



## Lessons From China and India: Policy Drivers of Rapid Growth in Emerging Economies

July 11, 2025

Created by:

**Fernando del Río**

ECOBAS, Universidade de Santiago de Compostela

**Francisco Xavier Lores**

ECOBAS, Universidade de Santiago de Compostela

# LESSONS FROM CHINA AND INDIA: POLICY DRIVERS OF RAPID GROWTH IN EMERGING ECONOMIES

FERNANDO DEL RÍO AND FRANCISCO-XAVIER LORES<sup>†</sup>

*ECOBAS-University of Santiago de Compostela*

## Abstract

This study employs Wedge-Growth Accounting within a neoclassical growth framework to dissect the economic growth miracles of China (1982–2019) and India (1991–2019). Our findings reveal that rapid growth in output and investment per capita in both nations was primarily driven by improvements in the efficiency wedge, reflecting technological catch-up spurred by market-oriented reforms. The investment wedge, indicative of reduced financial frictions, played a secondary but significant role, with China benefiting earlier from financial liberalization compared to India, where gains were concentrated post-1999. However, the labour wedge exerted a negative influence, particularly in India, where rigid labour regulations reduced per capita working hours, contrasting with a slight increase in China. Both economies experienced growth slowdowns in the 2010s, driven by decelerating efficiency and investment wedges, with China's slowdown suggesting a transition toward innovation-driven growth. These findings highlight the critical role of TFP-enhancing policies, such as trade liberalization and technology adoption, alongside financial reforms in sustaining high growth, while underscoring the need for labour market flexibility to maximize economic potential.

**Keywords:** Chinese Economic Growth, Indian Economic Growth, Wedge-Growth Accounting, Efficiency Wedge, Labour Wedge, Investment Wedge, Total Factor Productivity, Financial Reforms, Labour Market Reforms, Emerging Economies, Development Strategies.

**JEL Classification:** E13, E17, E25, O41, O47

<sup>†</sup>Financial support from the Spanish Ministry of Science and Innovation, Agencia Estatal de Investigación PID2020-118119GB-I00, PID2023-147667NB-100 and Xunta de Galicia GRC GI-2060 ED431C2023/05 are gratefully acknowledged. Postal Address: Facultade de Ciencias Económicas e Empresariais Avda. do Burgo, s/n, 15782 Santiago de Compostela, Spain.  
e-mail: franciscoxavier.lores@usc.es

# 1 Introduction

The economic ascendance of China and India, home to approximately 36% of the world's population in 2023 (with China at 1.42 billion and India at 1.43 billion), represents a monumental achievement in global development, lifting millions out of poverty (see [Appleton et al. \(2010\)](#)). Since the late 1970s in China and the mid-1980s in India, market-oriented reforms have propelled these nations onto trajectories of rapid economic growth, transforming their economies and lifting millions out of poverty. From 1982 to 2019, China's GDP per capita grew at an average annual rate of 5.6%, while India achieved a comparable 5.51% from 1991 to 2019. These growth rates starkly contrast with their earlier performances: from the early 1950s to 1982, China's GDP per capita grew at roughly 2% annually, and India's grew at just 1% from 1950 to 1991 (See [Figure 1](#)).<sup>1</sup>

We analyse the economic growth miracles in China and India in order to identify its primary driving forces, with the aim of comparing both experiences of economic development, draw some lessons for economic development and finding some salient features that can guide future research.

Our analysis, grounded in the neoclassical growth framework, uses the Wedge-Growth Accounting WGA methodology, which is closely inspired by the *Business Cycle Accounting* (BCA) methodology developed by [Chari et al. \(2007\)](#) and [Brinca et al. \(2016\)](#) and applied to long-run growth by [Hansen et al. \(2021\)](#). [Brinca et al. \(2024\)](#) provide an excellent review of the literature BCA. Unlike BCA, which focuses on short-term fluctuations, WGA employs a deterministic neoclassical growth model, making it well-suited for analysing the transitional dynamics of developing economies. [Del Río and Lores \(2021, 2023\)](#) carried out WGA exercises to analyse economic growth in the United States between 1954 and 2017 and economic development in Spain between 1850 and 2019.

The WGA procedure decomposes economic growth into contributions from efficiency, investment, labour, government consumption, and population wedges, which capture distortions in production, intertemporal resource allocation, labor-leisure choices, resource constraints, and population growth, respectively. The WGA procedure has two steps. First, some wedges are measured using the data together with the equilibrium conditions of a prototype model. Second, the measured wedge values are then fed back into

<sup>1</sup>Although [Figure 1](#) displays the evolution of population and GDP per capita, in our quantitative exercises we use GDP per working-age population as it helps isolate productivity changes from shifts in the age structure of the population.

the prototype model, individually and in combination, to assess how much of the observed movements in output, labour and investment can be attributed to each wedge, individually and in combination. By construction, all five wedges account for all the variation in the data. <sup>2</sup>

Our empirical findings reveal striking similarities in the growth experiences of China and India. In both countries, rapid growth in output and investment per capita was primarily driven by improvements in the efficiency wedge, reflecting significant technological catch-up facilitated by market-oriented reforms. The investment wedge, indicative of reduced financial frictions, played a secondary but critical role. However, the labour wedge exerted a negative influence, particularly in India, where it led to a decline in per capita working hours, contrasting with a slight increase in China. Both economies experienced growth slowdowns in the 2010s, driven by decelerations in the efficiency and investment wedges, though the relative importance of these factors differed between the two countries.

These findings carry profound policy implications for emerging economies. The dominance of the efficiency wedge underscores the importance of policies that enhance total factor productivity (TFP) through technological adoption and institutional reforms. In China, reforms such as agricultural liberalization, reform and privatization of state-owned enterprises, and integration into global markets (e.g., via WTO accession in 2001) catalysed TFP growth. [Yao and Yue \(2009\)](#) examine China's marketization path, the evolution of its legal and regulatory frameworks, and the interplay of law, finance, and economic growth since 1978, offering policy insights for developing countries with imperfect legal and financial systems. In India, the 1991 liberalization reforms, including trade barrier reductions and industrial deregulation, similarly spurred TFP. However, the persistent negative impact of the labour wedge, especially in India, highlights the need for labour market reforms to reduce rigidities and enhance flexibility. India's labour market, constrained by outdated regulations, contrasts with China's more dynamic labour allocation, despite its own challenges from social security reforms in the late 1990s. The investment wedge's role suggests that financial sector reforms, such as those following India's Narasimhan Committee-II recommendations, are crucial for easing capital allocation constraints.

For other emerging economies, these lessons emphasize the need for a balanced reform agenda. Prioritizing TFP-enhancing policies —such as opening markets, improving

<sup>2</sup>In their WGA exercises, [Del Río and Lores \(2021, 2023\)](#) also match the functional distribution of income. However, in this work, more in line with most of the literature, we ignore this issue. [Del Río and Lores \(2023\)](#) extend the BCA methodology to include the factorial distribution of income.

infrastructure, and fostering innovation— is critical for sustaining high growth. Simultaneously, addressing labour market distortions and improving financial systems can amplify the benefits of technological progress. However, the slowdown in both countries in the 2010s signals potential limits to catch-up growth, suggesting that emerging economies must transition toward innovation-driven growth models as they approach technological frontiers, as seen in China’s case (see [Kim, 2002](#)).

Other papers have analysed and compared some aspects of the Chinese and Indian economies. [Felipe et al. \(2008\)](#) analyze the economic growth of China and India from 1980 to 2003 using traditional growth accounting, concluding that India should prioritize reducing investment barriers, while China should shift toward an innovation-driven growth model. [Holz \(2008\)](#) analysed China’s growth and decomposed GDP growth into income components driven by labour quantity and quality, predicting sustained growth through 2015 followed by a gradual slowdown. Drawing on an analysis of China’s economic growth, [Zheng et al. \(2009\)](#) emphasized the necessity of policies to steer the economy toward a sustainable, innovation-driven growth model. [Kalirajan and Singh \(2008\)](#) analyse and compare the export potential of the Chinese and Indian economies and [Golley and Tyers \(2012\)](#) analyse and compare the relationship between demographic evolution and economic growth in both countries. By focusing on long-run growth through WGA, we provide a novel perspective on the macroeconomic drivers of these growth miracles and their implications for development policy. Methodologically, the closest work to ours is [Chakraborty and Otsu \(2013\)](#), which carries out a BCA exercise to analyse the recession of the late 1990s and the subsequent economic recovery in the BRICs (Brazil, Russia, India, and China).

The remainder of this paper is organized as follows. [Section 2](#) describes the model, while [Section 3](#) briefly describes the accounting procedure. [Section 4](#) presents and discusses the findings for China. [Section 5](#) is devoted to the findings and their discussion for India. In [Section 6](#) we summarize our findings for the Chinese and Indian economies and point out the similarities and differences between them. Finally, [section 7](#) concludes.

## 2 The Model

The prototype economy is a one-sector neoclassical growth model with labour and savings decisions and five exogenous wedges that represent the distortions in the equilibrium conditions: the efficiency wedge,  $\pi_{y,t}$ , the labor wedge,  $\pi_{l,t}$ , the investment wedge,  $\pi_{x,t}$ ,

the resource wedge,  $\pi_{g,t}$ , and the population wedge,  $\pi_{n,t}$ .

The equilibrium in the economy is therefore pinned down by (i) the production function,

$$y_t = \pi_{y,t} f(k_t, l_t), \quad (1)$$

where  $y_t$  is detrended output per capita,  $k_t$  is detrended capital per capita and  $l_t$  are hours worked per capita. The detrending factor is  $(1 + \gamma)^t$ , where  $\gamma \geq 0$  is the rate of labour-augmenting technical progress; (ii) the resource constraint,

$$\pi_{g,t} y_t = c_t + x_t, \quad (2)$$

where  $c_t$  is detrended consumption per capita and  $x_t$  is detrended investment per capita; (iii) the evolution law of population,

$$N_{t+1} = \pi_{n,t+1} N_t, \quad (3)$$

where  $N_t$  is population at time  $t$ ; (iii) detrended capital per capita accumulation involves investment adjustment costs

$$\pi_{n,t+1} (1 + \gamma) k_{t+1} = x_t + (1 - \delta) k_t \quad (4)$$

where  $0 < \delta < 1$  is the depreciation rate of capital and  $\gamma$  is the trend growth rate of capital, output, investment and consumption (all variables per capita); (iv) the labour-income choice

$$-\frac{u_{l,t}}{u_{c,t}} = \pi_{l,t} \pi_{y,t} f_{l,t} \quad (5)$$

where  $u_l$  and  $u_c$  are the derivatives of the utility function with respect to  $c$  and  $l$  and  $f_l$  the derivative of the production function with respect to  $l$ ; (v) the savings optimality condition

$$\frac{(1 + \gamma) u_{c,t}}{\pi_{x,t}} = \beta u_{c,t+1} \left( \pi_{y,t+1} f_{k,t+1} - \frac{1 - \delta}{\pi_{x,t+1}} \right) \quad (6)$$

where  $\beta$  is the discount factor and  $f_k$  is the derivative of the production function with respect to  $k$ .

The system of equations (1)-(6) characterizes the equilibrium of the economy.

### 3 The accounting procedure

*Utility and production functions.* The utility function is additive separable in labour and logarithmic consumption,

$$u(c_t, l_t) = \log c_t - \frac{l_t^{1-\nu}}{1-\nu},$$

where  $-\frac{1}{\nu}$  is the Frisch elasticity of the labour supply. The production function is Cobb-Douglas

$$f(k_t, l_t) = k_t^\theta l_t^{1-\theta}$$

*Parameters.* For all countries, we set  $\nu = -3$ , which implies a Frisch elasticity of  $1/3$ ,  $\beta = 0.97$ ,  $\delta = 0.05$ ,  $\theta = 0.35$ , and  $\gamma = 0.021$ , which is the average of the growth rate of world output per capita in the period 1950 – 2019. All values of the parameters are standard in the literature (see Brinca 2014 and Del R o and Lores 2023). Table 1 summarizes the parameters.

We assume that long-run population growth rate is 2% for both countries and the long-run value of the population wedge is set  $\pi_n = 1.02$ . The remaining long-run values of exogenous states  $\pi_{y,t}$ ,  $\pi_{l,t}$ ,  $\pi_{x,t}$ , and  $\pi_{g,t}$  are calculated by solving the equation system (1)-(6) to reproduce for each country the sample averages for detrended hours worked per capita, investment rate, and consumption to output rate in the period 2015 – 2019. In addition, for each country, we set the steady value of detrended GDP per capita,  $y^*$ , estimating by OLS the following convergence equation  $\log y_t = \alpha_0 + \alpha_1 x_t$ , which approximates the transition dynamics of the neoclassical growth model and where  $\alpha_0 = \log y_0$ ,  $\alpha_1 = \log y^* - \log y_0$  and  $x_t = (1 - e^{-\lambda t})$  with  $\lambda = 0.103$  being the speed of convergence implied by the model.<sup>3</sup> From each country, we use data from the first year that the country appears in the sample to 2019.

To compute the wedges, we solve the equilibrium equation system (1)-(6) for  $k_{t+1}$ ,  $\pi_{y,t}$ ,  $\pi_{l,t}$ ,  $\pi_{x,t}$  and  $\pi_{g,t}$  given an initial condition for capital,  $k_0$ , and the observed paths of  $\pi_{n,t+1}$ ,  $y_t$ ,  $c_t$ ,  $x_t$  and  $h_t$  in the 1952 – 2019 period for China and 1970 – 2019 for India as well as their assumed paths for  $t > 2019$ ,

$$j_t = j_T e^{-\iota(t-T)} + j (1 - e^{-\iota(t-T)})$$

where  $j_t$  is  $\pi_{n,t+1}$ ,  $c_t$ ,  $x_t$ ,  $y_t$  or  $l_t$  at period  $t \geq T$ ,  $T = 2019$  and  $j$  is the constant calibrated

<sup>3</sup>Although the residuals present autocorrelation, the OLS estimates are unbiased.

value above. We set  $\iota = 0.03$ , which is around the speed of convergence estimated in most works (see Barro and Sala-i-Martin, 1995). Our method allows us to compute converging paths of wedges from the initial period until infinity. In practice, we have computed 1000 periods. The initial condition for  $k_0$  is

$$k_0 = \frac{x_0}{y_0} \frac{1}{(1+g)\pi_{n,0} - (1-\delta)} y_0,$$

where  $x_0/y_0 = \frac{1}{T_x} \sum_{t=0}^{T_x-1} \frac{x_{t_0+t}}{y_{t_0+t}}$ ,  $\pi_{n,0} = \frac{1}{T_n} \log \frac{N_{t_0+T_n}}{N_{t_0}}$  and  $y_0 = y_{t_0}$  with  $T_x = 10$  and  $T_n = 20$ . We use these values for the wedges in our experiments.

Population,  $N$ , is *working-age population, ages 15 to 64* from UN, [World Population Prospects \(2024\)](#). The remaining data are provided by Feenstra et al. (2015) (PWT10). Output per capita is *Output-side real GDP at chained PPPs (rgdpo)*,<sup>4</sup> divided by  $N$ . We compute the consumption share dividing *Real consumption of households and government at current PPPs (ccon)* by *Expenditure-side real GDP at current PPPs (cgdpe)*,  $c/y = \mathbf{ccon}/\mathbf{cgdpe}$ . We compute investment at current PPPs by subtracting  $\mathbf{ccon}$  from *Real domestic absorption (real consumption plus investment) at current PPPs (cda)*. The investment share is computed dividing  $\mathbf{cda} - \mathbf{ccon}$  by  $\mathbf{cgdpe}$ ,  $x/y = (\mathbf{cda} - \mathbf{ccon})/\mathbf{cgdpe}$ . Consumption and investment per capita are obtained multiplying the consumption and investment shares by output per capita. Consumption per capita, investment per capita and output per capita at time  $t$  are divided by  $(1+\gamma)^t$  with  $\gamma = 0.021$ . Hours worked per capita are computed multiplying the *Number of persons engaged in production (emp)* by *Average annual hours worked by persons engaged (avh)* and dividing by  $N$ :  $l = \mathbf{emp} * \mathbf{avh} / N$

We perform simulations to see to what extent models with just one wedge can replicate observed data. In particular, we simulate the model for the observed path of  $\pi_{i,t}$  ( $i \in \{y, x, l, g, n\}$ ) assuming that the remaining wedges are in their steady-state values and that  $k_0$  is the detrended stock of capital per capita in the initial year. The results of the simulations for one wedge are called wedge-alone components.

We focus on the role played by wedges in the evolution of output per capita, investment per capita, and hours worked per capita (all variables in logs) in both China and India. We begin our analysis of the Chinese economy in 1982 and that of the Indian economy in 1991. These are the years that we consider most appropriate for locating the beginning of the economic booms in both countries. We examine the extent to which each wedge-alone component contributed the evolution of these variables. For the wedge-alone components

<sup>4</sup>The names of the variables that use the Penn World Table 10.0 are marked in bold.

of each variable, we calculate the  $\phi$ -statistic defined by [Brinca et al. \(2016\)](#) to intend to capture how closely a particular component tracks the underlying statistic. The  $\phi$ -statistic is defined for each wedge-alone component  $\pi_i$ ,  $i \in \{n, y, l, x, g\}$  of an observable variable  $\mathbf{y}$  as

$$\phi_{\pi_i}^{\mathbf{y}} = \frac{1/\sum_t (\mathbf{y}_{\pi_i,t} - \mathbf{y}_t)^2}{\sum_j (1/\sum_t (\mathbf{y}_{\pi_j,t} - \mathbf{y}_t)^2)},$$

where  $\mathbf{y}_{\pi_i,t} \in \{h_{\pi_i,t}, y_{\pi_i,t}, x_{\pi_i,t}\}$  is the wedge-alone component of a variable due to wedge  $\pi_i$  and  $\mathbf{y}_t \in \{h_t, y_t, x_t\}$  is the corresponding observed same variable. The  $\phi$ -statistic has the desirable feature that it lies in  $[0, 1]$ , sums to one across the five wedges, and when a particular output component tracks a variable perfectly, then its value is 1.

Below we present only the wedge-alone components due to the efficiency, investment and labour wedges and their corresponding  $\phi$ -statistics. We do not present the wedge-alone components due to the population and resource wedges and their corresponding  $\phi$ -statistics because they played a negligible role in accounting for the evolution of the variables in both China and India.

## 4 Accounting for Chinese growth miracle

In 1978, two years after Mao’s death, Deng Xiaoping emerged as the chief architect of China’s economic transformation. Recognizing the failures of the planned economy, he introduced a series of economic reforms under the policy framework of “Reform and Opening-Up”. At first, the reforms allowed farmers to sell their surpluses on the market, de-collectivised land and set up the first Special Economic Zones to attract foreign investment and technology transfer.<sup>5</sup> [Leutert \(2021\)](#) argues that China’s successful early market reforms in its state-owned economy from 1978 were facilitated by policy feedback loops that linked enterprises and the state, enabling information sharing and adaptive policymaking across hierarchical bureaucracies. In the 1980s, political decentralization was deepened and local governments were given greater control over economic decisions, encouraging regional experimentation,<sup>6</sup> the entry and expansion of non-state enterprises was encouraged, state-owned enterprises were allowed to sell excess production at market

<sup>5</sup>[Gao et al. \(2025\)](#) show that recent advancements in land title certification have significantly enhanced the efficient reallocation of land and labor in China and [Lyu et al. \(2025\)](#) analyse how China’s economic zones enhance allocative efficiency.

<sup>6</sup>[Brehm \(2013\)](#) finds that fiscal decentralization enhanced allocative efficiency in China.

prices, policy banks were created to finance specific sectors of the economy, and rural credit cooperatives were set up to provide banking services to the agricultural sector. In the 1990s, China further deepened its reforms by privatizing many state-owned enterprises and reducing tariffs and other trade barriers in a process that culminated in its accession to the World Trade Organization in 2001 (Ray 2002). The 1982 Constitution formalised Deng Xiaoping’s “Reform and Opening-Up” policy by embedding principles that allowed for a mixed economy with both public and private participation. Article 15 explicitly stated that the state would “practice a planned economy while also regulating the market”, signalling a departure from rigid state control. The 1982 Constitution was a foundational document in China’s economic transformation. By legitimising private enterprise, decentralisation, and foreign investment, it played a crucial role in China’s rise as an economic powerhouse. Later amendments (1993, 1999, and 2004) further strengthened private property rights and market mechanisms. The success of this economic and institutional transformation is now evident.<sup>7</sup> Due to the significance of the constitutional reforms of 1982, we date the beginning of the China’s economic boom to this year.

## 4.1 Wedge-alone contributions to growth

*Wedges.* Our analysis shows that the reforms allowed a rapid increase in the TFP of the Chinese economy —expressed in the efficiency wedge of our model— and a relaxation of the constraints on the intertemporal allocation of resources —expressed in the investment wedge of our model (see panel (a) Fig. 2). The increase in the efficiency wedge was especially rapid between the late 1990s and 2010. However, over the period analysed, the constraints on the allocation of labour —expressed in the labour wedge of our model— worsened, particularly from the early 2000s to the Great Recession. Between the early 1980s and the early 2000s, the labour wedge remained roughly stable. Since 2011, there has been a sharp slowdown in the growth of the efficiency wedge. The investment wedge has also experienced a significant slowdown since 2008, but to a lesser extent. The investment wedge improved significantly in the second half of the 1980s and between 2005 and 2008, the year of the Great Depression.

<sup>7</sup>Governance improvements in Chinese provinces might have additionally supported economic growth, but Wilson (2016) shows through causality tests that governance does not cause economic growth. However, Cheng et al. (2022) find that stronger state capacity in Chinese counties enhances economic performance by increasing public spending and fostering private investment.

*Output.* From 1982, growth in output per capita was mainly driven by the wedge-alone component due to the efficiency wedge and secondarily by the wedge-alone component due to the investment wedge (see panel (b) Fig. 2). The values of the  $\phi$ -statistics for the wedge-alone components of output due to the efficiency wedge and the investment wedge (0.550 and 0.212, respectively, see Table 2) reflect it. The slowdown in per capita output growth in the second decade of this century was mainly driven by the wedge-alone component due to the efficiency wedge. Since 1982, the Chinese economy has experienced two brief pauses in its high growth, the first in 1987-1989, coinciding with the Tiananmen Square protests and the halt in economic reforms, and the second in 1997-1999, coinciding with the Asian crisis and a period of labour protests and strikes. Both pauses were caused by a worsening of wedge-alone component due to the efficiency wedge. After both pauses, per capita output growth strengthened, driven primarily by the wedge-alone component of the efficiency wedge. The contribution of the investment wedge to output per capita growth was negligible until the late 1980s and has increased since then. The wedge-alone component of output due to the labour wedge has a negligible impact on per capita output growth except in the mid-2000s.

*Labour.* Hours worked per capita have slightly increased over the period (see panel (c) Fig. 2). The wedge-alone components due to the investment and labour wedges worked in opposite directions. The former contribute to the increase in hours worked per capita and the latter to their decrease. In particular, the increase in hours worked per capita until 2008 was mainly driven by the investment wedge. The efficiency wedge significantly contributed to the increase in hours worked per capita from the late 1990s to 2010. The wedge-alone component of hours worked due to the labour wedge declined strongly from the late 1990s until 2008, the year of the Great Recession. Despite the great decline of the wedge-alone component due to the labour wedge in this period, hours worked per capita only fell slightly between 2005 and 2008 because the increase of the wedge-alone components due to the investment and efficiency wedges offset the decrease in the wedge-alone component due to the labour wedge. The slight recovery in hours worked per capita after the Great Recession was driven by the wedge-alone component due to the labour wedge, while the wedge-alone component due to the efficiency wedge worked in the opposite direction.

*Investment.* Growth in investment per capita was mainly driven by the wedge-alone component due to the investment wedge and, secondarily, by the wedge-alone component due to the investment wedge (see panel (d) Fig. 2). The values of the  $\phi$ -statistics

for the two wedge-alone components are 0.490 and 0.284, respectively (see [Table 2](#)). The investment wedge particularly boosted per capita investment in the second half of 1980s and between 2005 and 2008. Growth slowdown in investment per capita after the Great Recession was driven by the efficiency and investment wedges, although the growth slowdown in the wedge-alone component due to the efficiency wedge was higher. The wedge-alone component of investment due to the labour wedge has a negligible impact on per capita output growth except in the mid-2000s.

*Summary.* Growth in output per capita per capita was driven primarily by improvements in the efficiency wedge and secondarily by improvements in the investment wedge, conversely in the case of investment per capita. The deterioration in the labour wedge was not a major constraint on the growth of these variables, but it was a major constraint on the growth of hours worked per capita. In particular, from the late 1990s until the Great Recession, the deterioration in the labour wedge acted as a strong brake on the growth of hours worked per capita. The slowdown in the growth of both output and investment per capita in the aftermath of the Great Recession has been driven mainly by the efficiency wedge. The investment wedge also played a significant, but secondary, role in the slowdown of investment per capita. Growth in output per capita was particularly strong in the first half of the 1990s and the first decade of the 21<sup>st</sup> century; in both cases, the acceleration of the wedge-alone component due to the efficiency wedge was the main driver of the high growth.

## 4.2 Economic policies and wedge-alone contributions

The economic liberalisation that began in the late 1970s allowed the China's TFP to grow rapidly, reflecting an intense process of technological catch-up, and was the main driver of subsequent growth in output, investment, and hours worked thereafter. Economic reforms also eased restrictions on the intertemporal allocation of resources, which further boosted economic growth. However, these reforms did not lead to an improvement in the labour wedge. The latter hindered, albeit very slightly, the growth of output and investment per capita and, to a greater extent, the growth of hours worked per capita.<sup>8</sup>

In the early years of the reforms, the investment wedge did not contribute to growth. However, its contribution was very significant in the second half of the 1980s and, although slowed, has continued since then. Until 1984, the People's Bank of China virtually mo-

<sup>8</sup>Based on provincial data from 1978 to 2009, [Anderson et al. \(2013\)](#) find that China's provinces exhibit short-term divergence but converge into two distinct growth clubs over the long term.

nopolized credit. However, in 1983, the People's Bank of China was officially separated from commercial banking functions, making it the central bank. In 1984, the government allowed four major specialized banks—which previously functioned as government financing arms—to operate more independently and engage in commercial banking activities: Industrial and Commercial Bank of China (took over commercial banking functions from the People's Bank of China; Agricultural Bank of China (focused on rural and agricultural financing); Bank of China (handled foreign exchange and international trade financing); and China Construction Bank (provided funding for infrastructure and construction projects). In 1986, the Chinese government permits the establishment of non-state financial institutions. These reforms aimed to improve financial efficiency and credit allocation, but full commercialization of the banking system took place gradually over the following decades. In any case, these initial reforms of the banking system may explain the significant improvement in the investment wedge in the second half of the 1980s and the subsequent deepening of financial sector liberalisation, the significant contribution of the investment wedge to growth in subsequent decades.

The sharp deterioration of the labour wedge from the late 1990s to the Great Depression and its consequent strong negative impact on hours worked per capita could have been due to several causes. At the end of the nineties, many state-owned enterprises were restructuring or privatizing, which led to large-scale layoffs. This caused a rise in unemployment, especially among workers in the state sector, who faced job insecurity and had limited opportunities for retraining or transitioning to new sectors. [Meng \(2012\)](#) reports the decline in state employment in China and finds that since the late 1990s the probability of finding a state job has declined sharply for young people and women. In the 2000s, there were growing signs of labour unrest, with a number of strikes and protests occurring, particularly in the export-oriented manufacturing sector. Workers, especially in factories in Guangdong and other southern provinces, began to demand better wages, improved working conditions, and the right to organize. [Lee \(2007\)](#) discusses labour protests in both northeastern and southern China, focusing on Guangdong's export-oriented manufacturing sector. However, we believe that the main reason for the deterioration in the labour wedge was the sharp increase in social contributions from workers and enterprises that took place in the late 1990s and early 2000s as a result of the reform of the China's social security system. The Ministry of Labour and Social Security was established in 1998 to lead and manage the reforms, which include the pension system, health care, unemployment insurance, and work injury insurance and require a shift from a system

largely administered by state-owned enterprises to a national system with mandatory contributions from both employers and employees (see [Leung 2003](#) and [Li et. al 2007](#)). The employee contribution to the pension fund was initially set at around 8% of their wages, which would be deposited into their individual accounts. The employer contribution was typically 20 – 25%, and in some cases, could reach as high as 28 – 30% depending on the province and the specific enterprise. This represented a significant increase in employee and employer contributions, as previously state-owned enterprises had not required the same level of individual contributions.

Since the early 1980s, the Chinese economy has experienced two brief periods of slowing growth: the 1987-1990 period —coinciding with the Tiananmen Square protests and the halt in reforms caused by political instability— and the 1997-1998 period —coinciding with the Asian financial crisis. After both crisis periods, China’s economic growth strengthened, driven by an improvement in the efficiency wedge and, in the second period, also by an improvement in the investment wedge. The most likely explanation for the growth surge in both periods is that economic reforms were intensified.

Economic reforms actually slowed down in the immediate aftermath of Tiananmen, as the government prioritized political stability over market liberalization. However, by the early 1990s, especially after 1992, reforms were revived and accelerated under Deng Xiaoping. His “Southern Tour” was a major turning point: Deng reaffirmed market-oriented policies, saying “To get rich is glorious” and urging faster reforms, the stock markets in Shanghai and Shenzhen were officially expanded, foreign direct investment surged as China opened more Special Economic Zones, and private businesses regained support, and state-owned enterprises reforms resumed (eventually leading to mass privatizations in the late 1990s).[Nolan and Xiaoqiang \(1999\)](#) examine the role of state-owned enterprise reforms in driving Chinese economic growth and [Walheer and He \(2020\)](#) find that private and foreign-owned firms in China outperform state and collective enterprises in technical efficiency and technology levels.

China also accelerated economic reforms in the late 1990s, particularly after the Asian Financial Crisis (1997-1998) and in preparation for its accession to the World Trade Organization in 2001. These reforms deepened market-oriented policies and shifted China’s economy toward a more open and modern market system.<sup>9</sup> In 1997, the government scaled back direct state control over many state-owned enterprises, and the policy of

<sup>9</sup>[McDonald et al. \(2008\)](#) investigate the effects of trade liberalization in China and India on trade flows and economic growth in East and Southeast Asia.

“grasping the large, letting go of the small” led to the privatisation or closure of smaller inefficient state-owned enterprises, while the state retained control over strategic industries (energy, finance, telecom, etc.); the agricultural tax burden on rural households was reduced; China significantly reduced tariffs and import restrictions, restructuring key industries to comply with World Trade Organisation rules; new regulations on foreign businesses, intellectual property, and corporate governance were introduced; and foreign direct investment was encouraged by offering incentives and liberalizing sectors for foreign companies. [Gunby et al. \(2017\)](#) conduct a meta-analysis of 37 studies with 280 estimates, finding that while initial analysis suggests a significant positive impact of foreign direct investment on China’s economic growth, the effect diminishes and becomes insignificant after adjusting for publication bias and preferred characteristics. [Feng et al. \(2021\)](#) show that trade openness significantly boosted wages, increased hours worked, and enhanced the health of Chinese workers. Economic reforms also have significantly enhanced China’s economic growth by promoting regional economic integration (see [Ke, 2015](#)).

As an important part of the broader economic transition, China’s financial system underwent profound reforms in the late 1990s. The focus was on modernising the banking system, developing capital markets, dealing with non-performing loans and increasing foreign investment, with the aim of making China’s financial system more market-oriented, competitive and integrated with the global economy. In particular, the four largest state-owned banks —Industrial and Commercial Bank of China), China Construction Bank, Bank of China, and Agricultural Bank of China— were recapitalized and restructured to operate more like commercial banks, focusing on profitability and risk management, rather than just serving state interests; the government set up Asset Management Companies to absorb and manage non-performing loans; the banking sector was open to foreign investors; China began to move towards a more flexible exchange rate regime, allowing the yuan to gradually become more market-driven, though it remained tightly controlled by the central government; and although the first stock exchanges were established in Shanghai (1990) and Shenzhen (1991), in the late 1990s, China allowed for the listing of more companies and encouraged private participation in the stock market. The success of this financial reform may explain the rise of the investment wedge since the beginning of the 21<sup>st</sup> century and, in particular, the strong improvement from 2005 to 2008.

The slowdown in China’s TFP growth in the second decade of this century and its consequent negative impact on the growth of investment per capita and output per capita can be attributed to several conjunctural factors, some of which directly reflect the im-

pact of the Great Recession. These include the decline in global trade volumes, which meant that China's export-driven economy was facing a slowdown; overcapacity in several sectors, especially manufacturing and real estate; the transition of the economy from an export- and investment-driven model to a more sustainable model based on domestic consumption, services and innovation; the tightening of regulations on industries with high pollution and waste levels; and the increase in local government debt and corporate debt, especially in state-owned enterprises. However, we believe that there is a more structural reason for this slowdown. According to our analysis, it has been driven by the slowdown in the growth of the TFP. This suggests that the economic convergence of the Chinese economy, led by a rapid process of technological catch-up — itself made possible by the deep economic reforms initiated in the late 1970s — is slowing down, which is in line with the main economic theories on the subject (see [Nelson and Phelps, 1966](#); and [Bils and Klenow, 2000](#)). Therefore, barring any major economic changes, the growth slowdown is likely to be a permanent rather than a temporary phenomenon.

## 5 Accounting for Indian growth miracle

Before the 1990s, India followed a state-led development model characterised by import-substitution industrialisation and a dominant public sector. By the late 1970s, this model had led to low economic growth, inefficient industries and a balance of payments crisis. In 1991, India faced a severe balance of payments crisis. To address the crisis, India sought a bailout from the IMF, which came with conditions requiring economic reforms. A new economic policy based on the recommendations of the Narasimhan-I Committee set up in 1991 was introduced based on three pillars: liberalisation, privatisation and globalisation. Subsequent reforms built on the momentous reforms of 1991, which moved in the three original directions (Narasimhan-II Committee set up in 1997). We therefore date the beginning of the India's economic boom to 1991. The reforms enabled India to become one of the fastest growing economies. Moreover, Chanda and Kabiraj (2020) find absolute convergence at the district level in India between 1996 and 2005, driven primarily by faster catch-up in poorer rural areas. [Bhagwati \(1993\)](#) discusses India's economic transformation, advocating for market-oriented reforms, trade liberalization, and reduced state control to overcome the inefficiencies of its pre-1991 protectionist policies, while analysing the challenges and opportunities for sustained growth (see also [Khatkhate \(1994\)](#)).

## 5.1 Wedge-alone contributions to growth

*Wedges.* Our analysis shows that the reforms allowed from 1991 a rapid increase in the TFP of the Indian economy —expressed in the efficiency wedge of our model— (see panel (a) in Fig. 3). However, the earlier reforms do not seem to have eased the constraints on the intertemporal allocation of resources —reflected in the investment wedge—, which remained roughly constant between 1991 and 1999, although it has risen since the latter year. Over the period analysed, the constraints on the allocation of labour —expressed in the labour wedge of our model— worsened. The second decade of the 21<sup>st</sup> century saw a slowdown in the growth of the efficiency and investment wedges.

*Output.* From 1991 onwards, growth in output per capita was mainly driven by the wedge-alone component due to the efficiency wedge and secondarily by the wedge-alone component due to the investment wedge (see panel (b) in Fig. 3). The high value of the  $\phi$ -statistic for the wedge-alone component of output due to the efficiency wedge, 0.8386, reflects its dominance (see Table 3). The significant contribution to per capita output growth from the investment wedge started in 1999, later than the contribution from the efficiency wedge. It was stronger from 1999 to 2005. Driven by the acceleration of the wedge-alone component due to the efficiency wedge, growth in output per capita increased in the early 2000s. The acceleration of the wedge-alone component due to the efficiency wedge was accompanied by a more moderated acceleration of the wedge-alone component due to the investment wedge. Since 2012, per capita output growth has slowed somewhat, driven by the deceleration of the wedge-alone components of output due to the efficiency and investment wedges. The wedge-alone component of output due to the labour wedge contributed to slow down growth in output per capita over the entire period.

*Labour.* The wedge-alone component of hours worked due to the labour wedge has been the main driver of the evolution of hour worked per capita. The high value of its  $\phi$ -statistic, 0.598, reflects its dominance (see Table 3). Since 1991, hours worked per capita have experienced a significant decline, which has been driven by the wedge-alone component of hours worked due to the labour wedge (see panel (c) in Fig. 3). Both the wedge-alone component of hours worked due to the efficiency wedge and the one due to the investment wedge contributed to the increase in hours worked; particularly the former. The wedge-alone component due to the investment wedge contributed particularly to increase hours worked per capita from 1999 to 2005.

*Investment.* Growth in investment per capita was mainly driven by the wedge-alone component of investment due to the efficiency wedge (see panel (d) in Fig. 3). The

high value of the  $\phi$ -statistic for the wedge-alone component of investment due to the efficiency wedge, 0.867, reflects its dominance (see [Table 3](#)). From 1999 to 2005, the significant improvement in the investment wedge strongly boosted investment per capita. The subsequent slowdown was driven by both the wedge-alone component of investment due to the efficiency wedge and by the wedge-alone component of investment due to the labour wedge. Over the entire period, the contribution of the wedge-alone component of investment due to the labour wedge to the growth of investment per capita was negative.

*Summary.* The rapid growth in output per capita and investment per capita since 1991 was mainly driven by the improvement in the efficiency wedge. The improvement of the efficiency wedge also contributed to the increase of hours worked per capita, but the deterioration of the labour wedge led to a decline in the hours worked per capita and slowed down the growth in output and investment per capita over the whole period. The investment wedge contributed significantly to the growth of investment, output and labour from 1999 to 2005, but its contribution to the evolution of these variables was minor in other years. Throughout the whole period, the worsening labour wedge hampered growth in investment per capita and output per capita and led to a significant decline in hours worked per capita. The slowdown in the growth of both the efficiency wedge and the investment wedge contributed to the slowdown in the growth of investment per capita and output per capita after 2012, although the contribution to growth in output per capita of the former remained relatively high.

## 5.2 Economic policies and wedge-alone contributions

Our analysis shows that the deep structural reforms of 1991 (relaxing industrial licensing, liberalisation of foreign direct investment,<sup>10</sup> devaluation of the rupee, reduction of trade barriers and dismantling of public sector monopolies in many sectors) boosted TFP growth and laid the foundation for India's rapid economic growth (see [Lal, 2008](#)). It was improved TFP that almost exclusively drove growth in output and investment per capita until the early 2000s.

The contribution of the investment wedge to the growth of output and investment was negligible until the early 2000 despite the structural reforms of the early 1990s. Based on the recommendations of the Narasimhan-I Committee, some reforms to liberalize

<sup>10</sup>[Chakraborty and Nunnenkamp, P. \(2008\)](#) find that, in post-reform India, FDI promotes economic growth primarily in the manufacturing sector, while showing no causal link in the primary sector and only temporary effects in the services sector.

the Indian financial system were implemented. Thus, in the early 1990s, state-owned banks were partially privatized, new operating licenses were granted to private banks, the insurance sector was privatized, interest rate controls were removed, banking regulation was brought into line with international standards, and stock market regulation was improved. However, despite all these reforms, the banking business remained largely in the hands of the state. Private banking accounted for less than 20% of the business and competition in the sector was low. Consistently, our results suggest that these policies did not have a profound impact on the investment wedge – which remained almost constant until the early 2000s – and growth.

In the late 1990s, a number of financial market reforms took place, which may explain why the investment wedge improved from then on and helped relaunch Indian economic growth. In December 1997, the Narasimhan-II Committee was set up to restructure and strengthen the banking sector. As a result of the recommendations of the Narasimhan-II Committee, the autonomy of state-owned banks was increased, the role of the central bank was reformed, bank mergers were encouraged, rules for entry of foreign banks were modified, the capital adequacy ratio of banks was increased to 1% and prudential norms on provisioning and asset classification were tightened. In addition, following also the recommendations of the committee, the Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act of 2002 should address the problem of the high proportion of non-performing assets in banks' portfolios, largely caused by the requirement to allocate 40% of loans to priority sectors and by politically motivated mismanagement. This law facilitates faster recovery of bad loans by allowing banks and financial institutions to take possession of and sell assets without going through a lengthy court process, which has improved confidence in the Indian banking system, especially among investors. Moreover, the Banking Regulation Act of 2000 introduced stricter corporate governance norms and relaxed the licensing rules for new banks, which led to the entry of private-sector and foreign banks and created healthy competition in the banking sector. Our results suggest that the banking and financial reforms of the late 1990s and early 2000s were successful, as reflected in the strong improvement in the investment wedge and the increase in its contribution to the growth of output per capita and investment per capita in the first years of the 21<sup>st</sup> century.

The poor performance of the labour wedge and its negative contribution to growth in output, investment and hours worked can be attributed to the shortcomings of the Indian labour market. The strict and rigid regulations of the Indian labour market are

well known. Much of this legislation has been inherited from the early years of independence or from the period before. These include the Industrial Disputes Act (1947), the Factories Act (1948), the Trade Union Act (1926), the Industrial Employment (Standing Orders) Act (1946) and the Contract Labour (Regulation and Abolition) Act, 1970. Labour legislation is much more extensive, but perhaps the earlier laws are the most significant. These laws set strict limits and complicated procedures for hiring and firing workers, including the need for government approval; they also extensively regulate working conditions and give trade unions great bargaining power.<sup>11</sup> Although India's leaders recognised the need for far-reaching economic reforms in the early 1990s, labour laws have remained largely unchanged. Here are some of the few reforms that have taken place. In 2001, some amendments were made to the Trade Union Act to strengthen the position of trade unions in collective bargaining and dispute resolution. In 2014, the government introduced the Factories (Amendment) Bill to increase flexibility in working hours and extend the definition of 'factory' to include more industrial establishments. In 2006, the government amended the Contract Labour Act to strengthen provisions for contractors and principal employers, and in 2016 reformed this act to simplify the registration and licensing process for contractors. In 2018, the Standing Orders (Amendment) Act enabled online submission of standing orders and simplified the approval process. Only a few states have ventured into more far-reaching reforms. For example, Rajasthan in 2003 and Haryana in 2004 relaxed industrial dispute laws, making it easier for companies to lay off workers. Since 2019, there have been attempts to consolidate India's labour laws to simplify compliance and bring greater flexibility to the labour market. A key initiative in this direction has been the introduction of labour codes (Code on Wages, 2019; Code on Industrial Relations, 2020; Code on Social Security, 2020; and Code on Occupational Safety, Health and Working Conditions, 2020). However, these reforms took place outside the analysis period of this work, which extends to 2019. It may be an interesting line of future research to examine the impact of these legislative changes on the Indian economy.

Since 2012, the growth of output per capita and investment per capita has slowed. Nagaraj (2025) attributes India's decade-long GDP growth decline in the 2010s to premature deindustrialization. We find that the growth rate of TFP has also slowed down but remains high. The decelerating growth of output and investment per capita is largely driven by the investment wedge. Therefore, in the near future, barring any major eco-

<sup>11</sup>Indian firms have attempted to circumvent legislative restrictions through temporary employment, contract labour and informal employment.

conomic changes, the high growth rate of the Indian economy is likely to continue. However, the poor performance of the labour wedge leads us to believe that the threats to Indian economic growth come mainly from the rigid functioning of its labour market, although recent legislative reforms may have made it more flexible.

## 6 China and India: in short

In this section we summarize our findings for the Chinese and Indian economies and point out the similarities and differences between them.

We find some similarities between the Chinese and Indian economic miracles:

- i. Both the Chinese and Indian booms were driven primarily by improvements in the efficiency wedge and secondarily by improvements in the investment wedge.
- ii. In both cases, but especially in India, the labour wedge held back growth in output, investment and hours worked.
- iii. In China and India, the growth slowdown in the second decade of this century was driven by the declining growth in the investment and efficiency wedges, but the relative importance of the former was higher in India and the importance of the later was higher in China.

Our analysis therefore suggests that in both countries, market-oriented economic reforms allowed for intensive technological catch-up, as reflected in an improvement in the efficiency wedge, while at the same time allowing for the relaxation of constraints on the intertemporal allocation of productive resources by reducing financial distortions and the costs of investment, as reflected in an improvement in the investment wedge. However, the reforms do not seem to have reduced labour market distortions, as the labour wedge worsened slightly in China and to a greater extent in India, where it had a significant negative impact on the evolution of output, investment and hours worked.

However, there are also some important differences between the two countries:

- i. In China, the investment wedge made a positive contribution to economic growth from the early 1980s onwards, but in India the contribution of the investment wedge to growth was virtually nil until 2000, probably because the economic reforms of the early 1990s promoted by the Narasimhan Committee-I failed to increase competition

and efficiency in the banking sector which remained largely state-owned. It was only in the first decade of the 21<sup>st</sup> century that the investment wedge made a strong contribution to Indian economic growth, following the financial system reforms promoted by the Narasimhan Committee-II, which facilitated the entry of new domestic and foreign operators into the financial sector.

- ii. Despite the slight deterioration of the labour wedge, in China hours worked per capita increased, but in India, the worsening of the labour wedge led to a decline in hours worked per capita since the early 1990, probably due to the regulations that have restricted its labour market and the lack of reforms in this area. In China, in the late 1990s and the early 2000s, the labour wedge experienced a sharp deterioration, which slowed the growth of hours worked during this period. We believe that the main reason for the deterioration of the labour wedge was the sharp increase in social contributions from workers and enterprises that took place in the late 1990s and early 2000s as a result of the reform of the Chinese social security system. The strong restructuring of employment in state-owned enterprises and the labour strikes and protests may also have had a negative impact on the labour wedge in these years.
- iii. In the second decade of this century, the slowdown in the growth of the efficiency wedge and in its contribution to output and investment growth was greater in China than in India. [Lu \(2017\)](#) also reports a sharp slowdown in Chinese TFP growth, arguing that China has entered a phase of moderate growth and [Eichengreen et al. \(2012\)](#) find that the growth rate of per capita income in fast-growing economies is reduced by at least 2 percentage points when their per capita income reaches a limit recently reached by China. The sharp slowdown in the Chinese efficiency wedge lends itself to an obvious neoclassical interpretation: the rapid convergence of the Chinese economy, driven by intensive technological catch-up, may be coming to a halt, which means that the Chinese economy may be tending towards an efficiency-based growth as developed countries did some time ago ([Kim, 2002](#)). In India, the investment wedge was mainly responsible for the growth slowdown, rather than the efficiency wedge, which grew at a high, albeit slower, pace, so India is likely to experience high growth in the coming years. However, the poor performance of the Indian labour wedge over the period analysed leads us to believe that the rigidities of the Indian labour market may pose a potential threat to the future growth of

the Indian economy. While the Indian government introduced major labour market reforms in 2020 to simplify, modernise and deregulate the country’s complex labour laws in order to boost employment, attract investment and improve the ease of doing business, they fall outside the scope of our study, which up 2019.

## 7 Conclusion

The economic miracles of China and India, representing 36% of the global population, have reshaped global development by lifting millions out of poverty. Using Wedge-Growth Accounting (WGA), this study dissects the drivers of their rapid growth from 1982 to 2019 for China and 1991 to 2019 for India, revealing both striking similarities and notable differences. These findings, rooted in the neoclassical growth model, highlight the roles of total factor productivity (TFP), financial frictions, and labour market distortions, offering critical insights for policymakers and lessons for emerging economies.

In both China and India, economic growth was primarily driven by improvements in the efficiency wedge, which reflects TFP gains from technological catch-up and market-oriented reforms. China’s “Reform and Opening-Up” policies, initiated in 1978 under Deng Xiaoping, decentralized economic decision-making, privatized enterprises, and integrated China into global markets, boosting TFP significantly from 1982. India’s 1991 reforms, triggered by a balance-of-payments crisis and guided by the Narasimhan-I Committee, liberalized trade and industry, driving TFP growth from 1991. The investment wedge, capturing reduced financial frictions, played a secondary but significant role in both nations. In China, financial liberalization began in the 1980s with banking reforms, enhancing capital allocation. In India, financial reforms gained traction only after the Narasimhan-II Committee’s recommendations in the late 1990s, significantly boosting investment from 1999 to 2005. However, the labour wedge, reflecting distortions such as taxes and rigid regulations, consistently hampered growth in output, investment, and hours worked in both countries, with a more pronounced negative effect in India.

Despite these similarities, key differences emerge. In China, the investment wedge contributed to growth from the early 1980s, reflecting early financial reforms, whereas in India, its impact was negligible until the late 1990s due to persistent state dominance in banking. Hours worked per capita increased slightly in China, driven by gains in efficiency and investment wedges, despite a deteriorating labour wedge linked to social security reforms in the late 1990s. In contrast, India’s hours worked per capita declined

significantly, driven by a sharply worsening labour wedge due to rigid labour laws, such as the Industrial Disputes Act of 1947, which remained largely unreformed until 2020. The growth slowdown in the 2010s affected both economies but was more pronounced in China, where a decelerating efficiency wedge suggests diminishing TFP gains as the economy approaches the technological frontier. In India, the slowdown was driven more by the investment wedge, though TFP growth remained robust, indicating potential for sustained high growth.

These findings carry significant policy implications. First, the dominance of the efficiency wedge underscores the critical role of market liberalization and technological adoption in driving TFP growth. Emerging economies should prioritize trade openness, private sector development, and technology transfer to replicate these gains. Second, financial sector reforms are essential to reduce investment distortions, as seen in China's early banking reforms and India's post-1990s financial liberalization. Policymakers must ensure competitive and efficient financial systems to support capital accumulation. Third, labour market rigidities, particularly in India, highlight the need for reforms to enhance labour supply and productivity. India's recent labor codes (post-2019) may address these issues, but their impact requires evaluation. China's experience suggests that social security reforms, while necessary, must be balanced to avoid labour market distortions.

The Chinese and Indian experiences offer key lessons and provide a roadmap for emerging economies seeking sustainable development in an increasingly complex global landscape. Liberalizing markets and integrating into global trade networks can unleash rapid TFP-driven growth, but sustained progress requires addressing structural bottlenecks, particularly in labour and financial markets. The slowdown in both nations signals that transitioning to innovation-driven growth is critical as technological catch-up diminishes. Governments must invest in human capital, research, and development to maintain growth momentum.

Future research should explore several avenues. First, extending WGA to include post-2019 data could assess the impact of India's recent labour reforms and China's shift toward consumption-driven growth. Second, incorporating sectoral data could reveal whether TFP gains were concentrated in specific industries, such as manufacturing or services. Third, analysing the role of human capital accumulation in driving the efficiency wedge could provide deeper insights into long-term growth prospects. Finally, comparative WGA studies of other emerging economies could test the generalizability of these findings, informing tailored development strategies.

## References

- ANDERSSON, F. N., EDGERTON, D. L., and OPPER, S. (2013). A matter of time: revisiting growth convergence in China. *World Development*, 45, 239-251. <https://doi.org/10.1016/j.worlddev.2012.12.013>
- APPLETON, S., SONG, L., and XIA, Q. (2010). Growing out of poverty: Trends and patterns of urban poverty in China 1988–2002. *World Development*, 38(5), 665-678.
- BARRO, R. J. and SALA-I-MARTIN, X. (1995). *Economic Growth*, McGraw Hill International Editions.
- BHAGWATI, J. (1993). *India in transition: Freeing the economy*. Oxford University Press.
- BILS, M. and KLENOW, P. J. (2000). Does schooling cause growth?. *The American Economic Review*, 90(5), 1160-1183.
- BREHM, S. (2013). Fiscal incentives, public spending, and productivity–county-level evidence from a Chinese province. *World Development*, 46, 92-103. <https://doi.org/10.1016/j.worlddev.2013.01.029>
- BRINCA, P. (2014). Distortions in the Neoclassical Growth Model: A CrossCountry Analysis. *Journal of Economic Dynamics and Control*, 47, 1-19.
- BRINCA, P., CHARI, V. V., KEHOE, P. J. and MCGRATTAN, E. R. (2016). Accounting for business cycles. In *Handbook of Macroeconomics* (Vol. 2, pp. 1013-1063). Elsevier.
- BRINCA, P., COSTA FILHO, J. R., and LORIA, F. (2024). Business Cycle Accounting: what have we learned so far?. *Journal of Economic Surveys*, 38(4), 1276-1316.
- CHAKRABORTY, C., and NUNNENKAMP, P. (2008). Economic reforms, FDI, and economic growth in India: a sector level analysis. *World development*, 36(7), 1192-1212. <https://doi.org/10.1016/j.worlddev.2007.06.014>
- CHAKRABORTY, S., and OTSU, K. (2013). Business cycle accounting of the BRIC economies. *The BE Journal of Macroeconomics*, 13(1), 381-413.
- CHANDA, A. and KABIRAJ, S. (2020). Shedding light on regional growth and convergence in India. *World Development*, 133, 104961. <https://doi.org/10.1016/j.worlddev.2020.104961>
- CHARI, V., KEHOE, P. J., and MCGRATTAN, E. R. (2007). Business cycle accounting. *Econometrica*, 75(3), 781-836.
- CHENG, H., GAWANDE, K., and QI, S. (2022). State capacity, economic output, and public goods in China. *World Development*, 158, 105990. <https://doi.org/10.1016/j.worlddev.2022.105990>

- DEL RÍO, F. and LORES, F. X. (2021). Accounting for US economic growth 1954–2017. *Economic Modelling*, 101, 105529. <https://doi.org/10.1016/j.econmod.2021.105529>
- DEL RÍO, F. and LORES, F. X. (2023). Accounting for the role of investment frictions in recessions. *Economica*, 90, 360. <https://doi.org/10.1111/ecca.12485>.
- EICHENGREEN, B., PARK, D., and SHIN, K. (2012). When Fast-Growing Economies Slow Down: International Evidence and Implications for China. *Asian Economic Papers*, 11 (1), 42-87.[https://doi.org/10.1162/ASEP\\_a\\_00118](https://doi.org/10.1162/ASEP_a_00118)
- FEEENSTRA, RC., INKLAAR, R., TIMMER, MP. (2015). The Next Generation of the Penn World Table. *American Economic Review*, 105(10), 3150–3182. Available for download at <https://www.ggdcc.net/pwt>
- FELIPE, J., LAVIÑA, E., and FAN, E. X. (2008). The diverging patterns of profitability, investment and growth of China and India during 1980–2003. *World Development*, 36(5), 741-774.<https://doi.org/10.1016/j.worlddev.2007.05.011>
- FENG, J., XIE, Q., and ZHANG, X. (2021). Trade liberalization and the health of working-age adults: Evidence from China. *World Development*, 139, 105344. <https://doi.org/10.1016/j.worlddev.2020.105344>
- GAO, X., SHI, X., and FANG, S. (2021). Property rights and misallocation: Evidence from land certification in China. *World Development*, 147, 105632.<https://doi.org/10.1016/j.worlddev.2021.105632>
- GOLLEY, J. and TYERS, R (2012). Demographic Dividends, Dependencies, and Economic Growth in China and India. *Asian Economic Papers* 11 (3): 1–26. [https://doi.org/10.1162/ASEP\\_a\\_00156](https://doi.org/10.1162/ASEP_a_00156)
- GUNBY, P., JIN, Y., and REED, W. R. (2017). Did FDI really cause Chinese economic growth? A meta-analysis. *World development*, 90, 242-255. <https://doi.org/10.1016/j.worlddev.2016.10.001>
- HANSEN, G.D., OHANIAN, L.E. and OZTURK, F. (2021). [Dynamic general equilibrium modeling of long and short-run historical events](#). Chapter 11, *Handbook of Historical Economics*, Academic Press, Pages 297-333, ISBN 978-0-12-815874-6, <https://doi.org/10.1016/B978-0-12-815874-6.00019-8>.
- HOLZ, C. A. (2008). China’s economic growth 1978–2025: what we know today about China’s economic growth tomorrow. *World Development*, 36(10), 1665-1691.<https://doi.org/10.1016/j.worlddev.2007.09.013>.
- KALIRAJAN, K., and SINGH, K. (2008). A comparative analysis of China’s and India’s recent export performances. *Asian economic papers*, 7(1), 1-28.
- KE, S. (2015). Domestic market integration and regional economic growth—China’s recent experience from 1995–2011. *World Development*, 66, 588-597. <https://doi.org/10.1016/j.worlddev.2014.09.024>

- KHATKHATE, D. (1994). Intellectual origins of Indian economic reform: A review of Jagdish Bhagwati's *India in transition: Freeing the economy* (1993). *World Development*, 22(7), 1097. [https://doi.org/10.1016/0305-750X\(94\)90151-1](https://doi.org/10.1016/0305-750X(94)90151-1)
- KIM, J. I. (2002). Total factor productivity growth in East Asia: Implications for the future. *Asian Economic Papers*, 1(2), 50-70.
- LAL, D. (2008). An Indian economic miracle. *Cato Journal*, 28, 11-33.
- LEE, C. K. (2007). *Against the law: labor protests in China's rustbelt and sunbelt*. Univ of California Press.
- LEUNG, J. C. (2003). Social security reforms in China: Issues and prospects. *International Journal of Social Welfare*, 12(2), 73-85.
- LEUTERT, W. (2021). Innovation through iteration: policy feedback loops in China's economic reform. *World Development*, 138, 105173. <https://doi.org/10.1016/j.worlddev.2020.105173>
- LI, J., FENG, Y., and GIZELIS, I. (2007). China's new social security system in the making: Problems and prospects. *International Journal of Public Administration*, 31(1), 5-23.
- LU, D. (2017). China's Growth Slowdown and Prospects for Becoming a High-Income Developed Economy. *Asian Economic Papers*, 16 (1), 89-113. [https://doi.org/10.1162/ASEP\\_a\\_00490](https://doi.org/10.1162/ASEP_a_00490)
- LYU, W., YANG, J., and YU, L. (2025). Place-based policies, pro-competitive effects, and allocative efficiency: Evidence from China's economic zones. *World Development*, 191, 106971. <https://doi.org/10.1016/j.worlddev.2025.106971>
- MCDONALD, S., ROBINSON, S., and THIERFELDER, K. (2008). Asian growth and trade poles: India, China, and East and Southeast Asia. *World Development*, 36(2), 210-234. <https://doi.org/10.1016/j.worlddev.2007.06.013>.
- MENG, X. (2012). Labor market outcomes and reforms in China. *Journal of economic perspectives*, 26(4), 75-102.
- NAGARAJ, R. (2025). India's premature deindustrialization and Falling investment rate in the 2010s. *World Development*, 191, 106954. <https://doi.org/10.1016/j.worlddev.2025.106954>
- NELSON, R. R. and PHELPS, E. S. (1966). Investment in humans, technological diffusion, and economic growth. *The American Economic Review*, 56(1/2), 69-75.
- NOLAN, P., and XIAOQIANG, W. (1999). Beyond privatization: Institutional innovation and growth in China's large state-owned enterprises. *World Development*, 27(1), 169-200. [https://doi.org/10.1016/S0305-750X\(98\)00132-6](https://doi.org/10.1016/S0305-750X(98)00132-6).

- RAY, A. (2002). The Chinese economic miracle: Lessons to be learnt. *Economic and Political Weekly*, 37, 3835-3848.
- YAO, Y., and YUEH, L. (2009). Law, finance, and economic growth in China: An introduction. *World development*, 37(4), 753-762. <https://doi.org/10.1016/j.worlddev.2008.07.009>
- WALHEER, B., and HE, M. (2020). Technical efficiency and technology gap of the manufacturing industry in China: Does firm ownership matter?. *World Development*, 127, 104769. <https://doi.org/10.1016/j.worlddev.2019.104769>
- WILSON, R. (2016). Does governance cause growth? Evidence from China. *World Development*, 79, 138-151. <https://doi.org/10.1016/j.worlddev.2015.11.015>
- ZHENG, J., BIGSTEN, A., and HU, A. (2009). Can China's growth be sustained? A productivity perspective. *World Development*, 37(4), 874-888. <https://doi.org/10.1016/j.worlddev.2008.07.008>

Table 1  
PARAMETERS HELD FIX ACROSS COUNTRIES.

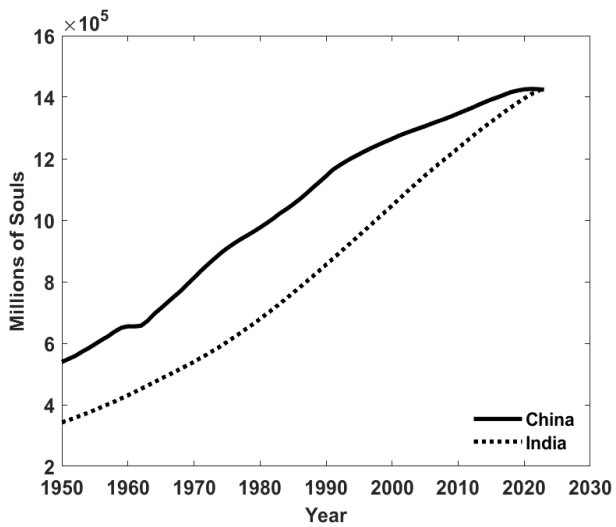
Parameter	Description	Value
$\gamma$	Growth Rate of Labour-Aumenting Technical Progress	0.0210
$\delta$	Depreciation Rate of Capital	0.0500
$\theta$	Production Function Parameter	0.3500
$\nu$	Frisch Elasticity Parameter	-3
$\beta$	Discount Factor	0.9700

Table 2  
 $\phi$ -STATISTICS CHINA.

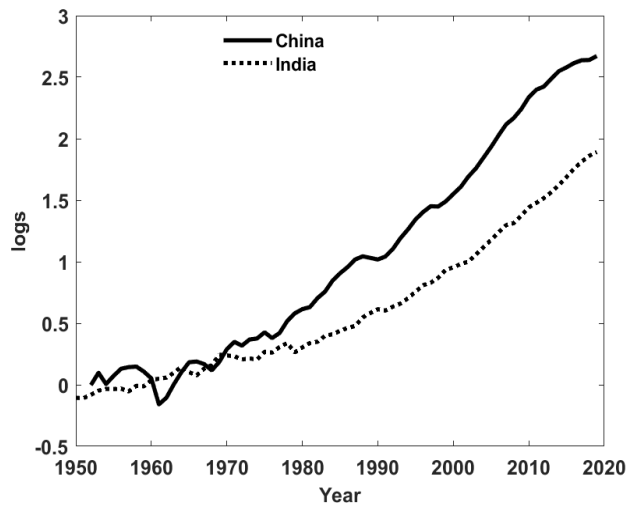
Variable	$\phi_{\pi_y}^y$	$\phi_{\pi_l}^y$	$\phi_{\pi_x}^y$
$h$	0.292	0.046	0.110
$y$	0.550	0.077	0.212
$x$	0.284	0.076	0.490

Table 3  
 $\phi$ -STATISTICS INDIA.

Variable	$\phi_{\pi_y}^y$	$\phi_{\pi_l}^y$	$\phi_{\pi_x}^y$
$h$	0.050	0.727	0.056
$y$	0.962	0.005	0.017
$x$	0.766	0.024	0.140



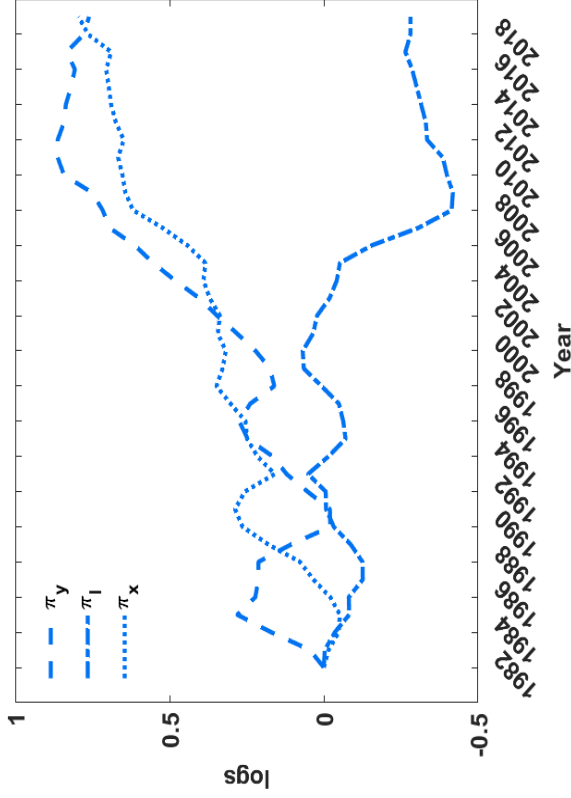
(a) Population.



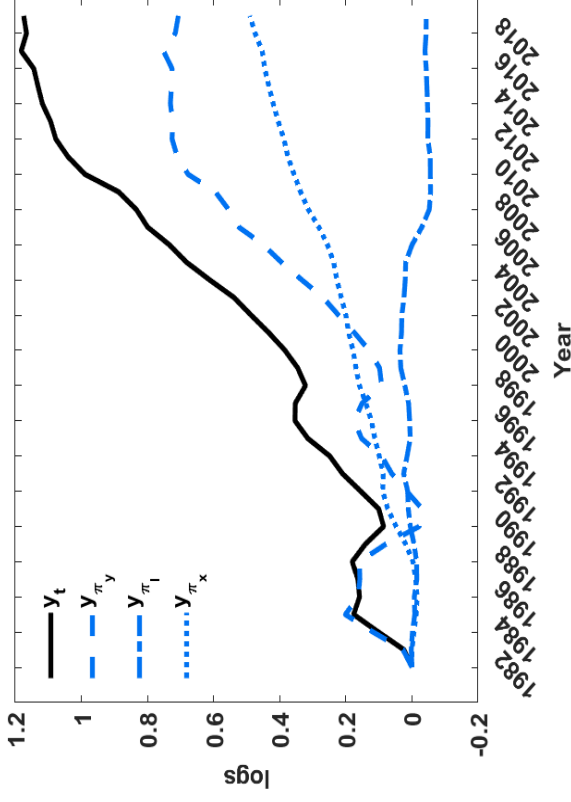
(b) GDP per capita.

Fig. 1: The economic miracles of China and India.

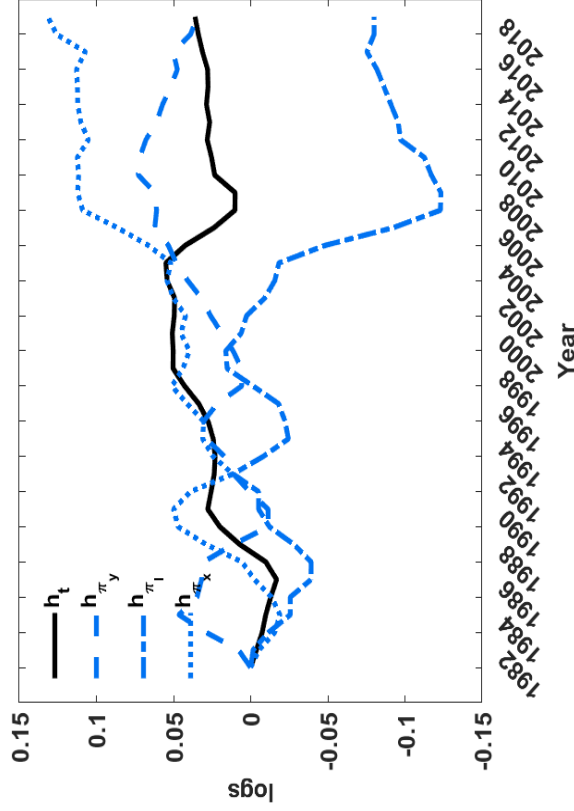
Note: Total population in millions and GDP per capita in miles of 2017 national prices. The total population source is [UN, World Population Prospects \(2024\)](#), and GDP per capita from [Feenstra et al. \(2015\)](#).



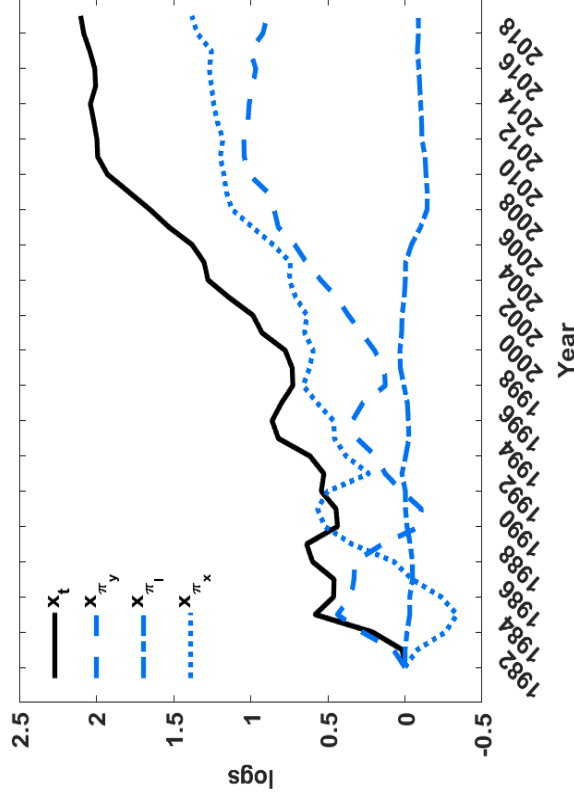
(a) Wedges.



(b) Output components.



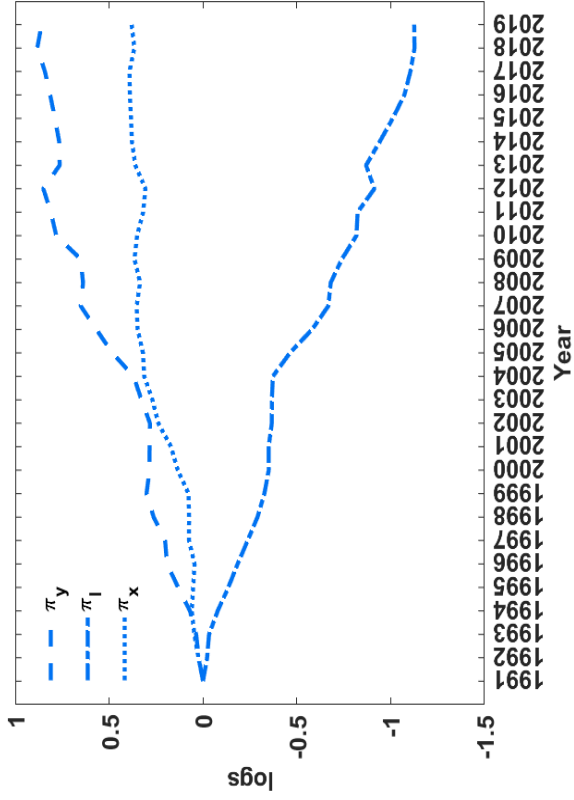
(c) Labour components.



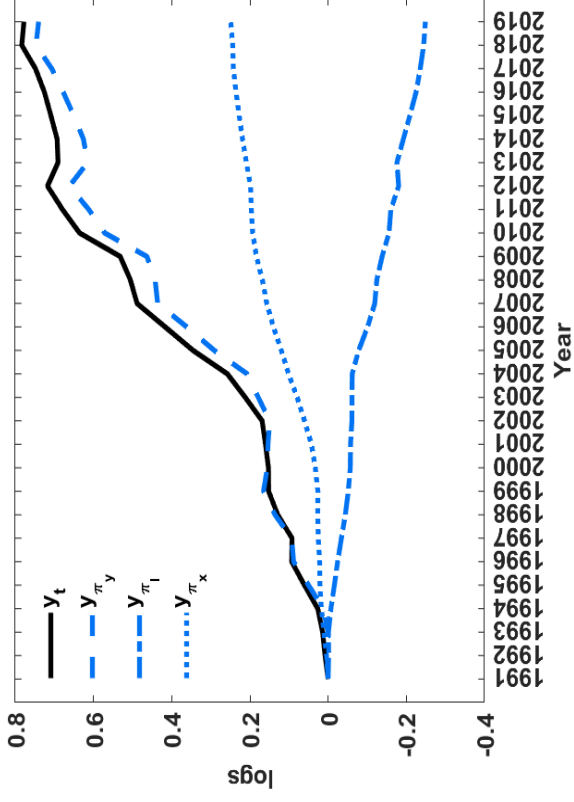
(d) Investment components.

Fig. 2: Wedges and wedge-alone components China.

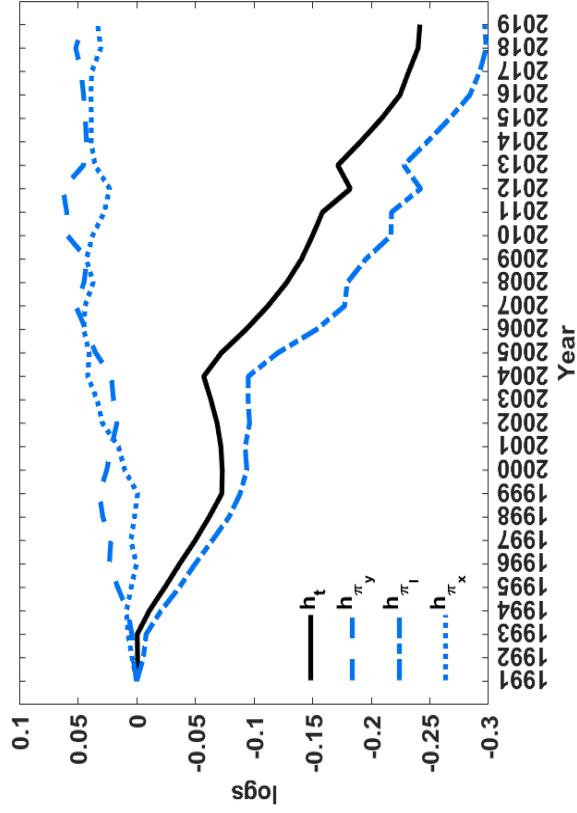
Note:  $y_{i,t} \in \{h_{i,t}, y_{i,t}, x_{i,t}\}$  is the wedge-alone component of a variable due to wedge  $i \in \{\pi_y, \pi_\pi, \pi_x\}$  and  $y_t \in \{h_t, y_t, x_t\}$  is the corresponding observed same variable.



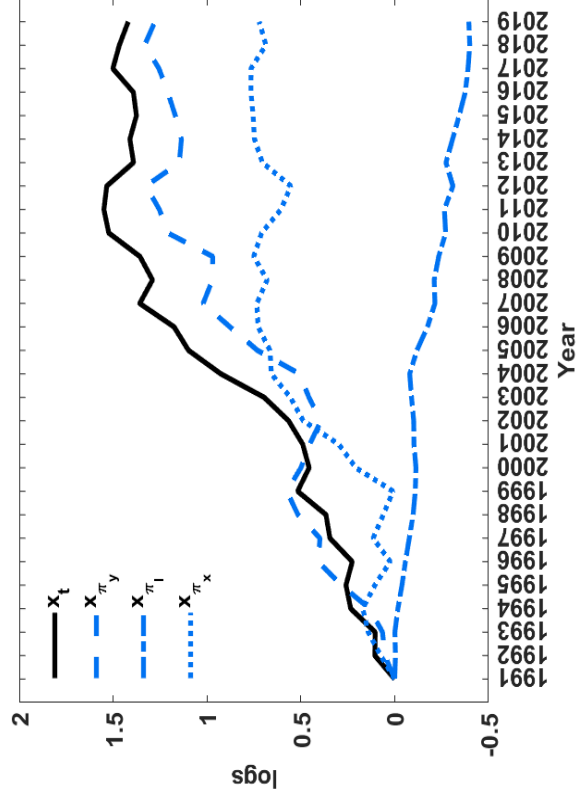
(a) Wedges.



(b) Output components.



(c) Labour components.



(d) Investment components

Fig. 3: Wedges and wedge-alone components India.

Note:  $y_{i,t} \in \{h_{i,t}, y_{i,t}, x_{i,t}\}$  is the wedge-alone component of a variable due to wedge  $i \in \{\pi_y, \pi_l, \pi_x\}$  and  $y_t \in \{h_t, y_t, x_t\}$  is the corresponding observed same variable.