Discussion

The Rise and Fall of India’s Relative Investment Price: A Tale of Policy Error and Reform

Why did the relative price of investment rise in India during the 1980s while it fell in the developed world?

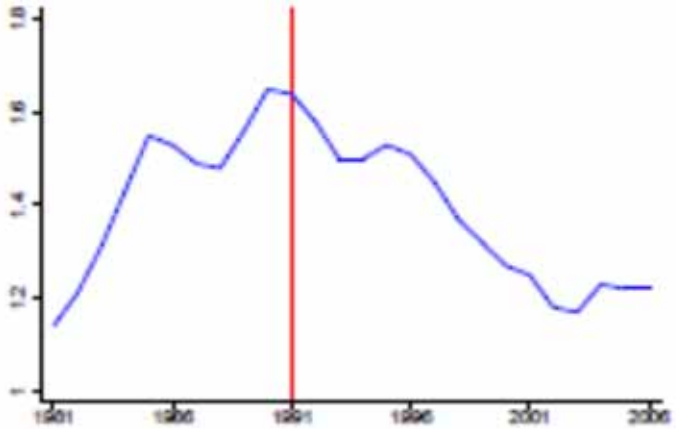


Figure 1: The relative price of investment in India from 1981 to 2006

Note: The vertical line denotes the year 1991 when capital import reform begins. *Source:* The Penn World Table 9.0.

- Link the relative price movements to the import substitution policies and its subsequent dismantling in 1991.
- Quantify the contribution of these policy shifts to the increase in the growth rate of GDP experienced by India in the decade and a half that followed the 1991 reforms.

- Small open economy model, where the investment good is produced by combining the imported good and the domestic final good. There are tariff as well as quantity restrictions on imports.
- Key results-Model can generate a 23% rise in the relative price of investment in the 1981-1991 (pre reform period).
- Intuitively, a rise in TFP raises the demand for investment goods which under import restrictions causes the relative price of capital to rise.

- Dismantling of tariffs and quotas post 1991 results in a 28% fall in the relative price of investment.
- It also accounts for 1/5th of the observed increase in GDP per capita in the post reform period (1991-2006).
- What is nice is that unlike a lot of the business cycle literature the model does not need capital adjustment costs to produce changes in the relative price of investment.
- This is also in contrast to papers which have shocks specific to the production of investment that determine exogenously the rate at which consumption goods are converted into new capital.

- Changes in the relative price of investment are endogenous and arise due to the quantity restrictions imposed on imports in the model.
- In the context of advanced economies at least there is evidence to suggest that that TFP and RPI are interrelated (Schmidt-Grohe and Uribe (2011). These two factors are related in the theory here as TFP shocks do ultimately lead to changes in RPI.

Average Annual Growth Rates (1960–1985).

	Y/L %	K/Y %	*TFP* %
Latin America	1.33	1.39	0.51
East Asia	4.74	1.63	2.83
Developed	2.40	0.61	1.50
World	2.24	1.08	1.24
U.S.	1.30	0.56	0.74

Based on Hopenhayn and Neumeyer (2004). Y/L = output per capita; K/Y = physical capital-output ratio; *TFP* = total factor productivity. TFP is calculated using a production function of the type $Y = AK^{\alpha}L^{1-\alpha}$, with $\alpha = 0.3$.

- The turnaround in economic performance—the decisive break with the past—occurred around 1980 and not in the 1990s as most accounts have it. (De Long (2003) and Williamson and Zagha (2002), Subramanian-Rodrik (2004))

Chart 1. Economic Performance in India 1960-2000
(log scale, 1960=1)

Table 1. India: Aggregated and Sectoral Growth Accounting
(annual average growth rates, unless otherwise specified)

	1960-70	*1970-80*	*1980-90*	*1990-99*
Bosworth-Collins (B-C)				
Output	3.84	2.98	5.85	5.59
Output per worker (Q/L)	1.87	0.69	3.90	3.27
Capital per worker	0.83	0.61	1.06	1.32
Education	0.29	0.58	0.32	0.34
Total factor productivity (TFP)	0.74	-0.50	2.49	1.57
IMF				
Output	3.75	3.16	5.64	5.61
Output per worker	1.77	0.86	3.69	3.30
Total factor productivity 1/	1.17	0.47	2.89	2.44
Total factor productivity 2/	-0.94	-2.07	1.28	0.94
Disaggregated growth of Q/L based on current employment shares				
Agriculture 3/	1.20	0.13	2.57	1.29
Manufacturing 4/		2.00	6.30	6.00
Services (B-C) 5/		2.12	6.32	6.57
Services (IMF) 6/		3.14	5.30	6.69
Growth rate of Aggregate Q/L with base-period employment shares as weights				
Aggregate (Bosworth-Collins)		0.69	3.66	3.08
Aggregate (IMF)		0.86	3.49	3.11
Contribution of labor-shifts to aggregate Q/L growth				
Aggregate (Bosworth-Collins)	n.a.		0.24	0.19
Aggregate (IMF)	n.a.		0.20	0.19
Employment Share 7/		*1975*	*1985*	*1995*
Agriculture		70.8	64.4	60.8
Industry		12.4	15.2	15.8
Services		16.8	20.4	23.4

Sources: Bosworth and Collins (2003); Ghose (1999); and authors' estimates

1/ Based on labor force

2/ Based on average years of schooling in population above 15 years of age

3/ From World Bank's World Development Indicators

4/ For 1980s and 1990s, data from IMF Working paper; for 1970s, estimate based on Ahulwahlia (1995)

5/ Calculated as a residual by deducting weighted average sectoral productivity growth rates from B-C agg. Q/L growth rate

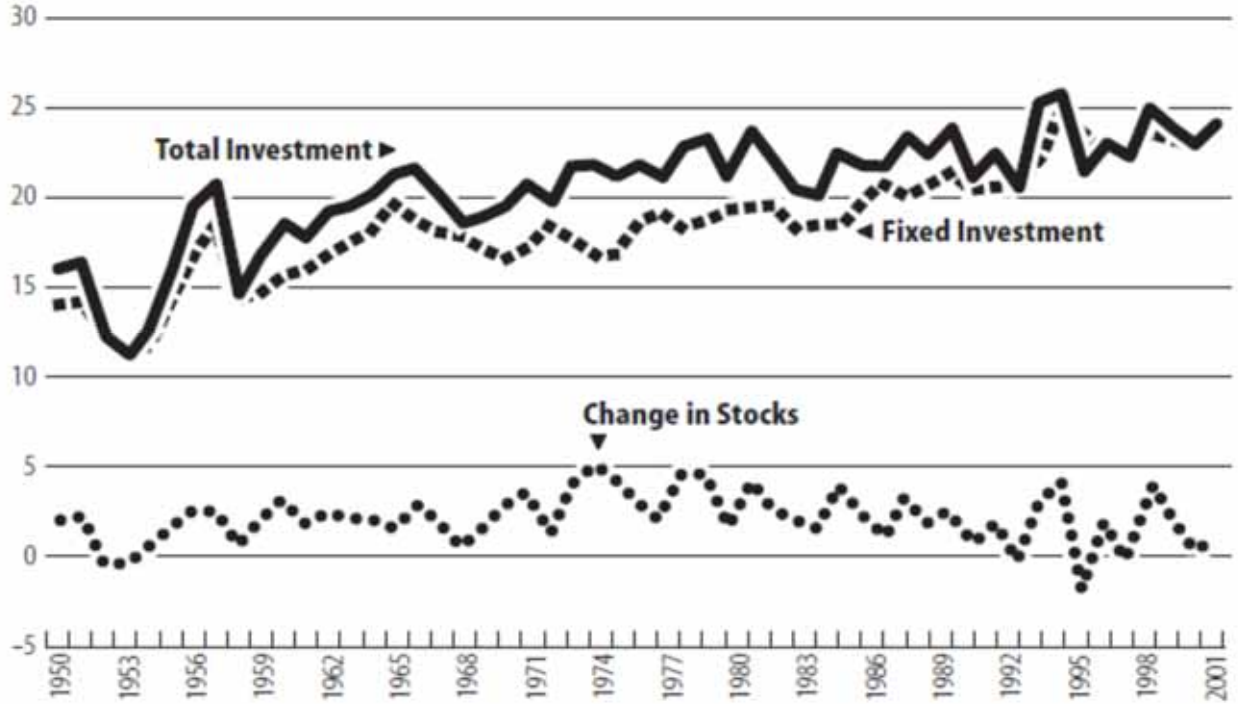
6/ Calculated as a residual by deducting weighted average sectoral productivity growth rates from IMF agg. Q/L growth rate

7/ Obtained from Ghose (1999). His number for 1977/78 is extrapolated backward to 1975 by applying trend between

- Regardless of whether the 1990s were slightly worse (or slightly better) than the 1980s, it is abundantly clear that India's economic performance improved sharply sometime around 1980.

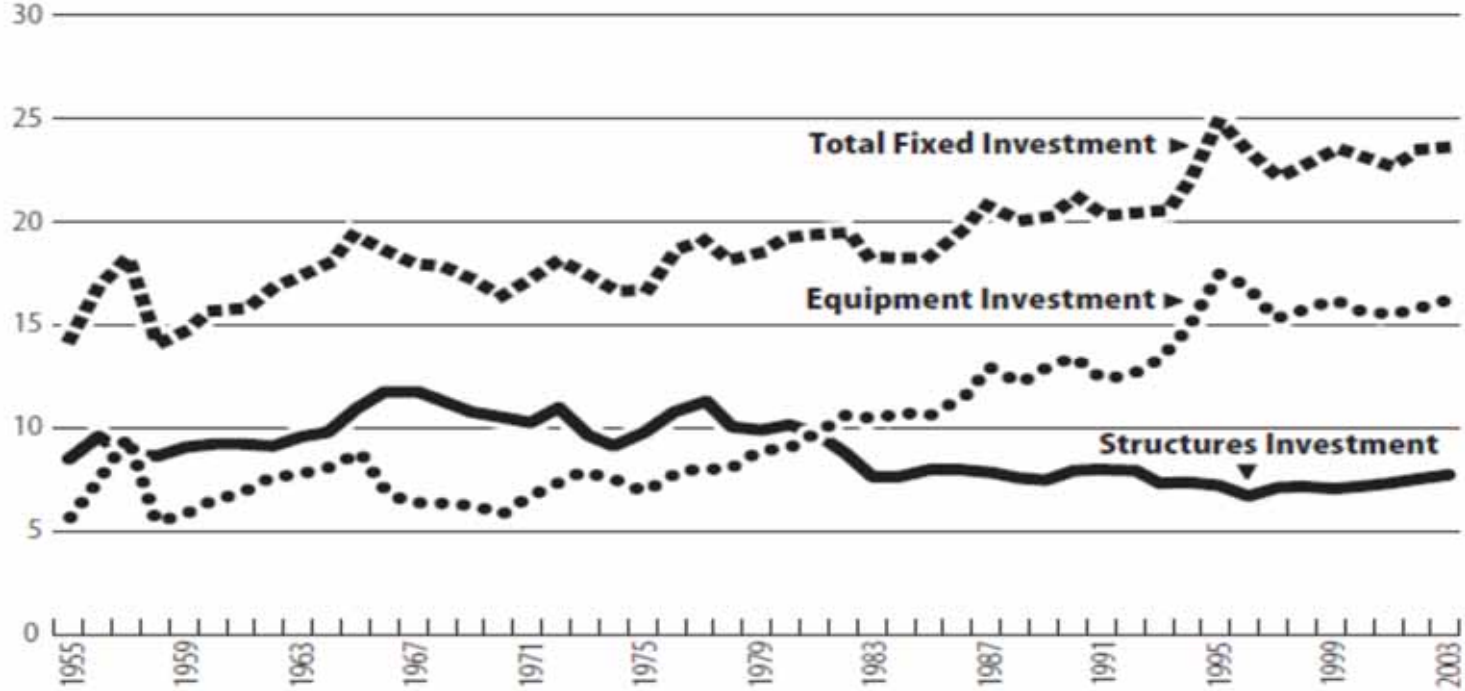
Figure 3: The Investment Rate and Its Components

Investment Rate (as % of GDP)



Source: Central Statistical Organisation, *National Accounts Statistics*, various issues.

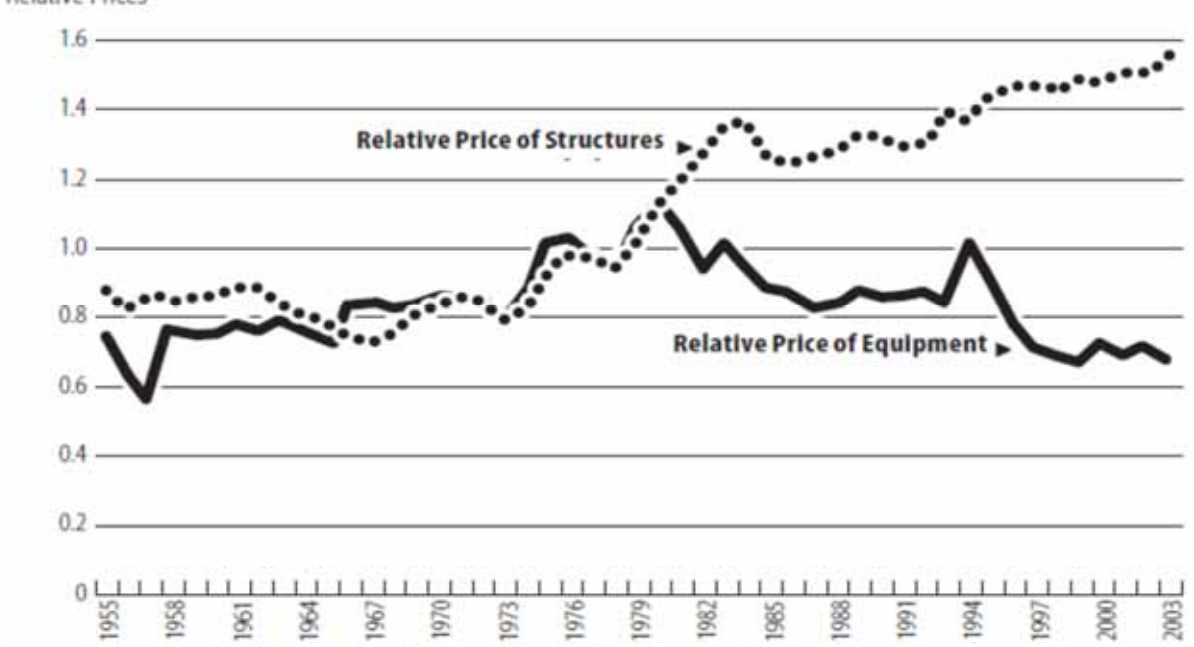
Fixed Investment (as % of GDP)



Source: Central Statistical Organisation, *National Accounts Statistics*, various issues.

- The increase in fixed capital formation can be clearly attributed to the rapid increase in equipment (machinery) investment since the mid-1970s which increased from 7.1 per cent of gdp in 1970-74 to around 12 per cent by the end of the 1980s. Structures (construction) investment has, on the other hand, fallen from 10.1 per cent of gdp in 1970-74 to around 7 per cent by the late 1980s.
- De Long and Summers (1993) show that the main reason why equipment investment boosts economic growth is via an increase in TFP growth – they find that there is a strong correlation between equipment investment and TFP growth in their sample of countries. The reason for this is that equipment investment has strong social rates of return.

Figure 9: Relative Price of Equipment and Structures



Source: Central Statistical Organisation, *National Accounts Statistics*, various issues.

- Data from the Penn World Tables (PWT) compiled by the World Bank (WB) for the United Nations International Comparison Program (ICP), the main source of capital goods prices (indices) across countries, suggest that the absolute price of capital goods was no higher in poor than in rich countries (1980,85,96)
- Hsieh and Klenow (2007) take this to mean the high relative price of capital is primarily driven by lower consumption goods prices.

- This contradicts the hypothesis that investment goods are taxed more heavily in poorer countries, or are subject to high tariffs or transportation costs that make them expensive for poor countries.
- Hence, the difference in the relative price in poor countries is driven by differences arising from cheap nontradables and the low productivity of poor countries in the investment and tradable goods sectors. Poor countries, therefore, appear to be plagued by low efficiency in producing investment goods.