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# THE MISMEASUREMENT OF ECONOMIC GROWTH

Martin J. Bailey

INTERNATIONAL  
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# **The Mismeasurement of Economic Growth**

Martin H. Bailey



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## PREFACE

The International Center for Economic Growth is pleased to publish *The Mismeasurement of Economic Growth*, by Martin J. Bailey, as the twenty-third in our series of Occasional Papers, which features reflections on broad policy issues by noted scholars and policy makers.

In this paper, Dr. Bailey discusses how current economic methods understate the gains an econoBailey discusses how current economic Much of the mismeasurement iBailey discusses how current economic between changes in pricing anBailey discusses how current economic national income. Other discrepBailey discusses how current economic measuring production or measuBailey discusses how current economic

Dr. Bailey is a distinguisBailey discusses how current economic contributions in public financBailey discusses how current economic ful insights about the practical implications of the uses of economic policy tools. We are confident that his contribution will be of interest to policy makers and researchers in all countries, developing or developed, that are engaged in deregulation of an economy. This topic is particularly relevant to developing and centralized economies undergoing a policy liberalization. If the measured gains from liberalization are small, there may be little incentive to continue the program in the face of any opposition. It is important to know if the measure is inaccurate and the actual gains are greater than those measured.

Nicolás Ardito-Barletta  
General Director  
International Center for Economic Growth

Panama City, Panama  
May 1991



## ABOUT THE AUTHOR

Martin J. Bailey is professor of economics at Emory University and has previously held this position at the University of Maryland, the University of Rochester (where he was also associate dean of management), and the University of Chicago. He has also held senior posts in the U.S. Departments of Defense, Treasury, and State. Dr. Bailey is the coeditor of *The Taxation of Income from Capital* with Arnold C. Harberger and is the author of *National Income and the Price Level*, *Reducing Risks to Life: Measurement of the Benefits*, and numerous articles.





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MARTIN J. BAILEY

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## The Mismeasurement of Economic Growth

During the 1980s we have seen or heard many accounts of how badly socialist and heavily regulated economies have performed, of how well the free economies have performed, and of dramatic gains for economies that have moved toward liberalization. These accounts have come not only from economists and scholars, but also from political leaders and journalists, among whom it has become fashionable in recent years to talk about “the magic of the market.” To those of us familiar with the themes presented in Adam Smith’s *Wealth of Nations* and with their more recent technical elaborations, the new revelations may be greeted either with wry satisfaction or with concern that the new fashion is neither profound nor likely to be long lasting.

If we also look at the data on real growth rates, it is surprising to find that there doesn’t seem to be much difference. The differences in reported growth rates between the free economies, as a group, and the socialist economies on which we have reasonably good data, as a group, are surprisingly unimpressive, especially compared with the variability within each group. The numbers are doubly surprising because both basic economic reasoning and the striking anecdotal accounts lead us to expect much more. Should we conclude that unsound, oppressive economic policies have little measurable effect on real

growth and that the enthusiasm behind much of the anecdotal information is overblown?

In fact there is a potentially measurable effect on real growth, but the conventional measures fail to show much of it. They understate it for two main reasons. First, because the usual measure is real gross national product (GNP), not real national income or income per capita, it omits some of the gains from more efficient resource allocation and all the gains from trade in consumer goods. Second, customary procedures for obtaining index numbers systematically understate real change and overstate inflation; this bias is stronger for free, fast-growing economies than for tightly controlled, slower-growing economies and is stronger still for newly liberalized economies. Data have not generally been collected that would provide accurate estimates of these biases, but there is reason to believe that they are substantial.

These measurement problems are distinct facets of the general problem of determining how much of the growth of national income or product, in nominal terms, is real growth and how much is merely an increase in the general level of prices. As we know from the literature on index numbers, different techniques for making the separation can give different results. Apart from the effects of foreign trade, it also makes a difference, in a distorted, inefficient economy, whether we make the separation with production or with consumption and investment—that is, whether we use prices paid by end users or prices received by producers.

## **Impressions and Indications**

Stories are now commonplace about the rapid growth of the most successful Asian economies—Japan, Korea, Taiwan, Singapore, and Hong Kong. In the cases of Hong Kong and Singapore—*island economies* with few natural resources other than their resourceful people—internal and external trade are almost completely free. The other three are notable for having shifted policy, sometime after World War II, toward encouragement of exports and relatively unrestricted internal trade; all three, however, restrict imports severely. Recently there have also been enthusiastic news stories about the effects on other low-income economies of new policies liberalizing trade and reducing in-

ternal regulation. Ghana and Mauritius are notable examples. There are also anecdotes about economies that have remained heavily statist and have stagnated; and there is extensive scholarly research, as well as ample news coverage, of the waste and disruption associated with price supports and trade manipulation of the agricultural policies of the developed industrial countries.

These impressions, not widely shared in earlier years, have gained much wider currency because of the striking experience of the 1980s. The relatively free developing economies, especially those in Asia, seem to be enjoying rampant prosperity and growth, whereas the more interventionist, socialist economies of the third world are suffering stagnation, continuing poverty, and debt. In Europe the high-price agricultural programs have shifted their economies from net importers of most farm commodities to net exporters of several major ones; whereas the disastrous low-price agricultural policies of Egypt and most of the rest of Africa have shifted several of those countries from net exporters to net importers of food. The shift to heavy intervention in labor markets in western Europe was followed by heavy unemployment throughout the region in the 1980s, compared with the low and falling rate of unemployment in the United States.

All these developments have been reported widely and have been appreciated as examples of bad policy in a much broader audience in the United States than had previously been the case.

## **Growth Rates of Real Output**

The general impression given by this information, mostly anecdotal, is that a dramatic increase in living standards and growth is a result of a shift from economic statism to relatively liberal policies, and that the opposite shift is costly for living standards and growth. One might think, therefore, that the regularly published data on growth rates would show striking differences between the countries that intervene heavily in their economies and those that intervene less or intervene very little. In fact, there are differences in the expected direction, but in many cases they are surprisingly modest and hard to separate from the variations in growth rates due to other influences.



Consider, for example, the following data from the leading industrial countries, shown in Table 1. The data are shown for two periods, 1950 to 1970 and 1970 to 1988, to highlight the general drop in growth rates around 1970. There was also a political change. West German economic policy had been noninterventionist and noninflationary before 1970. In the 1970s a Socialist election victory was followed by a major expansion of social legislation, especially important in the labor market, where it became costly and difficult to dismiss workers. Similar legislation was also passed in other European countries that had been highly interventionist in the earlier period.

The relatively high growth rates of the earlier period mainly reflected the rebound from the devastation of World War II. Note the high growth rates in that period for West Germany and Japan, whose economies suffered especially severe war damage. This large rebound effect makes it hard to identify any effect of economic policy in comparing the growth rates of the various countries in this period.

Nevertheless, the later period gives us two comparisons relevant to the issue at hand. First, we can compare the two relatively free economies in that period, Japan and the United States, with the others. Second, we can compare the change in West Germany's performance from the first period to the second with the corresponding change for the other European countries; this comparison can tell us something because West Germany shifted from a relatively free market policy to a heavily interventionist policy, of the type the others had in both periods.

Looking at the first of these two comparisons, we find that in the period after 1970 the average of U.S. and Japanese growth rates was higher than the average of growth rates for the four European coun-

TABLE 1 Comparative Growth Rates in Industrial Countries, 1950–1988 (percentage)

	West Germany	Japan	United States	Average of France, Italy, and United Kingdom
1950–70	6.64	10.20	3.54	4.71
1970–88	2.29	4.38	2.76	2.58

SOURCE: Japan, 1950–1955, from G. C. Allen, *Japan's Economic Expansion* (Oxford: Oxford University Press, 1965). All other data from International Monetary Fund, *International Financial Statistics* (Washington, D.C.: IMF, various years).

tries. It is hard to be much impressed by this small difference, especially when one considers the variability from one country to another and from one time to another in these rates.

The second comparison seems to be a little more telling. Before 1970 West Germany's growth rate was higher than the rates in the other three European countries (though not as high as Japan's), whereas after 1970 West Germany's growth rate fell below the three-country average. This comparison reinforces the impression, drawn from the first comparison, that there was a growth effect connected with state intervention. However, a third comparison fails to reinforce this impression—the drop in West Germany's growth rate after 1970 was smaller than the drop in Japan's. Thus, it is possible that we are seeing nothing more than random differences in the slowdown from the rebound after World War II.

By contrast, the data from the newly industrializing countries of Asia show a more clear-cut advantage for their relatively open economies. Table 2 shows that their growth rates since 1960 compare favorably with both the rates for developing countries in general and the rates for the developed countries shown in Table 1. From 1960 to 1980 the four Asian "tigers" had average growth rates between 8.8 and 9.8 percent, compared with 5.45 percent for all developing countries as a group. Among the developed countries, only Japan is comparable, with its heavy rebound element in the earlier 1950–70 period. In the more recent period after 1980, when recession lowered growth rates almost

TABLE 2 Comparative Growth Rates in Developing Countries (percentage)

	Singapore	Taiwan	South Korea	Hong Kong	Developing countries
1960–1980	9.19	9.29	8.85	9.75	5.45
1980–1987	8.03	—	8.66	7.01 <sup>a</sup>	1.80

a. 1980–84.

SOURCE: South Korea and Singapore from IMF, *International Financial Statistics*, various years. Taiwan from Samuel P. S. Ho, *Economic Development of Taiwan* (New Haven: Yale University Press, 1978), 123–25, and Shirley W. Y. Kuo, *The Taiwan Economy in Transition* (Boulder, Colo.: Westview Press, 1983), 201. Hong Kong from Gavin Peebles, *Hong Kong's Economy* (Oxford: Oxford University Press, 1988), 4, 45. Developing countries from International Monetary Fund, *World Economic Outlook* (Washington, D.C.: IMF, various years).



worldwide, the four Asian countries outgrew all others. Although the growth rates in these four countries did slow down, it is striking how little they slowed compared with other countries.

A puzzle here is why these Asian countries did so much better than the United States and Japan in recent years, when the policy environments were broadly similar in all six countries (Hong Kong and Singapore have had the nearest thing to free trade, whereas South Korea and Taiwan, like Japan and other developed countries, protect their agriculture and depart substantially from free trade in other ways). Although the policy environment may be a major influence on comparative growth rates, it is evidently not the only one.

Another related comparison that tells a similar story comes from the data for the small number of countries that have opened their economies and have shifted sharply in the direction of freer internal and external trade within the past fifteen years. In Table 3 and hereafter we refer to this shift as liberalization. The liberalizations occurred between 1975 and 1983, and the comparative base periods vary according to the availability of the data. The gains following liberalization range from 1.2 to 2.9 percent in the annual growth rate, but we should note that this improvement occurred when the world was in recession and ran counter to the poor experience of developing countries as a group. There is also a problem in the comparisons because of the specific base dates. For example, both Ghana and Turkey began their liberalizations in 1983, when the world economy was in reces-

TABLE 3 Effect of Liberalization on Growth Rates in Less-Developed Countries (percentage)

	Chile	Ghana	Mauritius	Turkey
Preliberalization	2.61	1.52	3.1	5.2
Postliberalization	3.85	4.43	5.4	6.6
Dates:				
Preliberalization	1950-75	1960-83	1960-80	1960-83
Postliberalization	1975-87	1983-87	1980-87	1983-87

SOURCE: IMF, *International Financial Statistics*, various years.

sion; consequently, the earlier period shows a lower growth rate and the later period a higher rate than would have been the case if world economic activity had been higher in 1983.

Taken together, these data suggest that liberalization pays, but that it is hard to predict how large the benefit will be. If we had to forecast the improvement in growth a country would enjoy as a result of liberalization, it would seem safe to forecast an improvement of 1 to 3 percent, compared with how well it would do otherwise. However, one could not have high confidence that the result would fall in even this relatively wide range. Clearly, the result varies with circumstances, and the effects of special circumstances usually cannot be foreseen. Why was Chile's improvement so small compared with other countries? Why are the differences so small among the developed countries? Of even more interest to our present inquiry is the question, why are these gains so modest in comparison with the anecdotal stories of dramatic gains from liberalization?

### **The Measurement Problem**

When a country liberalizes, a flood of imports enters the country, giving consumers the opportunity to buy modern foreign products that had previously been unavailable. Marketplaces that were previously rather colorless come alive with a diversity of goods. In many cases long waiting lines for necessities disappear. None of these changes are reflected in the data in Tables 1, 2, or 3.

The omission is serious but not surprising. Trying to capture all these changes with systematic data is extraordinarily difficult, would strain the resources of national statistical agencies, and would overstretch their technical capabilities. In fact, the types of changes involved are not dealt with properly in the developed countries; the statistical agencies in the United States have begun only a partial, cautious effort to deal with them. The natural conservatism of statistical agencies in most countries leads to an understatement of growth and to a particularly severe understatement of the impact of new products. Convention has also settled on a standard measure of growth that overlooks the effects of trade on the standard of living.

In spite of this, various past special studies of U.S. data provide us with valuable insights into the scope of the problem, particularly in connection with durable goods such as automobiles, household durables, and factory equipment. The problems of measurement affecting the standard growth data, on which these studies shed some light, are the following: (a) the introduction of new, improved models of previously existing products, (b) the introduction of entirely new products, and (c) the gains from trade.

**New, improved models.** Data for the United States are relatively plentiful on the problem of accounting for quality change in durable goods, because of a long series of studies and an active controversy about it. The main focus of this type of work has been on the proper measurement of price change in the major price indexes, such as the consumer price index. To the extent that measured price changes contain an element of quality change, the corresponding index of real output will be understated. The experience of the United States with this issue is therefore directly relevant to the measurement of growth in other countries where the measurement problem has scarcely been investigated.

With household durable goods (and other durable goods throughout the economy) a conventional index of price change has to cope with a continuing series of improvements and modifications of successive models. The typical pattern is that last year's standard model becomes this year's economy model, soon to be reduced for clearance and termination of production. Last year's premium model becomes this year's standard model, last year's deluxe model becomes this year's premium model, and a new, more elaborate deluxe model enters the line this year. Table 4 illustrates this progression with a hypothetical case, which could be a line of refrigerators or television sets.

The traditional procedure in decades past at the Bureau of Labor Statistics, and at other price-gathering agencies, was to use the price change for the top of the line, the standard item, and the economy item each year, comparing nonidentical items. In the table, the price changes obtained by this traditional procedure appear in the column headed "price change by rank order." It shows the price difference between the new deluxe model of 1990 with Model A, which was the top of the line in 1989, is a 23 percent increase. Similarly, the price