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Infrastructure and the Wealth of Nations

by Ed Nosal and Peter Rupert

Economies can't grow without a sufficiently developed infrastructure, but how deep does the infrastructure have to be to make a difference? The authors take a look at some research from the Fraser Institute that examines the relationship between economic growth and economic infrastructure across 123 countries. They find that infrastructure is a bit of an all-or-nothing proposition.

Why are some countries so wealthy and others so poor? The wealthiest nation in the world, the United States, is about 50 times wealthier than the poorest, Chad. Understanding the determinants of wealth and the growth necessary to achieve it is arguably the most important endeavor of economics, because that understanding can help to improve overall living standards.

Economists will tell you that a key ingredient in a country's economic growth and prosperity is the state of its infrastructure. A developed infrastructure allows competition to flourish and resources to flow to their highest-valued use. It enables investment and the accumulation of capital, both material and human, which lead to greater productivity and wealth. This *Commentary* explains why infrastructure is necessary for growth and explores how important its contribution might be by examining the relationship between infrastructure and growth across 123 countries.

The Infrastructure of Nations

Commonly, when people speak of a nation's infrastructure, they mean its roads, bridges, dams, rail lines, telecommunication networks, power-generating facilities, and so on. Infrastructure encompasses not only these tangible forms of capital but also some less tangible resources that are just as essential in promoting growth and prosperity. Such resources include things like property rights (and a legal system to help enforce them), a standard system of accounts, stable money, and a secure financial system.

It is obvious why tangible capital is necessary. The ability to move goods, capital, labor, ideas, and information to their highest-valued use is a key factor in determining growth and well-being. Advances in heating, ventilation, and air conditioning, along with improved materials and building design, made it possible to construct skyscrapers, which provide benefits by bringing high concentrations of people and trade close together. The list of such innovations is long.

What may not be obvious at first is where the less tangible type of infrastructure fits in. Think about why organizations undertake investment in costly research and development. Or what persuades investors to give up the certainty of wealth today for a claim to wealth in the future. How does one determine how much wealth an investor must give up for that future claim? It is precisely the less tangible items, like those already mentioned (and certainly others), that enable all of these things to happen.

As an example, patent laws allow innovators to reap the fruits of the years of research and development necessary to produce new ideas and products. Well-defined and enforced property rights give the owners of capital the confidence to install and use it and to collect its rewards. These rights also assure owners of claims to future wealth that their claims cannot be ignored. This means that confiscation of property, including confiscation by the ruling government, cannot occur without due process of law.

A standardized accounting system ensures that the financial data necessary to make informed decisions are reliable. This holds true for figures such as the U.S. national income and product accounts as well as firms' earnings reports. Decisions about when and how much to invest, whether to shut down a current product line, and so on may depend on the health of the industry, nation, or global economy. Reliable information allows companies and individuals to accurately assess the risks and possible rewards of any current or potential investment. A standard system of accounts is also necessary for placing a meaningful value on future claims. This holds true for individual companies as well as nations.

A Stable Financial System

One important element of economic infrastructure is a secure, stable financial system. This includes not only secure financial institutions and markets, but also the stable purchasing power of money. Secure institutions ensure that credit markets are accessible and reliable and that transactions can be accomplished quickly and accurately. Almost always, a stable financial system includes a central bank that can give the banking system the necessary liquidity (money reserves), thereby minimizing the possibility of disruptions from large-scale banking panics. This liquidity will have great value—to both the financial sector and consumers—if money's purchasing power is stable.

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Money is useful in an economy precisely because it can overcome certain trading frictions, such as a lack of double coincidence of wants. Money is said to be *essential* if a society can achieve better outcomes with money than without it. The characteristics of money taught in introductory economics courses—medium of exchange, unit of account, and store of value—all contribute to making money essential.

Money's effectiveness varies directly with its quality, that is, its ability to hold its value. And, like other macroeconomic statistics, the quality of the signal that money sends makes us surer of the response to the information that the signal provides. If the signal's quality is high, money prices give households and businesses reliable information about the relative costs of goods and services. This information enables them to make sound economic decisions, thereby fostering economic prosperity.

Unexpected inflation greatly impairs money's role as a signal, making it difficult to separate a general rise in prices from a change in the relative price of a good. At some sufficiently high rate of inflation, money is no longer essential and substitutes appear, such as a currency board or the use of another country's money. Dollarization, which is widespread in the world today, is one example of a money substitute.

Neither inflation nor deflation enhances economic performance. Both, if unanticipated, induce a redistribution of wealth—especially between debtors and creditors—and lower the average standard of living. When money's quality is high, people can make decisions in the confident expectation that all observed changes in money prices are changes in *relative* prices, and all observed changes in interest rates are changes in *real* rates.

Money with stable purchasing power provides a means of payment that allows the economy to achieve higher levels of prosperity. Consumers, producers, and financial institutions all benefit from stable money.

Infrastructure and the Performance of Nations

If a nation's economic infrastructure—its legal and political institutions, monetary policy, and so on—is a major contributor to economic growth and prosperity, we ought to see a clear correlation between better infrastructure and greater economic growth across countries.

To test this hypothesis, we need an objective measure of the infrastructure. Fortunately, one exists: The economic freedom index produced by the Fraser Institute, a nonprofit public policy research organization. The index evaluates countries' economic infrastructures in terms of seven major categories (see box above). It captures some basic economic freedoms, such as the ability to exchange goods and currencies, as well as the likelihood that those and other types of property will be confiscated. The index gives about 40 percent of its weight to stable money, the ability to trade currencies easily, and the freedom to exchange in capital and financial markets.

Obviously, it is hard to quantify a concept as amorphous as economic freedom. Assigning a number on a zero-to-ten scale for each component in every country involves assumptions and subjective decisions. But the economic freedom index seems a reasonable place to begin. (Numerous academic and policy papers have explored the strengths and weaknesses of the index. See Gwartney, Lawson, and Block 1996 for a list. The procedures used to construct the index are described there as well.) Table 1 shows an overview of the countries included in the economic freedom index and their ratings and rankings in 1999.

Comparing ratings on the index with figures for output and growth provides substantial support for the hypothesis that economic freedom plays a major role in determining both the level and growth rate of many economic variables as well as other measures of well-being.

Figure 1 shows the relationship between income and economic freedom. The average income for the lowest quintile is roughly one-tenth the average income for the top quintile. Much more surprising, the income for the second-highest quintile is only about half that for the highest quintile.

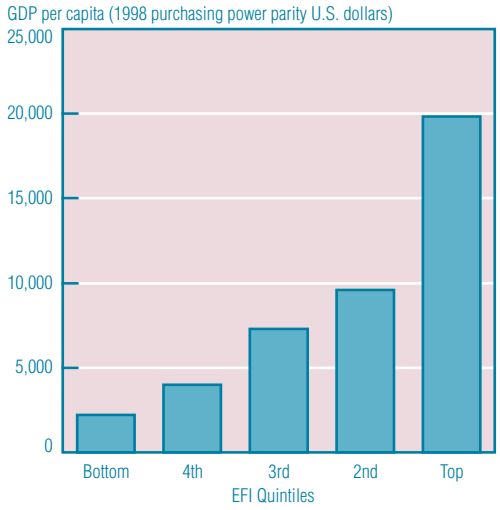
In a way, the remarkable difference between the top and bottom quintiles of the index ratings is not that surprising. The top 20 percent of the countries studied have the requisite freedoms and institutions that provide incentives to invest, accumulate capital, and so on; the bottom 20 percent lack them. But what about the middle 60 percent? While these countries have achieved some of the basic freedoms (perhaps even the more important ones), the freedoms achieved are insufficient to generate substantial prosperity; the obstacles are still too great. Unless those obstacles are removed, the countries in the middle quintiles will not be able to catch up to those in the top quintile. This observation is supported by figure 2, which shows the relationship between index ratings and GDP growth over the 1990s. The difference between the highest and second-highest quintiles in figure 2 is smaller than the difference in figure 1, but this is deceiving. Even small differences in growth *rates* can lead to large differences in *levels* over time. Figures 1 and 2 imply that these countries' levels are not converging. The figures suggest that differences in levels between the

COMPONENTS OF THE ECONOMIC FREEDOM INDEX

Category	Weight (percent)
Size of government: consumption, transfers, and subsidies	11.0
Structure of the economy and use of markets (*production and allocation via governmental and political mandates rather than private enterprises and markets*)	14.2
Monetary policy and price stability (*protection of money as a store of value and medium of exchange*)	9.2
Freedom to use alternative currencies	14.6
Legal structure and property rights (*security of property rights and viability of contracts*)	16.6
International exchange: freedom to trade with foreigners	17.1
Freedom of exchange in capital and financial markets	17.2

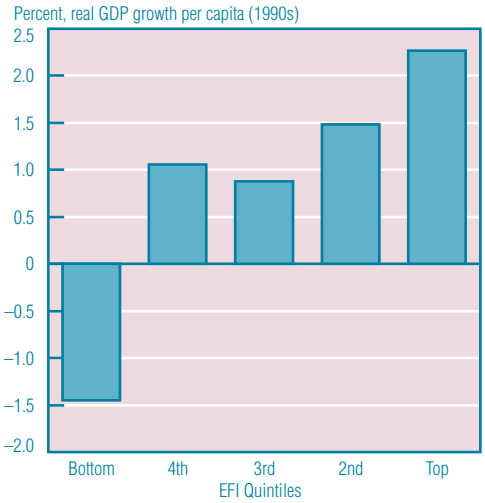
SOURCE: The Fraser Institute, *Economic Freedom of the World, 2001 Annual Report,* 2001.

FIGURE 1 ECONOMIC FREEDOM AND INCOME



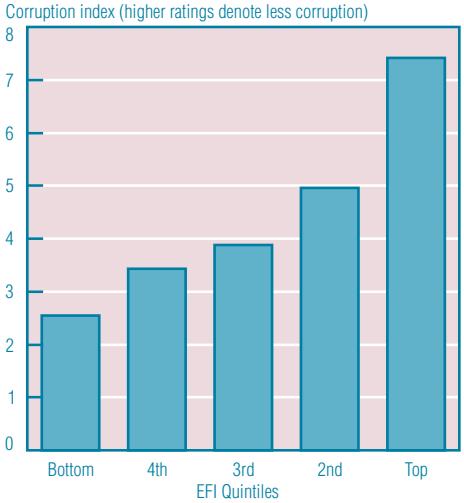
SOURCE: The Fraser Institute, *Economic Freedom of the World, 2001 Annual Report,* 2001.

FIGURE 2 ECONOMIC FREEDOM AND GROWTH IN THE 1990s



SOURCE: The Fraser Institute, *Economic Freedom of the World, 2001 Annual Report,* 2001.

FIGURE 3 ECONOMIC FREEDOM AND CORRUPTION



SOURCE: The Fraser Institute, *Economic Freedom of the World, 2001 Annual Report,* 2001.

TABLE 1 ECONOMIC FREEDOM INDEX, COUNTRIES' SUMMARY RATINGS AND RANKINGS, 1999

Country	Rank	Rating	Country	Rank	Rating	Country	Rank	Rating
Hong Kong	1	9.4	Kuwait	41	7.2	Sri Lanka	81	5.8
Singapore	2	9.3	Hungary	43	7.1	Tanzania	81	5.8
New Zealand	3	8.9	South Korea	43	7.1	Barbados	85	5.7
United Kingdom	4	8.8	Uganda	43	7.1	Poland	85	5.7
United States	5	8.7	Latvia	46	7.0	Ghana	87	5.6
Australia	6	8.5	South Africa	46	7.0	Cote d'Ivoire	88	5.5
Ireland	6	8.5	Trinidad/Tobago	46	7.0	Haiti	89	5.4
Switzerland	6	8.5	Unit. Arab Em.	46	7.0	Nepal	89	5.4
Luxembourg	9	8.4	Botswana	50	6.9	Zimbabwe	89	5.4
Netherlands	9	8.4	Namibia	50	6.9	Benin	92	5.3
Argentina	11	8.3	Egypt	52	6.8	India	92	5.3
Bolivia	11	8.3	Jordan	52	6.8	Mali	92	5.3
Canada	13	8.2	Thailand	52	6.8	Croatia	95	5.2
Finland	14	8.1	Uruguay	52	6.8	Brazil	96	5.1
Austria	15	8.0	Guatemala	56	6.7	Niger	97	5.0
Chile	15	8.0	Israel	56	6.7	Pakistan	97	5.0
Denmark	15	8.0	Malaysia	56	6.7	Cameroon	99	4.9
Germany	15	8.0	Malta	56	6.7	Bangladesh	100	4.8
Iceland	15	8.0	Czech Rep.	60	6.6	Senegal	100	4.8
Belgium	20	7.9	Honduras	60	6.6	Albania	102	4.7
El Salvador	20	7.9	Lithuania	62	6.5	Burundi	102	4.7
Japan	20	7.9	Mexico	62	6.5	Chad	102	4.7
Sweden	20	7.9	Bahamas	64	6.4	Iran	102	4.7
Costa Rica	24	7.8	Cyprus	64	6.4	Ukraine	106	4.6
Italy	24	7.8	Ecuador	64	6.4	Congo, Rep. of	107	4.5
Norway	24	7.8	Guyana	64	6.4	Nigeria	107	4.5
Portugal	24	7.8	Belize	68	6.3	Togo	107	4.5
Bahrain	28	7.7	Kenya	68	6.3	C. African Rep.	110	4.4
Oman	29	7.6	Slovak Rep.	68	6.3	Madagascar	110	4.4
Panama	29	7.6	Zambia	68	6.3	Malawi	110	4.4
Peru	29	7.6	Fiji	72	6.2	Rwanda	110	4.4
Philippines	29	7.6	Indonesia	72	6.2	Gabon	114	4.3
Spain	29	7.6	Morocco	72	6.2	Pap. N. Guinea	114	4.3
France	34	7.5	Slovenia	72	6.2	Syria	114	4.3
Nicaragua	34	7.5	Turkey	72	6.2	Russia	117	3.9
Estonia	36	7.4	Venezuela	77	6.1	Romania	118	3.8
Mauritius	36	7.4	Tunisia	78	6.0	Sierra Leone	119	3.5
Greece	38	7.3	Bulgaria	79	5.9	Guinea-Bissau	120	3.3
Paraguay	38	7.3	Jamaica	79	5.9	Congo, Dem. Rep.	121	3.0
Taiwan	38	7.3	China	81	5.8	Algeria	122	2.6
Dominican Rep.	41	7.2	Colombia	81	5.8	Myanmar	123	1.9

SOURCE: The Fraser Institute, *Economic Freedom of the World, 2001 Annual Report,* 2001.

first and second quintile, which are already large, might only be magnified over time; in other words, wealth inequality across nations may increase.

Figure 3 compares economic freedom to a measure of corruption in order to get at things such as bribery and other practices that divert resources. It shows a strong correlation: more economic freedom, less corruption. Bribery acts just like a tax, so that the buyer pays more than the seller receives. This lowers the rate of return for any investment, which decreases the amount of investment.

Over the last two decades or so, many nations have made great strides in achieving a monetary policy that is consistent with a stable value of money. How far have they come? The index's assessment of the stable money component of economic freedom shows that 5.5 percent of the nations studied were rated 9.0 or higher in 1975 (the highest possible rating is 10). By 1999, roughly 38 percent of the countries studied had that rating. The recognition of the link between stable money and growth and prosperity probably led to the greater use of currency boards and the increase of dollarization witnessed in the past 20 years.

Although countries differ along many dimensions, a sound economic infrastructure seems to be a necessary ingredient for achieving prosperity and growth. We've seen evidence suggesting how important that infrastructure is. The realization of the connection between infrastructure and growth has probably caused more countries to add at least one important component to their infrastructure—a stable monetary and financial system.

Recommended Reading

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