

# Capital and its Complements

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We economists are professionally required by our discipline to be of at least two minds on every issue: on the one hand, but on the other hand—was it Harry S Truman who famously said that he desperately wished to find a one-handed economist? Usually, however, the “on the one hand, on the other hand” structure of economic argument is more of a pose than a reality. One does give the arguments on both sides, but one of the hands is strong and capable and the other one is palsied. The mind behind one hand is strong, confident, and loud; the other whispers “but what if?” in the backs of our brains.

On today’s issue—capital and its complements, the role of saving, investment, and international capital flows in modern economic growth—however, the “on the one hand, on the other hand” structure of the argument is definitely not a pose. Economists today should be, must be of at

least two minds with two if not three hands as they try to assess what is going on in global capital markets and what impact it has had and will have on modern global economic growth. This mode of proceeding has benefits: we are genuinely uncertain, and we are genuinely confused. It has costs as well: the thread of the argument is hard to follow, if indeed there is a thread, or an argument. One ends up confused—but at least one's confusion has been raised to a more sophisticated, subtle, and complex level.

This paper will therefore present a confused and rambling look at the issue of capital and its complements in economic growth in five stages:

- Historical patterns: what has been the relationship between capital and growth in the past, and what economists have thought about that relationship.
- The capital accumulation gradient: the increasing difficulty as industrialization proceeds that poor developing countries have in raising their capital intensities to levels that allow use of the most modern productive technologies.

- The neoliberal bet: the hope so confidently and widely shared a couple of decades ago that international capital mobility would greatly aid in helping poor countries climb up the capital accumulation gradient—that heightened capital mobility would be able to produce rapid industrialization and growth throughout the world.
- The unexpected reversal: the fact that international capital mobility over the past two decades (a) has expanded much more rapidly than almost anybody had predicted, but (b) has expanded in the wrong direction—the poor have not been borrowing from the rich to finance their investment and industrialization, instead the rich have on net been borrowing from the poor to finance their own consumption.
- What is to be done: this is the weakest part of the paper, because it is not at all clear what is to be done.

Think of it as a classically-structured tragedy, in five acts. The tragic flaw is the assumption that the relationship between capital flows, investment, and growth today and tomorrow would be the same as it had been in the past—specifically, in the late nineteenth century when capital flows to capital-scarce but resource-rich regions had powerfully fueled

industrialization and development. The critical reversal of fortune comes when the unblocking of the barriers to large net capital flows sees the flows proceed at an unexpectedly large intensity—but in a large and destructive way. The denouement—that has yet to be written; in fact, it will be our job over the next decades to write it.

### **Act I: Capital, Growth, and History**

Begin with the economic history: what professional economists have thought about the capital stock and its importance for economic growth over the past two centuries, starting with economics founding father Adam Smith (1776). For Smith and his successors up until 1950 or so, capital was absolutely essential for economic growth. At the foundation you needed good institutions: “security of property and tolerable administration of justice” Smith (1776) called it, little more than which was required, in his view, to raise countries’ economies to the maximum feasible heights of prosperity. If these fundamental institutions were right, then landlords, merchants, and manufacturers would invest and improve. In investing and improving, they would add to the capital stock:

In all countries where there is a tolerable security [of property], every man of common understanding will endeavour to employ whatever [capital] stock he can command, in procuring either present enjoyment or future profit... A man must be perfectly crazy, who, where there is a tolerable security, does not employ all the stock which he commands, whether it be his own, or borrowed of other people....

And a larger capital stock would mean thicker markets, a finer division of labor, and a more productive economy. A society with a sophisticated division of labor would have very high productivity, and that process was how you got to the wealth of nations.

Reverse the process and you had the poverty of nations, as Smith believed that he saw in the Asia of his time:

In those unfortunate countries, indeed, where men are continually afraid of the violence of their superiors, they

frequently bury or conceal a great part of their stock, in order to have it always at hand to carry with them to some place of safety, in case of their being threatened with any of those disasters to which they consider themselves at all times exposed. This is said to be a common practice in Turkey, in Indostan, and, I believe, in most other governments of Asia...

For Smith and his successors over the first 175 years of the economics profession, capital was seen as absolutely essential for any episode of sustained economic growth. We economists were by and large capital boosters, and our mantra was that saving, investment, thrift, and wealth accumulation is the magic formula that gets us to where we want to be. The last and fullest expression of this line of thought comes in 1957 with W.W. Rostow's *Stages of Economic Growth: A Non-Communist Manifesto*. In Rostow, the key to joining the industrial economies and triggering self-sustained modern economic growth came when the economy (and the polity) reached the point where it could suddenly—over a decade or a little more—double its private and national savings and investment rate. That, and

of course, the sociological, political, and other economic processes that triggered that doubling and sustained it, was what was most needed.

It was in large part because this line of thought had been so dominant, essentially unquestioned, that the work of Solow (1956) and Abramovitz (1957) came as such a shock and had such great influence. They made the assumption that the social marginal product of capital is well-captured by the individual returns that corporations and other businesses earn as profits and that savers and investors receive as income. They said: “wait a minute: under that assumption, capital is not that important after all.” Looking at the sources of productivity growth and increases in living standards in America over the twentieth century, both Abramovitz and Solow calculated that something like 75 or 80 percent did not come from increasing the capital-output ratio—at least not if the private marginal product of capital was taken as an indicator of the social marginal product. Instead, the keys to growth and development appeared to be other things than a rise in capital intensity as measured by the capital-output ratios: skills, education, technology broadly understood, and improvements in organizational management.

Then in the 1990s there comes a partial reaction against the conclusions of Abramovitz and Solow. Mankiw, Romer, and Weil's (1992) very influential cross-country growth study found, in its final and preferred specification, as capital share  $\alpha$  in the Cobb-Douglas production function of a half, with signs that capital was more important in growth the further down the income scale you looked. Profit share-based estimates had produced estimates of  $\alpha$  in the range of 1/3 to 1/4. It makes a significant difference whether output per worker is linear in the savings-investment rate, as Mankiw, Romer, and Weil's coefficients suggested, as opposed to the alternative of growing with the square or cube root of the savings-investment rate.

DeLong and Summers (1991) found that the post-World War II cross-country dataset contained an extraordinarily strong correlation between growth and *private* investment in machinery and equipment. Public investment by state-owned monopolies did not do it. Investment in structures did not do it. The correlation was very strong in OECD-class and middle-income economies. And it appeared to remain even when you looked far down at the very bottom of the cross-country income distribution—high-investment low-growth Tanzania and Zambia being neutralized in the

dataset by still higher-investment and extraordinarily rapid growth in their neighbor Botswana. The correlation appeared to arise whether the high rate of equipment investment was driven by a high domestic savings rate, large capital inflows, or low relative prices of machinery and equipment that translated a moderate savings effort into a substantial investment outcome.

At the conceptual level, this makes considerable sense. A lot of what we economists think of as total factor productivity is in one way or another embodied or has essential requirements in the shape and magnitude of collective capital stock. It is not unreasonable to think that simply piling up more capital without having better organizations or better technology does not do much good. Yet it is also not unreasonable to think that a high level of capital is an essential complement to the things that really do matter, and that the things that do matter the most matter the most only if capital is not a significant constraint. In the framework of Rodrik (2004), a shortage of capital can be but not must be a binding growth constraint: a place where “the biggest bang for the reform buck can be obtained” if it is “the most significant bottleneck in the economy.” But if not, not.

From this perspective, large estimated coefficients in cross-country growth regressions found either for investment in the aggregate capital stock, as shown in Mankiw, Romer and Weil (1992), or for investment in the machinery capital stock, as in DeLong and Summers (1991), has three meanings. First, that high investment serves as a marker that other binding constraints to growth are absent. Causation thus runs both ways: a rich country where things are going well, profits are high, and property is secure will be a natural place to invest. High investment is a cause of prosperity and also a signal of prosperity, showing that things are going right. Second, that policies aimed at spurring investment may well prove unsuccessful and counterproductive if there are other binding constraints to growth—and if investors are smart enough to recognize that these other binding constraints mean that the rate of private return on investment is not likely to be high. Third, that in a significant fraction of times and places a shortage of new capital is the binding constraint on growth, and that relaxation of this constraint does indeed reveal a very high marginal social product of capital.

## **Act II: Population, Relative Price Structures, and Growth**

The argument that a shortage of capital is frequently an important binding constraint on developing-country growth has several steps. The first step is to note that poor countries are still, for the most part, rapid-population-growth countries. China and India either are approaching zero population growth, or would be approaching zero population growth if not for the enormous momentum currently embedded in the age structure. But there are still a huge number of countries—and not just the countries in Africa—where populations are growing rapidly. Their populations are growing rapidly because countries with low levels of prosperity and low levels of literacy are countries where people find it advantageous for private insurance reasons to have relatively large numbers of children. High mortality means that only ample reproduction now can ensure that one is outlived by one's descendants. And low education levels mean that children soon turn from mouths into hands, and so add to the household's productive potential in the relatively short run. These facts of life mean that population and labor force growth is relatively fast, which means that unless domestic

savings in these countries goes through the roof, domestic capital-output ratios will be relatively low.

When, as in Mexico today, your population is growing at between 2 and 3 percent per year, it requires a huge domestic savings effort to increase your capital-output ratio—unless, that is, you can ship a huge share of that increase of the labor force north over the border and lessen your own domestic problems of growth. Thus rapid population-growth countries will be relatively poor countries, which will be rapid population-growth countries.

[Figures 6.1 and 6.2 about here]

The second step is to take a look at relative poverty and real investment, as depicted in two interesting figures from a paper by Chang-Tai Hsieh and Peter Klenow (2003). Figure 6.1 shows investment rates as a share of GDP plotted against GDP per worker, using a purchasing power parity concept and common international prices worldwide. Figure 6.2 shows the same investment rates at domestic prices. While Figure 6.2 is flat, Figure 6.1

shows a sharp rise from 5 percent to 25 percent of GDP as you move from the poorest to the richest countries in the world.

Relative to the price of output, the price of capital broadly understood, according to Hsieh and Klenow, varies by a factor of five and varies systematically with income. If you are Tanzania or Mali or even Bangladesh, it takes 4 percent of GDP devoted to national savings and domestic prices to produce a 1 percent real investment share of GDP when real investment is measured at standard international prices. This implies an extraordinarily tilting of relative price structures against the poor countries of this world: it requires enormous domestic savings efforts to get even tolerable amounts of real capital to use for development.

If we are right in our guess that capital is close enough to being a composite commodity such that we can talk about capital and labor, and still make coherent sense looking all the way across the world's income distribution, then for this reason alone a relatively poor country is going to find it next to impossible to get a reasonable capital-output ratio through its domestic savings, solely, because of this tilting of relative price structures. This is a

much stronger disadvantage of backwardness than the crowding of markets for primary products stressed by the original statements of the price-structure-and-underdevelopment thesis in, for example, Prebisch (1959). It also points out a defect in the thesis that one reason that poor countries are poor is that their citizens or their leaders or their governments have by and large chosen to consume rather than to save. That is simply not the case: savings rates on a national level have little or no partial correlation with prosperity. It is relative price structures, and thus real investment shares of GDP as measured in international dollars, that have this high correlation.

The reason for this striking association is clear. Modern transportation via container ship makes the cost of transporting durable commodities across oceans essentially zero. Thus the nominal prices of tradeable manufactured goods will be close to the same all across the globe. What will not be the same are the nominal prices of services provided by unskilled labor: those will be roughly proportional to the product of the real wage—for which read real labor productivity—and the equilibrium real exchange rate. Any exchange rate that balances trade will thus produce a very high price of manufactured goods in terms of services and unskilled labor in poor

countries. And that is the tilt of the relative price structure against investment, which is heavily weighted toward the price of manufactured tradeable goods.

### **Act III: The Neoliberal Bet on International Capital Mobility**

Thus for poor countries to bootstrap themselves by their own efforts alone into rapid sustainable growth is very difficult. Hence the neoliberal bet: the hope that international capital mobility would come to the rescue, first by relaxing this binding capital constraint imposed by the tilt of relative price structures and second by reducing the scope for corruption and rent seeking via the economic controls imposed to prevent international capital mobility.

Courtesy of Christopher Meissner and Alan Taylor at this conference, we have already heard about the historical precedent: Britain before 1914.

According to Meissner and Taylor, Britain's net foreign assets in 1913 were equal to 20 months' GDP. Net foreign assets in 1913 equaled 60 percent of Britain's domestic capital stock.

A huge amount of industrialization in the resource-rich, temperate periphery before 1913, was financed by the willingness of British investors to commit their capital overseas—not just to build up Britain’s capital stock, but to build up capital stocks abroad as well. (Let’s pass over for a moment the fact that the British investors in the Erie Railroad found that Jay Gould stole two-thirds of their money, not least by taking a huge leveraged long position in the stock and then announcing his retirement from the company. He retired, the stock price boomed, and he pocketed something like 50 percent of the present discounted value of the fact that he would no longer be around to loot the company.)

Fifteen years ago I certainly shared this belief: that international capital mobility was perhaps the best thing that could help the world economy. It held the promise of allowing the relatively rich core to fund the industrialization of the poor periphery. Back in 1993 at then-current exchange rates China’s entire capital stock was \$2 trillion, at a time when the capital stock of the United States was \$20 trillion. All that you would have had to do to double the capital stock of China through international capital mobility was to gradually, over the course of a decade, move 10

percent of the capital stock of the United States across the Pacific. That would have done truly wonderful things.

Thus the neoliberal hope at the start of the 1990s was essentially to place a large economic policy bet on capital mobility: to trust that very large and very poor labor forces across the world would turn out to be very attractive to global capital free to flow. If relatively small amounts of technology transfer could be used to make such labor even a small fraction as productive as industrial core labor, the incentives for capital to flow toward the periphery like a mighty river would be overwhelming. Before 1914 it was natural resources that had provided the irresistible incentive for international capital mobility toward a periphery composed of economies like Canada, Australia, New Zealand, and the United States but also Argentina, Chile, Uruguay, South Africa, Kenya, Malaysia, Singapore, and Hong Kong. The hope was that in some respects this pre-1914 process could be replicated. That would cut at least a generation off the time needed to make a truly humane and prosperous world economy.

## **Act IV: The Unexpected Reversal**

But that is not what has happened. We know the unexpected outcome: global imbalances. Yes, there have been large flows of capital going both ways around the world. But the huge increase in gross flows is not the big story. The big story is that the large net flow of capital from the rich to the poor countries of the world seeking high profits from reducing disequilibria between the wages and the relative productivity of labor has simply not happened. Instead, the principal thing that happened was an enormous flow of capital from the periphery to the poor, a flow perhaps best-tracked in real time by Brad Setser of the Council on Foreign Relations on his weblog <<http://www.regmonitor.com/blog/stetser>>.

Personally, I first saw this at work in 1994, when I was sitting at the Treasury, blithely writing memos about the North American Free Trade Agreement (NAFTA). NAFTA promised to provide Mexico with guaranteed tariff-free access to the largest consumer market in the world. Thus, we modeled, there would be an extra \$20 to \$30 billion a year of capital outflow from the United States to Mexico as companies sought to take advantage of Mexico's new long-term comparative advantage as a manufacturing

production platform. The expectation was that it was that capital inflow into Mexico that would support a relatively high value of the peso for a substantial time—and hence produce immediate benefits from NAFTA to Mexico in terms of an investment boom and a higher level of real consumption because American imports would be available on easier terms. Hence, I argued, the late Rudiger Dornbush was almost surely wrong when he worried in the early 1990s about the state of the Mexican peso and the possibility of yet another Mexican devaluation crisis.

Well, as so often happened, Dornbusch proved smarter than I was. It turned out that \$20 billion to \$30 billion of capital a year did flow from the United States to Mexico as American firms sought production platforms. But it also turned out that what looked to be \$30 billion to \$40 billion a year of capital flowed from Mexico to the United States. Relatively rich Mexicans took a look at the country's monetary and political instability. They decided that in the event that something went really wrong from their perspective in Mexico and they had to flee across the Rio Grande in a rubber boat, it would be much better to get to Texas and have a large dollar-denominated asset account waiting for them in New York, rather than run the risk of having all

of one's money back in Mexico in the wake of whatever political instability led one to flee.

In addition there was and is a belief, stronger outside the United States than within, that the marginal product of capital within the United States is high, that there is an capital-technology complementarity, and that investing in the United States is the way to take advantage of this and make a profit from this special relationship. It is indeed the case that U.S. labor productivity is now 35 percent higher than it was back in 2000, with, as best as we can see, real wages remaining exactly the same. That represents a huge shift of income in the direction of capital. These represent huge potential profits, which attract foreign investment. It is not just political risks of investing abroad that are driving the long-term inflow of capital to the United States

Yes, there are benefits to international capital mobility. But for most of the past generation and looking into the future for the next, the message of the market is that those benefits do not include a relaxation of the capital constraint and thus an acceleration of growth in the global periphery. The attraction is not that the periphery offers an attractive labor force for capital

to profit from. The attraction is that the core—especially the United States—offers a form of protection for capital against unanticipated political disturbances. Since 1990 global investors have valued the American-provided political risk insurance that they can obtain by placing their money in the United States more than U.S.-based companies have liked the idea of producing abroad in places where the wages of labor are lower.

Dwarfing whatever private insurance against political risk was purchased by the inflow of private capital to the United States was the public purchase of political risk by emerging market governments, especially the government of China. Such large inward capital flows are a very good thing for China's state council: 300 million Chinese people living on the coast, largely in the cities, and 900 million people, most of whom are still desperately poor, residing in the interior. There are enormous pressures to move China's workers into more productive urban and non-agricultural occupations as fast as possible. The only sure way to do this for sure is to put them to work in coastal manufacturing and in supporting occupations.

This requires that somebody be willing to buy the products of China's manufacturing sector. Who is the world's importer of last resort? The world's importer of last resort is the United States. What would the consequences for China be if it could no longer think of increasing its exports by 25 percent or more per year? With its current rates of internal migration, there would be extraordinary economic, extraordinary social, and probably extraordinary political consequences as well if this export growth were curtailed. Inward capital flows are good for the world's rich, who are diversifying their portfolios into the core in a major way. The rich in the periphery can now sleep soundly, knowing that they have assets in a safe place, in case they have to take to the rubber boat. Or, if their great grandchildren might want to live in the United States, having lots of property in the United States now is a good way to get a letter from a senator to the Immigration and Naturalization Service. But global capital mobility does not appear to be a good way to relax whatever aggregate capital shortages serve as severe growth constraints on emerging markets.

Recognition of these facts came relatively slowly.

At first the consensus was that the inflow of capital was largely due to cyclical factors. The 1990s, now an eternity ago, saw U.S. Treasury Secretary Lawrence Summers attribute the pattern of capital flows to imbalances in the business cycle, and warn that the world economy had to get the business cycle back into balance and could do so either “by balancing up or balancing down.” In Summers’s view, the U.S. current account deficit could not be long sustained at its then extraordinary level of \$200 billion a year for very long. 2007 saw an American current account deficit nearly four times as large as the one that Secretary Summers had said was about to become unsustainable nearly a decade before.

Then the consensus shifted to believing that the large inflows on net of capital to the United States were largely the result of policy mistakes that had recreated the large U.S. budget deficits of the Reagan era. Somebody had to buy the newly-issued debt of the U.S. Treasury, and foreigners were a natural set of people to buy and hold it. Then the consensus shifted to seeing the capital inflow as the result of the U.S. housing bubble—the fact that all of my neighbors in California have been using their houses as gigantic

automatic teller machines to pull out huge amounts of equity to then spend on the style to which they would like to become accustomed.

Those—most aggressively Center for Economic and Policy Research economist Dean Baker—warned that the housing price appreciation of the 2000s was not entirely the result of Benjamin Bernanke’s global savings glut but was instead a bubble that would prove a dangerous source of financial instability have been proven correct. In retrospect it is difficult to imagine what those who approved adjustable-rate low-down payment mortgages were thinking. There were always large tail risks involved in such mortgages coming either from employment or interest rate changes, and it would have been proper for these risks to have been much more thoroughly diversified. Doctors living in suburban San Francisco should not be in the business of bearing such risks. Neither should highly-leveraged investment banks which have an originate-and-sell business model.

But does this mean the low interest rate policies of the United States in the early 2000s were a policy mistake? Would we really have a better world if interest rates had not been lowered so much in the early 2000s, and had all

the labor structurally displaced from the dot-com and telecommunications booms gone into unemployment? I do not believe so—although one has to grant that financial regulators would have served the public better had their communications strategies placed more emphasis on the inappropriateness of individuals bearing idiosyncratic financial risk, and both low down payments and adjustable rates are large sources of idiosyncratic risk.

The net flow of capital into the United States has been good for American spenders who have been able to borrow very cheaply and spend \$90,000 on a kitchen renovation. But is this easy feeding of America's appetite for consumption truly a good thing? Shouldn't America's domestic savings rate be higher? The old Solow model Golden Rule of thumb is that national savings rates should be equal to capital shares. Moving to a framework that, appropriately, allows for greater time discounting either through more steeply declining marginal utility of wealth or pure time preference reduces that somewhat, but still leaves America more likely than not in a situation in which it is short of savings.

This influx of capital to the core has been good to savers and governments abroad seeking insurance and—so far—returns. It may well have been good for the core by offering it capital to fund consumption on favorable terms at low interest rates. But it has not been so good for labor in the periphery. The hopes of seeing capital flowing from rich to poor to periphery, producing higher capital-output ratios out on the periphery, and transferring technology and boosting real wages for those who are not at the top of the income distribution, have really not been realized.

And there remain today the risks of sudden stops and reversals in international capital flows that could make the subprime crisis of 2007-2008 look like a Sunday afternoon picnic in Battery Park.

### **Act V: We Must Write It...**

This brings me to the final act: what is to be done? That is for us to decide. And I have no answers. I will, however, suggest three things. First, we need to recognize that the core is not a net capital provider to the periphery in the

current generation, there is no sign that it is going to be, and that is a bad outcome. Second, even though net international capital flows are going the wrong way there are still substantial gross capital flows outward. We can hope that the gross outward capital flow from the core to the periphery that will carry along with it the institutions and managerial expertise that have made people in areas around the Wequasset Inn at which this conference has been held so wealthy.

Third, we need to worry about tail risks, sudden stops, and why financial markets have not been appropriately pricing the risks generated by large-scale persistent inflows of capital to the core of the world economy.

### **Epilogue: April 5, 2008: Can a Global Recession Be Avoided?**

It is not yet foredoomed that the world economy will undergo a substantial recession. We might still escape. But governments should play it safe by starting to take more steps now to cushion, soften, and shorten the period of

high unemployment and slow, or negative, growth that now looks very likely.

Perhaps the best way to look at the situation is to recall that three locomotives have driven the world economy over the past 15 years. The first was heavy investment, centered in the United States, owing to the information technology revolution. The second was investment in buildings, once again centered in the United States, driven by the housing boom. The third was manufacturing investment elsewhere in the world, predominantly in Asia—as the United States became the world economy’s importer of last resort.

For 15 years, these three locomotives kept the world economy near full employment and growing rapidly. When the high-tech boom ended in 2000, the Federal Reserve orchestrated its replacement by the housing boom, while investment in Asia to supply the U.S. market was chugging along at an increasing pace.

The first locomotive ran out of fuel seven years ago, and there is no clear technology-driven alternative leading sector, like biotechnology, that can inspire similar exuberance—rational or otherwise. The second locomotive began sucking fumes two years ago, and is now coasting to a halt, which means that the third—the United States as importer of last resort—is losing speed as well: the weak dollar accompanying the housing finance crash makes it unprofitable to export to the United States.

The world economy, as John Maynard Keynes put it 75 years ago, is developing magneto trouble. What it needs is a push—more aggregate demand. In the United States, the weak dollar will be a powerful boost to net exports, and thus to aggregate demand. But from the perspective of the world as a whole, net exports are a zero-sum game. So we will have to rely on other sources of aggregate demand.

The first source is the government. Fiscal prudence is as important as ever over the medium and long term. But for the next two or three years, governments should lower taxes—especially for the poor, who are most likely to spend—and spend more.

The second source is private investment. The world's central banks are already cutting interest rates on safe assets and will cut them more as the proximity and magnitude of the likely global slump becomes clear.

But low interest rates are entirely compatible with stagnation or depression if risk premia remain large, as the world learned in the 1930s and Japan relearned in the 1990s. The most challenging task for governments is to boost the private sector's effective risk-bearing capacity so that businesses have access to capital on terms that tempt them to spend.

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