

Potential Output and High-Income Convergence in Fiji

Matteo Ghilardi and Sonam Tobgay

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Prepared by Matteo Ghilardi and Sonam Tobgay*

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ABSTRACT: This paper examines Fiji's potential output growth using a production-function approach and analyzes income convergence toward high-income status. Potential growth is estimated at around 3.4 percent over the medium term, with capital accumulation and productivity as the main drivers. The analysis indicates that convergence to high-income status by 2050 is feasible under conditions of sustained and productive investment, particularly targeted at enhancing resilience to climate-related shocks.

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SELECTED ISSUES PAPERS

Potential Output and High-Income Convergence in Fiji

Republic of Fiji

Prepared by Matteo Ghilardi and Sonam Tobgay¹

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PROTENTIAL OUTPUT AND HIGH-INCOME CONVERGENCE IN FIJI¹

This paper examines Fiji's potential output growth using a production-function approach and analyzes income convergence toward high-income status. Potential growth is estimated at around 3.4 percent over the medium term, with capital accumulation and productivity as the main drivers. The analysis indicates that convergence to high-income status by 2050 is feasible under conditions of sustained and productive investment, particularly targeted at enhancing resilience to climate-related shocks.

A. Introduction

1. Fiji has declared an ambitious long-term vision of raising living standards, strengthening economic resilience, and achieving sustainable growth, as set out in its National Development Plan and Vision 2050. This framework emphasizes productivity-enhancing reforms, higher investment, and greater resilience to climate-related risks as central pillars of the country's development strategy to reach high income status by 2050. In this context, understanding the economy's underlying growth capacity and the pace at which incomes can converge toward high-income levels is essential for gauging the realism of these objectives and the policy effort required to achieve them.

2. This papers estimates Fiji's potential output growth using a production-function approach and examining the implications for income convergence over the long term. The analysis focuses on the economy's supply-side capacity, decomposing potential growth into contributions from capital accumulation, labor input, human capital, and productivity. This framework provides a transparent basis for linking policy choices, particularly those affecting investment and productivity, to long-run growth outcomes, while abstracting from short-term cyclical fluctuations. The results suggest that Fiji would make substantial progress toward high-income status by 2050 under baseline assumptions, but that achieving full convergence would likely require higher and more resilient investment, particularly to mitigate the effects of climate-related shocks on the capital stock, alongside continued productivity gains.

B. Estimating Potential Output Growth in Fiji: A Production-Function Approach

3. This section presents estimates of Fiji's potential output growth using a production-function framework. The approach follows standard growth-accounting practice and draws on Kotera and Xu (2023) and Oura (2007). Under plausible assumptions about capital accumulation and productivity, Fiji's potential growth is estimated at around 3.4 percent in the baseline. Scenario analysis shows that Fiji's potential growth is estimated to lie in a range of 2.4 – 3.6 percent, highlighting uncertainty around potential growth estimates. The decomposition highlights that

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capital is the dominant driver across scenarios, while TFP assumptions are the main source of uncertainty around the level of potential growth.

C. Framework and Growth Decomposition

4. Potential output is defined as the level of output consistent with sustainable use of factor inputs and trend productivity. We model potential output using an augmented Cobb–Douglas production function that combines physical capital, labor input, human capital, and productivity:

$$Y_t^* = A_t K_t^\alpha (N_t H_t)^{1-\alpha}$$

where Y_t^* denotes potential output, A_t is total factor productivity, K_t^S denotes capital services, N_t is labor input measured as total hours worked, H_t captures human capital per worker, and α is the capital share. Denoting the log difference as $x_t = \Delta \ln(X_t)$:

$$y_t = a_t + \alpha \cdot k_t + (1 - \alpha) \cdot (n_t + h_t)$$

This formulation allows potential growth to be expressed as the sum of contributions from capital services, labor input, human capital accumulation, and productivity growth.

The analysis relies primarily on Penn World Table (PWT) version 11.0 for historical data through 2023, which provides internally consistent measures of output, capital services, capital stock, human capital, and TFP.² Where relevant, the dataset is updated using official Fiji releases. From 2024 onward, each factor input is projected under transparent assumptions designed to capture plausible medium-term trends rather than short-term cyclical movements.

D. Factor Input Projections

Capital

5. Capital input is measured using capital services, which capture the effective flow of productive capital and account for differences in asset composition. Consistent with the PWT methodology, capital services (*rkna*) differ from the capital stock (*rnna*) and provide a more appropriate measure of capital input in production. Because capital services are not directly projected in PWT, we approximate their growth using the historical relationship between capital services and capital stock growth. To project capital services beyond the historical sample, we extrapolate from the last observed level of *rkna* using an empirically estimated relationship between the growth rate of capital services and the growth rate of the capital stock. Specifically, the growth rate of capital services is estimated as:

$$gr_t^{rkna} = \hat{\alpha} + \hat{\beta} \cdot gr_t^{rnna}$$

² Data available on <https://www.rug.nl/ggdc/productivity/pwt/?lang=en>.

where $gr_t^{rkna} \equiv \Delta \ln(rkna_t)$ denotes the log growth rate of capital services and $gr_t^{rkna} \equiv \Delta \ln(rkna_t)$ denotes the log growth rate of the capital stock. The coefficients $\hat{\alpha}$ and $\hat{\beta}$ are obtained from an ordinary least squares regression of $\Delta \ln(rkna_t)$ on $\Delta \ln(rkna_t)$ over the period 2000–2023. The estimated relationship is then used to project capital services growth in the projection period, with capital services evolving recursively according to $rkna_t = rkna_{t-1} \exp(gr_t^{rkna})$.³

6. The capital stock is projected using the perpetual inventory method, with depreciation calibrated to PWT averages. The law of motion for the capital stock is given by:

$$rkna_t = rkna_{t-1} \cdot (1 - \delta) + I_t$$

where the depreciation rate is set to $\delta = 0.0884$, equal to its average value over 2000–23 in the PWT. Investment I_t is constructed by extrapolating the investment series using the growth rate of gross fixed capital formation (GFCF):

$$I_t = I_{t-1} \cdot (1 + gr_t^{GFCF})$$

where gr_t^{GFCF} denotes the growth rate of real gross fixed capital formation. From 2024 onward, the baseline scenario assumes that real GFCF grows at 3.9 percent, corresponding to the average growth rate observed over 2010–23.

Under each investment assumption, the implied path of the capital stock determines the growth rate gr_t^{rkna} , which in turn maps into projected capital services growth via the estimated relationship above. This approach ensures internal consistency between the investment path, capital stock accumulation, and the evolution of capital services used in the production-function framework.

Labor and Human Capital

7. Labor input is defined as total hours worked and is constructed as the product of employment and average hours per worker. In the projection period, labor input dynamics are driven primarily by demographic trends rather than cyclical labor market fluctuations. Consistent with this approach, we assume that the employment rate remains constant at its 2023 level, implying that employment evolves in line with the working-age population:

$$N_t = \text{Employment Rate}_{2023} \times \text{Working Age Population}$$

where working-age population projections are taken from United Nations demographic forecasts. This assumption abstracts from short-term labor market volatility and reflects the expectation that participation gains will remain limited over the medium term, consistent with demographic trends and migration patterns.

³ This projection assumes stability in the historical relationship between capital stock and capital services; faster technological progress could imply somewhat stronger capital services growth than projected.

8. Human capital augments effective labor input and is measured using the Penn World Table (PWT) human capital index. In PWT, human capital is constructed as a function of average years of schooling among adults aged 25 and above, mapped into efficiency units using piecewise-linear returns to education. Let s_t denote average years of schooling.⁴ Human capital evolves according to:

$$H_t = \exp(\Phi(s_t))$$

where the schooling-to-human-capital mapping $\Phi(s)$ follows the following specification:

$$\Phi(s) = \begin{cases} 0.134 \cdot s, & s \leq 4 \\ 0.134 \cdot 4 + 0.101 \cdot (s - 4), & 4 < s \leq 8 \\ 0.134 \cdot 4 + 0.101 \cdot 4 + 0.068 \cdot (s - 8), & s > 8 \end{cases}$$

Human capital is proxied using the Penn World Table (PWT) human capital index, which maps average years of schooling into efficiency units of labor using externally calibrated returns to education. The index is constructed as the exponential of a piecewise-linear function of schooling, with returns that decline as educational attainment increases. Specifically, returns are set at 13.4 percent per year for the first four years of schooling, 10.1 percent for years five through eight, and 6.8 percent for schooling beyond eight years, following the standard PWT methodology. Accordingly, the human capital measure captures variation in education-adjusted labor input over time and across countries, rather than estimating marginal returns to an additional year of schooling.

For Fiji, post-2010 schooling data in PWT are partially extrapolated based on trends observed during 2005–10. From 2024 onward, the baseline assumes an annual increase in years of formal schooling of 0.05 years, corresponding to the average gain observed over 2010–2023. Under these assumptions, human capital accumulation proceeds at a gradual pace and contributes steadily, though modestly, to potential output growth over the projection horizon. This specification assumes constant returns to schooling over time, consistent with the standard Mincer-type formulation used in the Penn World Table human capital index.

TFP

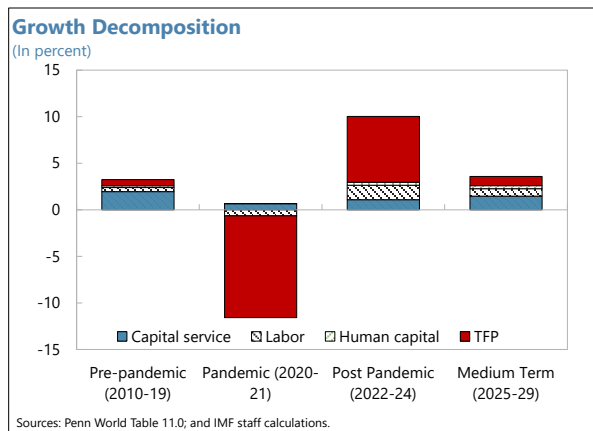
9. TFP growth is assumed to follow Fiji's pre-pandemic structural productivity performance. Accordingly, TFP growth is set equal to its average rate over 2010–2019, estimated at 0.99 percent. This period provides a benchmark for underlying productivity trends by excluding pandemic-related disruptions while capturing Fiji's most recent structural growth dynamics, consistent with standard growth-accounting projection practices.

⁴ The coefficients in the human-capital specification correspond to returns to schooling based on Mincer-type regression estimates reported in Psacharopoulos (1994).

Results and Scenario Analysis

10. Under the baseline assumptions, Fiji's potential output growth is estimated at 3.4 percent.

The composition of potential growth over the medium term is broadly consistent with pre-pandemic trends, with capital accumulation providing the largest contribution, followed by total factor productivity, labor input, and human capital accumulation. While capital accumulation accounts for the largest contribution to potential growth, variation in TFP assumptions explains most of the differences across scenarios. Prior to the pandemic, potential growth was underpinned by steady capital and moderate productivity gains. During the pandemic, potential growth weakened markedly, reflecting persistent supply-side effects from border closures and widespread disruptions to economic activity that reduced effective labor input and productivity, while capital accumulation remained relatively resilient. Human capital, which evolves gradually with educational attainment, contributed little to short-run variation. In the immediate post-pandemic period, potential growth increased as the reopening of the economy restored labor utilization and productivity, temporarily lifting potential growth.



11. Alternative scenarios illustrate how Fiji's potential growth responds to changes in key supply-side drivers. These scenarios imply a plausible range for potential growth between 2.4 and 3.6 percent, with differences driven primarily by investment and productivity dynamics. Variations in labor input have a comparatively limited effect on potential growth, reflecting structural constraints on labor supply in a small, migration-prone economy. The scenarios are constructed by varying assumptions on investment, productivity, and labor input, which together capture the main sources of uncertainty around Fiji's potential growth:

- Investment.** In the baseline, real investment growth is calibrated at 3.9 percent, corresponding to the average growth rate of gross fixed capital formation over 2010–2023.⁵ The slower investment scenario, based on the longer-run average over 2000–2023, illustrates the downside risk from weaker investment momentum, which would modestly reduce potential growth by slowing capital accumulation. Conversely, the faster investment scenario illustrates the upside from higher investments and sustained improvements in its execution.
- Employment.** The growth in the employment rate with respect to the working-age population is assumed to increase to 0.3 from the baseline value of 0.2. This scenario illustrates the potential growth impact of policies that raise labor force participation and employment, including measures to strengthen female labor force participation, and to reduce net outward migration,

⁵ Excluding the pandemic and subsequent recovery period, real investment growth averaged 4.9 percent over 2010–2019.

particularly among skilled workers. The employment scenario illustrates the limited scope for labor supply to act as a major growth lever. Even under more favorable assumptions for employment relative to the working-age population, the contribution of labor input to potential growth increases only modestly.

- **TFP.** The low-TFP scenario reflects a continuation of subdued productivity observed over the period 2010-2023, which would significantly lower potential growth. This period includes the pandemic and highlights the vulnerability of productivity dynamics in a small, shock-prone economy such as Fiji, where repeated disruptions can slow technology adoption and the diffusion of productivity gains, posing a material risk to medium-term convergence.

Text Table. Fiji: Potential Growth Decomposition: Alternative Scenarios

	Baseline	Slower Investment Growth (2.6)	Faster Investment Growth (5.1)	Slower TFP Growth (0.03)	Growth in employment rate (0.3)
GDP	3.4	3.2	3.6	2.4	3.5
Capital Service	1.5	1.2	1.7	1.5	1.5
Labor	0.6	0.6	0.6	0.6	0.8
Human Capital	0.3	0.3	0.3	0.3	0.3
TFP	1.0	1.0	1.0	0.0	1.0

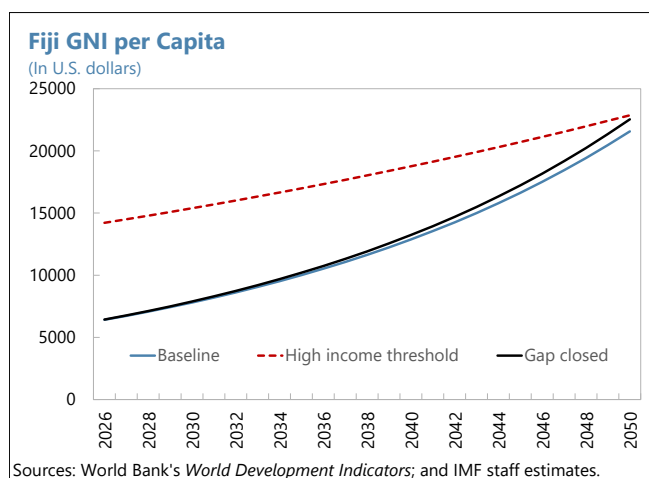
12. Across all scenarios, capital accumulation remains the dominant contributor to potential growth. Even when alternative assumptions are imposed on investment growth, TFP, or labor input, capital services consistently account for the largest share of potential growth. Labor input and human capital contributions are relatively stable across scenarios, reflecting demographic trends and gradual improvements in educational attainment. These results underscore the importance of sustained investment and productivity performance for Fiji's medium-term growth prospects.

E. Is High-Income Convergence Achievable by 2050?

13. This section assesses whether Fiji can reach high-income status by 2050, as laid out in the National Development Plan. The analysis focuses on the growth rate required to close the current income gap by 2050 and compares it with Fiji's estimated potential growth under baseline assumptions. It then examines the policy margins, particularly investment and resilience to climate shocks, that could bridge the remaining gap.

14. With sustained growth over time, and absent major shocks, Fiji would make substantial progress toward high-income status but would fall marginally short by 2050.⁶

Baseline projections imply continued income convergence, but climate-related shocks and capital losses weigh on long-run growth, preventing the full closure of the income gap. This result highlights that the convergence challenge is not one of fundamentally insufficient growth capacity, but rather one of protecting and sustaining growth over time. In particular, even small and persistent output losses associated with natural disasters compound over decades, lowering the level of income relative to the high-income threshold.



15. Closing the remaining income gap would require policies that raise growth above the baseline path, including through higher and more effective investment. A growth rate of 3.6 percent is needed to close the gap, with a particular focus on strengthening resilience to climate-related shocks. In this context, increasing capital expenditure can support growth by accelerating capital accumulation and strengthening productive capacity. The composition of this additional investment also matters. In a country highly exposed to natural disasters, directing a greater share of investment toward climate-resilient infrastructure can enhance the growth resilience by reducing repeated capital losses associated with climate-related shocks. Absent this, disaster-related output losses can weigh on long-run growth outcomes through cumulative erosion of the capital stock.⁷ Under a scenario in which Fiji increases climate-related and resilience-enhancing investment, average growth is estimated to be around 0.2 percentage point higher than in the baseline, which would be sufficient to close the remaining income gap by 2050. This growth gain would primarily reflect reduced capital losses from climate-related shocks and the preservation of productive capital, rather than higher total factor productivity growth.

⁶ The projection excludes pandemic-scale global disruptions and assumes future shocks are broadly consistent with historical averages.

⁷ See Annex X of 2025 Article IV Staff Report for an analysis of the impact of natural disasters on growth.

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