Structural Transformation in China and India: The Role of Macroeconomic Policies

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Summary

I. The Intuition

II. Performance of Formal-Informal Sectors in China and India

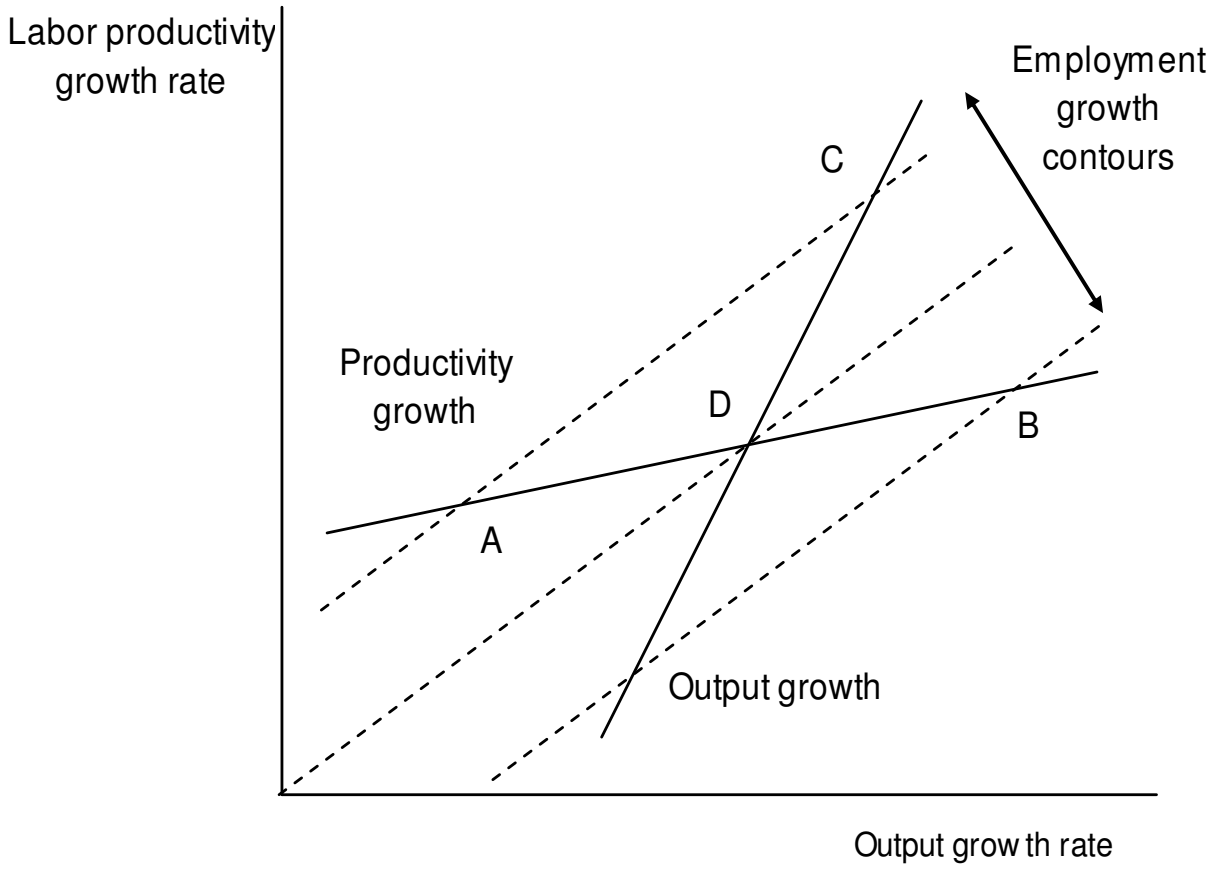
III. The Model

IV. Simulations results

V. Policy implications

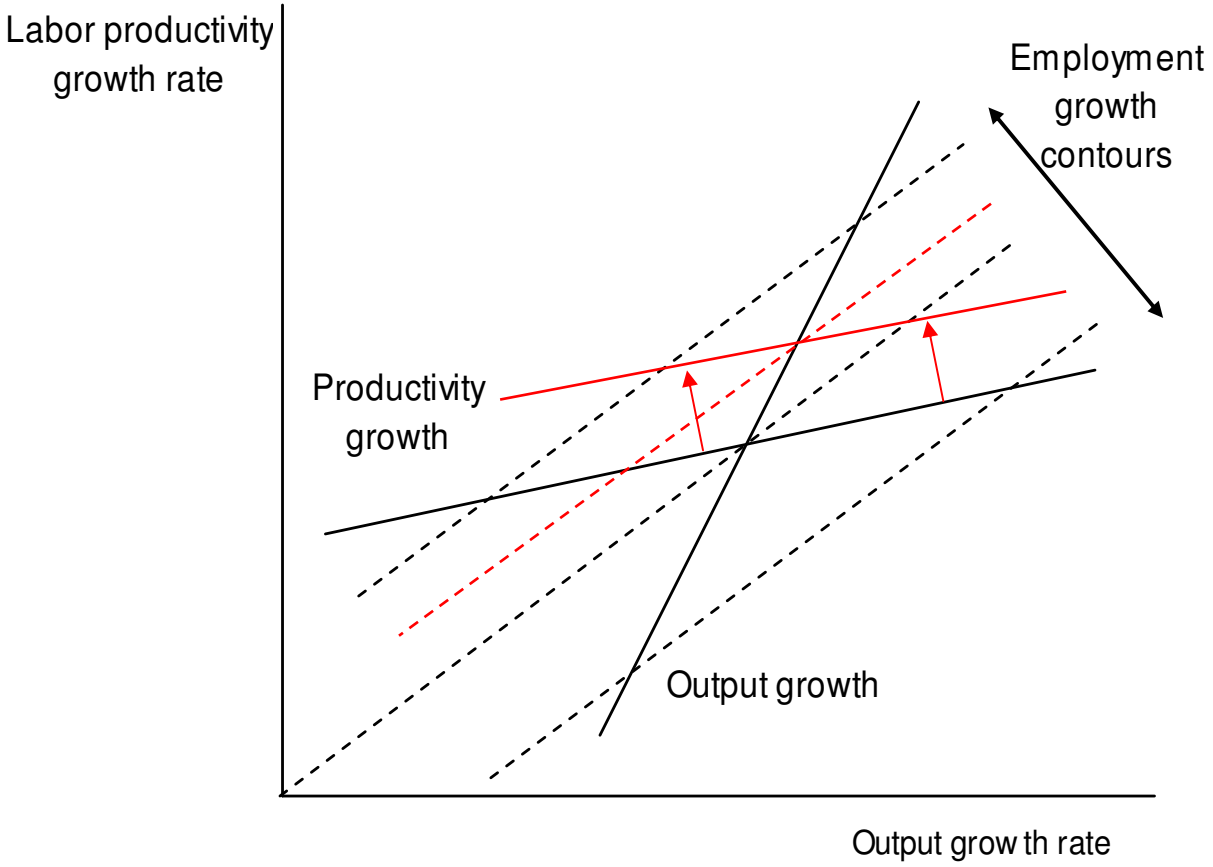
The Intuition

Output Growth = Employment Growth + Productivity Growth



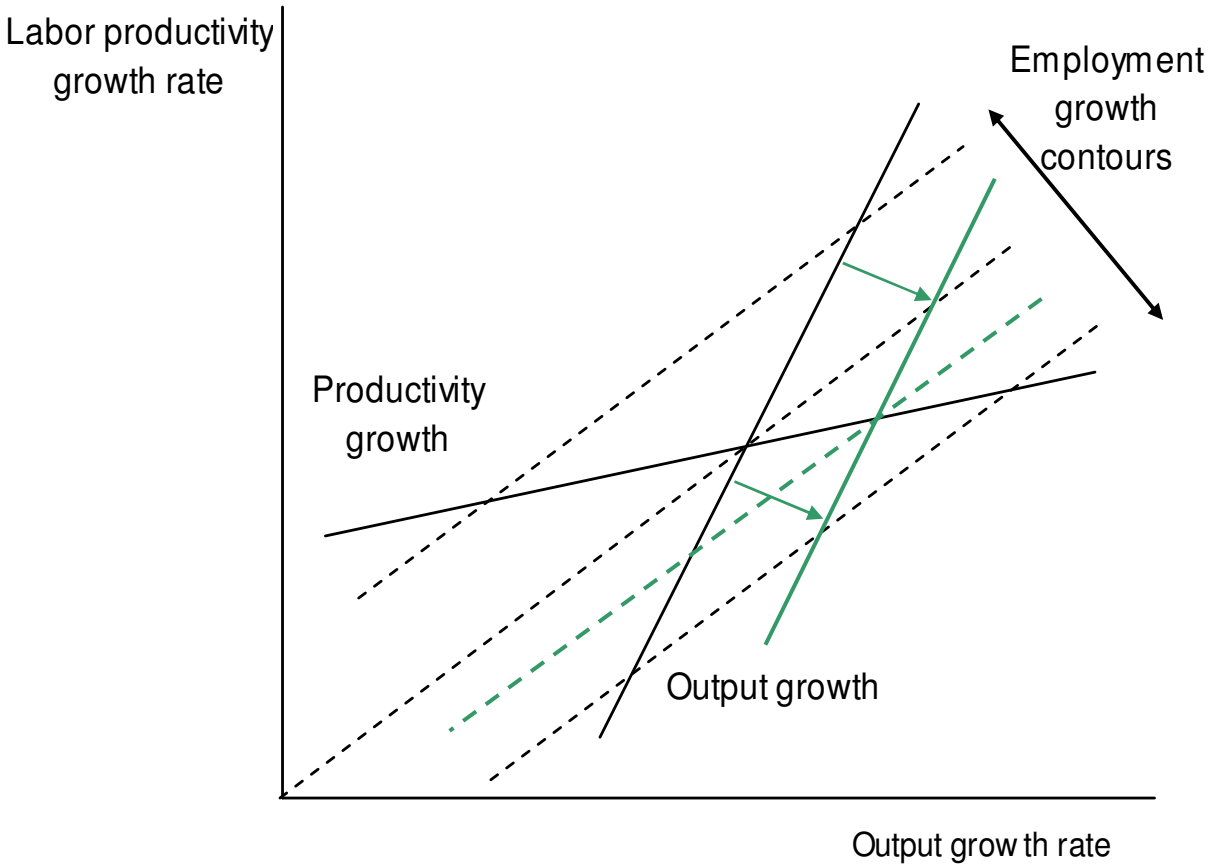
The Intuition

Output Growth = Employment Growth + Productivity Growth
Example 1: A labor-shedding equilibrium



The Intuition

Output Growth = Employment Growth + Productivity Growth
Example 2: A job-creation equilibrium



II. Formal and Informal Sectors in India and China

Estimation of the Formal/Informal SAM for China and India

China:

Wage shares of regular and irregular employment are applied to official statistics on final and intermediate consumption, value-added and the flow of funds table (physical transactions) from the national accounts published in *China Statistical Yearbook* for various years.

India:

Official statistics on the shares of factor incomes by organized and unorganized activities are used as weights to estimate the economic transactions between the two sectors.

China: Formal/Informal Wage Shares

Wage Shares	Agriculture		Other Industry		Services		Overall Economy	
	Formal	Informal	Formal	Informal	Formal	Informal	Formal	Informal
1990	0.04	0.96	0.88	0.12	0.93	0.07	0.56	0.44
1991	0.04	0.96	0.90	0.10	0.94	0.06	0.57	0.43
1992	0.04	0.96	0.90	0.10	0.95	0.05	0.59	0.41
1993	0.05	0.95	0.88	0.12	0.93	0.07	0.64	0.36
1994	0.05	0.95	0.90	0.10	0.94	0.06	0.66	0.34
1995	0.05	0.95	0.91	0.09	0.95	0.05	0.66	0.34
1996	0.05	0.95	0.90	0.10	0.93	0.07	0.65	0.35
1997	0.06	0.94	0.89	0.11	0.92	0.08	0.66	0.34
1998	0.06	0.94	0.83	0.17	0.87	0.13	0.66	0.34
1999	0.07	0.93	0.81	0.19	0.85	0.15	0.67	0.33
2000	0.06	0.94	0.79	0.21	0.83	0.17	0.68	0.32
2001	0.06	0.94	0.78	0.22	0.82	0.18	0.68	0.32
2002	0.06	0.94	0.79	0.21	0.82	0.18	0.71	0.29

Table 4: Share of wage bill of regular/irregular economic activities in China.
Source: Author's calculations based on data on employment from Ghose (2005) and data on wage levels from China Statistical Yearbook (various years).

India:
Formal/Informal Output Shares

Output (shares)	1993-94	1998-99	2002-03
Primary	*0.33*	*0.29*	*0.24*
Organised	0.04	0.03	0.04
Unorganised	0.96	0.97	0.96
Secondary	*0.24*	*0.24*	*0.24*
Organised	0.64	0.61	0.61
Unorganised	0.36	0.39	0.39
Trade, Hotel transport	*0.19*	*0.21*	*0.23*
Organised	0.24	0.27	0.29
Unorganised	0.76	0.73	0.71
Other Services	*0.24*	*0.26*	*0.29*
Organised	0.66	0.72	0.72
Unorganised	0.34	0.28	0.28
All sectors			
Organised	0.37	0.40	0.43
Unorganised	0.63	0.60	0.57

Table 6: Shares of organized and unorganized sector in Net Domestic Product in India
Based on Statement 76.1: Factor Incomes by Kind of Economic Activity
Source: National Accounts Statistics, CSO.

Economic Performance during 1990s

	Output		Productivity		Employment		Wage	Inv	Exports	Formal employment share		Relative labor productivity
	$\hat{X}_M$	$\hat{X}_S$	$\hat{\varepsilon}_{LM}$	$\hat{\varepsilon}_{LS}$	$\hat{L}_M$	$\hat{L}_S$	$\hat{w}_M$	$\hat{I}$	$\hat{E}$	$\lambda_{1990/91}$	λ_{2000}	$(\varepsilon_{LM}/\varepsilon_{LS})_{2000}$
China	12.2	6.82	9.42	6.74	2.53	0.07	8.9	14.1	16.0	36.5	42.3	2.84
India	6.6	5.06	6.11	3.15	0.45	2.21	5.4	6.3	12.8	8.4	7.2	8.37

Where M stands for the formal or modern sector,
and S stands for the subsistence of informal sector

III. The Model

The Theory

- Smith: division of labor and the role of economies of scale
- Young and Marshall: the role of increasing returns
- Lewis: the role of the surplus labor
- Arrow: the role of learning by doing
- Verdoorn: dynamic relationship between productivity and output growth
- Kaldor: macroeconomic model of growth and the demand and supply constraints

Accounting framework of the model

SAM for an economy with formal/informal sectors	Costs		Use of Income						TOTALS
	Formal (A)	Informal (B)	Formal Households (C)	Business (D)	Informal households (E)	Government (F)	Exports (G)	Investment (H)	(I)
(1) Formal	Intermediate inputs	Intermediate inputs	Formal HH consumption of formal goods	Formal goods consumption	Informal HH consumption of formal goods	Public consumption	Foreign Demand	Capital accumulation of formal goods	Formal sector output
(2) Informal	Intermediate inputs	Intermediate inputs	Formal HH consumption of informal goods		Informal HH consumption of informal goods			Capital accumulation of informal goods	Informal sector output
(3) Labor(F)	Wages of formal HH			Dividends and interest income paid to formal HH		Government transfers and interest on public debt	Net transfers to formal HH from rest of the world		Formal HH income
(4) Business (F)	Profits		Interest payments by formal HH		Interest payments by informal HH	Interest on public debt and transfers			Business sector income
(5) Labor (I)		Wages and operating surplus of informal HH		Dividends and interest income paid to informal HH		Government transfers and interest on public debt	Net transfers to informal HH from rest of the world		Informal HH income
(6) Government	Taxes on production		Income tax by formal HH	Corporate income tax	Income tax by informal HH				Government income
(7) Imports	Imported inputs								Payments to the rest of the world
(8) Savings			Formal HH saving	Corporate sector saving	Informal HH saving	Public saving	Foreign saving	Total capital accumulation	0
(9) TOTALS	Formal sector output	Informal sector output	Use of formal HH income	Use of business income	Use of informal HH income	Aggregate government expenditure	Receipts from the rest of the world	0	

Table 1: A Social Accounting Matrix for an economy with formal/informal sectors

Formal or Modern Sector
Productivity, Output and Employment

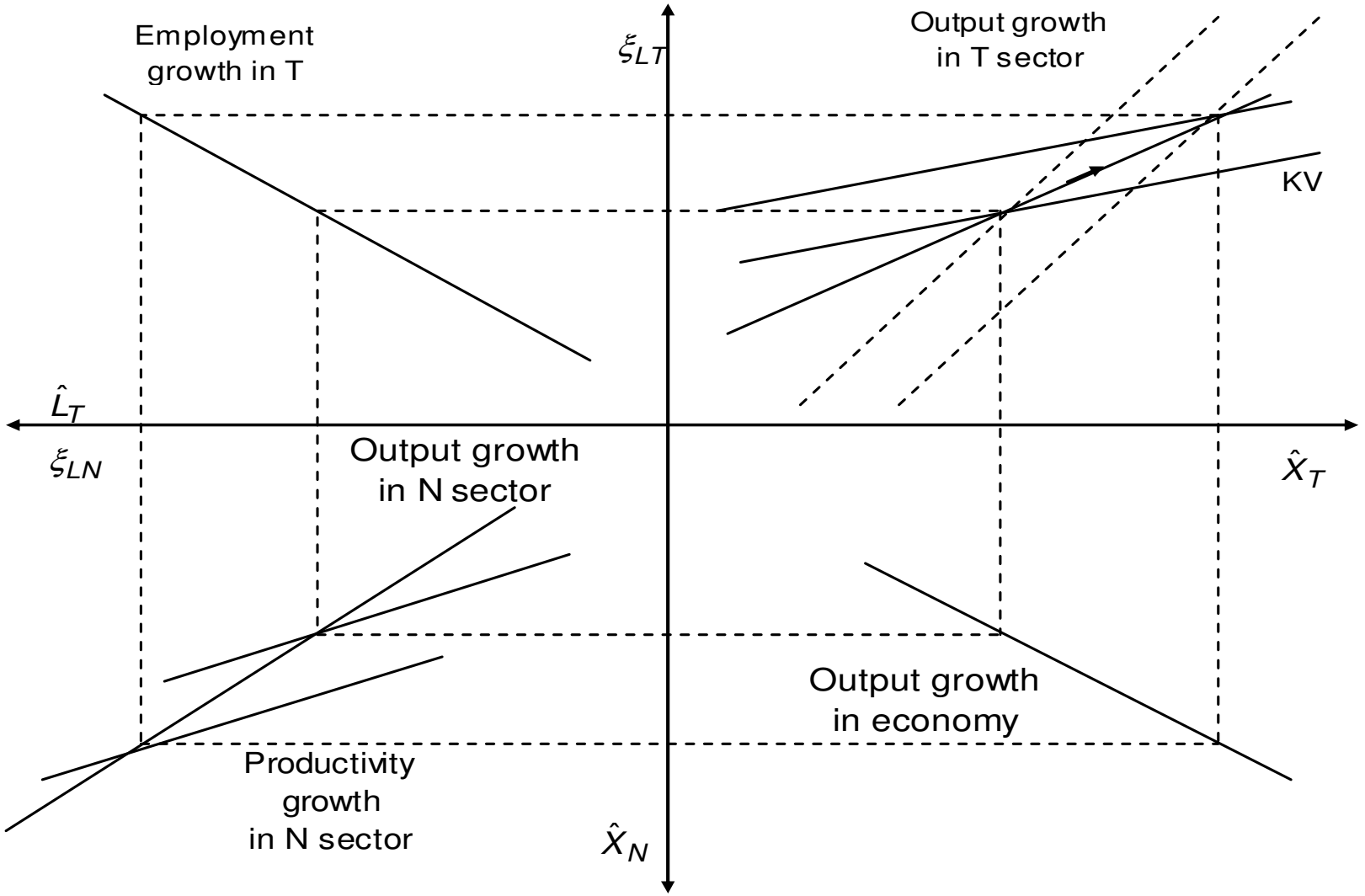
Total differentiation of the model in level form, and solving simultaneously for rates of growth of output, productivity and employment we obtain:

$$\hat{X}_M = \frac{1}{1-\gamma_0\chi_2}[\chi_2(\bar{\varepsilon}_{LM} - \hat{w}_M) + \chi_1\hat{I}_0 + \chi_3\hat{e}_r + \chi_4\hat{E}_0] \qquad (1)$$

$$\hat{\varepsilon}_{LM} = \frac{1}{1-\gamma_0\chi_2}[\bar{\varepsilon}_{LM} + \gamma_0(\chi_1\hat{I}_0 + \chi_3\hat{e}_r - \chi_2\hat{w}_M + \chi_4\hat{E}_0)] \qquad (2)$$

$$\hat{L}_M = \frac{1}{1-\gamma_0\chi_2}[(1-\gamma_0)(\chi_1\hat{I}_0 - \chi_2\hat{\omega}_M + \chi_3\hat{e}_r + \chi_4\hat{E}_0) - (1-\chi_2)\bar{\varepsilon}_{LM}] \qquad (3)$$

Virtuous Circle in a Dual Economy



Long-run Dynamics based on the Retardation of the Kaldor-Verdoorn Coefficient

- KV-coefficient decreases over time due to
  - technological catch-up
  - weakened economies of scale and
  - inter-sectoral linkages as well as a diminishing labor surplus.

- TPF “is likely to be convex upwards and flatten out altogether beyond a certain point” (Kaldor 1957, EJ).

Stagnation or Transformation in a Two-Sector Economy

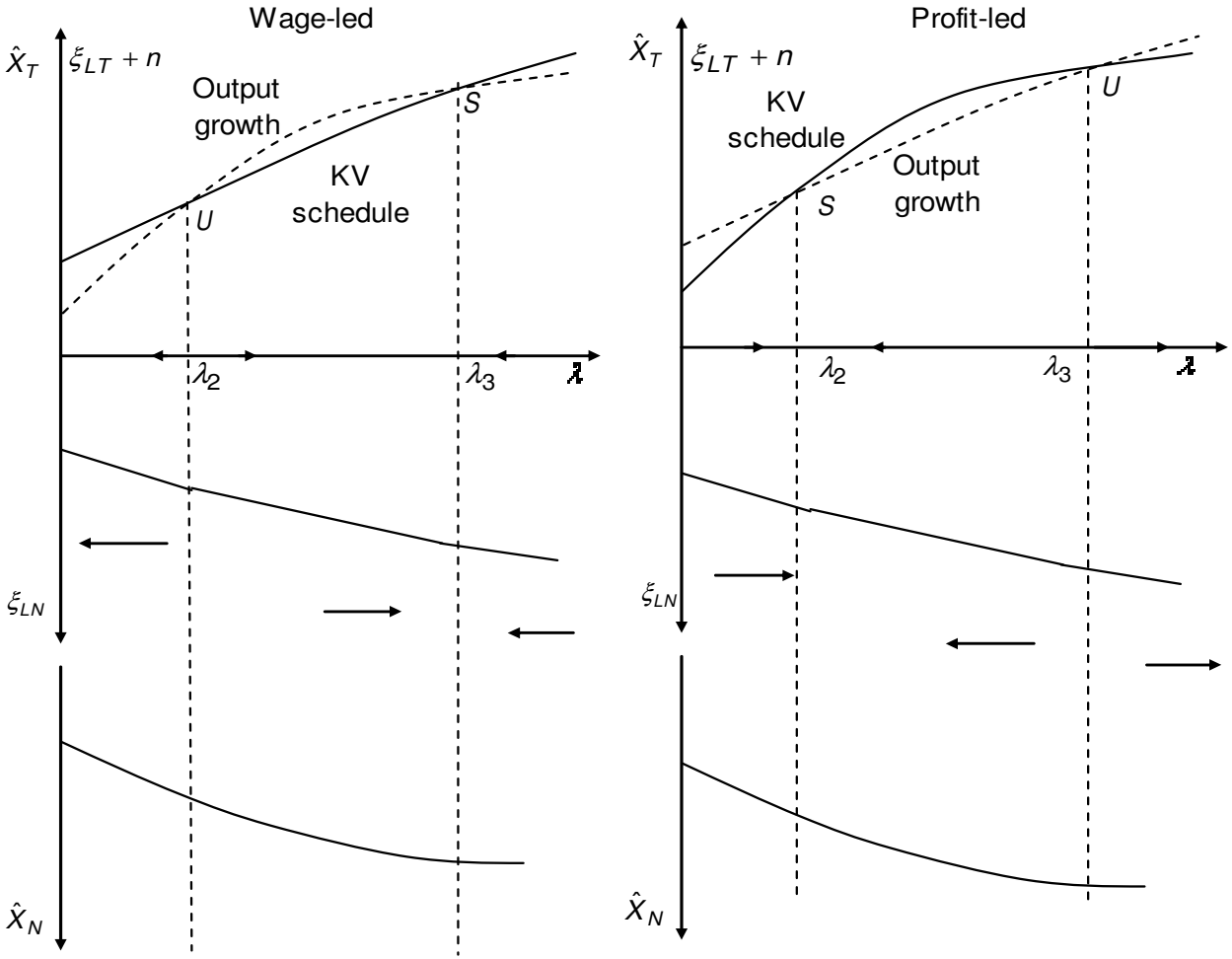


Figure 7: Output, labor productivity, and employment growth in a two-sector economy when retardation is present

IV. Simulations Results

Data Sources

- The formal/informal SAMs for China and India
- National Accounts Statistics
- Other Studies
- Parameterization of the model

Incoming Variables and Parameters (modern sector only)

Variables–base year	China	India
$\hat{w}$	10.3%	10.4%
$\hat{e}_r$	2.0%	2.0%
$\bar{\xi}_{LM}$	3.0%	3.0%
l_0	3.0%	2.5%
n	1.0%	1.9%

Incoming Variables and Parameters

Parameters Formal Sector	China	India
Kaldor-Verdoorn	0.61	0.45
Saving rate	0.47	0.24
Labor share	0.57	0.61
ϕ_X	1.00	0.90
ϕ_M	0.20	0.20
θ_X	0.10	0.40
θ_e	1.00	1.00
θ_M	0.20	0.20
Investment elasticity	1.44	1.55
Income distribution elasticity	0.23	0.46
Exchange rate elasticity	0.07	-0.37
Exports elasticity	1.11	1.41

Short-run Results

	Shock		Output growth	Productivity growth	Employment growth
Base run		China	9.7%	8.8%	0.9%
		India	7.42%	7.45%	0.0%
Investment growth	3% → 3.5%	China	10.5%	9.3%	1.2%
	2.5% → 3.5%	India	9.6%	8.7%	0.8%
Productivity growth	3% → 4%	China	9.9%	10.0%	0.0%
	3% → 4%	India	8.1%	8.8%	-0.8%
Productivity and Investment	3% → 4%, 3% → 4.5%	China	12.6%	11.6%	1.0%
	3% → 4%, 2.5% → 4%	India	11.3%	10.8%	0.5%
Wage growth	10% → 7%	China	10.6%	9.3%	1.2%
	10% → 7%	India	9.6%	8.7%	0.8%
Depreciation	2% → 4%	China	9.8%	8.9%	0.9%
	2% → 4%	India	6.4%	6.8%	-0.4%

Long-run Results

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