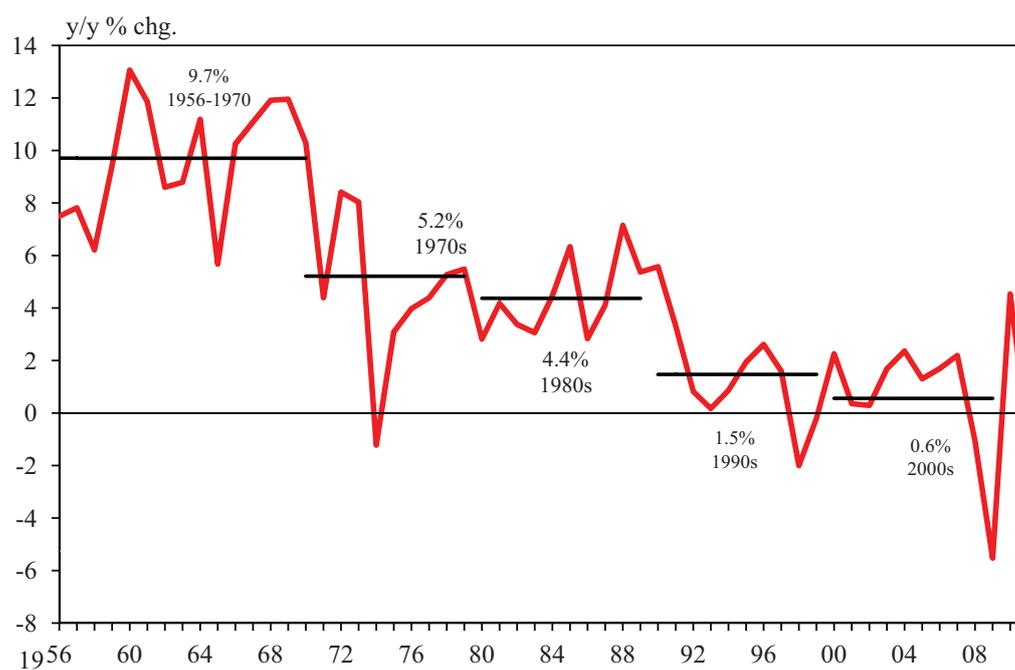
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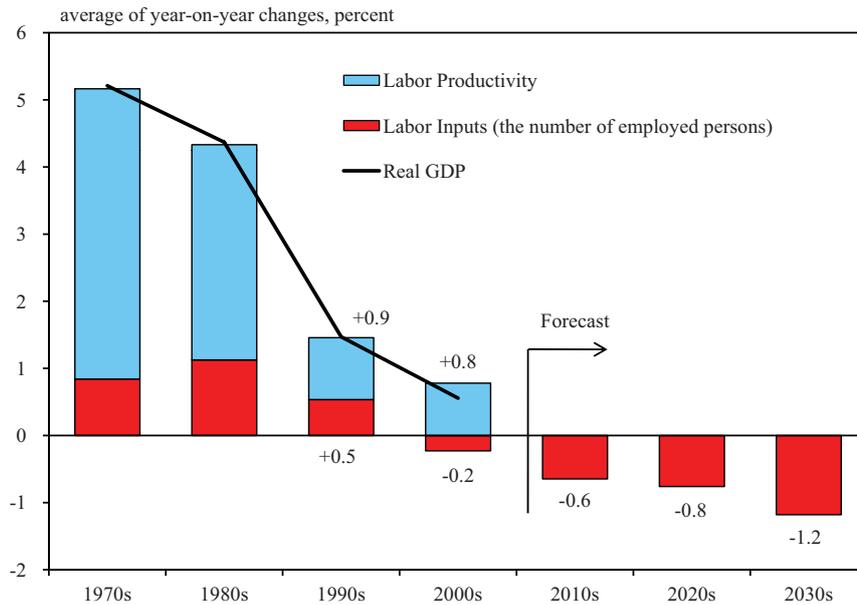
Chart 1

Real GDP Growth in Japan



Source: Cabinet Office.

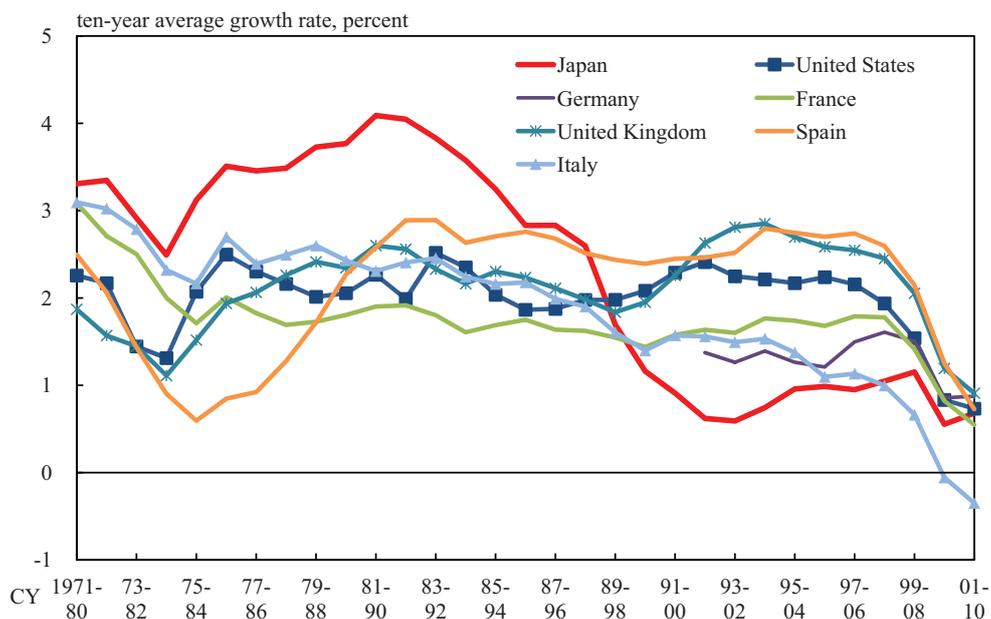
Decomposition of Real GDP Growth in Japan



Note: Fiscal-year basis. The rates of change in the number of employed persons from the 2010s onward are calculated using the population outlook (medium variant) and the projected labor force participation rates (assuming the labor force participation rates in each age/sex group remain the same as those in 2010).

Sources: Cabinet Office; Ministry of Internal Affairs and Communications; National Institute of Population and Social Security Research.

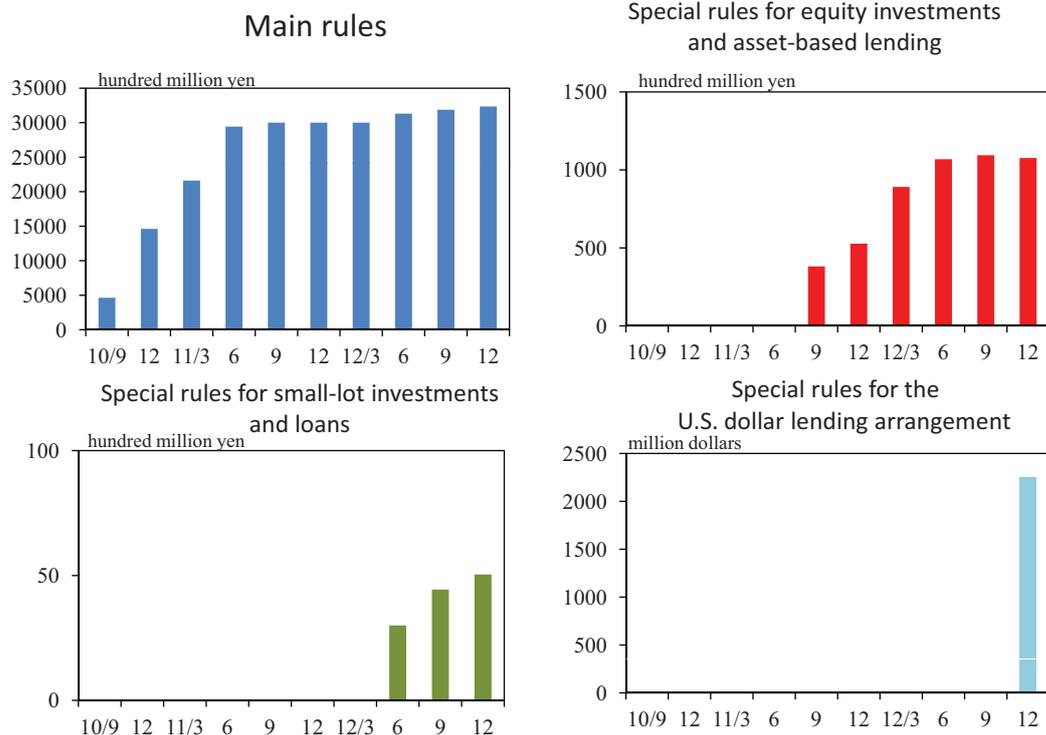
Per-capita GDP Growth in Advanced Countries



Sources: United Nations; statistics by individual countries.

GFSF (Growth Foundation Strengthening Facility) Loans

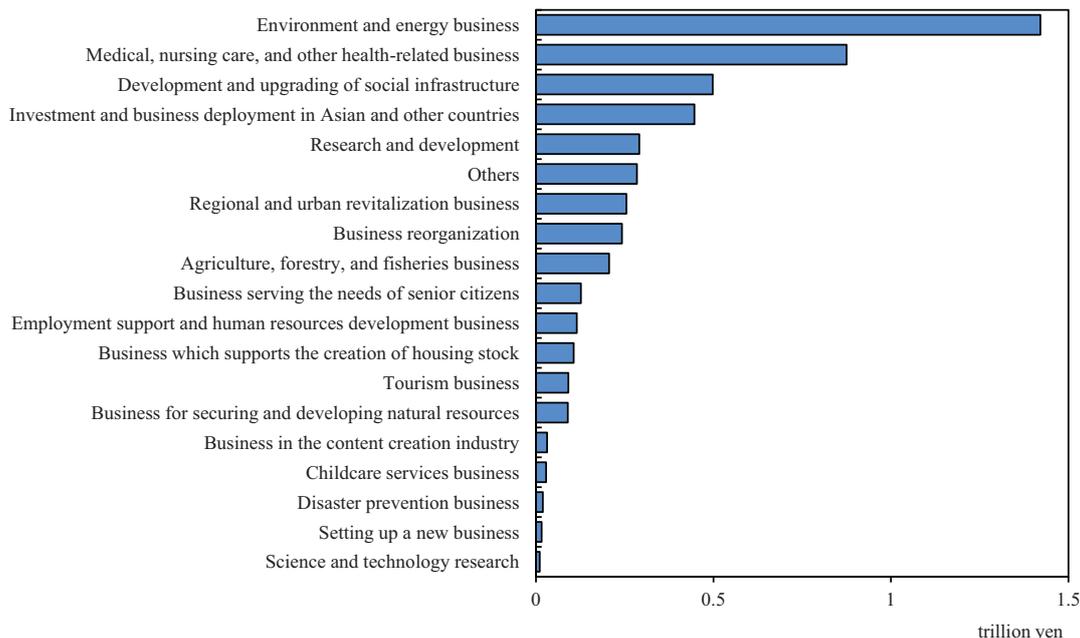
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Note: Outstanding balance of loans estimated at each period. Only the number for December 2010 is the actual amount.

Sources: Bank of Japan

Efforts of Financial Institutions to Strengthen the Foundations for Economic Growth: Individual Loans and Investments by Growth-related Business Lines



Note: Based on the records of investment or lending that were submitted to the Bank for the 1st-10th new loan disbursement under the main rules, the 6th new loan disbursement under the special rules for equity investments and asset-based lending and the 3rd new loan disbursement under the special rules for small-lot investments and loans under the fund-provisioning measure, and were confirmed by the Bank that investment or lending was carried out under their plans. The investment or lending amount does not reflect reductions due to bullet prepayment or scheduled repayment.

Sources: Bank of Japan