Topic 2: Accounting for Observed Growth

By

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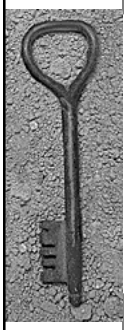


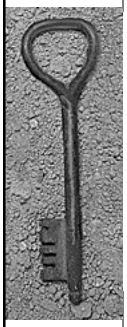
Growth Accounting

So far we have done the following:

- ✓ **Measures of Living standards**
  - *** Per capita income (we are pursuing now)**
  - *** Human Development Index and PQLI**

Today we do growth Accounting: The Sources of growth

Growth accounting, can explain why some countries grew faster than another country, what has been the source for such differences, but it cannot predict where the economy is going.



Topics

Representation of income (Production function)

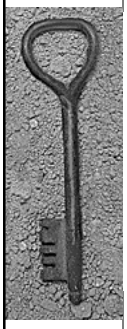
- Inputs: capital, labor, technology
- Growth accounting formula-decomposing observed income growth into above sources (growth in capital, labor and total factor productivity)
- Example: (growth accounting for Korea, Japan and US)

Determinants of each factor:

- Labor: population grwoth, hours of work,education
- Capital: Domestic Savings and foreign investment
- Technology: R&D

Representation of National and per capita income

- Review of production function.
- Example: using capital labor you can produce income. Suppose output we want to produce is computer program. Capital is a Pentium 4 machine time denote by K, and labor hours of the students in this class, denoted by L. Combining different amounts of these two inputs we will be able to produce different types of programs which we can sell to have income. More we spend in terms of computer time and hours of labor, better will be the quality of the program and higher will be the income we can earn when we sell it in the market. This relationship can be represented by a production function
- $Y = F(K, L)$
- Example: $F(K,L)= 2K + 3L$
- Technological change over time can be represented as $Y(t) = A(t)F(K(t),L(t)$.
- Computation of growth rate of a variable. (explain on the board with an example)



Growth Accounting Formula

- Growth accounting formula

$$r_Y = r_A + \eta_{FK} \cdot r_K + \eta_{FL} \cdot r_L$$

- What each term means, and how to compute this decomposition with data.

Comparing the sources of Growth for US, Korea and Japan

Sources of growth	Japan:1953-1971	Korea:1963-1982	U.S:1948-1973
Output growth	8.81	8.13	3.79
Contribution of			
gr. in labor	1.85	3.31	1.42
gr. in capital	2.10	1.58	0.71
gr. in TFP	4.86	3.24	1.66

Source: Kim and Park [1985].

Table 2.3: Growth accounting for Korea, Japan and the U.S.

Sources of Growth in Labor

1. Population growth
2. Hours of Work
3. Education

Sources of growth	Japan:1953-1971	Korea:1963-1982	U.S:1948-1973
Output growth	8.81	8.13	3.79
Contribution of growth in labor	1.85	3.31	1.42
• employment	1.14	2.18	1.22
• hours	0.21	0.43	-0.24
• education	0.34	0.39	0.41

Source: Kim and Park [1985].

Table 2.4: Contribution of employment, hours of work and education to growth in output of Korea, Japan and the U.S.

Sources of Growth in capital

$$I = S + (T - G) + (X - M)$$

where S = domestic household savings, T = tax revenues, G = government expenditure, thus $T - G$ = government budget deficit or government savings, X = export, M = imports, and thus $X - M$ = foreign savings.

S :
- interest rate
- per capita current income or permanent income
- imperfection in the capital markets
- tax rates on wage income and capital gains
- **demographic characteristics of the population**

Our main interest in this course is in the effects of demographic characteristics on aggregate household savings which we do in the next subsection.

$T - G$: reduction of government spending will increase government saving or increase in tax revenues

$X - M$: higher export relative to imports. Policies such as devaluation of local currency, increasing international competitiveness.