
Distinguished Lecture on Economics in Government: Big Bills Left on the Sidewalk:
Why Some Nations are Rich, and Others Poor

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Distinguished Lecture on Economics in Government

Big Bills Left on the Sidewalk: Why Some Nations are Rich, and Others Poor

Mancur Olson, Jr.

There is one metaphor that not only illuminates the idea behind many complex and seemingly disparate articles, but also helps to explain why many nations have remained poor while others have become rich. This metaphor grows out of debates about the “efficient markets hypothesis” that all pertinent publicly available information is taken into account in existing stock market prices, so that an investor can do as well by investing in randomly chosen stocks as by drawing on expert judgment. It is embodied in the familiar old joke about the assistant professor who, when walking with a full professor, reaches down for the \$100 bill he sees on the sidewalk. But he is held back by his senior colleague, who points out that if the \$100 bill were real, it would have been picked up already. This story epitomizes many articles showing that the optimization of the participants in the market typically eliminates opportunities for supranormal returns: big bills aren’t often dropped on the sidewalk, and if they are, they are picked up very quickly.

Many developments in economics in the last quarter century rest on the idea that any gains that can be obtained are in fact picked up. Though primitive early versions of Keynesian macroeconomics promised huge gains from activist fiscal and monetary policies, macroeconomics in the last quarter century has more often than not argued that rational individual behavior eliminates the problems that activist policies were supposed to solve. If a disequilibrium wage is creating involuntary unemployment, that would mean that workers had time to sell that was worth less to them than to prospective employers, so a mutually advantageous employment

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contract eliminates the involuntary unemployment. The market ensures that involuntarily unemployed labor is not left pacing the sidewalks.

Similarly, profit-maximizing firms have an incentive to enter exceptionally profitable industries, which reduces the social losses from monopoly power. Accordingly, a body of empirical research finds that the losses from monopoly in U.S. industry are slight: Harberger triangles are small. In the same spirit, many economists find that the social losses from protectionism and other inefficient government policies are only a minuscule percentage of the GDP.

The literature growing out of the Coase theorem similarly suggests that even when there are externalities, bargaining among those involved can generate socially efficient outcomes. As long as transactions costs are not too high, voluntary bargaining internalizes externalities, so there is a Pareto-efficient outcome whatever the initial distribution of legal rights among the parties. Again, this is the idea that bargainers leave no money on the table.

Some of the more recent literature on Coaseian bargains emphasizes that transactions costs use up real resources and that the value of these resources must be taken into account in defining the Pareto frontier. It follows that, if the bargaining costs of internalizing an externality exceed the resulting gains, things should be left alone. The fact that rational parties won't leave any money on the table automatically insures that *laissez faire* generates Pareto efficiency.

More recently, Gary Becker (1983, 1985) has emphasized that government programs with deadweight losses must be at a political disadvantage. Some economists have gone on to treat governments as institutions that reduce transactions costs, and they have applied the Coase theorem to politics. They argue, in essence, that rational actors in the polity have an incentive to bargain politically until all mutual gains have been realized, so that democratic government, though it affects the distribution of income, normally produces socially efficient results (Stigler, 1971, 1992; Wittman, 1989, 1995; Thompson and Faith, 1981; Breton, 1993). This is true even when the policy chosen runs counter to the prescriptions of economists: if some alternative political bargain would have left the rational parties in the polity better off, they would have chosen it! Thus, the elemental idea that mutually advantageous bargaining will obtain all gains that are worth obtaining—that there are no bills left on the sidewalk—leads to the conclusion that, whether we observe *laissez faire* or rampant interventionism, we are already in the most efficient of all possible worlds.¹

The idea that the economies we observe are socially efficient, at least to an approximation, is not only espoused by economists who follow their logic as far as it will go, but is also a staple assumption behind much of the best-known empirical work. In the familiar aggregate production function or growth accounting empirical studies, it is assumed that economies are on the frontiers of their aggregate pro-

¹ A fuller statement of this argument, with additional citations to the literature on “efficient redistribution,” appears in my draft paper on “Transactions Costs and the Coase Theorem: Is This Most Efficient of All Possible Worlds?” which is available on request.

duction functions. Profit-maximizing firms use capital and other factors of production up to the point where the value of the marginal product equals the price of the input, and it is assumed that the marginal private product of each factor equals its marginal social product. The econometrician can then calculate how much of the increase in social output is attributable to the accumulation of capital and other factors of production and treat any increases in output beyond this—"the residual"—as due to the advance of knowledge. This procedure assumes that output is as great as it can be, given the available resources and the level of technological knowledge.

If the ideas evoked here are largely true, then the rational parties in the economy and the polity ensure that the economy cannot be that far from its potential, and the policy advice of economists cannot be especially valuable. Of course, even if economic advice increased the GDP by just 1 percent, that would pay our salaries several times over. Still, the implication of the foregoing ideas and empirical assumptions is that economics cannot save the world, but at best can only improve it a little. In the language of Keynes' comparison of professions, we are no more important for the future of society than dentists.

The Boundaries of Wealth and Poverty

How can we find empirical evidence to test the idea that the rationality of individuals makes societies achieve their productive potential? This question seems empirically intractable. Yet there is one type of place where evidence abounds: the borders of countries. National borders delineate areas of different economic policies and institutions, and so—to the extent that variations in performance across countries cannot be explained by the differences in their endowments—they tell us something about the extent to which societies have attained their potentials.

Income levels differ dramatically across countries. According to the best available measures, per capita incomes in the richest countries are more than 20 times as high as in the poorest. Whatever the causes of high incomes may be, they are certainly present in some countries and absent in others. Though rich and poor countries do not usually share common borders, sometimes there are great differences in per capita income on opposite sides of a meandering river, like the Rio Grande, or where opposing armies happened to come to a stalemate, as between North and South Korea, or where arbitrary lines were drawn to divide a country, as not long ago in Germany.

At the highest level of aggregation, there are only two possible types of explanations of the great differences in per capita income across countries that can be taken seriously.

The first possibility is that, as the aggregate production function methodology and the foregoing theories suggest, national borders mark differences in the scarcity of productive resources per capita: the poor countries are poor because they are short of resources. They might be short of land and natural resources, or of human

capital, or of equipment that embodies the latest technology, or of other types of resources. On this theory, the Coase theorem holds as much in poor societies as in rich ones: the rationality of individuals brings each society reasonably close to its potential, different as these potentials are. There are no big bills on the footpaths of the poor societies, either.

The second possibility is that national boundaries mark the borders of public policies and institutions that are not only different, but in some cases better and in other cases worse. Those countries with the best policies and institutions achieve most of their potential, while other countries achieve only a tiny fraction of their potential income. The individuals and firms in these societies may display rationality, and often great ingenuity and perseverance, in eking out a living in extraordinarily difficult conditions, but this individual achievement does not generate anything remotely resembling a socially efficient outcome. There are hundreds of billions or even trillions of dollars that could be—but are not—earned each year from the natural and human resources of these countries. On this theory, the poorer countries do not have a structure of incentives that brings forth the productive cooperation that would pick up the big bills, and the reason they don't have it is that such structures do not emerge automatically as a consequence of individual rationality. The structure of incentives depends not only on what economic policies are chosen in each period, but also on the long run or institutional arrangements: on the legal systems that enforce contracts and protect property rights and on political structures, constitutional provisions, and the extent of special-interest lobbies and cartels.

How important are each of the two foregoing possibilities in explaining economic performance? This question is extraordinarily important. The answer must not only help us judge the theories under discussion, but also tell us about the main sources of economic growth and development.

I will attempt to assess the two possibilities by aggregating the productive factors in the same way as in a conventional aggregate production function or growth-accounting study and then consider each of the aggregate factors in turn. That is, I consider separately the relative abundance or scarcity of "capital," of "land" (with land standing for all natural resources) and of "labor" (with labor including not only human capital in the form of skills and education, but also culture). I will also consider the level of technology separately, and I find some considerations and evidence that support the familiar assumption from growth-accounting studies and Solow-type growth theory that the same level of technological knowledge is given exogenously to all countries.² With this conventional taxonomy and the assumption that societies are on frontiers of their aggregate neoclassical production functions, we can derive important findings with a few simple deductions from familiar facts.

The next section shows that there is strong support for the familiar assumption that the world's stock of knowledge is available at little or no cost to all the countries

² The different assumptions of endogenous growth theory are explored later.

of the world. I next examine the degree to which the marginal productivity of labor changes with large migrations and evidence on population densities, and I show that diminishing returns to land and other natural resources cannot explain much of the huge international differences in income. After that, I borrow some calculations from Robert Lucas on the implications of the huge differences across countries in capital intensity—and relate them to facts on the direction and magnitude of capital flows—to show that it is quite impossible that the countries of the world are anywhere near the frontiers of aggregate neoclassical production functions. I then examine some strangely neglected natural experiments with migrants from poor to rich countries to estimate the size of the differences in endowments of human capital between the poor and rich countries, and I demonstrate that they are able to account for only a small part of the international differences in the marginal product of labor.

Since neither differences in endowments of any of the three classical aggregate factors of production nor differential access to technology explain much of the great variation in per capita incomes, we are left with the second of the two (admittedly highly aggregated) possibilities set out above: that much the most important explanation of the differences in income across countries is the difference in their economic policies and institutions. There will not be room here to set out many of the other types of evidence supporting this conclusion, nor to offer any detailed analysis of what particular institutions and policies best promote economic growth. Nonetheless, by referring to other studies—and by returning to something that the theories with which we began overlook—we shall obtain some sense of the why variations in institutions and policies are surely the main determinants of international differences in per capita incomes. We shall also obtain a faint glimpse of the broadest features of the institutions and policies that nations need to achieve the highest possible income levels.

The Access to Productive Knowledge

Is the world's technological knowledge generally accessible at little or no cost to all countries? To the extent that productive knowledge takes the form of unpatentable laws of nature and advances in basic science, it is a nonexcludable public good available to everyone without charge. Nonpurchasers can, however, be denied access to many discoveries (in countries where intellectual property rights are enforced) through patents or copyrights, or because the discoveries are embodied in machines or other marketable products. Perhaps most advances in basic science can be of use to a poor country only after they have been combined with or embodied in some product or process that must be purchased from firms in the rich countries. We must, therefore, ask whether most of the gains from using modern productive knowledge in a poor country are mainly captured by firms in the countries that discovered or developed this knowledge.

Since those third world countries that have been growing exceptionally rapidly

must surely have been adopting modern technologies from the first world, I tried (with the help of Brendan Kennelly) to find out how much foreign technologies had cost some such countries. As it happens, there is a study with some striking data for South Korea for the years from 1973 to 1979 (Koo, 1982). In Korea during these years, royalties and all other payments for disembodied technology were minuscule—often less than one-thousandth of GDP. Even if we treat all profits on foreign direct investment as solely a payment for knowledge and add them to royalties, the total is still less than 1.5 percent of the *increase* in Korea's GDP over the period. Thus the foreign owners of productive knowledge obtained less than a fiftieth of the gains from Korea's rapid economic growth.³

The South Korean case certainly supports the long-familiar assumption that the world's productive knowledge is, for the most part, available to poor countries, and even at a relatively modest cost.⁴ It would be very difficult to explain much of the differences in per capita incomes across countries in terms of differential access to the available stock of productive knowledge.⁵

Overpopulation and Diminishing Returns to Labor

Countries with access to the same global stock of knowledge may nonetheless have different endowments, which in turn might explain most of the differences in per capita income across countries. Accordingly, many people have supposed that the poverty in the poor countries is due largely to overpopulation, that is, to a low ratio of land and other natural resources to population. Is this true?

There is some evidence that provides a surprisingly persuasive answer to this question. I came upon it when I learned through Bhagwati (1984) of Hamilton and Whalley's (1984) estimates about how much world income would change if more workers were shifted from low-income to high-income countries. The key is to examine how much migration from poorer to richer countries *changes* relative wages and the marginal productivities of labor.

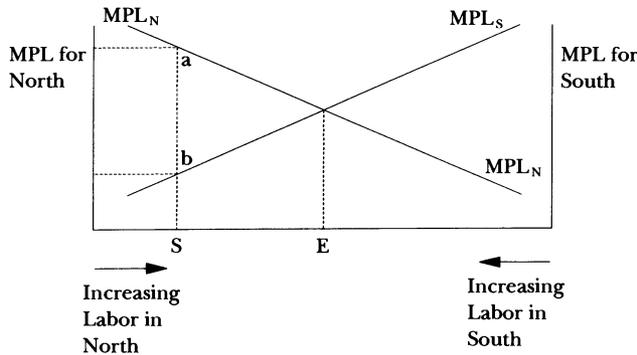
For simplicity, suppose that the world is divided into only two regions: North and South, and stick with the conventional assumption that both are on the fron-

³ My calculation leaves out that portion of the cost of new equipment that is an implicit charge for the new ideas embodied in it. We must also remember that by no means all of Korea's growth was due to knowledge discovered abroad.

⁴ It is sometimes said that developing countries do not yet have the highly educated people needed to use modern technologies, and so the world's stock of knowledge is not in fact accessible to them. This argument overlooks the fact that the rewards to those with the missing skills, when other things are equal, would then be higher in the poor societies than in societies in which these skills were relatively plentiful. If difficulties of language and ignorance of the host country's markets can be overcome, individuals with the missing skills would then have an incentive to move (sometimes as employees of multinational firms) to those low-income countries in which they were most needed.

⁵ We shall see, when we later consider a heretofore neglected aspect of the relationship between levels and rates of growth of per capita incomes, that the new or endogenous growth theory objection to this assumption need not concern us here.

Figure 1
Population Distribution and Relative Wages



tiers of their aggregate production functions. As we move left to right from the origin of Figure 1, we have an ever larger workforce in the North until, at the extreme right end of this axis, all of the world's labor force is there. Conversely, as we move right to left from the right-hand axis, we have an ever larger workforce in the South. The marginal product of labor or wage in the rich North is measured on the vertical axis at the left of Figure 1. The curve MPL_N gives the marginal product or wage of labor in the North, and, of course, because of diminishing returns, it slopes downward as we move to the right. The larger the labor force in the South, the lower the marginal product of labor in the South, so MPL_S , measured on the right-hand vertical axis, slopes down as we move to the left. Each point on the horizontal axis will specify a distribution of the world's population between the North and the South. A point like S represents the status quo. At S , there is relatively little labor and population in relation to resources in the North, and so the Northern marginal product and wage are high. The marginal product and wage in the overpopulated South will be low, and the marginal product of labor in the North exceeds that in the South by a substantial multiple.

This model tells us that when workers migrate from the low-wage South to the high-wage North, world income goes up by the difference between the wage the migrant worker receives in the rich country and what that worker earned in the poor country, or by amount ab . Clearly, the world as a whole is not on the frontier of its aggregate production, even if all of the countries in it are: some big bills have not been picked up on the routes that lead from poor to rich countries.⁶ Of course,

⁶ In other words, there has not been a Coase-style bargain between rich and poor regions. Given that income increases by, say, tenfold when labor moves from the poor to the rich countries, there would be a continuing incentive for the poor to migrate to the rich countries even if the rich countries took, for example, half of this increase and kept it for their citizens. The transactions costs of such a deal would surely be minute in relation to the gains.

the argument that has just been made is extremely simple, and international migration involves many other considerations. We can best come to understand these considerations—as well as other matters—by staying with this simple factor proportions story a while longer.

The Surprising Results of Large Migrations

This elementary model reminds us that, if it is diminishing returns to land and other natural resources that mainly explain international differences in per capita incomes, then large migrations from poorer to richer societies will, if other things (like the stocks of capital) remain equal, necessarily reduce income differentials. Such migration obviously raises the resource-to-population ratio in the country of emigration and reduces it in the country of immigration, and if carried far enough will continue until wages are equalized, as at point *E* in Figure 1.

Now consider Ireland, the country that has experienced much the highest proportion of outmigration in Europe, if not the world. In the census of 1821, Ireland had 5.4 million people, and Great Britain a population of 14.2 million.⁷ Though the Irish have experienced the same rates of natural population increase that have characterized other European peoples since 1821, in 1986, Ireland had only 3.5 million people. By this time, the population of Great Britain had reached 55.1 million. In 1821, the population density of Ireland was greater than that of Great Britain; by 1986, it was only about a fifth as great.⁸

If the lack of “land” or overpopulation is decisive, Ireland ought to have enjoyed an exceptionally rapid growth of per capita income, at least in comparison with Great Britain, and the outmigration should eventually have ceased. Not so. Remarkably, the Irish level of per capita income is still only about five-eighths of the British level and less than half of the level in the United States, and the outmigration from Ireland is still continuing. As we shall see later, such large disparities in per capita income cannot normally be explained by differences in human capital. It is clear that in the United States, Britain and many other countries, immigrants from Ireland tend to earn as much as other peoples, and any differences in human capital could not explain the *increase* in wage that migrants receive when they go to a more productive country. Thus we can be sure that it is not the ratio of land to labor that has mainly determined per capita income in Ireland.

Now let us look at the huge European immigration to the United States between the closing of the U.S. frontier in about 1890 and the imposition of U.S.

⁷ At the time I wrote this, I had not read Joel Mokyr’s (1983) analysis of nineteenth-century Ireland. For a richer analysis of nineteenth-century Ireland, see his *Why Ireland Starved*. After detailed quantitative studies, he concludes that “there is no evidence that pre-famine Ireland was overpopulated in any useful sense of the word” (p. 64).

⁸ Northern Ireland is excluded from both Great Britain and Ireland. See Mitchell (1962), Mitchell and Jones (1971), Ireland Central Statistics Office (1986) and Great Britain Central Statistical Office (1988).

immigration restrictions in the early 1920s. If diminishing returns to labor were a substantial part of the story of economic growth, this vast migration should have caused a gradual reduction of the per capita income differential between the United States and Europe. In fact, the United States had a bigger lead in per capita income over several European countries in 1910 and 1920 than it had in the nineteenth century. Although many European countries did *not* narrow the gap in per capita incomes with the United States in the nineteenth century when they experienced a large outmigration to the United States, many of these same countries did nearly close that gap in the years after 1945, when they had relatively little emigration to the United States, and when their own incomes ought to have been lowered by a significant inflow of migrants and guest workers. Similarly, from the end of World War II until the construction of the Berlin wall, there was a considerable flow of population from East to West Germany, but this flow did not equalize income levels.

Consider also the irrepressible flow of documented and undocumented migration from Latin America to the United States. If diminishing returns to land and other natural resources were the main explanation of the difference in per capita incomes between Mexico and the United States, these differences should have diminished markedly at the times when this migration was greatest. They have not.

Several detailed empirical studies of relatively large immigration to isolated labor markets point to the same conclusion as the great migrations we have just considered. Card's (1990) study of the Mariel boatlift's effect on the wages of natives of Miami, Hunt's (1992) examination of the repatriation of Algerian French workers to Southern France, and Carrington and De Lima's (1996) account of the repatriates from Angola and Mozambique after Portugal lost its colonies all suggest that the substantial immigration did not depress the wages of natives.⁹

Perhaps in some cases the curves in Figure 1 would cross when there was little population left in a poor country. Or maybe they would not cross at all: even that last person who turned the lights out as he left would obtain a higher wage after migrating.

Surprising Evidence on Density of Population

Let us now shift focus from changes in land/labor ratios due to migration to the cross-sectional evidence at given points in time on ratios of land to labor. Ideally, one should have a good index of the natural resource endowments of each country. Such an index should be adjusted to take account of changes in international prices, so that the value of a nation's resources index would change when the prices of the resources with which it was relatively well endowed went up or down. For lack of such an index, we must here simply examine density of population. Fortunately,

⁹ I am grateful to Alan Krueger for bringing these studies to my attention.

the number of countries on which we have data on population and area is so large that population density alone tells us something.

Many of the most densely settled countries have high per capita incomes, and many poor countries are sparsely settled. Argentina, a country that fell from having one of the highest per capita incomes to third world status, has only 11 persons per square kilometer; Brazil, 16; Kenya, 25; and Zaire, 13. India, like most societies with a lot of irrigated agriculture, is more densely settled, with 233 people per square kilometer. But high-income West Germany, with 246 people per square kilometer, is more densely settled than India. Belgium and Japan have half again more population density than India, with 322 and 325 people per square kilometer, and Holland has still more density with 357. The population of Singapore is 4,185 per square kilometer; that of Hong Kong, over 5,000 persons per square kilometer (United Nations, 1986). These two densely settled little fragments of land also have per capita incomes 10 times as high as the poorest countries (and as of this writing they continue, like many other densely settled countries, to absorb migrants, at least when the migrants can sneak through the controls).

The foregoing cases could be exceptions, so we need to take all countries for which data are available into account and summarily describe the overall relationship between population density and per capita income. If we remember that the purpose is description and are careful to avoid drawing causal inferences, we can describe the available data with a univariate regression in which the natural log of real per capita income is the left-hand variable, and the natural log of population per square kilometer is the “explanatory” variable. Obviously, the per capita income of a country depends on many things, and any statistical test that does not take account of all important determinants is misspecified, and thus must be used only for descriptive and heuristic purposes. It is nonetheless interesting—and for most people surprising—to find that there is a *positive* and even a statistically significant relationship between these two variables: the *greater* the number of people per square kilometer the *higher* per capita income.¹⁰

The law of diminishing returns is indisputably true: it would be absurd to suppose that a larger endowment of land makes a country poorer. This consideration by itself would, of course, call for a negative sign on population density. Thus, it is interesting to ask what might account for the “wrong” sign and to think of what statistical tests should ultimately be done. Clearly, there is a simultaneous two-way relationship between population density and per capita income: the level of per capita income affects population growth just as population, through diminishing returns to labor, affects per capita income.

The argument offered here suggests that perhaps countries with better economic policies and institutions come to have higher per capita incomes than countries with inferior policies and institutions, and that these higher incomes bring

¹⁰ Specifically, the regression results are PER CAPITA GDP = 6.986 + 0.1746 POPULATION DENSITY. The $r^2 = .05$, and the t -statistic is 2.7.

about a higher population growth through more immigration and lower death rates. In this way, the effect of better institutions and policies in raising per capita income swamps the tendency of diminishing returns to labor to reduce it. This hypothesis also may explain why many empirical studies have not been able to show a negative association between the rate of population growth and increases in per capita income.

One reason why the ratio of natural resources to population does not account for variations in per capita income is that most economic activity can now readily be separated from deposits of raw materials and arable land. Over time, transportation technologies have certainly improved, and products that have a high value in relation to their weight, such as most services and manufactured goods like computers and airplanes, may have become more important. The Silicon Valley is not important for the manufacture of computers because of deposits of silicon, and London and Zurich are not great banking centers because of fertile land. Even casual observation suggests that most modern manufacturing and service exports are not closely tied to natural resources. Western Europe does not now have a high ratio of natural resources to population, but it is very important in the export of manufactures and services. Japan has relatively little natural resources per capita, but it is a great exporter of manufactures. Certainly the striking successes in manufactures of Hong Kong and Singapore cannot be explained by their natural resources.

Diminishing Returns to Capital

We have seen that large migrations of labor do not change the marginal productivities of labor the way that they would if societies were at the frontiers of aggregate neoclassical production functions and that there is even evidence that labor is on average more highly paid where it is combined with less land. We shall now see that the allocation of capital across countries—and the patterns of investment and migration of capital across countries of high and low capital intensities—contradict the assumption that countries are on the frontiers of aggregate neoclassical production functions in an even more striking way.

This is immediately evident if we return to Figure 1 and relabel its coordinates and curves. If we replace the total world labor supply given along the horizontal axis of Figure 1 with the total world stock of capital and assume that the quantity of labor as well as natural resources in the North and South do not change, we can use Figure 1 to analyze diminishing returns to capital in the same way we used it to consider diminishing returns to labor.

As everyone knows, the countries with high per capita incomes have incomparably higher capital intensities of production than do those with low incomes. The countries of the third world use relatively little capital, and those of the first world are capital rich: most of the world's stock of capital is "crowded" into North America, western Europe and Japan.

If the countries of the world were on the frontiers of neoclassical production functions, the marginal product of capital would therefore be many times higher in the low-income than in the high-income countries. Robert Lucas (1990) has calculated, albeit in a somewhat different framework,¹¹ the marginal product of capital that should be expected in the United States and in India. Lucas estimated that if an Indian worker and an American worker supplied the same quantity and quality of labor, the marginal product of capital in India should be *58 times* as great as in the United States. Even when Lucas assumed that it took *five* Indian workers to supply as much labor as one U.S. worker, the predicted return to capital in India would still be a multiple of the return in the United States.

With portfolio managers and multinational corporations searching for more profitable investments for their capital, such gigantic differences in return should generate huge migrations of capital from the high-income to the low-income countries. Capital should be struggling at least as hard to get into the third world as labor is struggling to migrate into the high-wage countries. Indeed, since rational owners of capital allocate their investment funds across countries so that the risk-adjusted return at the margin is the same across countries, capital should be equally plentiful in all countries. (As we know from the Heckscher-Ohlin-Stolper-Samuelson discovery, if all countries operate on the same aggregate production functions, free trade alone is sometimes enough to equalize factor price ratios and thus factor intensities even in the absence of capital flows.)

Obviously, the dramatically uneven distribution of capital around the world contradicts the familiar assumption that all countries are on the frontiers of aggregate neoclassical production functions. A country could not be Pareto efficient and thus could not be on the frontier of its aggregate production unless it had equated the marginal product of capital in the country to the world price of capital.¹² If it were not meeting this law-of-one-price condition, it would be passing up the gains that could come from borrowing capital abroad at the world rate of interest, investing it at home to obtain the higher marginal product of capital and pocketing the difference—it would be leaving large bills on the sidewalk. Accordingly, the strikingly unequal allocation of the world's stock of capital across nations proves that the poor countries cannot be anywhere near the frontiers of their aggregate production functions.

Sometimes the shortcomings of the economic policies and institutions of the low-income countries keep capital in these countries from earning rates of return appropriate to its scarcity, as we may infer from Harberger's (1978) findings and

¹¹ Lucas's calculations are set in the context of Solow's theory of long-run growth. To bring the contradiction between the assumption that societies are on the frontiers of aggregate neoclassical production functions and what is actually observed, most starkly and simply, I have focused on a single point in time and used the framework Solow put forth for empirical estimation. It would add little insight to the present argument to look at the growth paths of different countries.

¹² Since each third world economy is small in relation to the world economy, it is reasonable to assume that no one of them could change the world price of capital, so that the marginal cost of capital to the country is equal to its price.

other evidence. Sometimes the shortcomings of the economic policies and institutions of poor countries make foreign investors and foreign firms unwelcome, or provoke the flight of locally owned capital, or make lending to these countries exceedingly risky. Whether the institutional and policy shortcomings of a country keep capital from having the productivity appropriate to its scarcity or discourage the investments and lending that would equalize the marginal product of capital across countries, they keep it from achieving its potential.

On top of all this, it is not rare for capital and labor to move *in the same direction*: both capital and labor are sometimes trying to move out of some countries and into some of the same countries. Of course, in a world where countries are on the frontiers of their aggregate production functions, capital and labor move in opposite directions.¹³

Given the extraordinarily uneven allocation of capital across the countries of the world and the strong relationship between capital mobility and the economic policies and institutions of countries, the stock of capital cannot be taken to be exogenous in any reasonable theory of economic development.

Distinguishing Private Good and Public Good Human Capital

The adjustment of the amount of human capital per worker in Lucas's (1990) foregoing calculation for India and the United States raises a general issue: can the great differences in per capita income be mainly explained by differences in the third aggregate factor, labor, that is, by differences in the *human* capital per capita, broadly understood as including the cultural or other traits of different peoples as well as their skills? The average level of human capital in the form of occupational skills or education in a society can obviously influence the level of its per capita income.

Many people also argue that the high incomes in the rich countries are due in part to cultural or racial traits that make the individuals in these countries adept at responding to economic opportunities: they have the "Protestant ethic" or other cultural or national traits that are supposed to make them hard workers, frugal savers and imaginative entrepreneurs. Poor countries are alleged to be poor because they lack these traits.¹⁴ The cultural traits that perpetuate poverty are, it is argued, the results of centuries of social accumulation and cannot be changed quickly.

Unfortunately, the argument that culture is important for economic development, though plausible, is also vague: the word "culture," even though it is widely used in diverse disciplines, has not been defined precisely or in a way that permits

¹³ In a neoclassical world with only capital and labor, they would necessarily move in opposite directions, but when there is a disequilibrium with respect to land or other natural resources, both capital and labor could both move to correct this disequilibrium.

¹⁴ In his Ely lecture, Landes (1990) made an argument along these lines.

comparison with other variables in an aggregate production function. We can obtain conceptions of culture that are adequate for the present purpose by breaking culture down into two distinct types of human capital.

Some types of human capital are obviously marketable: if a person has more skill, or a propensity to work harder, or a predilection to save more, or a more entrepreneurial personality, this will normally increase that individual's money income. Let us call these skills, propensities, or cultural traits that affect the quality or the quantity of productive inputs that an individual can sell in the marketplace "marketable human capital" or, synonymously, "personal culture." Max Weber's analysis of what he called the Protestant ethic was about marketable human capital or personal culture.

The second type of culture or human capital is evident when we think of knowledge that individuals may have about how they should vote: about what public policies will be successful. If enough voters acquire more knowledge about what the real consequences of different public policies will be, public policies will improve and thereby increase real incomes in the society. But this better knowledge of public policy is usually not marketable: in a society with *given* economic policies and institutions, the acquisition of such knowledge would not in general have any affect on an individual's wage or income. Knowledge about what public policy should be is a public good rather than a private or marketable good. Thus this second kind of human capital is "public good human capital" or "civic culture." Whereas marketable human capital or personal culture increases an individual's market income under given institutions and public policies, public good human capital or civic culture is not normally marketable and only affects incomes by influencing public policies and institutions.

With the aid of the distinction between marketable and public good human capital, we can gain important truths from some natural experiments.

Migration as an Experiment

As it happens, migration from poor to rich countries provides researchers with a marvelous (and so far strangely neglected) natural experiment. Typically, the number of individuals who immigrate to a country in any generation is too small to bring about any significant change in the electorate or public policies of the host country. But the migrant who arrives as an adult comes with the marketable human capital or personal culture of the country of origin; the Latin American who swims the Rio Grande is not thereby instantly baptized with the Protestant ethic. Though the migrant may in time acquire the culture of the host country, the whole idea behind the theories that emphasize the cultural or other characteristics of peoples is that it takes time to erase generations of socialization: if the cultural or other traits of a people could be changed overnight, they could not be significant barriers to development. Newly arrived immigrants therefore have approximately the same marketable human capital or personal culture they had before they migrated, but

the institutions and public policies that determine the opportunities that they confront are those of the host country. In the case of the migration to the United States, at least, the data about newly arrived migrants from poor countries are sufficient to permit some immediate conclusions.

Christopher Clague (1991), drawing on the work of Borjas (1987), has found that individuals who had just arrived in the United States from poor countries, in spite of the difficulties they must have had in adjusting to a new environment with a different language and conditions, earned about 55 percent as much as native Americans of the same age, sex and years of schooling.¹⁵ New immigrants from countries where per capita incomes are only a tenth or a fifth as large as in the United States have a wage more than half as large as comparable American workers.¹⁶ Profit-maximizing firms would not have hired these migrants if they did not have a marginal product at least as large as their wage. The migrant's labor is, of course, combined with more capital in the rich than in the poor country, but it is not an accident that the owners of capital chose to invest it where they did: as the foregoing argument showed, the capital-labor ratio in a country is mainly determined by its institutions and policies.

Migrants might be more productive than their compatriots who did not migrate, so it might be supposed that the foregoing observations on immigrants are driven by selection bias. In fact, no tendency for the more productive people in poor countries to be more likely to emigrate could explain the huge increases in wages and marginal products of the *migrants themselves*. The migrant earns and produces much more in the rich country than in the poor country, so no tendency for migrants to be more productive than those who did not migrate could explain the *increase* in the migrant's marginal product when he or she moves from the poor to the rich country.¹⁷ In any event, developing countries often have much more unequal income distributions than developed nations, and the incentive to migrate from these countries is greatest in the least successful half of their income distributions. In fact, migrants to the United States are often drawn from the lower portion of the income distribution of underdeveloped countries (Borjas, 1990).

It is also instructive to examine the differences in productivity of migrants from poor countries with migrants from rich countries and then to see how much of the

¹⁵ Clague takes the intercept of Borjas's regression about how the migrants' wages increase with time in the United States as the wage on arrival.

¹⁶ Apparently, somewhat similar patterns can be found when there is migration from areas of low income to other high-income countries. The increases in the wages that migrants from low-wage countries like Turkey, or from the German Democratic Republic, have received in West Germany are well known and in accord with the argument I am making. As Krueger and Pischke (1995) show, after German unification, East German workers who work in West Germany earn more than those who work in East Germany. By my reading of their numbers, the increase from this migration is less than it was before German unification. If Germany is succeeding in its efforts to create the same institutional and policy environment in East as in West Germany, the gains from east to west migration in Germany should diminish over time. But the structures of incentives in East and West Germany are not yet by any means identical.

¹⁷ To account for this result in terms of selection bias, one would have to argue that those workers who remained in the poor countries would not have a similar increase in marginal product had they migrated.

difference in per capita incomes in the countries of origin is likely to be due to the differences in the marketable human capital or personal culture of their respective peoples. Compare, for example, migrants to the United States from Haiti, one of the world's least successful economies, with migrants from West Germany, one of the most successful. According to the 1980 U.S. Census, self-employed immigrants from Haiti earned \$18,900 per year, while those from West Germany earned \$27,300; salaried immigrants from Haiti earned \$10,900, those from West Germany, \$21,900. Since the average Haitian immigrants earned only two-thirds or half as much as their West German counterparts in the same American environment, we may suspect that the Haitians had, on average, less marketable human capital than the West Germans.

So now let us perform the thought experiment of asking how much West Germans would have produced if they had the same institutions and economic policies as Haiti, or conversely how much Haitians would have produced had they had the same institutions and economic policies as West Germany. If we infer from the experience of migrants to the United States that West Germans have twice as much marketable capital as the Haitians, we can then suppose that Haiti with its present institutions and economic policies, but with West German levels of marketable human capital, would have about twice the per capita income that it has. But the actual level of Haitian per capita income is only about a tenth of the West German level, so Haiti would still, under our thought experiment, have less than one-fifth of the West German per capita income. Of course, if one imagines Haitian levels of marketable human capital operating with West German institutions and economic policies, one comes up with about half of the West German per capita income, which is again many times larger than Haiti's actual per capita income.

Obviously, one of the reasons for the great disparity implied by these thought experiments is the different amounts of tangible capital per worker in the two countries. Before taking this as given exogenously, however, the reader should consider investing his or her own money in each of these two countries. It is also possible that different selection biases for immigrants from different countries help account for the results of the foregoing thought experiments. Yet roughly the same results hold when one undertakes similar comparisons from migrants from Switzerland and Egypt, Japan and Guatemala, Norway and the Philippines, Sweden and Greece, the Netherlands and Panama, and so on.¹⁸ If, in comparing the incomes of migrants to the United States from poor and rich countries, one supposes that selection bias leads to an underestimate of the differences in marketable human capital between the poor and rich countries, and then makes a larger estimate of this effect than anyone is likely to think plausible, one still ends up with the result that the rich countries have vastly larger leads over poor countries in per capita incomes than can possibly be explained by differences in the marketable human

¹⁸ I am thankful to Robert Vigil for help in studying the incomes of migrants from other countries to the United States.

capital of their populations. Such differences in personal culture can explain only a small part of the huge differences in per capita income between the rich and the poor countries.

History has performed some other experiments that lead to the same conclusion. During most of the postwar period, China, Germany and Korea have been divided by the accidents of history, so that different parts of nations with about the same culture and group traits have had different institutions and economic policies. The economic performances of Hong Kong and Taiwan, of West Germany and of South Korea have been incomparably better than the performances of mainland China, East Germany and North Korea. Such great differences in economic performance in areas of very similar cultural characteristics could surely not be explained by differences in the marketable human capital of the populations at issue.

It is important to remember that the foregoing experiments involving migration do not tell us anything about popular attitudes or prejudices in different countries regarding what public policy should be. That is, they do not tell us anything about the public good human capital or civic cultures of different peoples. As we know, the migrants from poor to rich countries are normally tiny minorities in the countries to which they migrate, so they do not usually change the public policies or institutions of the host countries. The natural experiments that we have just considered do not tell us what would happen if the civic cultures of the poor countries were to come to dominate the rich countries. For example, if traditional Latin American or Middle Eastern beliefs about how societies should be organized came to dominate North America or western Europe, institutions and economic policies—and then presumably also economic performance—would change.

The Overwhelming Importance of Institutions and Economic Policies

If what has been said so far is correct, then the large differences in per capita income across countries cannot be explained by differences in access to the world's stock of productive knowledge or to its capital markets, by differences in the ratio of population to land or natural resources, or by differences in the quality of marketable human capital or personal culture. Albeit at a high level of aggregation, this eliminates each of the factors of production as possible explanations of most of the international differences in per capita income. The only remaining plausible explanation is that the great differences in the wealth of nations are mainly due to differences in the quality of their institutions and economic policies.

The evidence from the national borders that delineate different institutions and economic policies not only contradicts the view that societies produce as much as their resource endowments permit, but also directly suggests that a country's institutions and economic policies are decisive for its economic performance. The very fact that the differences in per capita incomes across countries—the units with

the different policies and institutions—are so large in relation to the differences in incomes across regions of the same country supports my argument. So does the fact that national borders sometimes sharply divide areas of quite different per capita incomes.

Old Growth Theory, New Growth Theory and the Facts

The argument offered here also fits the relationships between levels of per capita income and rates of growth better than does either the old growth theory or the new. As has often been pointed out, the absence of any general tendency for the poor countries with their opportunities for catch-up growth to grow faster than the rich countries argues against the old growth theory. The new or endogenous growth models feature externalities that increase with investment or with stocks of human or tangible capital and can readily explain why countries with high per capita incomes can grow as fast or faster than low-income countries.

But neither the old nor the new growth theories predict the relationship that is actually observed: *the fastest-growing countries are never the countries with the highest per capita incomes but always a subset of the lower-income countries.* At the same time that low-income countries as a whole fail to grow any faster than high-income countries, a subset of the lower-income countries grows far faster than *any* high-income country does. The argument offered here suggests that poor countries on average have poorer economic policies and institutions than rich countries, and, therefore, in spite of their opportunity for rapid catch-up growth, they need not grow faster on average than the rich countries.

But any poorer countries that adopt relatively good economic policies and institutions enjoy rapid catch-up growth: since they are far short of their potential, their per capita incomes can increase not only because of the technological and other advances that simultaneously bring growth to the richest countries, but also by narrowing the huge gap between their actual and potential income (Barro, 1991). Countries with the highest per capita incomes do not have the same opportunity.

Thus the argument here leads us to expect what is actually observed: no necessary connection between low per capita incomes and more rapid rates of growth, but much the highest rates of growth in a subset of low-income countries—the ones that adopt better economic policies and institutions. During the 1970s, for example, South Korea grew seven times as fast as the United States. During the 1970s, the four countries that (apart from the oil-exporting countries) had the fastest rates of growth of per capita income grew on average 6.9 percentage points faster per year than the United States—more than five times as fast. In the 1980s, the four fastest growers grew 5.3 percentage points faster per year than the United States—four times as fast. They outgrew the highest income countries as a class by similarly large multiples. All of the four of the fastest-growing countries in each decade were low-income countries.

In general, the endogenous growth models do not have anything in their structures that predicts that the most rapid growth will occur in a subset of low-income countries, and the old growth theory is contradicted by the absence of general convergence.

Note also that, as the gap in per capita incomes between the relatively poor and relatively rich countries has increased over time, poor countries have also fallen further behind their potential. Therefore, the argument offered here predicts that the maximum rate of growth that is possible for a poor country—and the rate at which it can gain on the highest per capita income countries—is increasing over time. This is also what has been observed. In the 1870s, the four continental European countries with the fastest growth of per capita incomes grew only 0.3 of 1 percent per annum faster than the United Kingdom. The top four such countries in the 1880s also had the same 0.3 percent gain over the United Kingdom. As we have seen, the top four countries in the 1970s grew 6.9 percentage points faster than the United States, and the top four in the 1980s, 5.3 percentage points faster. Thus, the lead of the top four in the 1970s was *23 times* as great as the lead of the top four in the 1870s, and the lead of the top four in the 1980s was more than *17 times* as great as the top four a century before.¹⁹

Thus neither the old nor the new growth theory leads us to expect either the observed overall relationship between the levels and rates of growth of per capita incomes or the way this relationship has changed as the absolute gap in per capita incomes has increased over time. The present theory, by contrast, suggests that there should be patterns like those we observe.

Picking Up the Big Bills

The best thing a society can do to increase its prosperity is to wise up. This means, in turn, that it is very important indeed that economists, inside government and out, get things right. When we are wrong, we do a lot of harm. When we are right—and have the clarity needed to prevail against the special interests and the

¹⁹ Germany was the fastest-growing European country in the 1870s, but its borders changed with the Franco-Prussian war, and so the “1870s” growth rate used for Germany is that from 1872 to 1882. Angus Maddison’s estimates were used for the nineteenth century; World Bank data for the twentieth. The top four qualifying growth countries in each decade were the following: for the 1980s, Korea, China, Botswana and Thailand; for the 1970s, Botswana, Malta, Singapore and Korea; for the 1880s, Germany, Finland, Austria and Denmark; for the 1870s, Germany, Belgium, the Netherlands and Austria. Those countries that still had open frontiers in the nineteenth century, or in some cases even until World War I, or that were major oil-exporting countries at the times of the oil shocks are not apt countries for the comparisons at issue now. It would be going much too far to extend the argument here about the limited importance of land and natural resources to growth to countries that are in major disequilibrium because of open frontiers or huge changes in their terms of trade. That is why I excluded the oil-exporting countries and compared the fastest-growing continental European countries with Britain in order to analyze the speed of catch-up after the industrial revolution.

I am thankful to Nikolay Gueorguiev for gathering and analyzing the data on this issue.

quacks—we make an extraordinary contribution to the amelioration of poverty and the progress of humanity. The sums lost because the poor countries obtain only a fraction of—and because even the richest countries do not reach—their economic potentials are measured in the trillions of dollars.

None of the familiar ideologies is sufficient to provide the needed wisdom. The familiar assumption that the quality of a nation's economic institutions and policies is given by the smallness, or the largeness, of its public sector—or by the size of its transfers to low-income people—does not fit the facts very well (Levine and Renelt, 1992; Rubinson, 1977; Olson, 1986).

But the hypothesis that economic performance is determined mostly by the *structure of incentives*—and that it is mainly national borders that mark the boundaries of different structures of incentives—has far more evidence in its favor. This lecture has set out only one of the types of this evidence; there is also direct evidence of the linkage between better economic policies and institutions and better economic performance. Though it is not feasible to set out this direct evidence here, it is available in other writings (Clague, Keefer, Knack and Olson, 1995; Olson, 1982, 1987a, 1987b, 1990).

We can perhaps obtain a glimpse of another kind of logic and evidence in support of the argument here—and a hint about what kinds of institutions and economic policies generate better economic performance—by returning to the theories with which we began. These theories suggested that the rationality of the participants in an economy or the parties to a bargain implied that there would be no money left on the table. We know from the surprisingly good performance of migrants from poor countries in rich countries, as well as from other evidence, that there is a great deal of rationality, mother wit and energy among the masses of the poor countries: individuals in these societies can pick up the bills on the sidewalk about as quickly as we can.

The problem is that the really big sums cannot be picked up through uncoordinated individual actions. They can only be obtained through the efficient cooperation of many millions of specialized workers and other inputs: in other words, they can only be attained if a vast array of gains from specialization and trade are realized. Though the low-income societies obtain most of the gains from self-enforcing trades, they do not realize many of the largest gains from specialization and trade. They do not have the institutions that enforce contracts impartially, and so they lose most of the gains from those transactions (like those in the capital market) that require impartial third-party enforcement. They do not have institutions that make property rights secure over the long run, so they lose most of the gains from capital-intensive production. Production and trade in these societies is further handicapped by misguided economic policies and by private and public predation. The intricate social cooperation that emerges when there is a sophisticated array of markets requires far better institutions and economic policies than most countries have. The effective correction of market failures is even more difficult.

The spontaneous individual optimization that drives the theories with which I

began is important, but it is not enough by itself. If spontaneous Coase-style bargains, whether through laissez faire or political bargaining and government, eliminated socially wasteful predation and obtained the institutions that are needed for a thriving market economy, then there would not be so many grossly inefficient and poverty stricken societies. The argument presented here shows that the bargains needed to create efficient societies are not, in fact, made. Though that is another story, I can show that in many cases such bargains are even logically inconsistent with rational individual behavior.²⁰ Some important trends in economic thinking, useful as they are, should not blind us to a sad and all-too-general reality: as the literature on collective action demonstrates (Olson, 1965; Hardin, 1982; Sandler, 1992; and many others), individual rationality is very far indeed from being sufficient for social rationality.

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²⁰ The logic at issue is set out in a preliminary way in the aforementioned Olson (1995) working paper, "Transactions Costs and the Coase Theorem."

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