Pacific Economic Cooperation Council

Commentaries on the Signature Project: "Addressing Labor Shortages Due to Low Birth Rates and Aging Population in the APEC Region"

Challenges and Policy Directions for Sustaining Economic Growth and Enhancing Productivity in an Aging Society

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SUMMARY

- Aging populations threaten economic growth by reducing labor supply and productivity.
- While technologies such as AI and robotics can boost productivity, their benefits require complementary investments in human capital, organizational reform, and supportive infrastructure.
- To ensure sustainable growth, aging societies must improve productivity through better policy design, enhanced data infrastructure, and regional digital cooperation.

1. Introduction

Population aging poses serious challenges to economic growth. A declining working-age population reduces labor input, while aging can also lower individual productivity due to deteriorating physical and cognitive abilities.[1] Furthermore, aging may weaken entrepreneurship and overall economic dynamism.[2]

While a declining gross domestic product (GDP) growth rate is concerning, the more pressing issue lies in the secondary consequences: pressures on the sustainability of social security systems, reduced access to public services, and potential declines in overall living standards. To sustain or improve living standards, maintaining economic growth – especially per capita growth – is crucial.

Given shrinking labor input, increasing output will require either greater capital input or productivity improvements. Figure 1 shows the projected aging rates in 2035 (the proportion of the population aged 65 and over) and the levels of labor productivity among APEC member economies in 2017. Productivity growth is particularly critical for aging economies such as Japan and Republic of Korea, where productivity levels remain

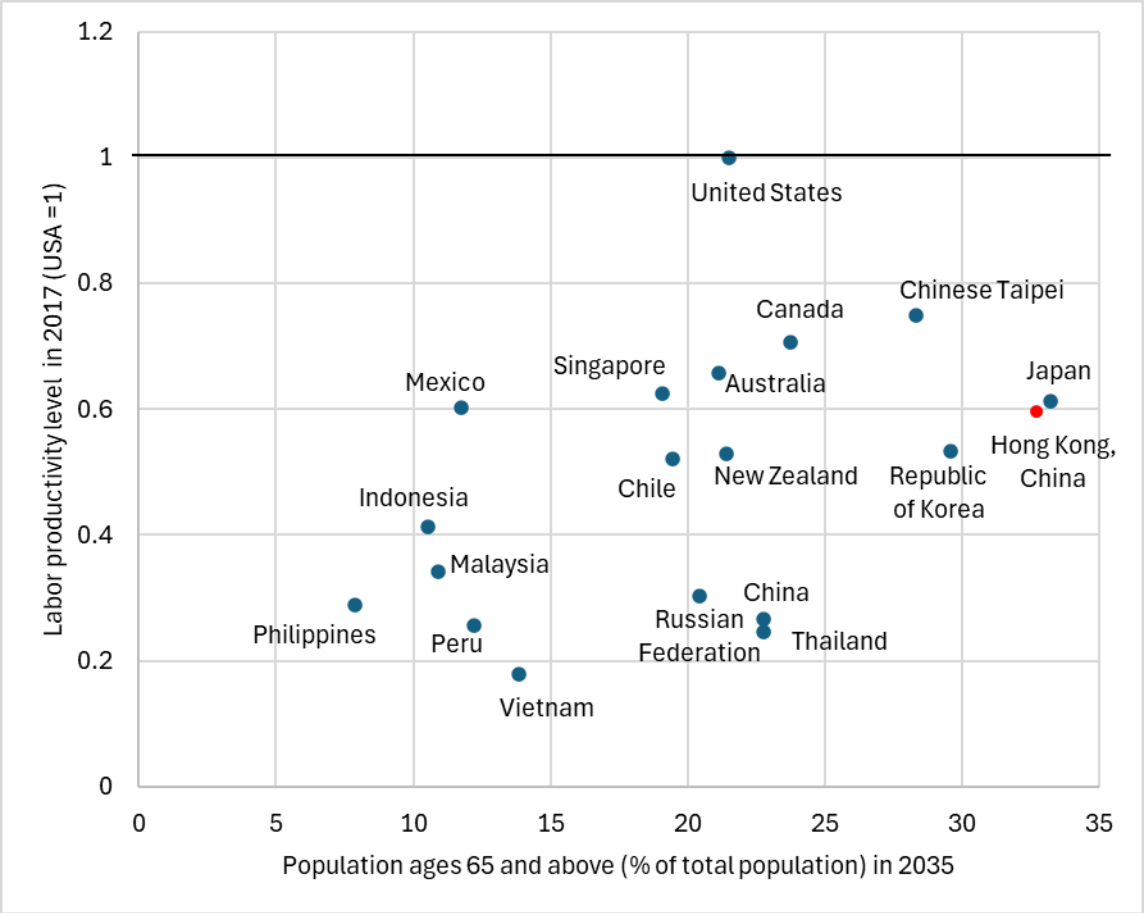
[1] See, for example, Aiyar, Ebeke, and Shao (2016), Maestas, Mullen, and Powell (2023).

[2] Liang, Wang, and Lazear (2018).

around 60% of that in the United States. A scenario of advancing aging combined with stagnant productivity could lead to a rapid contraction in economic scale.

This commentary examines the challenges and policy options for sustaining growth through improved productivity, especially by leveraging digital technologies such as information and communication technology (ICT) and artificial intelligence (AI).

Figure 1. Projected aging rates and labor productivity levels for APEC members



Note: For Hong Kong, China, overall labor productivity was calculated excluding the “others” sector, which includes the arts, entertainment, and other services. This is because labor productivity in that sector is exceptionally high—about 15 times the average of all other industries—and its share of GDP is also relatively large at around 8%. Including this sector would result in overall labor productivity appearing about 1.5 times higher than that of the United States.

Sources: The GGDC Productivity Level Database 2023 and United Nations, Department of Economic and Social Affairs, Population Division (2024), “World Population Prospects: The 2024 Revision”; custom data acquired via website: https://population.un.org/wpp/

2. Can AI and robotics boost productivity?

A growing body of research suggests that technologies such as AI, robotics, and ICT can enhance productivity, even in aging societies. Studies, including those by Acemoglu and Restrepo (2017), show that such technologies have contributed to productivity gains in economies with shrinking workforces.

However, the benefits of new technologies are unevenly distributed across industries, firms, and workers.[3] Adoption of automation and ICT has widened wage disparities, displacing workers in some occupations while benefiting others.[4] Moreover, as Brynjolfsson et al. (2018) argue, it may take some time for the new technologies to translate into actual productivity gains. The productivity-enhancing effects of AI may not be very large at the macroeconomic level (Acemoglu [2025]). Without workers who can effectively use these technologies, productivity gains may be limited.

To maximize their impact, complementary investments – ranging from workforce training and organizational restructuring to the development of supportive infrastructure – are vital.

3. Is investment in new technologies sufficient?

To assess the effectiveness of these technologies, it is helpful to examine economies where relevant data is available. As shown in Figure 2, the US has achieved relatively higher labor productivity growth than major European economies, with both ICT-related tangible investments and intangible assets such as R&D and organizational capital playing key roles. The business innovation-related intangibles in Figure 2, which include organizational capital and human capital, are particularly closely related to the complementary investments mentioned above.

In contrast, Japan has seen little contribution from either ICT-related tangible or business-related intangible investments. This is particularly concerning given its significantly higher

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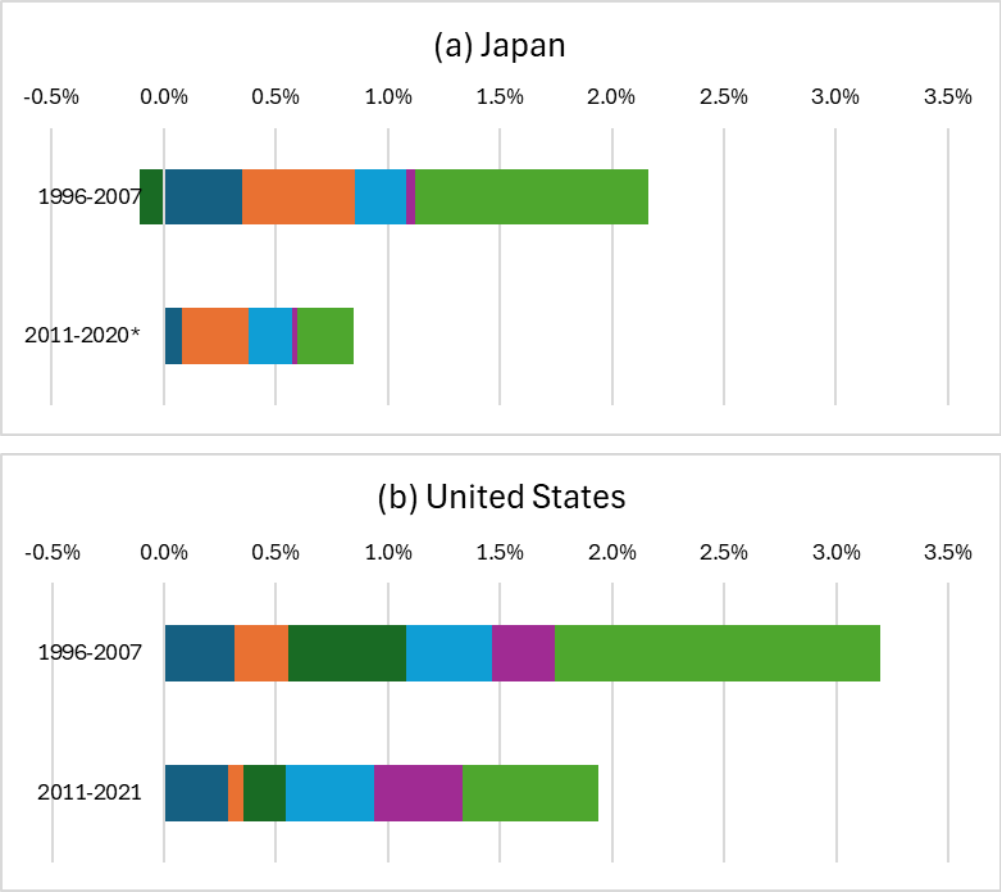
[3] For Asian economies, see, for example, Asian Development Bank (2019), Lee et al. (2020), Kanazawa et al. (2022), and Park et al. (2022).

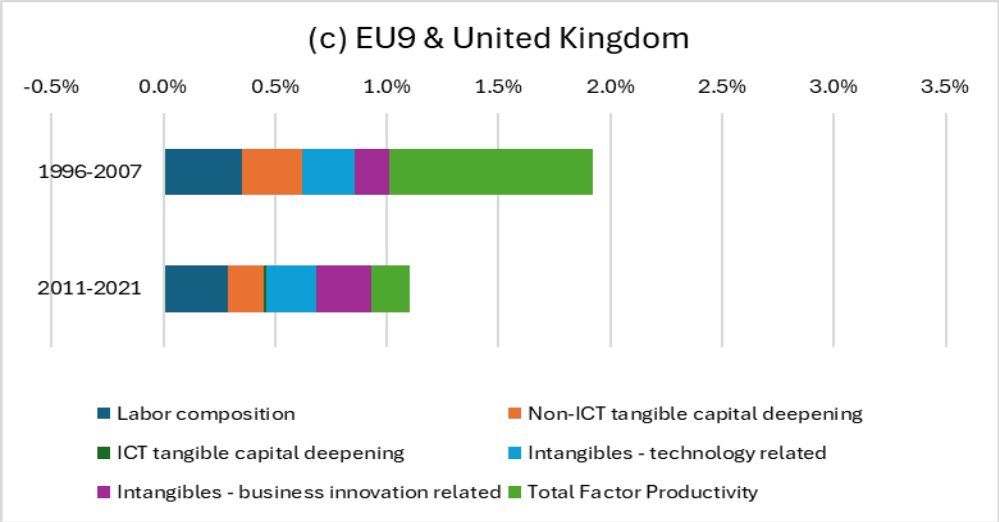
[4] Acemoglu and Restrepo (2022).

aging rate. For Japan, enhancing labor productivity through both tangible and intangible investments is an urgent necessity.

Unfortunately, most APEC member economies lack internationally comparable data on productivity and investment trends. While the EU has made progress in developing such data, many APEC economies have not. This data gap limits evidence-based policymaking and international comparison.

Figure 2. Decomposition of labor productivity in market economies, 1996-2007 and 2011-2021





Notes: Labor productivity growth is calculated as value-added growth per hour worked (%) for market economies (excluding public sectors); for the United States and European economies, the agricultural sector is also excluded. The figure shows the annual average labor productivity growth and the contribution of each factor for the periods 1996-2007 and 2011-2021 (-2020 for Japan). "Intangibles – technology-related" are measured as part of GDP and included in the national accounts (software, database, research and development, mineral exploration, and artistic, entertainment and literary originals). "Intangibles – business innovation-related" are not included in GDP in the national accounts (industrial designs, financial product development, market research and branding, operation models, platforms, supply chains, and distribution networks, and employer-provided training).

Source: EUKLEMS & INTANProd database, 2025 release.

4. Policy recommendations for aging societies

4.1 Promote complementary investment and avoid misaligned incentives

Investments in AI-enabled robotics and other ICT-related assets are necessary but not sufficient. Complementary investment in human capital and organizational reform is critical. In Japan, such investments remain weak, especially among small and medium-sized enterprises (SMEs) that face greater challenges in securing capital.

Policy support should not simply favor small firms indiscriminately but instead should target those actively investing in growth and innovation. Poorly designed policies that make it advantageous to remain small can hinder productivity and growth.

4.2 Support labor mobility and upskilling

The introduction of AI and robotics can help address labor shortages but will also displace workers in certain occupations. To minimize adverse effects, governments should strengthen education and training systems and support smoother labor mobility across sectors and firms.

Without such measures, inequality could widen between workers who benefit from technology and those whose jobs are at risk. While temporary income support during job transitions is necessary, programs should be designed to incentivize workers to acquire new skills and transition quickly into more productive roles.

4.3 Expand regional cooperation and digital collaboration

Accepting more immigrants and foreign workers is one way to mitigate labor shortages in the short term. Facilitating labor mobility within the Asia-Pacific region is also important. However, sudden inflows of foreign workers may trigger social tensions, and competition for talent could intensify as many Asian economies age simultaneously.

In this context, regional cooperation in technology and innovation may offer more sustainable long-term solutions by accelerating the adoption of new technologies more efficiently and effectively. For instance, the Asia Digital Transformation (ADX) Promotion Program launched by the Japan External Trade Organization (JETRO) in 2020 supports collaboration between Japanese and ASEAN firms to address regional challenges through digital innovation. These initiatives can help ease the demographic burden by improving productivity.

Many APEC economies possess advanced digital infrastructure and talent. In the IMD World Digital Competitiveness Ranking 2024, Singapore ranked first, with the US placing fourth and Korea, Chinese Taipei, and Hong Kong, China also positioned in the top ten. Other high-ranking economies include the People's Republic of China and Australia.

By leveraging digital tools to facilitate regional division of labor, APEC economies can improve efficiency and offset declining labor supplies. However, challenges such as establishing common digital trade rules and avoiding wage disparities both between and within economies remain. Robust multilateral and bilateral cooperation are needed, but geopolitical tensions – especially between the US and China – and the rise of

protectionism could hinder collaboration.

While it is ideal for major powers to lead cooperation efforts, the economies most affected by aging should consider initiating smaller-scale collaborative programs among themselves.

4.4 Build better data for better policy

The development of relevant statistics is essential not only to assess the impact of new technologies but also to evaluate the effectiveness of complementary investments and policy interventions.

Many APEC economies currently lack detailed internationally-comparable data on productivity and investment trends at the industry level. This is a major barrier to formulating evidence-based policies and promoting regional collaboration.

In contrast, data development is progressing in Europe. APEC economies should prioritize improving their data infrastructure and collaborate to ensure better comparability and more effective use of data in policymaking.

5. Conclusion

Despite demographic challenges, aging economies can still achieve sustainable growth by improving productivity through the adoption of new technologies. However, realizing this potential requires more than just introducing AI or robotics; it demands complementary investments in human capital, organizational reform, and better policy design.

APEC economies must also overcome gaps in data infrastructure and pursue closer regional cooperation, particularly in the digital space. With thoughtful investment, evidence-based policy, and international collaboration, even rapidly aging societies can maintain economic dynamism and improve living standards.

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