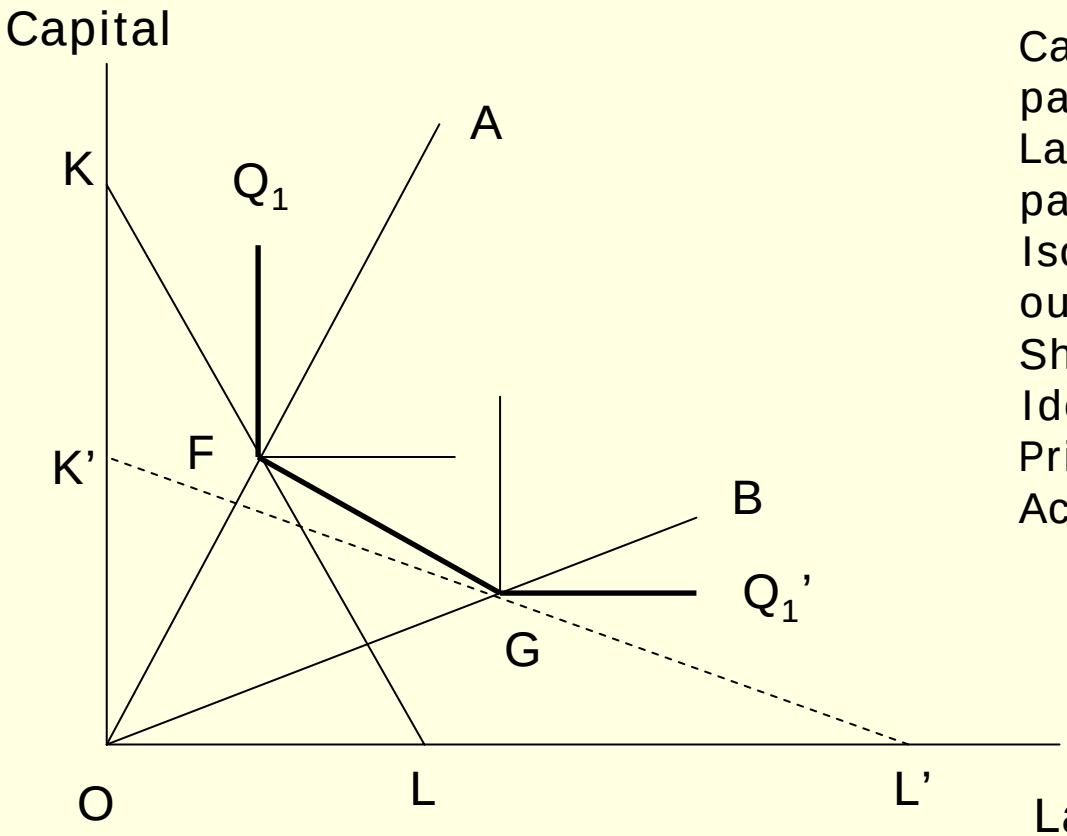
Lecture 5
Structural Change
(Based on Chapter 3 of Perkins et al.)
Autumn 2004

Sumon Bhaumik

Choice of Technology



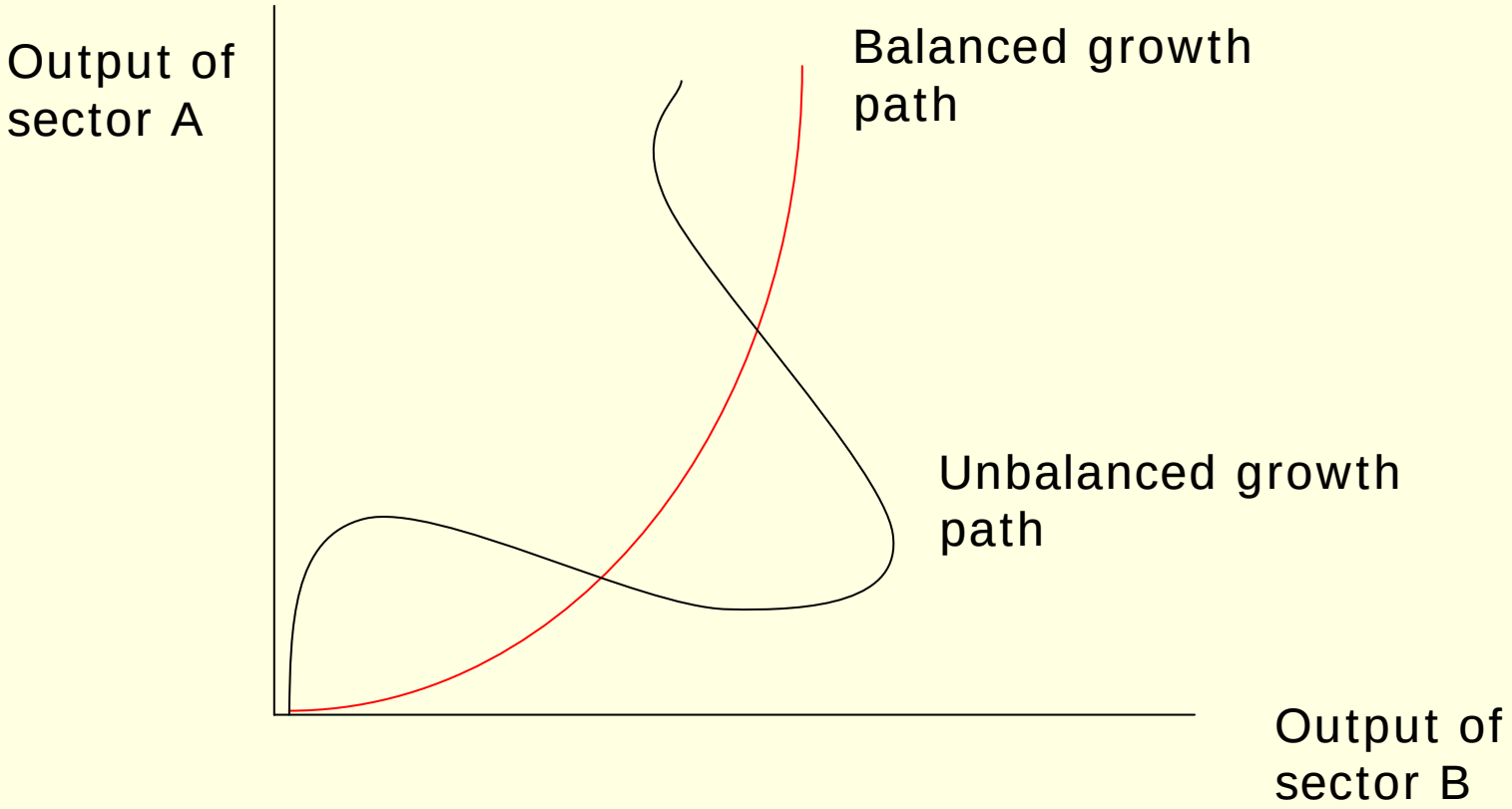
Capital intensive expansion path = OA
Labour intensive expansion path = OB
Isoquant for 1 unit of output = Q_1FGQ_1'
Shadow price line = K'L'
Ideal optimum = G
Price line facing firms = KL
Actual optimum = F

Concepts

- Balanced growth.
  - Linkages.
    - Backward
    - Forward
  - Import substitution.

- Critical minimum effort.

Balanced vs. Unbalanced Growth



Critical Minimum Effort and Big Push

- Stage 1.
  - Everyone is an agricultural worker.
    - Subsistence economy.
    - No surplus for purchasing industrial goods.
- Stage 2.
  - Industrialisation.
    - One (or a few industries) unviable.
    - Profitability of each industry depends on profitability of all other firms.
    - Coordination failure with respect to training labourers.

Flow Matrix

	X_1	X_2	X_3	X_4	Total Inter.	Final Use	Total Use
Primary Goods (X_1)	20	65	50	10	145	245	390
Consumer Goods (X_2)	0	30	0	0	30	260	290
Producers Goods (X_3)	50	60	70	15	195	50	245
Services (X_4)	40	15	50	70	175	200	375
Total	110	170	170	95	545		
Value added	280	120	75	280		755	
Total output	390	290	245	375			1300

Input-Output Matrix …. 1

	X_1	X_2	X_3	X_4
Primary goods (X_1)	0.05	0.23	0.20	0.03
Consumer goods (X_2)	0.00	0.10	0.00	0.00
Producer goods (X_3)	0.13	0.21	0.29	0.04
Services (X_4)	0.10	0.05	0.20	0.18
Total purchases	0.28	0.59	0.69	0.25
Value added	0.72	0.41	0.31	0.75
Total output	1.00	1.00	1.00	1.00

Input-Output Matrix …. 2

- Central planning:
  - Set target for income growth.
  - Estimate total final demand for all sectors at the new income level.
  - Estimate total intermediate demand for all sectors at the new income level.
  - Easy?

Input-Output Matrix …. 3

- Example:
  - Sector = 1
  - Final demand = F_1
  - Intermediate demands:
    - Sector 1 = $a_{11}X_1$
    - Sector 2 = $a_{12}X_2$
    - Sector 3 = $a_{13}X_3$
    - Sector 4 = $a_{14}X_4$
  - Total demand:
    - $X_1 = a_{11}X_1 + a_{12}X_2 + a_{13}X_3 + a_{14}X_4 + F_1$

Input-Output Matrix …. 4

- All sectors:
  - $X_1 = a_{11}X_1 + a_{12}X_2 + a_{13}X_3 + a_{14}X_4 + F_1$
  - $X_2 = a_{21}X_1 + a_{22}X_2 + a_{23}X_3 + a_{24}X_4 + F_2$
  - $X_3 = a_{31}X_1 + a_{32}X_2 + a_{33}X_3 + a_{34}X_4 + F_3$
  - $X_4 = a_{41}X_1 + a_{42}X_2 + a_{43}X_3 + a_{44}X_4 + F_4$

- Number of variables = 4
- Number of equations = 4

Input-Output Matrix …. 5

- Uses:
  - Industrial planning
    - Measure of backward linkage = $\sum_i a_{ij}$
    - Example:
      - Value added by an industry = 30 percent
      - Value of imported inputs = 15 percent
      - Backward linkage = 100 – 30 – 15 = 55 percent
  - Educational planning
    - Supply of skilled labour.
- Implications:
  - Role of technological innovations.

Social Accounting Matrix

TABLE 3–3 SIMPLIFIED SOCIAL ACCOUNTING MATRIX

RECEIPTS	EXPENDITURES 1. ACTIVITIES	2. COMMODITIES	3. FACTORS	4. ENTERPRISES	5. HOUSEHOLDS	6. GOVERNMENT	7. CAPITAL	8. REST OF WORLD	9. TOTAL
1. ACTIVITIES		DOMESTIC SALES				EXPORT SUBSIDIES		EXPORTS	TOTAL SALES
2. COMMODITIES	INTERMEDIATE DEMAND				HOUSEHOLD CONSUMPTION	GOVERNMENT CONSUMPTION	INVESTMENT		TOTAL DEMAND
3. FACTORS	FACTOR PAYMENTS								VALUE ADDED
4. ENTERPRISES			GROSS PROFITS			TRANSFERS			ENTERPRISE INCOME
5. HOUSEHOLDS			WAGES	DISTRIBUTED PROFITS		TRANSFERS		FOREIGN REMITTANCES	HOUSEHOLD INCOME
6. GOVERNMENT	INDIRECT TAXES	TARIFFS	FACTOR TAXES	ENTERPRISE TAXES	DIRECT TAXES				GOVERNMENT RECEIPTS
7. CAPITAL				RETAINED EARNINGS	HOUSEHOLD SAVINGS	GOVERNMENT SAVINGS		NET CAPITAL INFLOW	TOTAL SAVING
8. REST OF WORLD		IMPORTS							IMPORTS
9. TOTAL	TOTAL PAYMENTS	TOTAL ABSORPTION	VALUE ADDED	ENTERPRISE EXPENDITURE	HOUSEHHOLD EXPENDITURE	GOVERNMENT EXPENDITURE	TOTAL INVESTMENT	FROEIGN EXCHANGE	

Source: Sherman Robinson, "Multisectoral Models," in Chenery and Srinivasan, *Handbook of Development Economics*, Vol. 2, p. 897. Reprinted with permission.