



Macroeconomics II

Lecture 04 (Feb 2020)

Stylised facts, concepts

Evidence

Evolution of the Kaldor facts

Lecture 02

Economic growth: stylized facts

- how to study (describe, analyse, explain) modern economic growth?
- critical reading of a paper: a method.
- who was Nicholas Kaldor? how to read his famous paper?
- Kaldor (1961): the six “stylized” facts.
- more recent evidences: the new Kaldor facts.

Reading

Jones & Vallrath (2013), chap. 1, pp. 1 – 19
“Introduction: the facts of economic growth”.

Further readings

Kaldor, N. (1961), Capital Accumulation and Economic Growth, in Lutz & Hague (eds), *The Theory of Capital*, St. Martins Press, 1961, pp. 177-222.

Jones, C., P. Romer (2009), *The New Kaldor Facts: Ideas, Institutions, Population and Human Capital*. Paper January 2009 annual meeting American Economic Association.

how to investigate economic growth?

we need to “look” at the reality and to find “facts” (trends, stabilities, etc)

facts may be investigated (causes) and such investigation should be supported by some theory (causality relations with other variables).

this requires:

to be clear about what we want to “see”;

to be focussed on that purpose;

to make use of appropriate analytical tools;

what do we see? 1000 years of economic evolution

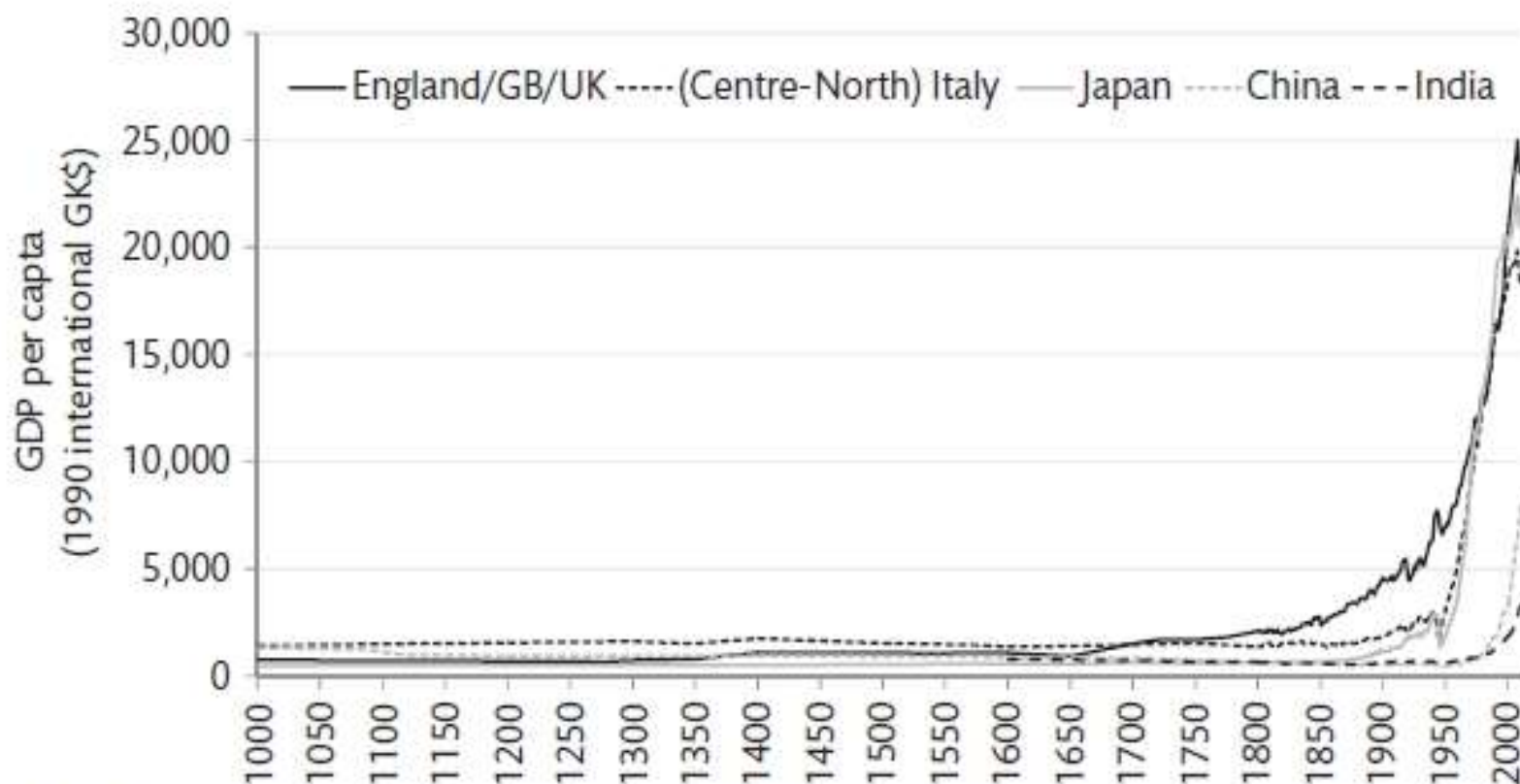


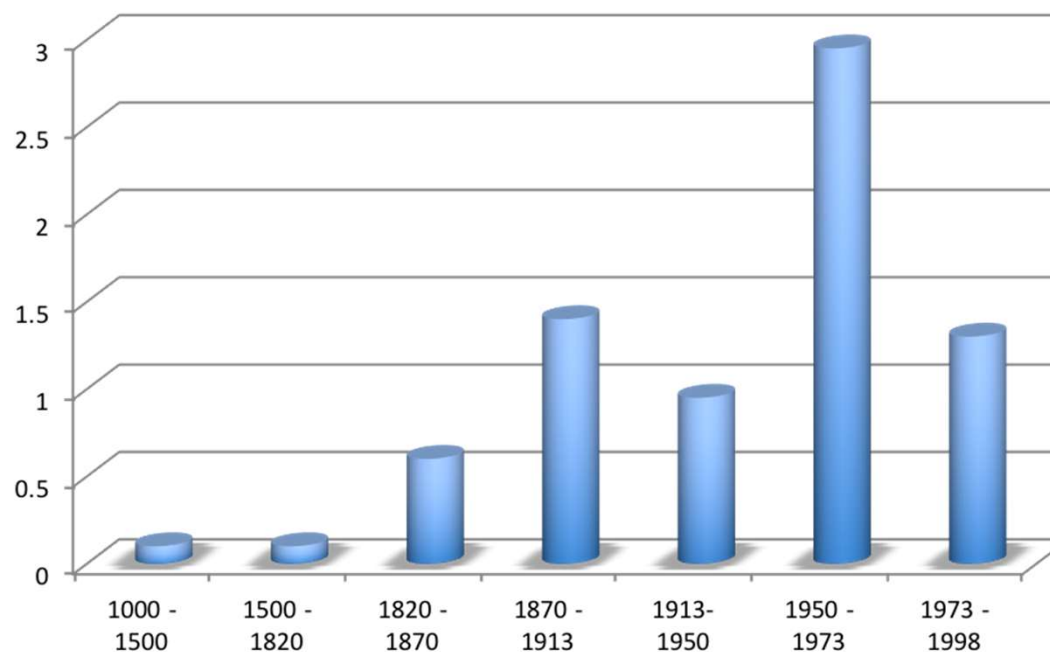
Figure 8.1 GDP per capita (1990 international Geary-Khamis dollars): 1000–2010.

Source: New Maddison Project Database - Bolt and Van Zanden (2013); Broadberry (2013).

Note: All data from the New Maddison Project Database apart from data for China pre-1850, which is from Broadberry. All series have been linearly interpolated to create annual series.

and now?

- rates of growth
- periodization



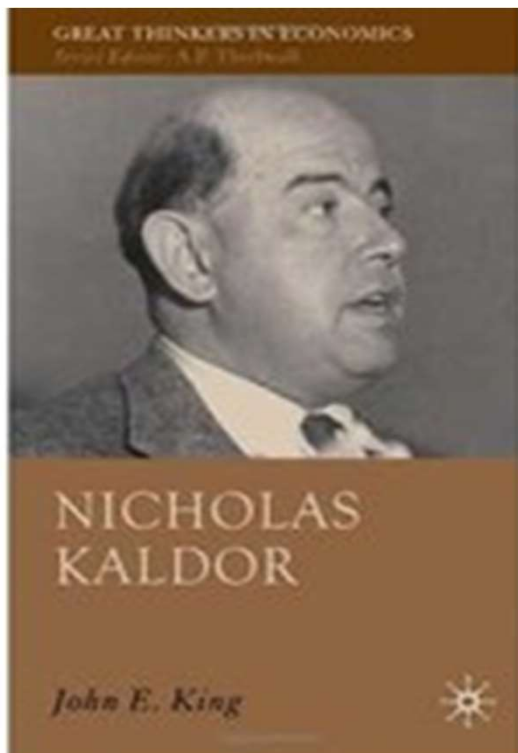
Growth rate
(%) of
GDP per capita
World average

Source:
Maddison
(2001)

- growth was negligible from the Middle Ages to the Industrial Revolution;
- from the early 19th century until WW I growth accelerated dramatically;
- WW I and II and the Great Depression slowed down growth;
- WW II was followed by the Golden Age of growth, until the early 1970s;
- with the outbreak of the recession of the 1970s, growth slowed down.



who was Nicholas Kaldor?



Hungarian economist (1908-1986).

Studied economics at LSE (London).

After II WW worked as as Director of Research and Planning at the Economic Commission for Europe

He was consultant for the British government, responsible for the creation of VAT in the UK.

In 1966 moved to Cambridge (UK) University.

Relevant theoretical contributions to welfare economics (30 years old).

In 1957 (aged 49) published a paper “A model of economic growth” in the *Economic Journal*. The basic ideas in this paper were developed in “Capital Accumulation and Economic Growth” in 1961.



LISBON
SCHOOL OF
ECONOMICS &
MANAGEMENT
UNIVERSIDADE DE LISBOA



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Sao Paulo
30 December 1962 / 17 January 1963

CAPITAL ACCUMULATION AND ECONOMIC GROWTH

BY
NICHOLAS KALDOR
King's College, Cambridge

REPRINTED FROM
THE THEORY OF CAPITAL
MACMILLAN & CO LTD
1961

Topics (cont)

4. **The supporting arguments** (*Which theories does the author/s base their work on?*)
5. **The main arguments** (*How does the author/s defend their main arguments and ideas?*)
6. **The major contributions** (*What is the main contribution of this paper to furthering knowledge on this subject/question?*)
7. **The overall impact** (*How did this paper influence economic thinking? How many other authors have cited this paper in their work?*)
8. Why is this paper a **classic from the literature** on Economic Theory (*Your own personal, opinion, which should try and elaborate on how this paper has made an important contribution to economic thinking*)

CAPITAL ACCUMULATION AND
ECONOMIC GROWTH^{1, 2}

BY

NICHOLAS KALDOR
King's College, Cambridge

I. INTRODUCTION

A THEORETICAL model consists of certain hypotheses concerning the causal inter-relationship between various magnitudes and the sequence in which they react on each other. We find that the basic requirement of any model is that it should be of explaining the characteristic features of the economic process we find them in reality. It is no good starting off a model with a kind of abstraction which initially excludes the influence of the variables which are mainly responsible for the behaviour of the economic variables under investigation; and upon finding that the theoretical results contrary to what we observe in reality, attributing a contrary movement to the compensating (or more than compensating) influence of residual factors that have been assumed away in the model. In dealing with capital accumulation and economic growth we are only too apt to begin by assuming a 'given state of knowledge' (that is to say, absence of technical progress) and the absence of 'uncertainty', and content ourselves with saying that the difference between the factors — technical progress and uncertainty — must have been responsible for the difference between theoretical expectation and the recorded facts of experience. The interpretative value of the theory of theory must of necessity be extremely small.

Any theory must necessarily be based on abstractions; but the type of abstraction chosen cannot be decided in a vacuum: it must be appropriate to the characteristic features of the economic process.

¹ Editor's footnote: Mr. Kaldor's paper as printed here represents a condensed written version of an address delivered by him orally to the conference in accordance with prior arrangement made with the I.E.A. In the subsequent discussion the members of the Round Table did not have the present text in their hands.

² The author is indebted to Mr. L. Pasinetti and Mr. F. H. Hahn for assistance in setting out the models in algebraic form.

Scientific paper (theoretical)

a theoretical contribution to the method
of creation of a theory that explains
economic growth



the need for a scientific method

(abstraction, with focus on the essential
issues, on what is relevant)

to look at the reality, at what is relevant:
a “stylized” view of the facts, identifying
patterns, ignoring irrelevant details

the six stylized facts as the author
“sees” the reality (in 1961)

he makes use of:

concepts

data

facts (looking at data, using concepts)

Macro-Economic Models

as recorded by experience. Hence the theorist, in choosing a particular theoretical approach, ought to start off with a summary of the facts which he regards as relevant to his problem. Since facts, as recorded by statisticians, are always subject to numerous snags and qualifications, and for that reason are incapable of being accurately summarized, the theorist, in my view, should be free to start off with a ‘stylized’ view of the facts — i.e. concentrate on broad tendencies, ignoring individual detail, and proceed on the ‘as it’ method, i.e. construct a hypothesis that could account for these ‘stylized’ facts, without necessarily committing himself on the historical accuracy, or sufficiency, of the facts or tendencies thus summarized.

As regards the process of economic change and development in capitalist societies, I suggest the following ‘stylized facts’ as a starting-point for the construction of theoretical models :

(1) The continued growth in the aggregate volume of production and in the productivity of labour at a steady trend rate ; no recorded tendency for a *falling* rate of growth of productivity.

(2) A continued increase in the amount of capital per worker, whatever statistical measure of ‘capital’ is chosen in this connection.

(3) A steady rate of profit on capital, at least in the ‘developed’ capitalist societies ; this rate of profit being substantially higher than the ‘pure’ long-term rate of interest as shown by the yield of gilt-edged bonds. According to Phelps Brown and Weber¹ the rate of profit in the United Kingdom was remarkably steady around 10½ per cent in the period 1870–1914, the annual variations being within 9½–11½ per cent. A similar long-period steadiness, according to some authorities, has shown itself in the United States.

(4) Steady capital-output ratios over long periods ; at least there are no clear long-term trends, either rising or falling, if differences in the degree of utilization of capacity are allowed for. This implies, or reflects, the near-identity in the percentage rates of growth of production and of the capital stock — i.e. that for the economy as a whole, and over longer periods, income and capital tend to grow at the same rate.

(5) A high correlation between the share of profits in income and the share of investment in output ; a steady share of profits (and of wages) in societies and/or in periods in which the investment coefficient (the share of investment in output) is constant. For example, Phelps Brown and Weber found long-term steadiness in the investment coefficient, the profit share and the share of wages in the U.K., combined with a high degree of correlation in the (appreci-

¹ *Economic Journal*, 1953, pp. 263-88.

theoretical challenge

if the current neoclassical theory
does not explain



we need a new theory

Kaldor — Capital Accumulation and Economic Growth

able) short period fluctuations of these magnitudes.¹ The steadiness in the *share* of wages implies, of course, a rate of increase in real wages that is proportionate to the rate of growth of (average) productivity.

(6) Finally, there are appreciable differences in the *rate* of growth of labour productivity and of total output in different societies, the range of variation (in the fast-growing economies) being of the order of 2-5 per cent. These are associated with corresponding variations in the investment coefficient, and in the profit share, but the above propositions concerning the constancy of relative shares and of the capital-output ratio are applicable to countries with differing rates of growth.

None of these 'facts' can be plausibly 'explained' by the theoretical constructions of neo-classical theory. On the basis of the marginal productivity theory, and the capital theory of Böhm-Bawerk and followers, one would expect a continued *fall* in the rate of profit with capital accumulation, and not a steady rate of profit. (In this respect classical and neo-classical theory, arguing on different grounds, come to the same conclusion — Adam Smith, Ricardo, Marx, alike with Böhm-Bawerk and Wicksell, predicted a steady fall in the rate of profit with economic progress.) Similarly, on the basis of the neo-classical approach, one expects diminishing returns to capital accumulation which implies a steady *rise* in the capital-output ratio *pari passu* with the rise in the capital-labour ratio; and a diminishing rate of growth in the productivity of labour at any given ratio of investment to output (or savings to income). Finally, the fluctuations in the *share* of profits that are associated with fluctuations in the rate of investment cannot be accounted for at all on the basis of the marginal productivity theory — if we assume, as I believe we must, that the fluctuations in the level of investment are the causal factor, and the fluctuations in the share of profits consequential, rather than the other way round.

My purpose here is to present a model of income distribution and capital accumulation which is capable of explaining at least some of these 'stylized' facts. It differs from the prevailing approach to problems of capital accumulation in that it has more affinities with the classical approach of Ricardo and Marx, and also with the general equilibrium model of von Neumann, than with the neo-classical models of Böhm-Bawerk and Wicksell; or with the theories which start off with the Cobb-Douglas type of production function. It differs from the classical models in that it embodies the basic ideas of the Keynesian theory of income generation, and it takes the well-known 'dynamic equation' of Harrod and Domar as its starting-point.

¹ *Op. cit.* Fig. 7.

The stylized facts of growth, according to Kaldor (1961)

1. Labour productivity (Y/L) has grown at a sustained rate.
2. Capital per worker (K/L) has also grown at a sustained rate.
3. The real interest rate or return on capital (r) has been stable.
4. The ratio of capital to output (K/Y) has also been stable.
5. Capital ($r.K$) and labour ($w.L$) have captured stable shares of national income ($w.L/Y$ and $r.K/Y$).
6. Among the fast growing countries of the world, there is an appreciable variation in the rate of growth (g) of the order of 2 to 5 percent.

“Two recent waves of research have changed our views on the subject (economic growth).

One wave started in the mid-1950s and lasted until the early 1970s. The **second** started in the mid-1980s and continues to this day. Both led to major revisions of the theory and empirics of growth.”

Helpman, E. (2010), *The Mystery of Economic Growth*. The Belknap Press of Harvard University Press.

New stylised facts as proposed by the literature:

1. There is a **large variation in per capita income** across countries. The poorest countries have per capita incomes that are less than 5 percent of per capita incomes in the richest countries.
2. **Rates of economic growth** vary **substantially** across countries.
3. **Growth rates** are **not generally constant** over time. For the world as a whole, growth rates were **close to zero over most of history** but have **increased sharply in the twentieth century**. For individual countries, growth rates also change over time.
4. A country's **relative position** in the world distribution of per capita incomes is **not immutable**. Countries can move from being “poor” to being “rich” and vice versa.
5. In the **United States** over the last century: a) the real **rate of return** to capital (r) shows no trend upward or downward but some **oscillations**; b) the **shares of income** to capital ($r.K/Y$) and labour ($w.L/Y$) show no trend; and c) the average **growth rate** of output per person has been positive and relatively constant over time, that is, the USA exhibits steady, sustained per capita income growth;
6. Growth in **output** and growth in the volume of **international trade** are closely related.



50 years after Kaldor (1961)



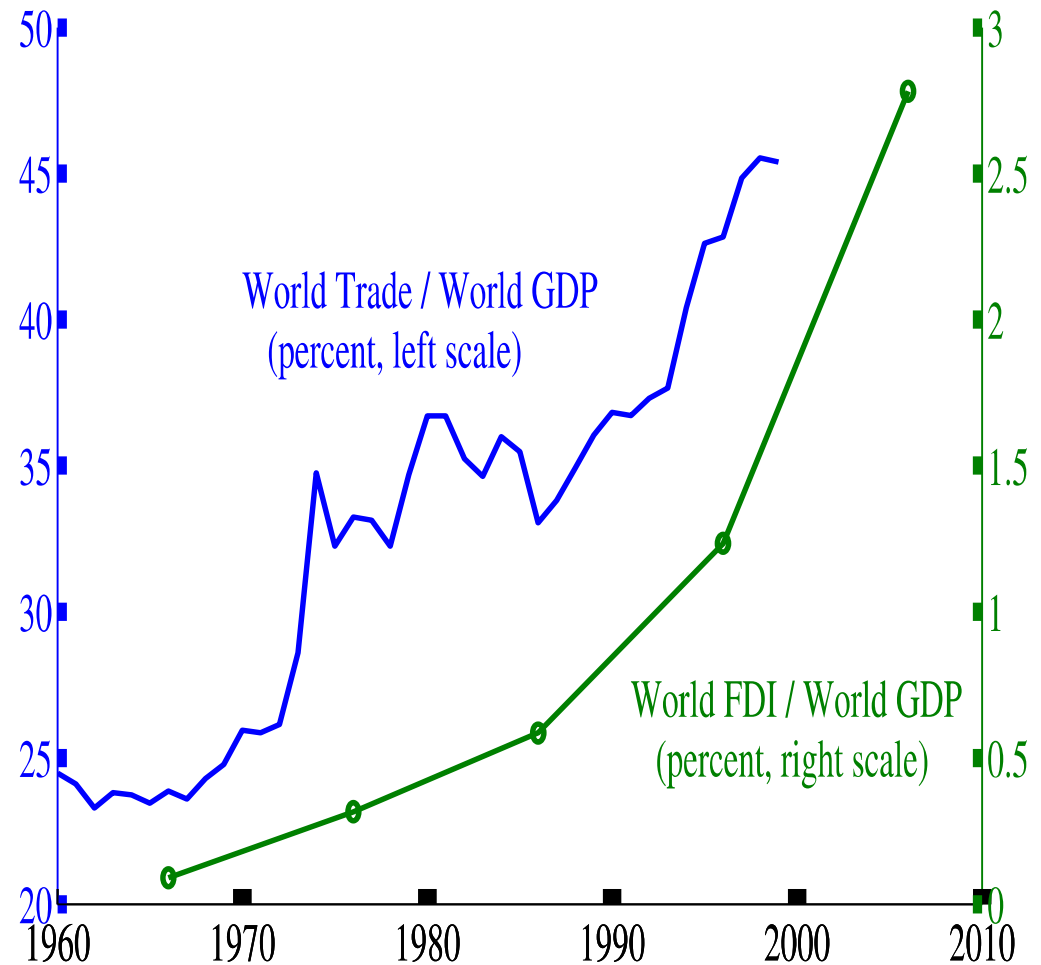
Jones, C. I., Romer, P. M. (2009), *The New Kaldor Facts: Ideas, Institutions, Population and Human Capital*. Paper presented at the January 2009 annual meeting of the American Economic Association



Figure 1: The Rise in Globalization

1. Increased extent of the market

Increased flows of goods, ideas, finance, and people – via globalization as well as urbanization – have increased the extent of the market for all workers and consumers.

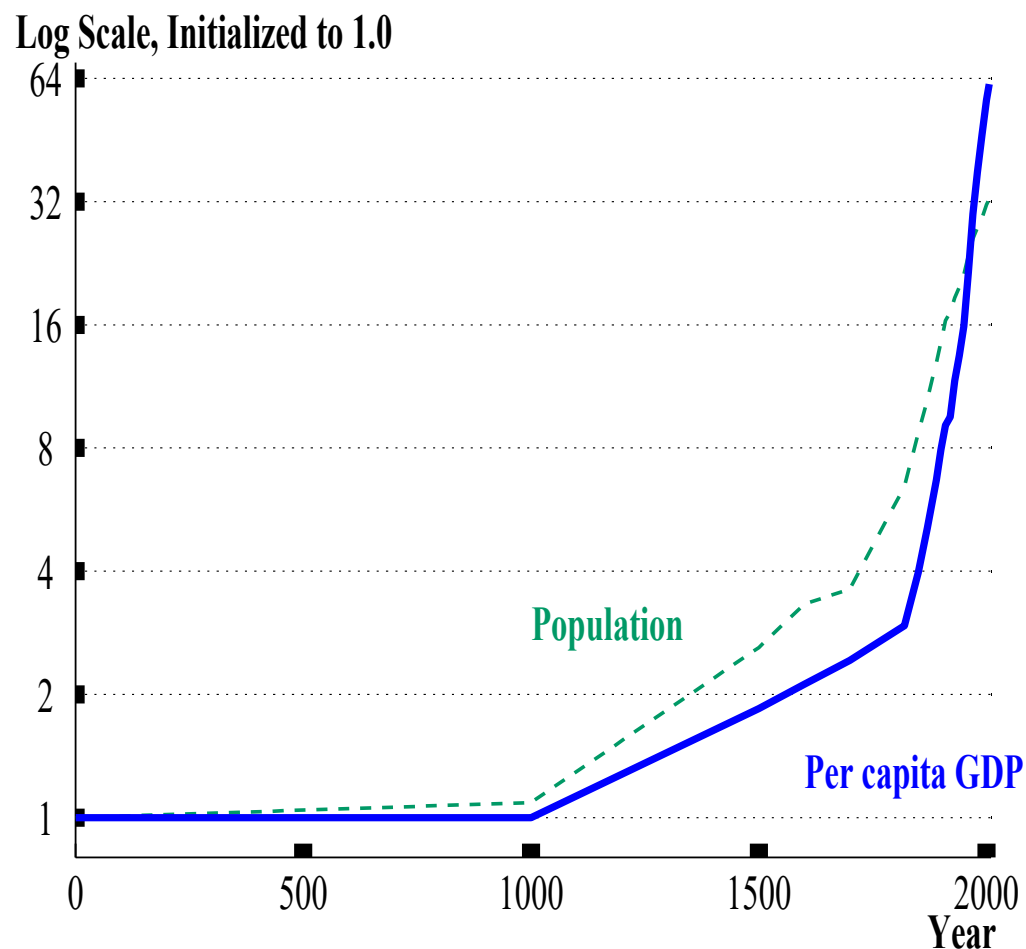


Note: World trade is the sum of world exports and imports as a share of world GDP from the Penn World Tables 6.1. FDI as a share of GDP is from the World Bank's *World Development Indicators*.

2. Accelerating growth

For the two centuries, growth in both population and per capita GDP has accelerated, rising from virtually zero to the relatively rapid rates observed in the last century.

Figure 2: Population and Per Capita GDP over the Very Long Run



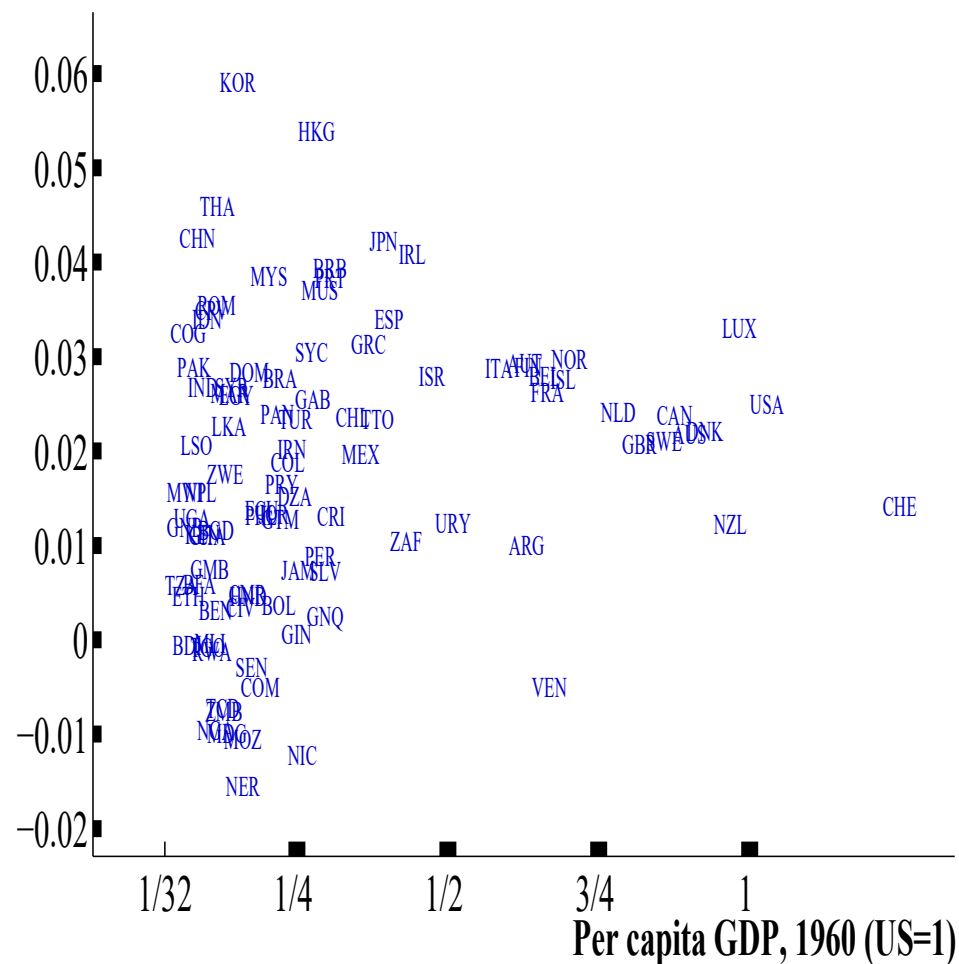
Note: Population and GDP per capita for “the West,” defined as the sum of the United States and 12 western European countries. Both series are normalized to take the value 1.0 in the initial year, 1 A.D. Source: Maddison (2008).

Figure 3: Growth Variation and Distance from the Frontier

3. Variation in modern growth rates

The variation in the rate of growth of per capita GDP increases with the distance to the technology frontier.

Growth rate, 1960–2000



Source: Penn World Tables 6.1.

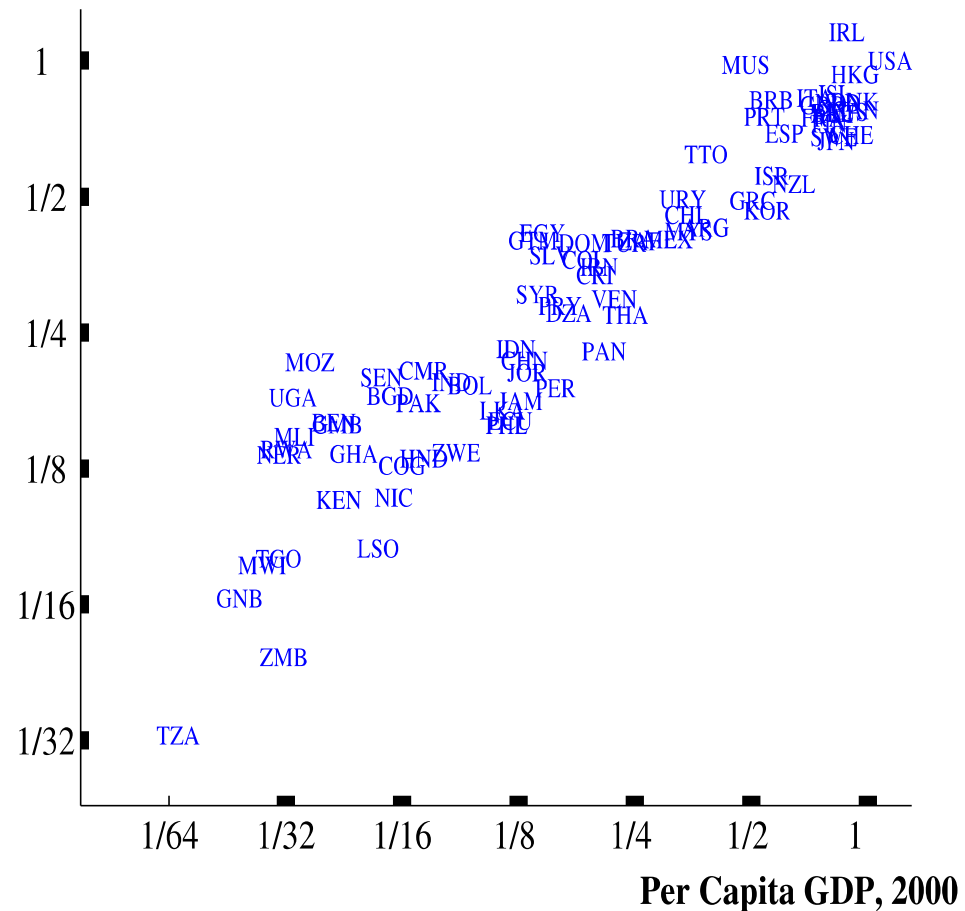


Figure 4: Large Income and TFP Differences

4. Large income and TFP differences

Differences in measures inputs explain less than half of the enormous cross country differences in per capita GDP.

Total Factor Productivity, 2000

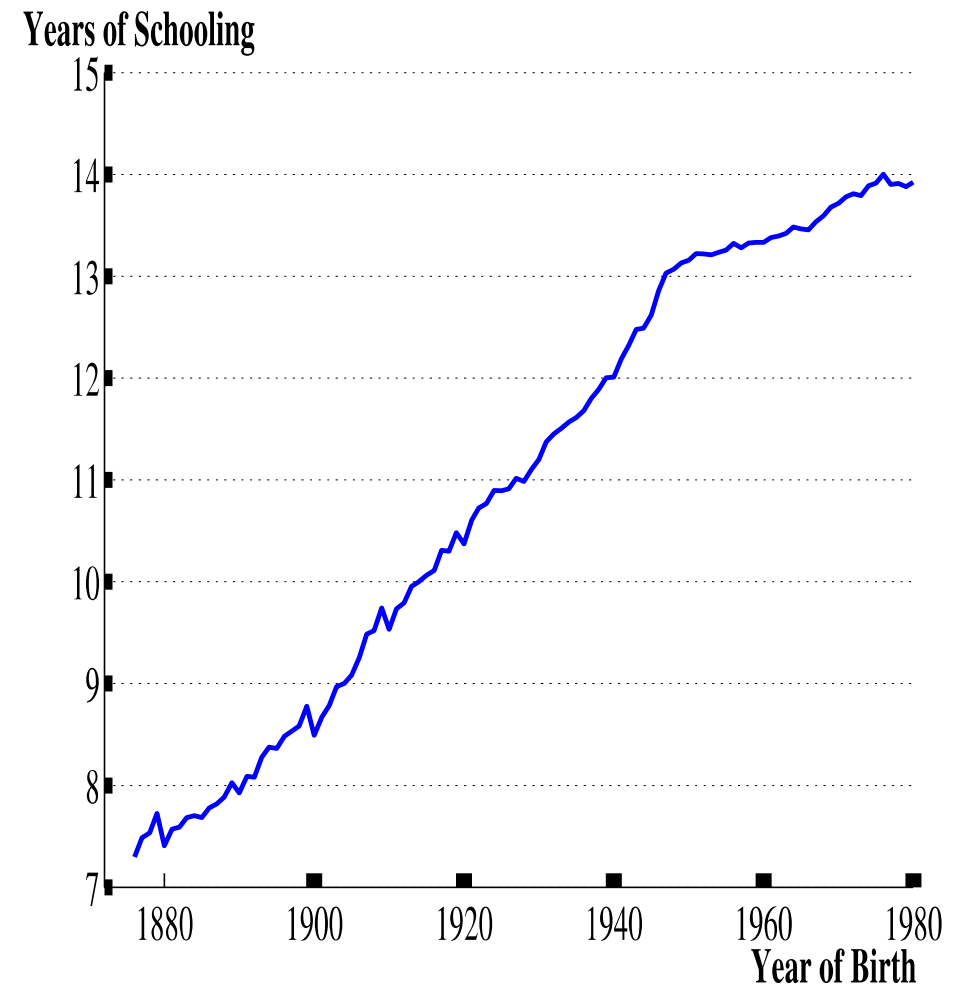


Note: Both TFP and per capita GDP are normalized so that the U.S. values are 1.0. TFP is reported in “labor-augmenting” form and is constructed following the methodology of Hall and Jones (1999) using the Penn World Tables 6.1 and the education data of Barro and Lee (2000).

5. Increases in “human capital” per worker

“Human capital” per worker is rising dramatically throughout the world.

Figure 5: Years of Schooling by Birth Cohort, United States

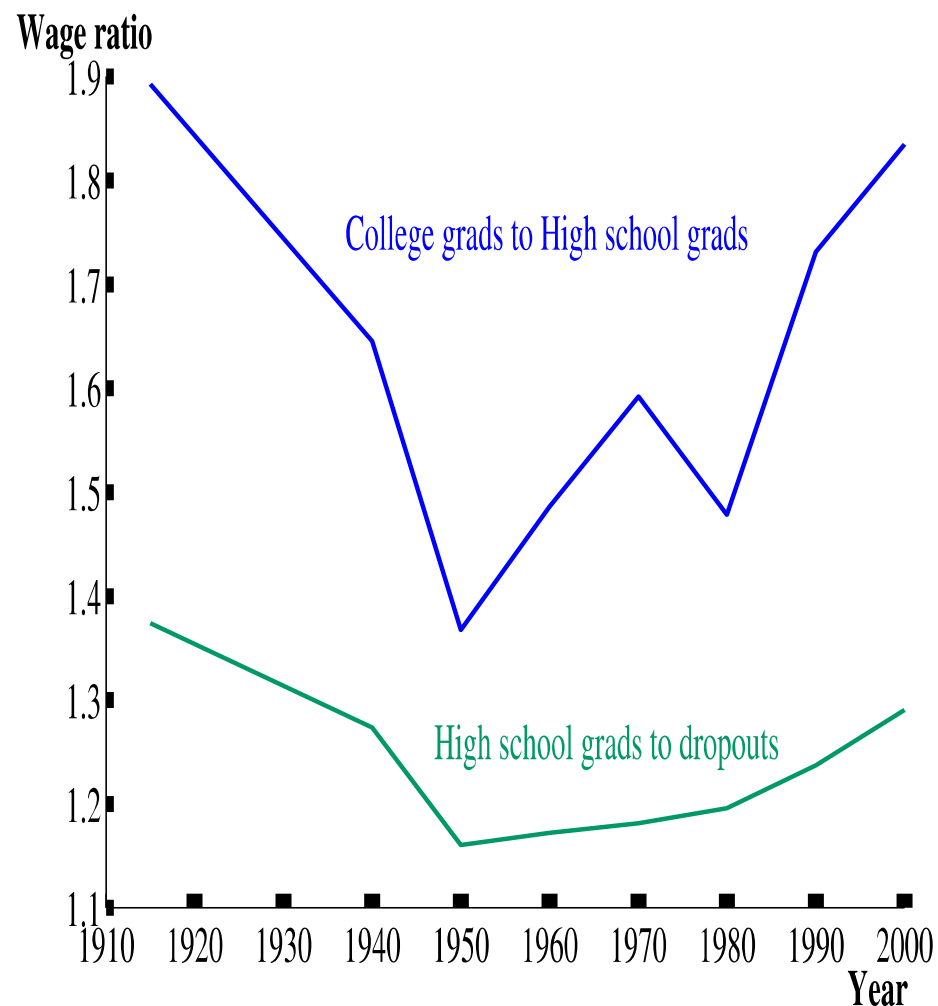


Source: Goldin and Katz (2007), Figure 7.

Figure 6: The U.S. College and High School Wage Premiums

6. Long-run stability of relative wages

The rising quantity of human capital relative to unskilled labor has not been matched by a sustained decline in its relative price.



Source: Goldin and Katz (2008), Table D1.



relevant questions:

does economic theory respond to such stylized facts incorporating explanatory theories in the bulk of scientific knowledge?

to what extent does the “new” growth theories respond to the “new” stylized facts?

To what extent do stylized facts reflect “reality”?