Japan’s Potential Output and Productivity Growth

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Introduction

Japan’s economic re-awakening over the past five years raises the question of whether the country’s potential output growth rate may now be higher. Structural adjustments to the imbalances of the “bubble” years have strengthened fundamentals. At the same time, an aging population complicates the challenge of ensuring strong self-sustaining growth.

With Japan’s birth rate well below the population’s replacement rate, the working-age population in fact has been contracting since 2000, and the elderly dependency ratio (the share in the working-age population of people at least 65 years old) is now the highest among industrial countries. With a declining labor force, per capita income growth will depend critically on higher productivity.¹

This chapter tries to shed light on the drivers of Japan’s long-term growth—and speculates about future potential growth. More specifically, it seeks to estimate the current level of potential output growth, the determinants of productivity growth, and the likely impact on productivity growth and potential output of reforms undertaken in recent years.

The empirical results indicate that potential output growth in Japan is likely to have picked up and is likely to be in the range of 1¾ to 2 percent in the near term. Higher total factor productivity (TFP) growth has helped offset a declining contribution of capital inputs and a negative contribution of labor inputs. The results also confirm that product market competition, openness, and research and development (R&D) investment are key determinants of productivity growth. At the same time, structural unemployment, which remains historically high at around 4 percent, is...
directly related to the generosity of the unemployment insurance system (the level of out-of-work benefits relative to in-work wages and salaries) and the aging of the labor force.

The potential gains from reforms are significant. The findings suggest that, going forward, the removal of lingering labor and product market distortions—cutting excessive domestic regulation, strengthening the anti-trust framework, and further liberalizing trade (specifically, agricultural)—together with increased returns on R&D investment, could raise further total factor productivity and hence potential output growth. Additional efforts to liberalize the labor market to reduce structural unemployment (e.g. reducing the negative effects of unemployment benefits on work incentives) could also provide a significant boost to output.

What is potential output growth?

There is a plethora of studies on Japan’s potential output growth. Depending on the methodology used, results differ markedly both with respect to the estimated potential growth rate and the contributions of key structural factors. Estimates of potential output growth recently prepared by official agencies range between 1½ percent and 2 percent. This diversity in estimates stems mainly from the fact that potential output is an unobserved variable and can only be inferred indirectly.

The methodology used here combines filtering techniques to estimate trends along with estimation of a structural model encompassing behavioral relationships from economic theory. Potential output is considered as the level of output that would emerge from an aggregate production function, given the current levels of fixed inputs and levels of variable inputs consistent with stable inflation (Appendix 2.1).

Econometric analysis produces parameter estimates that are significant and correctly signed (Table 2.1). The estimated system consists of four basic structural equations (see Appendix 2.2)—an aggregate production function, a Phillips curve, an equation to estimate the non-accelerating inflation rate of unemployment (NAIRU), and “Okun’s law” relating the unemployment gap to the output gap—as well as several identities. In particular:

- In the aggregate production function, total factor productivity depends on R&D intensity (as measured by R&D spending in relation to GDP), mark-ups (as measured by the ratio of operating profits to sales net of cost of sales), and import penetration (as measured by