India’s Public Capex Push: Positive but Insufficient Effects to Strongly Boost Long-Term Growth

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Confidential

Executive summary

India’s Union Budget for FY 2026/27 confirms a continued focus on an infrastructure-led growth strategy, with effective public capital expenditure reaching approximately 4.4% of GDP, up from 3.9% the previous year and accounting for nearly one-third of total expenditure. This expansion builds on a sustained increase in public investment over the past decade and reflects a deliberate policy effort to support long-term growth and crowd in private investment, against a backdrop of persistently weak private investment (around 12% of GDP).

At the same time, India remains exposed to short-term macroeconomic risks, notably from global energy shocks, which could force the authorities to prioritize public spending to support households and businesses weakened by the effects of the conflict in the Middle East. Indeed, recent geopolitical tensions in the Middle East have disrupted energy supply chains, increasing import costs and inflationary pressures, and highlighting India’s structural dependence on imported fossil fuels. While these risks may affect near-term dynamics, they do not alter the government’s strategic commitment to infrastructure-led growth.

To assess the long-term impact of the capex push, this paper uses the World Bank Long-Term Growth Model (LTGM), which captures the role of public and private capital in shaping potential output.

The direct effect of the investment shock raises potential growth by around 0.2 percentage points in 2027 before gradually fading. This translates into a long-run increase in the level of potential output by 3.6%. Accounting for crowding-in effects slightly amplifies these results, with private investment rising by 0.37 per unit of public investment and long-run output gains reaching 4.5%.

While these effects are significant, they remain far from sufficient on their own for India to achieve high-income status by 2047. Without additional investment programs or a strong acceleration in productivity growth, this objective would not be reached until around 2075.

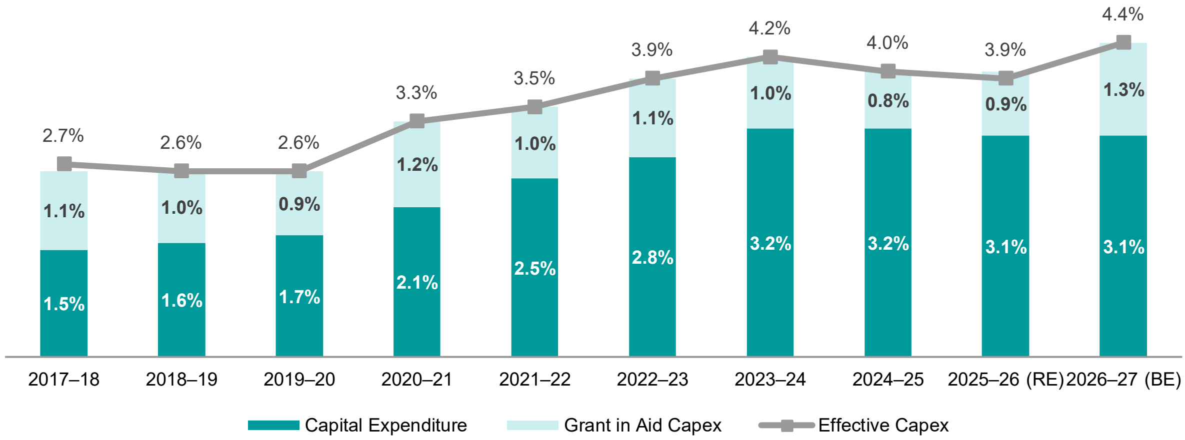
1. India is moving towards an infrastructure-led growth strategy

1.1. Increase in Public Capital Expenditure in FY 2026/27

India’s Union Budget for fiscal year (FY) 2026/27[1] reinforces the government’s infrastructure-led growth strategy through a further expansion in public capital expenditure. Budgeted capital expenditure is set at **₹12.2 lakh crore, equivalent to 3.1% of GDP, representing an increase in nominal terms from ₹11 lakh crore relative in FY 2025/26**. However, this headline figure **understates the scale of the public investment effort**, as it excludes grants-in-aid for capital creation. When these grants are included, **effective public capital expenditure rises to approximately ₹17.1 lakh crore, or 4.4% of GDP**, up from **3.9% in FY 2025/26.** At this level, public capital expenditure accounts for roughly **32% of total budgeted expenditure**, highlighting the central role of investment in the government’s fiscal strategy.

The increase builds on a **sustained upward trajectory over the past decade**. Capital expenditure has risen from **₹2.6 lakh crore in FY 2017–18 (1.5% of GDP) to ₹11 lakh crore in FY 2025–26 (3.1% of GDP) (Budget Estimates**), **and further to ₹12.2 lakh crore in FY 2026/27 (3.1% of GDP)**. Over the same period, grants-in-aid for capital creation have also expanded significantly, from ₹1.9 lakh crore to ₹4.9 lakh crore, reinforcing the scale of effective capital formation supported by the public sector.

Figure 1: Public capital expenditure (% of GDP)



Source: Union Budget Expenditure 2026-27, Ministry of Finance, India

The budget also outlines a **set of targeted infrastructure initiatives** aimed at strengthening both physical connectivity and emerging industrial capabilities. Key projects are outlined as follows:

- **Infrastructure Risk Guarantee Fund:** Establishment of a fund to provide partial credit guarantees to lenders, aimed at mitigating construction-phase risks and crowding in private investment.
- **Transport Infrastructure Expansion:**
  - Development of a Dedicated Freight Corridor and 20 new national waterways.
  - Proposal for seven high-speed rail corridors connecting major economic hubs (e.g., Mumbai–Pune, Delhi–Varanasi).

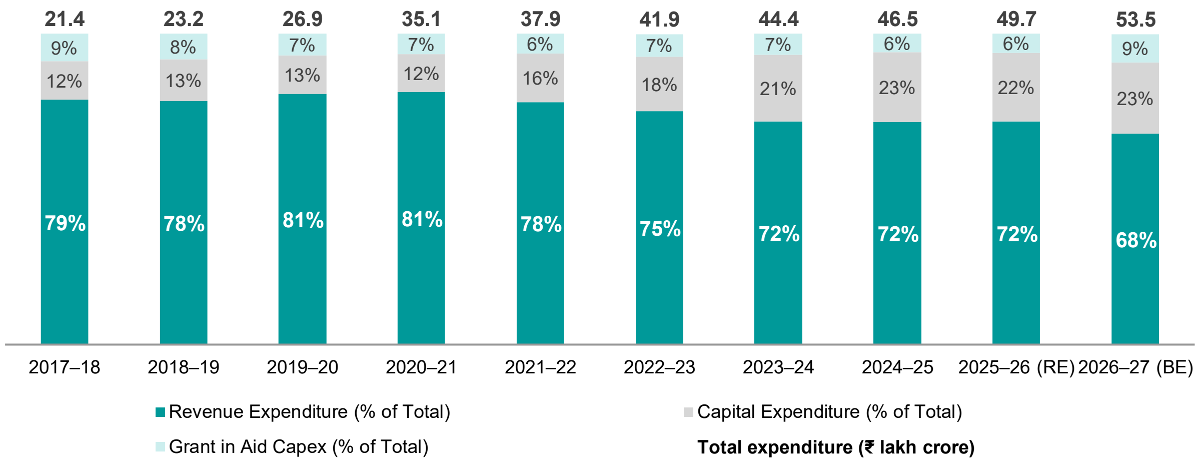
[1] In India, the fiscal year runs from April 1 to March 31 of the following year.

- **Seaplane Viability Gap Funding (VGF) Scheme:** Support for seaplane manufacturing and operations to enhance last-mile connectivity and promote tourism.
- **Carbon Capture, Utilization, and Storage (CCUS):** Allocation of ₹20,000 crore over five years to scale CCUS technologies across key industrial sectors (power, steel, cement, refineries, chemicals).
- City Economic Regions (CERs):
  - Focus on Tier II and Tier III cities[2], including temple towns.
  - Mapping of urban clusters based on growth drivers to leverage agglomeration effects.
  - Allocation of ₹5,000 crore per CER over five years.

1.2. The focus is on infrastructure development

The FY **2026/27 budget is consistent with a broader and sustained policy shift toward investment-led growth**. The emphasis on infrastructure development is not a one-off response but part of a multi-year strategic reorientation of fiscal policy. A **defining feature of recent budgets has been the decomposition of public expenditure**. While overall **government spending has moderated slightly, capital expenditure has increased as a share of total expenditure** as seen below.

Figure 2: Evolution of composition of the Expenditures



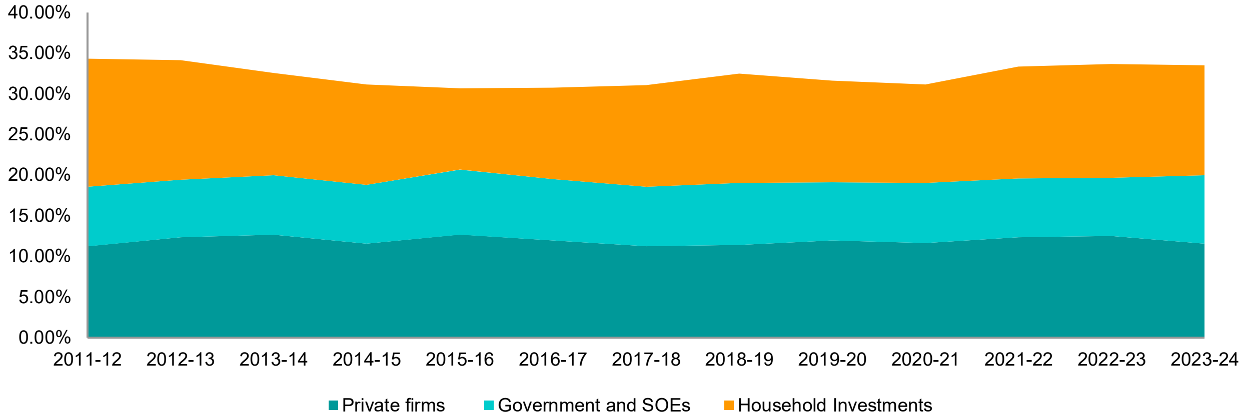
Source: Union Budget Expenditure 2026-27, Ministry of Finance, India

This reflects a deliberate policy choice to prioritize long-term productive capacity over short-term consumption-oriented spending. This strategic shift is **embedded within a broader policy narrative centered on enhancing productivity and crowding in private sector investment**. Since assuming office in 2014, Prime Minister Narendra Modi has implemented a **series of pro-business reforms,** including reducing corporate tax rates, providing subsidies to support manufacturing initiatives, and introducing a comprehensive bankruptcy law**.** In addition to increasing capital expenditure, the government has introduced a range of **institutional and financial innovations to support infrastructure financing and asset monetization,** over the past decade. These include Infrastructure Investment Trusts (InvITs) and Real Estate Investment Trusts (REITs), as well as dedicated institutions such as the National Investment and Infrastructure Fund (NIIF) and the National Bank for Financing Infrastructure and Development (NaBFID).

[2] Indian cities with a population in the range of 50,000 to 100,000 are classified as Tier II cities, while those with a population of 20,000 to 50,000 are classified as Tier III cities

At the same time, **private investment dynamics remain relatively subdued**. Private firms' contribution to Gross Fixed Capital Formation (GFCG) declined to 34.4% in FY 2023/24, the lowest level in over a decade[3]. Similarly, the share of private investment in real GDP has fallen to 11.5%, down from peak of 13% eight years earlier. These trends underscore the continued reliance on public sector investment to sustain overall economic growth.

Figure 3: Private firms' contribution to India's GDP (% of GDP)



Source: India's Ministry of Statistics and Planning Implementation | *A. Srivastav and S. Bose* | *December 4, 2025*

Against this backdrop, the current phase of elevated public capital expenditure should be understood not as a temporary stimulus measure, but as a structural strategy aimed at raising India's long-term growth potential. The key analytical question, therefore, is the extent to which this infrastructure push can durably enhance productivity and crowd in private investment, thereby lifting potential GDP growth rather than merely supporting short-term cyclical activity.

2. Could the conflict in the Middle East temporarily divert authorities from their infrastructure investment strategy?

Recent geopolitical developments in the Middle East constitute a significant short-term macroeconomic risk for India, that could drag on efforts to boost long-term capital expenditures if a sizeable short-term stimulus is required to offset the impacts of this conflict.

The escalation of the US–Iran conflict has materially disrupted energy flows from the Gulf. As of 7 April 2026, restrictions on transit through the Strait of Hormuz, combined with damage to critical energy infrastructure, have triggered a supply shock in global oil and LNG markets.

India, as a large net energy importer, is particularly exposed. The resulting supply constraints have contributed to an LPG shortage resulting in disruptions in manufacturing activity, and rising inflationary pressures

2.1. India's Energy Vulnerability is a structural problem

India's exposure to global energy shocks is not episodic but structural. Past episodes, including the 2003 Gulf War and the 2008 oil price spike have consistently resulted in widening trade deficits, elevated inflation, and

[3] Reuters, India capex hole puts world-beating growth at risk, December 2025

fiscal interventions. The current US–Iran conflict reinforces this pattern, highlighting India's persistent dependence on imported fossil fuels.

Oil and gas account for around 30% of India's energy mix, with a high degree of dependence on imports[4].

- Crude oil: 90% as of Feb 2026[5]
- Natural gas: 50% as of Mar 2026[6]

2.2. Coal as a Short-Term Shock Absorber

In response to energy supply disruptions, India has increasingly relied on coal as a system stabiliser. Current trends demonstrate higher coal utilisation[7], which clearly reflects its role as a fallback when gas becomes scarce or expensive. Coal-fired power plants are being pushed to operate at higher capacity to maintain electricity supply.

However, this strategy also possesses persistent import exposure as India imports over 240 million tonnes[8] of coal annually (in addition to over 1 billion tonnes of domestic production), particularly coking coal and high-grade thermal coal. In addition, higher emissions and air pollution impose long-term social and economic burdens, adding to the environmental and health costs.

In effect, coal enhances short-term resilience but reinforces long-term structural vulnerability

2.3. Short-term Macroeconomic Impact: Inflationary pressures and reduced remittances

With nearly 60 per cent of India's LPG demand met through imports and over 90 per cent of those imports routed through the Strait of Hormuz, the energy crisis has already translated into price increases, as of March 2026[9]:

- Domestic LPG: +₹60 per cylinder (~7%)
- Commercial LPG: +₹130 per cylinder (~6.5%)

By contrast, petrol prices at the pump have remained broadly stable for now[10].

This occurs against the backdrop of the RBI's earlier projection of the inflation environment (2.1% for FY2025–26). However, CPI inflation has already risen to 3.21% in February, with March estimates in the 3.3–3.5% range. Beyond direct price increases, supply shortages have significantly disrupted food services, the informal economy, and manufacturing.

In the food services sector, reduced commercial gas availability, estimated at 30–50% due to prioritisation policies (see Section 2.4) has forced restaurants and street vendors to scale down operations. Many have

[4] *Breaking the cycle of energy shocks: India's renewable opportunity*. (2026). Climate Analytics. https://climateanalytics.org/comment/breaking-the-cycle-of-energy-shocks-indias-renewable-opportunity

[5] Slav, I. (2026, February 24). *India's Oil Import Dependence Climbs to Nearly 89% as Domestic Output Lags*. OilPrice.com. https://oilprice.com/Latest-Energy-News/World-News/Indias-Oil-Import-Dependence-Climbs-to-Nearly-89-as-Domestic-Output-Lags.html

[6] Verma, N. (2026, March 19). India, a major energy consumer and refiner, assesses domestic availability. *Reuters*. https://www.reuters.com/business/energy/india-major-energy-consumer-refiner-assesses-domestic-availability-2026-03-19/

[7] R, S. N. (2026, March 10). India to boost coal use for summer power as Mideast crisis hits LNG supplies. Reuters. https://www.reuters.com/sustainability/boards-policy-regulation/india-boost-coal-use-summer-power-mideast-crisis-hits-lng-supplies-2026-03-10/

[8] Staff Reporter. (2025, May 28). India's coal imports down 7.9% in FY 2025. Asian Power. https://asian-power.com/news/indias-coal-imports-down-79-in-fy-2025

[9] Policy Responses to India's LPG Supply Crisis – Takshashila Institution. (2026, March 18). Takshashila.org.in. https://takshashila.org.in/content/publications/20260318-Policy-Responses-to-India-LPG-Supply-Crisis.html

[10] Petrol, Diesel price today (April 13): As Diesel, ATF export duties see hike, check fuel rates in Delhi, Mumbai, Kolkata and other cities – The Economic Times (13 April 2026)

shifted to "half-kitchen" models, offering limited menus while passing on higher input costs to consumers through what is often described as an "LPG crisis premium."

These constraints have led to a wave of restaurant closures in major urban centres, alongside weakened consumer demand driven by both rising prices and reduced service availability. Employment effects have been particularly acute among informal and temporary workers, who constitute a large share of the sector's labour force.

At the industrial level, energy-intensive sectors including stainless steel, ceramics, and glass manufacturing experiencing production slowdowns. Although some larger firms are attempting to mitigate the shock through a transition to electric heating, MSMEs are facing binding constraints in terms of capital, technology, and operational flexibility. This asymmetry increases the likelihood of output contraction and employment losses concentrated within the MSME segment, with potential knock-on effects across supply chains

2.4. India's Policy Response is a mix of short- and medium-term reforms, spanning over both domestic and external measures

Short-Term Measures

In the demand side, demand prioritization has been the cornerstone of intervention, with LPG supply redirected toward households, which account for roughly 85–87%[7] of total demand. This has come at the expense of commercial and industrial users, who continue to face severe shortages.

On the supply side, domestic augmentation measures have been implemented to expand availability. Refineries have been instructed to maximize LPG output, including the full diversion of C3/C4 streams to public sector oil marketing companies namely IOCL, BPCL, and HPCL resulting in an estimated 25–30% increase in domestic production.

Complementing these efforts, external measures have focused on securing import flows, notably through diplomatic engagement to ensure tanker transit via the Strait of Hormuz. Emergency shipments, such as those carried by the Shivalik and Nanda Devi, have provided some relief, though their contribution remains limited at roughly 5% of monthly import volumes.

Medium term reforms rooted in infrastructure led growth strategy for India

In the medium term, India's adjustment strategy centres on expanding domestic refining capacity as a means of strengthening energy security. A key development in this regard is the government's approval of a revised project cost and additional equity infusion for the HPCL Rajasthan Refinery Limited (HRRL). This intervention reflects a broader infrastructure-led approach aimed at reducing structural vulnerabilities to external supply shocks by enhancing domestic processing capabilities. While such capacity expansion is expected to improve resilience and flexibility over time, it is unlikely to materially reduce India's dependence on LPG imports in the near term, given the scale of demand and the continued reliance on global supply chains

3. Quantifying the impact of the public capital expenditure push on potential GDP: positive but relatively modest overall effects

3.1. The direct effect of the announced public capital expenditure push is positive but relatively modest

To assess the macroeconomic impact of the announced public capital expenditure push in India, we mobilize the **World Bank Long-Term Growth Model (LTGM)**[11], extended to explicitly incorporate public capital (**see Box 1).**

Box 1: The long-term growth model of the World Bank

The LTGM provides a **framework** to evaluate the **medium- to long-term effects of investment shocks on potential economic growth.** It is particularly well suited to this exercise, as it allows us to **trace the dynamic impact of higher public investment on output through capital accumulation**, while accounting for country-specific characteristics such as initial capital stocks and structural parameters.
At its core, the model relies on a **production function combining four key inputs**:

- **Labor**
- **Private capital**
- **Public capital (infrastructure)**
- **Total factor productivity (TFP)**

Technical details on the model structure, equations, and calibration assumptions are provided in the **Appendix**. **Nevertheless, several key features of the LTGM are worth highlighting here:**

- **Decreasing marginal returns to capital:** As the stock of capital increases, **each additional unit contributes less to growth**. This implies that the **growth impact of sustained investment gradually declines over time**, even if investment rates remain elevated.
- **Moderate elasticity of output to public capital:** Based on the empirical literature, the elasticity of output with respect to public capital is **calibrated at 0.17 by the world bank**. This implies that public investment has a **positive but not substantial effect on growth**, consistent with cross-country empirical evidence.
- **Dynamic adjustment and transition effects:** The model captures the fact that the impact of public investment is front-loaded on growth **but fades over time, as capital accumulates and diminishing returns set in.**
- **Role of capital accumulation versus productivity:** While higher public and private investment can raise the **level of output**, the model highlights that **sustained long-run growth ultimately depends on TFP**. Without improvements in productivity, investment-led growth effects dissipate.

Thus, while increased public investment can **meaningfully raise output levels**, its ability to generate **persistent high growth is inherently limited** by decreasing returns to capital and the moderate elasticity of output to infrastructure. This highlights the central role of **total factor productivity improvements**, which capture technological progress, efficiency gains, and institutional quality. Enhancing TFP is therefore essential to unlock **larger and more sustained long-run growth effects**.

[11] Sarmila Devadas, Steven Pennings, World Bank, Assessing the Effect of Public Capital on Growth An Extension of the World Bank Long-Term Growth Model, October 2018

We now incorporate **the announced capital spending plans** from the **2026/27 Union Budget** into the model. The first step is to translate the budgeted increase into an increase in **Gross Fixed Capital Formation (GFCF)**, which corresponds to **public investment in the model.**

The **investment shock** is defined as the increase in public investment **relative to a counterfactual scenario without the investment push.** We assume that the change in the **investment-to-GDP ratio** in the first year of the shock (2026) is equal to the increase in **effective public capital expenditure** between 2025 and 2026, expressed as a share of **2025 GDP**[12].

Formally, the **shock to the public investment to GDP ratio**, $Shock_{26}^{I^G/Y}$, is defined as follows:

$$Shock_{26}^{I^G/Y} = \frac{Effective\ public\ capex_{26} - Effective\ public\ capex_{25}}{GDP_{25}}$$

According to **India's 2026/27 Union Budget**, total **effective capital expenditure**, defined as the sum of **capital expenditure** and **grants-in-aid for the creation of capital assets**, amounts to **₹17.1 lakh crore**. This represents an increase of **₹3.1 lakh crore** relative to 2025/26, equivalent to approximately **0.9% of 2025 GDP** (see Table 1).

The **World Bank baseline** assumes a public investment-to-GDP ratio of **7.3% in 2025**. In the **shock scenario**, we therefore add **0.9 percentage points**, bringing the ratio to **8.2%**. This higher level is assumed to be **maintained over time**, reflecting the government's stated objective of **sustaining elevated public investment levels**.

We assume that the shock **materializes during the 2026–27 fiscal year**. While, in practice, investment disbursements may be **spread over several years**, there is **no detailed information available on the timing of implementation**, only the total planned public capex for the fiscal year 2026-27 according to the Union Budget. Importantly, as the model focuses on the **impact on potential GDP through capital accumulation**, the long-run effects depend primarily on the **overall increase in investment rather than its precise timing**. As such, whether the investment is implemented in one year or phased over several years **does not affect the overall long-term results**.

Table 1: Mapping union budget public capital expenditure to a public investment shock (₹ crore)

	2025	2026
GDP	35,098,400	38,966,432
Capital expenditure	1,095,755	1,221,821
Grants in aid for creation of capital assets	308,181	492,702
Total effective capex	1,403,936	1,714,523
Shock (in % of 2025 GDP)		*0.9%*

Source: Government of India Union Budget Documents 2026-27

We now proceed to analyze the effects of this shock on **potential GDP in India** using the model described in the previous section.

It is important to emphasize that **these results do not constitute GDP forecasts**. Rather, they provide a **model-based assessment of the impact of the investment push on the economy's potential output**. Accordingly, all figures are presented **relative to a counterfactual scenario without the investment shock**, and **not as point estimates of GDP growth**. In addition, the analysis **abstracts from short-run demand-**

[12] Using lagged GDP avoids embedding endogenous growth effects from the policy into the denominator.

side effects, which may also influence observed GDP through movements in the **output gap**. The focus here is exclusively on the **supply-side (potential) channel** of public investment. (**See Box 2** for further details on the decomposition of GDP into potential output and the output gap).

<u>Box 2: Definition of potential GDP</u>

In macroeconomics, observed GDP (y_t) can be decomposed into two components:

- A long run, supply driven component, known as potential output ($\overline{y_t}$)
- A short-run, demand-driven component, known as the output gap ($\widehat{y_t}$)

Formally, this decomposition can be written as:

$$y_t = \overline{y_t} + \widehat{y_t}$$

Potential output ($\overline{y_t}$) reflects the level of production determined by **structural factors**, such as capital accumulation, labor supply, human capital, and total factor productivity. It represents the level of output that can be sustained **without generating inflationary or deflationary pressures**.

The output gap ($\hat{y}_t$) captures **short-run fluctuations around potential**, driven by demand-side factors such as monetary conditions and business cycle dynamics.

In this study, we focus exclusively on the **long-run, supply-side effects** of public investment. Accordingly, the analysis is conducted in terms of **potential GDP ($\bar{y}_t$)**, abstracting from short-run demand-side fluctuations captured by the output gap.

Figure 4 shows the effects of the **investment shock from the Union Budget announcement** on the model's **key variables relative to a counterfactual scenario without the investment push**. Starting in **2026**, the **public investment-to-GDP ratio increases by 0.9 percentage points**, and this increase is **permanent in the model**, implying a **structural change in India's public investment stance, in coherence with the government's announced plans** (see Figure 4.a).

The increase in investment leads to **stronger public capital accumulation starting in 2027**, the year following the shock, raising the **public capital-to-GDP ratio**, which continues to increase in the long run with **decreasing marginal returns** (see Figure 4.b).

This increase in the growth rate of public capital leads to a rise in potential GDP growth, reaching around +0.2 percentage points[13] (ppt%) in 2027 (see Figure 4.c). According to the World Bank model assumptions, potential GDP growth would be **5% in the counterfactual scenario** without the investment increase, implying a **rise to 5.2% under the investment scenario**, in 2027**.**

Due to diminishing returns to public capital, the effect on GDP growth gradually fades over time, and growth slowly converges back towards the counterfactual path. Ten years after the initial shock, in **2037**, potential GDP growth remains only about **0.1 ppt%** above the counterfactual (**3.2% instead of 3.1%**), and in the longer run **(post-2037), the effect becomes negligible, falling below 0.1 percentage points** (**see Figure 4.c**).

However, these relatively small increases in GDP growth accumulate over time and translate into a permanently higher level of potential output relative to the counterfactual. In other words, the Indian economy operates under higher production in the long run (see Figure 4.d). The effect on the level of GDP

[13] This effect corresponds to the marginal product of measured public capital (see derivation of formula in appendix) under the assumption that the public capital-to-GDP ratio is 0.8 in 2026 and that the elasticity of output to public capital (ϕ) is equal to 0.17.

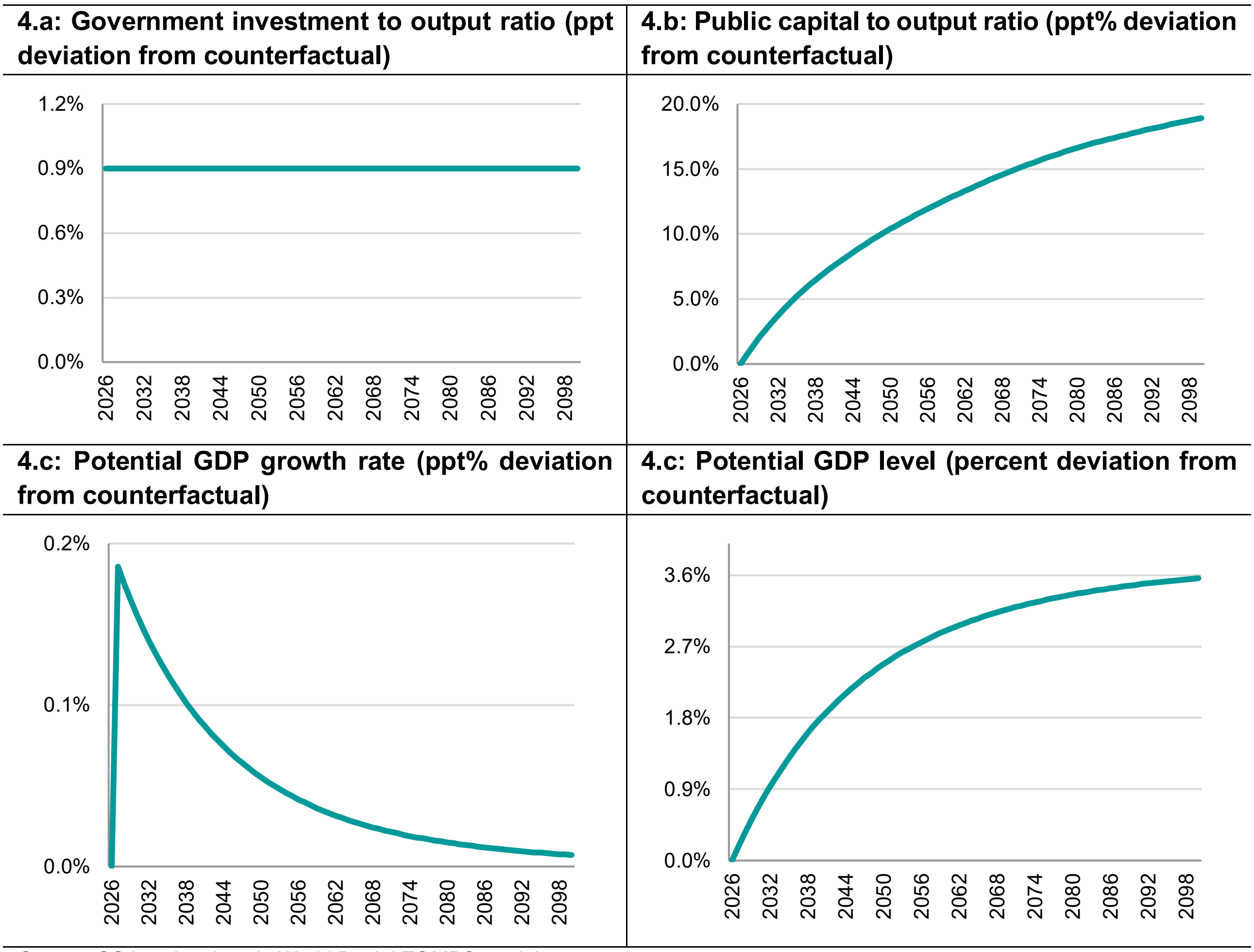
follows a concave trajectory, **reflecting diminishing marginal returns to public capital:** while gains continue to build over time, **the incremental increase in output becomes progressively smaller each year.** Quantitatively, the level effect rises from **+0.2% in 2027** to **1.5% in 2037** and reaches **3.6% in the very long run (2100)** (see **Figure 4.d**).

Overall, the **direct effects of the announced public investment push are noticeable**, leading to a **permanent increase in potential output**, but they remain **short of a "tiger growth" scenario** for the country. This relatively modest effect is **consistent with the assumptions of the World Bank long-term growth model**, and with its central conclusion that **infrastructure investment alone does not generate growth miracles**. This reflects two key features of the model: the **relatively low elasticity of output to public capital (0.17)** and **diminishing returns to public capital**, which implies that the **marginal contribution of additional capital declines as the stock rises**, thereby limiting the overall long run impact on growth. The relatively low elasticity of output to public capital is **grounded in empirical evidence from the literature**, which finds that **once endogeneity biases are addressed, the growth impact of infrastructure investment is moderate**[14]. It also reflects the fact that not all public investment translates into **productive capital** and that public capital is **only one input among many in the production process, limiting its overall contribution to output**.

These results abstract from potential indirect effects of the public investment push. In the **next section**, we incorporate these channels by **estimating the crowding-in effect on private investment** and its implications for potential growth, and by assessing how **improvements in productivity** could generate more sizeable, long-run effects.

[14] Sarmila Devadas, Steven Pennings, World Bank, Assessing the Effect of Public Capital on Growth An Extension of the World Bank Long-Term Growth Model, October 2018

Figure 4: Effects of announced public investment push on key model variables (In deviation from no investment push counterfactual)



Source: GSA estimation via World Bank LTGMPC model

3.2. Limited crowding-in effects in India imply only modest additional growth through private investment

One of the central objectives of India's recent capex push is to stimulate private investment through a crowding-in effect. The 2026/27 Union Budget explicitly frames public infrastructure spending as a mechanism to *"*crowd in private investment,*"* reflecting a broader strategy in which public capital formation acts as a **catalyst for private sector activity**[15].

While this crowding-in effect is a **core policy objective**, it is not automatic. A shock to public investment can generate **two opposing forces** on private investment. On the one hand, through the **marginal productivity channel**, increased public spending on key infrastructure facilities **enhances the productivity of private capital**, raises expected returns, and thereby **encourages additional private investment** (the crowding-in effect). On the other hand, through the **cost-of-capital channel**, if public investment is financed domestically, it may reduce the availability of loanable funds, put **upward pressure on interest rates**, and **increase financing costs for firms**, thereby **discouraging private investment** (the crowding-out effect).

[15] The economic times, Capex drive to power growth as Budget 2026 hikes investment to sustain growth & modernise logistics, February 2026

Empirical evidence for India points to a positive but relatively limited crowding-in effect. Bahal et al. (2018)[16] estimate the relationship between public and private investment in India over the long term and highlight a clear structural shift. **Prior to the 1980s**, public investment tended to **crowd out private investment**, consistent with earlier findings (e.g., Mitra, 2006[17]). However, in the **post-1980 period**, the relationship turns positive, with public investment exerting a **net crowding-in effect** on private capital formation. The authors attribute this shift to the gradual implementation of **pro-business policies in the 1980s**, followed by **broader structural reforms in the 1990s and 2000s**, which improved the complementarity between public and private capital. **Despite this positive shift, the magnitude of the effect remains modest.** Quantitatively, the estimates suggest that a one-rupee increase in public investment leads to an increase of about **0.37 rupees in private investment in the first year**, with the cumulative effect rising to approximately **0.6 rupees after three years, implying a less than one for one relationship**.

This relatively modest empirical effect is consistent with observed trends in private investment. Indeed, private investment has remained sluggish over the past decade, **stagnating at around 12% of GDP**, despite the significant public capex push in recent years (**see Part 1 for further details**).

To quantify the impact of the crowding-in effect on potential GDP, we **apply the coefficient estimated by Bahal et al. (2018)** to derive the additional private investment response, which is then incorporated into the World Bank long-run growth model. **Figure 5** presents the contribution of both the **direct effect** and the **crowding-in channel** to the overall impact, relative to the no-investment counterfactual.

As in the previous scenario, public investment increases by **0.9 percent of GDP in 2026 (see Figure 5.a)**. Applying the estimated relationship from Bahal et al. (2018), this implies an increase in **private investment** of **0.33 percent of GDP in the first year** and **0.54 percent of GDP after three years (2029) (see Figure 5.b)**. As a result, **both public and private capital accumulate**, reinforcing the overall investment effect.

This leads to a stronger, but still **relatively modest impact on GDP growth**. The total effect on potential growth reaches **around 0.25 percentage points in 2027**, only **0.05 percentage points higher than the direct effect alone (see Figure 5.c)**. Thereafter, the impact gradually declines, reflecting **decreasing marginal returns to both public and private capital**.

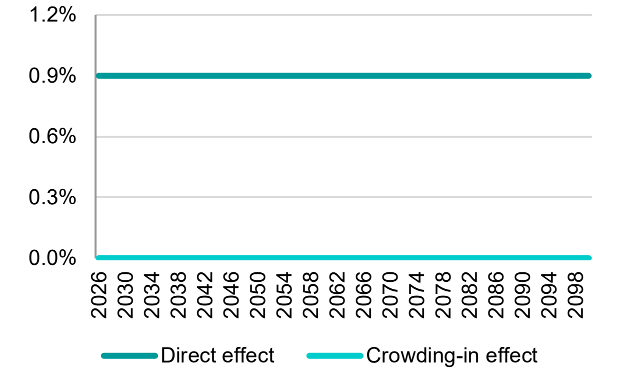
While the impact on growth rates remains limited, the **level effects accumulate over time**. The crowding-in channel raises the level of potential GDP by **2.1 percent relative to the counterfactual**, representing an additional **0.5 percentage points compared to the direct effect alone**. In the very long run, potential output is **4.5 percent higher than the counterfactual**, corresponding to an additional **1.2 percentage points relative to the direct effect scenario (see Figure 5.d)**.

Overall, crowding-in enhances potential GDP, but only modestly. This reflects both its **limited empirical magnitude in India,** and the presence of **decreasing marginal returns to capital**.

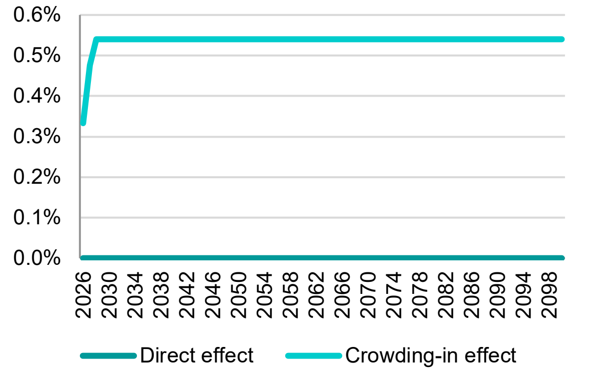
[16] Grisi Baal, Mehdi Raissi, Volodymyr Tulin, World development, crowding-our or crowding-in? Public and private investment in India, 2018
[17] Pritha Mitra, American Economic Review, Has Government Investment Crowded Out Private Investment in India? 2006

Figure 5: Direct and crowding-in effects of announced public investment push on key model variables (In deviation from no investment push counterfactual)

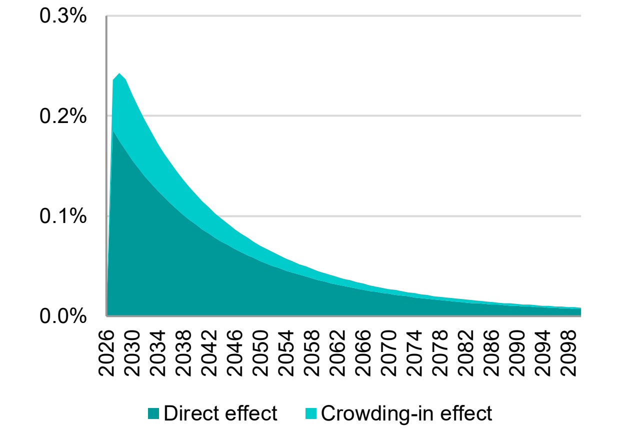
5.a: Government investment to output ratio (ppt deviation from counterfactual)



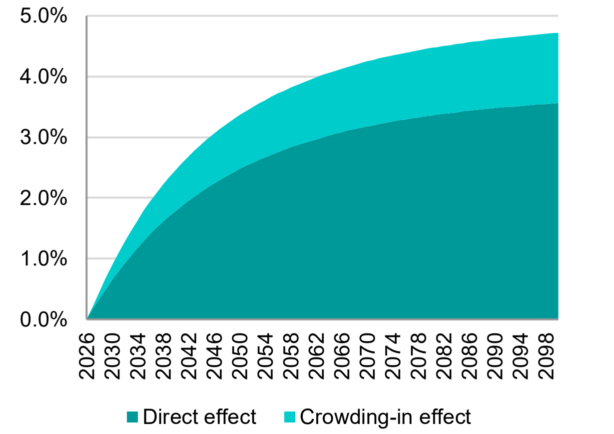
5.b: Public capital to output ratio (ppt% deviation from counterfactual)



5.c: Potential GDP growth rate (ppt% deviation from counterfactual)



5.d: Potential GDP level (percent deviation from counterfactual)



Source: GSA estimation via World Bank LTGMPC model

3.3. Investment alone is not enough: TFP growth as the key to achieving India's ambition of high-income status by 2047

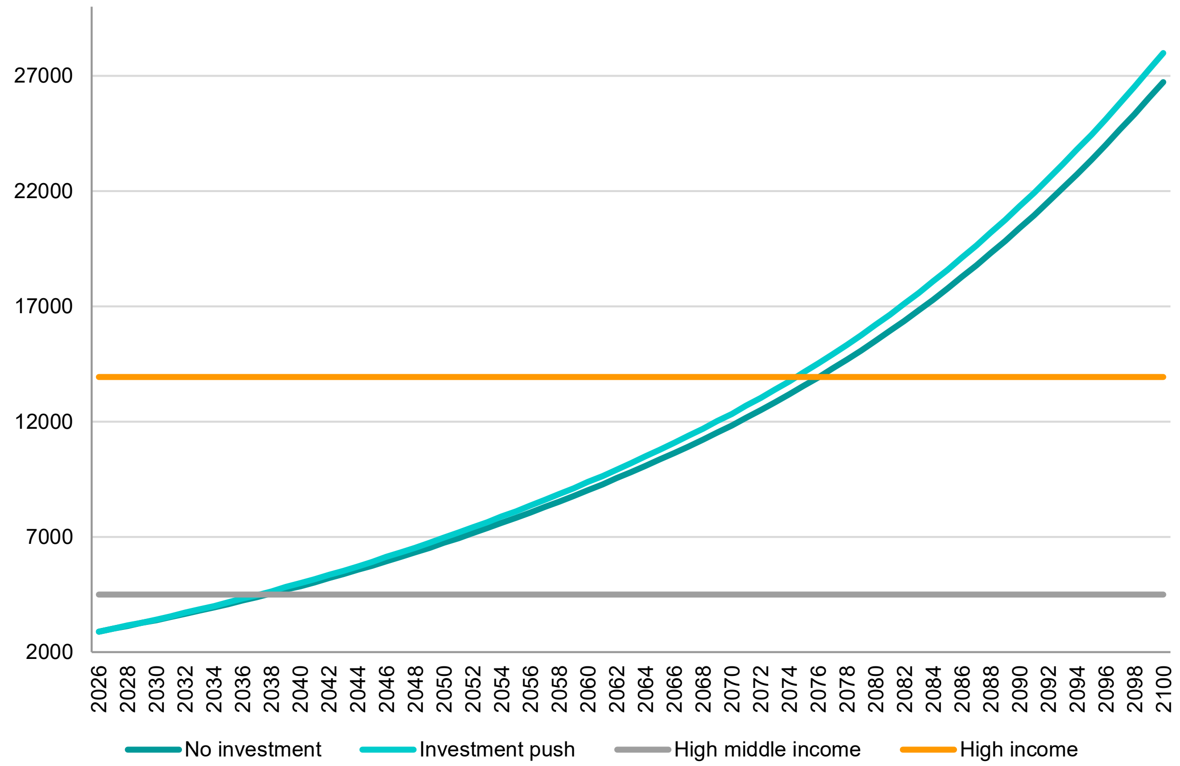
The current public capex push in India is part of a broader strategic objective set by policymakers: to achieve **high-income status within one generation, by 2047, marking the 100th anniversary of independence**[18]. According to the World Bank classification, the threshold for high-income status is a **Gross National Income (GNI) per capita of 13,935 USD**, while India's current level stands at approximately **USD 2,880.**

Taking into account both the **direct effects of public investment** and **the crowding-in effects on private investment** quantified above, the model suggests that India would **reach upper middle-income status by around 2037.** However, it would still **fall significantly short of achieving high-income status by 2047**, with GNI per capita reaching only USD 6,324, **less than half of the required threshold** (see Figure 6). Under the capex push scenario with crowding-in effects, India **would only reach high-income status by 2075**, representing a **modest gain of just three years relative to the no-capex push counterfactual**, where the threshold is reached in **2077** (see Figure 6).

[18] RSIS, India's Path to Becoming a Developed Nation, April 2025

While policymakers do not expect the public capex push alone to deliver high-income status by 2047, this exercise provides a useful benchmark. It illustrates that, even under favorable assumptions, **the growth gains from infrastructure investment remain limited**, reinforcing the conclusion that **additional drivers, particularly productivity growth, are required to achieve the stated objective.**

Figure 6: Gross National Income per Capita (Atlas Method, current USD)



Source: GSA estimation via World Bank LTGMPC model

Reaching high-income status within a single generation is a **rare achievement**. According to recent World Bank analysis, only **34 countries have successfully made this transition since 1990**, with **more than a third having either integrated into the European Union or discovered oil**[19]. As countries move into the middle-income range, growth typically begins to **slow and converge**, a phenomenon commonly referred to as the ***middle-income trap***. This reflects the fact that growth strategies based primarily on **capital accumulation and investment attraction**, while **highly effective in the early stages of development**, become **less powerful** over time due to **diminishing marginal returns to capital**.

To sustain high growth and transition to high-income status, the World Bank emphasizes a **three-stage development framework**. In the first stage, countries rely on **investment and capital accumulation** to move **from low- to middle- income status**. This stage has been **a key driver of India's growth in recent decades**. However, once this threshold is reached, a **more sophisticated growth model becomes necessary**. In the second stage, countries must **adopt and diffuse existing technologies from abroad**, enabling firms to operate **closer to the global productivity frontier**. This process requires a strong base of **human capital**, including **engineers, scientists, and skilled workers**, as well as sustained investment in **education, R&D, and technology adoption**. In the third stage, economies transition toward **domestic innovation and technological leadership**, generating their **own productivity gains** rather than relying primarily on external

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[19] World bank, What China and India must do to join the rich club, 2024

technologies. This stage has been **exemplified by economies such as South Korea**, where firms like **Samsung emerged as global innovation leaders**.

India’s current development strategy cannot be characterized as being confined to a single stage, as **it combines elements of different phases of the convergence process.** While a significant share of policy efforts **remains focused on physical infrastructure investment,** some sectors have already reached higher levels of sophistication, particularly in **services and some manufacturing industries**. Nevertheless, the literature suggests that, at the aggregate level, progress toward high-income status will **increasingly depend on strengthening the second and third stages**, where productivity gains are driven by **technological diffusion, human capital, and innovation.**

Although the authorities have made progress in implementing structural reforms to improve the business environment (see Part 1), India still lags on key **productivity-enhancing dimensions**. For instance, spending on **research and development (R&D) remains relatively low**, at around **0.6% of GDP**, compared to **0.9% in emerging market peers** and **2.2% in advanced economies**[20]. Similarly, India has a relatively limited research base, with **fewer than 300 researchers per million inhabitants**, compared to around **1,800 in China**, **1,000 in emerging markets**, and **5,000 in advanced economies**[21].

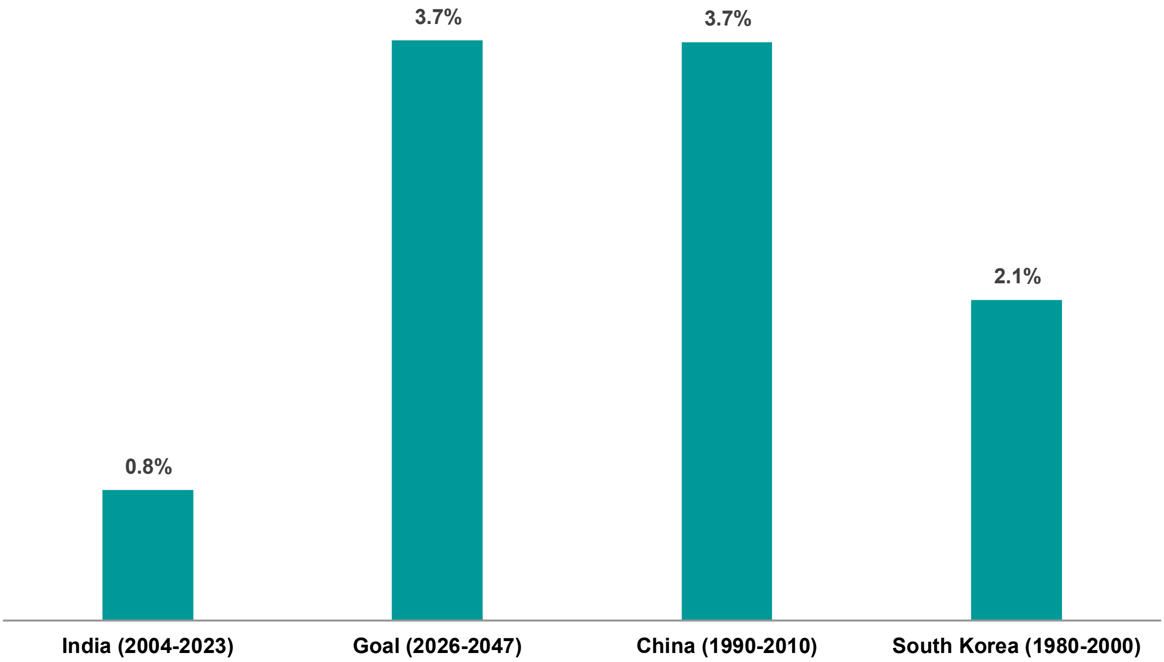
Strengthening investment in these areas is critical to boosting **total factor productivity (TFP)**, which is the key driver of sustained long-run growth. India’s TFP growth has been relatively solid over the past two decades, averaging around **0.8% per year between 2004 and 2023**, slightly above the emerging market average of around **0.5%**. However, this **level remains insufficient to achieve the country’s ambition of reaching high-income status within the targeted timeframe.**

Historical experience underscores the magnitude of the challenge. For example**, South Korea** recorded average TFP growth of around **2.1% between 1980 and 2000**, a critical period of rapid structural transformation. Using the World Bank Long-Term Growth Model, **we estimate the TFP growth required for India to reach high-income status by 2047** under the current capex scenario. The model implies an average TFP growth rate need of approximately **3.7% over the 2026–2047 period**, a level that is **exceptionally high** by historical standards and **has only been observed in a few cases**, notably **China** during its peak convergence phase between **1990 and 2010.**

A more realistic, albeit **still ambitious**, scenario would be for India to achieve **TFP growth rates comparable to South Korea’s experience (2.1%)**. Under such assumptions, the model suggests that India would reach high-income status by around **2059**, falling **short of the 2047 ambition**, but representing a gain of **16 years** relative to a scenario in which TFP growth remains at its current level of 0.8%.

[20] IMF, India Article IV consultation, November 2025
[21] IMF, India Article IV consultation, November 2025

Figure 7: Average YoY TFP growth



Source: GSA estimation via World Bank LTGMPC model
Note: Goal represents the average TFP growth needed over the 2026-2047 period for India to reach its goal of becoming a high-income economy by 2047

4. Appendix

Presentation of key features of the world bank long term growth model:

In this section, we present the key features of the model relevant for analyzing the impact of public investment on growth, without going into the full model derivation. For a complete presentation, see the world bank reference paper[22].

Production function

The model is based on a production function that can be written as:

$$Y_t = A_t(\theta_t K_t^{Gm})^{\varphi}(K_t^P)^{1-\beta-\gamma\varphi}(h_t L_t)^{\beta}$$

Where Y_t is total output, A_t is technology (TFP), K_t^{Gm} is the public capital stock, K_t^P is the private capital stock, and $h_t L_t$ is effective Labor. β and $1-\beta$ are labor and private capital income shares. θ_t is the average efficiency of public capital, γ reflects potential congestion effects. Finally, φ is the elasticity of output to efficient public capital.

Capital accumulation

Public capital evolves according to a standard accumulation equation:

$$K_{t+1}^{Gm} = (1-\delta^G)K_t^{Gm} + I_t^G$$

[22] Sarmila Devadas, Steven Pennings, World Bank, Assessing the Effect of Public Capital on Growth An Extension of the World Bank Long-Term Growth Model, October 2018

Next period capital stock K_{t+1}^{Gm} thus comes from the previous period undepreciated stock ($(1-\delta^G)K_t^{Gm}$) where δ^G is the depreciation rate of public capital, and new public investment, I_t^G. The same accumulation process applies to private capital.

Growth decomposition

We can re-write the production function into per worker terms by dividing both sides by L_t:

$$y_t = A[\theta_t(L_t)^{1-\gamma}k_t^{Gm}]^{\varphi}(k_t^p)^{1-\beta-\gamma\varphi}h_t^{\beta}$$

Where lower case letters represent the variables in per worker terms. Noting that $L_t = \rho_t\omega_t N_t$ where N_t is total population, ω_t is working age population and ρ_t is the labor participation rate. This equation can be represented in terms of growth rates as follows:

$$1+ g_{y,t+1} = [(1+\Gamma_{t+1})^{(1-\gamma)\varphi}](1+g_{A,t+1})(1+g_{\theta,t+1})^{\varphi}(1+g_{k^{Gm},t+1})^{\varphi}(1+g_{k^P,t+1})^{1-\beta-\gamma\varphi}(1+g_{h,t+1})^{\beta}$$

Where $g_{x,t+1}$ represents the growth rate of variable x from time t to $t+1$. Γ is the growth rate of the number of workers.

$$1+\Gamma_{t+1} = (1+ g_{\varrho,t+1})(1+ g_{\omega,t+1})(1+ g_{N,t+1})$$

To obtain growth rate of output per capita instead of per worker, we get:

$$1+ g_{y,t+1}^{PC} = (1+ g_{y,t+1})(1+g_{\varrho,t+1})(1+g_{\omega,t+1})$$

Using a log-linear approximation, and assuming that the efficiency of new public investment is the same as past investment, output per capita growth can be expressed as:

$$g_{y,t+1}^{PC} \approx g_{A,t+1} + \beta(g_{\varrho,t+1} + g_{\omega,t+1} + g_{h,t+1}) - (1-\beta)g_{N,t+1} + \varphi\left[\frac{I_t^G/Y_t}{K_t^{Gm}/Y_t} - \delta^G\right] + (1-\beta-\gamma\varphi)(\frac{I_t^P/Y_t}{K_t^P/Y_t} - \delta^P)$$

Marginal effect of public investment

From this expression, the impact of a one percentage point increase in the public investment-to-GDP ratio on next-period growth is given by:

$$\frac{\partial g_{y,t+1}^{PC}}{\partial I_t^G/Y_t} = \frac{\varphi}{K_t^{Gm}/Y_t}$$

This expression corresponds to the **marginal product of efficient public capital**. It highlights two key features of the model:

- A **positive dependence on φ**, the elasticity of output with respect to public capital
- A **negative dependence on the existing public capital stock**, K_t^{Gm}/Y_t, implying **decreasing marginal returns to public investment**

Calibration

The calibration of parameters follows world bank assumptions, which are publicly available[23].

[23] World bank, The Long Term growth Model, 2026