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When Will the United States Grow Out of Its Foreign Debt?

One of the most provocative developments in the U.S. economy during the 1980s was the rapid increase in net foreign claims on U.S. assets, with its counterpart in a large domestic trade deficit. To some observers, the heightened pace of foreign acquisition of U.S. assets was clear evidence of an improved investment climate and so should be regarded as a sign of strength. To others, however, the foreign capital inflows were the result of a broad-based consumption binge. By drawing down wealth to support present spending levels, U.S. residents were compromising their future living standards.

In an article in the September 1989 issue of *Economic Review*, I argued that a substantial portion of the foreign capital inflows could be explained by U.S. demographics. During the 1980s, the baby boom generation created large investment demands, yet offered little saving to finance them. This behavior was normal, given the age of the cohort, however, and so the resulting foreign capital inflows held little significance for future U.S. living standards, one way or the other. As members of the baby boom aged, saving would rise, domestic investment would drop, and the United States would switch from being an importer to a net exporter of capital. My calculations showed that projected shifts in the age distribution of U.S. households were significant enough to raise net capital outflows to 3 percent of gross national product (GNP) by the year 2010.

A principal assumption in my earlier analysis was that rising U.S. capital outflows could be absorbed by the rest of the world without a decline in interest rates. In this article, I consider the reasonableness of this assumption and re-

evaluate the accuracy of my earlier projections. First, I look at the other major industrialized countries to see if their demographics would support a rapid turnaround in the U.S. capital account. The results are decidedly negative. Although the U.S. population will age significantly over the next several decades, so will the populations of other major trading nations. This coincidence in aging serves to postpone the date of improvement in the U.S. foreign investment position. A simulation of patterns of capital flow based on demographic conditions in the United States, Japan, Germany, and the United Kingdom suggests that the U.S. could remain a net importer of capital throughout the 1990s and into the early part of the next century.

This analysis probably represents an extreme among possible outcomes since other factors affecting the world capital market over the next few decades are likely to support rather than depress interest rates. I believe two to be especially important: (1) a more complete integration of developing countries into the world capital market and (2) the transformation of centrally planned economies into market economies. The United States is a young nation by the standards of the major industrialized countries, but it is old

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relative to the less-developed world. If, through internal reforms, countries such as Mexico and Argentina can gain broader participation in the world capital market, their demographics will lead them to draw capital from the United States and other developed countries.

A second factor that may significantly raise world investment demand over the next few decades is the economic liberalization of Eastern Europe and the former Soviet Union. Because of technological isolation and distorted incentive structures, a huge fraction of the capital stock in these countries is outmoded and will have to be modernized or replaced. The effects could be dramatic. In a simulated reconstruction of Eastern Europe, where the domestic capital stock is effectively doubled over the next ten years, I find that U.S. capital flows rise from -1 percent of GNP at the end of the 1980s to 1 percent of GNP by the end of the century. The consequences of a recapitalization of the former Soviet Union could be far greater.

After weighing these alternative considerations, I remain in general agreement with my earlier conclusion: with the aging of the baby boom generation, the United States is likely to become a major capital exporter by the end of this decade and throughout the early part of the next century. This course of events is not a given, however. Indeed, it is incompatible with the economic environment of the 1980s, where international capital flows were confined largely to

major Organization of Economic Cooperation and Development (OECD) countries. But the capital market of the future is likely to contain many new players, especially a number of developing and newly liberalized countries. The new participants will be net borrowers of capital and so will support the turnaround in the U.S. capital account that is called for by the aging of the U.S. population.

Demographics and capital flows within OECD countries

A limitation of the analysis in my earlier paper is that the effects of U.S. demographics on U.S. capital outflows were evaluated in a vacuum, without reference to demographic conditions in other trading countries. In this section, I look simultaneously at the demography of four major industrialized countries: the United States, Japan, Germany,² and the United Kingdom. These are among the largest of the developed countries, and their demographic characteristics are varied enough to be representative of all OECD countries.

The analysis here is based on numerical solutions of an overlapping generations model similar to the one I used in my earlier paper. The model is briefly described in the box titled "The Simulation Model." The simulations evaluate the effect of comparative demographics on the net external asset position of each country for each year from 1970 to 2010. Demographic differences highlighted in the model relate to historical variations in the size of successive birth cohorts. The analysis ignores any variation in life expectancy or patterns of household formation.

The results for the decade of the 1980s are very similar to those I found in my earlier work. When demographic conditions in the four countries are considered together, the United States remains a net capital importer, with a current account deficit averaging 1 percent of GNP each year throughout the decade. The dominant capital-exporting country is Japan, with annual outflows averaging 3 percent of its GNP. The United States is a net recipient of foreign capital not because its savings rate is low by international standards, but because its investment rate is relatively high. The high rate of domestic investment over this period reflects the entry of the baby boom generation into the U.S. work force.³

² The data for this article refer to West Germany before unification with East Germany.

³ Interestingly, the simulations indicate that U.S. capital inflows should have been as large during the 1970s as they were during the 1980s. Official estimates, on the other hand, date the decline in U.S. net foreign assets to the early 1980s. This disparity between the simulated and measured series adds a new perspective to the debate on the origin of U.S. foreign indebtedness. Traditional analysis has emphasized the emergence of factors during the 1980s, such as the U.S. federal budget deficit, that drew foreign capital into the United States. It may be equally important, however, to look for a cessation of factors that had restrained capital inflows during the 1970s. Most important in this regard may be the dismantling of capital controls by Japan and other major countries.

The Simulation Model

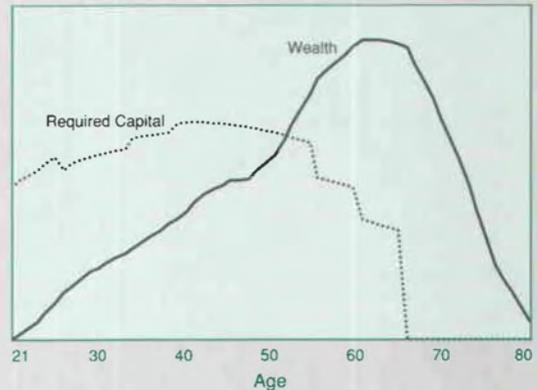
The model is designed not to replicate history or to forecast, but to evaluate the partial effect of demographic conditions on world capital flows. Households have identical preferences for consumption over time and identical life-cycle patterns of labor supply. Countries produce a single good using a common technology. Simulated movements in the external asset position of a country are entirely the result of relative shifts in population age mix.

Wealth accumulation. Households are formed by two adults of age 21. Each member has a fixed and known life expectancy. Households accumulate wealth according to the life-cycle theory. Each maximizes a lifetime utility function containing two parameters: an elasticity of intertemporal substitution and a pure rate of time preference. Following recent literature, I set the elasticity of substitution at a low value. The utility function also contains periodic weights reflecting family needs. These weights are defined by combining age-specific consumption weights with an assumed life-cycle pattern of family size and age composition.

Households begin their lives with no wealth, and they leave no bequests. They borrow and lend at a single rate of interest on the basis of their current and future labor income. Household labor supply is exogenous but is defined to reflect age-related variations in labor force participation and worker productivity.

Figure A shows an optimal wealth profile for a given wage and interest rate. The profile has the traditional hump shape, reflecting a pattern of accumulation during the working years followed by a reduction in wealth during retirement. The principal limitation of

Figure A
Life-Cycle Profiles of Household Wealth
and Required Capital



NOTE: With a world capital market, relative demographics determine the international investment position of a country. Young countries become net debtors because the capital required to support their work forces exceeds the accumulated wealth of their residents. Conversely, old countries become creditors to the rest of the world.

the life-cycle model is that it overstates the rate at which households draw down their wealth late in life. For some countries, the share of the elderly in the domestic population changes significantly over the period of our analysis. As I will note later, however, the direction of the bias is clear, and it reinforces the conclusions of the analysis.

Capital formation. Each country produces a single, nondepreciating good using labor and the good itself (capital). There are no adjustment costs in capital formation. The capital stock in a country depends on its labor supply and current factor prices.

(Continued on the next page)

The Simulation Model—Continued

All types of labor are perfect substitutes, but the efficiency of an individual's labor varies with age. The assumed effects of age on male productivity are based on studies of age-earnings profiles of U.S. men with college experience. Earnings for female workers are assumed to be independent of age and 1.3 times the earnings of an entry-level male worker.

Each household generates a demand for capital that is proportional to its labor supply. Figure A shows the relationship between age and required capital for a given wage and interest rate. The shape of the profile during the first half of the life cycle reflects gains in the productivity of the male worker and changes in the rate of female labor force participation associated with child rearing. Effective household labor supply peaks when adults are in their early forties. After that, labor supply begins to decline—slowly at first, tracking the decline in worker productivity, and then more rapidly as labor force participation falls.

Equilibrium. The real interest rate adjusts to ensure that aggregate wealth at the beginning of a year is just sufficient to finance aggregate capital requirements for that year. The net foreign asset position of a country is determined by the relative age mix of its population. Individual household wealth, w , depends on age, a , and the interest rate, r , but not on country of origin. The implied capital requirement of a household, k , is also inde-

pendent of its country of origin, varying only with age and the rate of interest. In equilibrium, therefore, net foreign assets per household in a given country can be written as

$$NFA = \sum_a [p(a) - p^*(a)][w(a,r) - k(a,r)],$$

where $p(a)$ is the fraction of the country's household population of age a and $p^*(a)$ is the corresponding fraction for the world. Differences in age mix provide the only basis for international exchange. The net external asset position of an individual household rises monotonically with age. Thus, countries with young populations become net international debtors. Their net foreign asset positions increase as they age relative to the rest of the world.

Demographic data. The model requires information on the number of households living in each country during the period 1970–2010. To measure the households formed in a given country in year t , I divide by 2 the number of individuals who were of age 37 (the median age of the statistical age bracket 35–39) and residing in the country during year $(t+16)$. Individuals are counted in their late thirties as a crude adjustment for immigration. Population projections are drawn from official sources. Because the period of analysis ends with the year 2010, relevant birth rates are known, leaving immigration as the major source of uncertainty in the projections.

Table 1

Simulated Rates of U.S. Saving, Investment, and Capital Outflow, 1990–2009

| Macroeconomic Aggregate | Average of Annual Rates (percent) | | | |
|--|--------------------------------------|--------------|--------------|--------------|
| | 1990–94 | 1995–99 | 2000–04 | 2005–09 |
| Constant World Interest Rate ^a | | | | |
| Saving/GNP | 3.9 (3.9) | 4.4 (3.7) | 5.4 (3.7) | 6.0 (3.5) |
| Investment/GNP | 3.9 (2.5) | 3.5 (1.7) | 3.0 (.9) | 2.0 (.2) |
| Capital Outflow/GNP | 0 (1.4) | .9 (2.0) | 2.4 (2.8) | 4.0 (3.3) |
| Declining World Interest Rate ^b | | | | |
| Saving/GNP | 3.9 (3.9) | 4.3 (3.6) | 5.3 (3.6) | 5.8 (3.3) |
| Investment/GNP | 5.3 (3.9) | 5.5 (3.6) | 5.9 (3.6) | 5.3 (3.3) |
| Capital Outflow/GNP | -1.4 (0) | -1.2 (0) | -.6 (0) | .5 (0) |

NOTE: Figures in parentheses are macro aggregates for a collective group consisting of the United States, Japan, the former West Germany, and the United Kingdom.

^aInterest rate held constant at its market-clearing value in 1989.

^bInterest rate adjusted each year so that capital flows among the four major countries net to zero.

Projected capital flows for the next two decades differ greatly, depending on whether interest rates are assumed constant or are adjusted until flows among the four major countries net to zero. The two cases are contrasted in Table 1 and Figures 1A and 1B. With a constant interest rate, demographic shifts within the U.S. population produce over the period 1990–2009 a 2-percentage-point rise in the savings rate and a 2-percentage-point decline in the rate of investment, as shown in Table 1. Accordingly, U.S. capital outflows rise by 4 percentage points of GNP. This is a repetition of the dramatic projections contained in my earlier article.

At a constant interest rate, the United States would seek to reduce its external debt. But the other major countries would wish to remain capital exporters, as indicated in Figure 1B. The result is a capital glut, with aggregate wealth exceeding

aggregate capital demand by more than 10 percent by 2010.⁴ Interest rates must fall to equalize capital flows among the countries. Investment spending is substantially more interest elastic than saving, so the bulk of the disequilibrium adjustment falls on investment. For the United States, the positive effect on investment from a falling interest rate offsets the negative effect of slower labor force growth. Any reduction in the rate of capital inflow

⁴ The size of the surplus is probably understated. For Japan and Germany, the share of the population age 65 and over is projected to rise significantly throughout the 1990s and 2000s. Given that the life-cycle model overstates the rate of dissaving among the elderly, the savings overhang is likely to be even larger than my analysis suggests.

Figure 1A
Projected Net Capital Outflow of the United States: Constant vs. Declining World Interest Rate

Percent of U.S. GNP

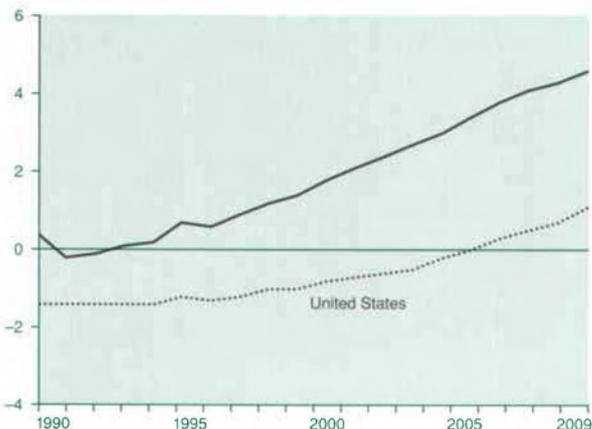
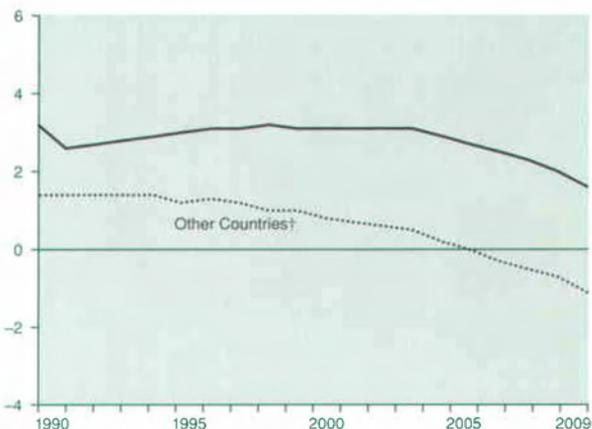


Figure 1B
Projected Net Capital Outflow of Other Selected Industrialized Countries: Constant vs. Declining World Interest Rate

Percent of U.S. GNP



† Japan, Germany, and the United Kingdom, collectively.

NOTE: With a constant world interest rate, the United States moves steadily toward becoming a large net exporter of capital by the early part of the next century. Other major industrialized countries wish to remain capital exporters, however. Without external investment opportunities to accommodate these capital outflows, interest rates must fall. The drop in rates would stimulate investment spending around the world and delay the date of improvement in the U.S. international investment position.

occurs because of an increase in the savings rate. U.S. net foreign assets continue to decline throughout the 1990s and on into the next century.

The basic reason for these results is as follows. The U.S. population will age significantly over the next two decades, reflecting the aging of the large baby boom cohort. By itself, this aging would produce a substantial rise in the U.S. foreign investment position. However, the populations of other major industrialized countries will also age over this period. On balance, the U.S.–world median age differential will rise only moderately. The implication is that any increase in U.S. net foreign assets will be much smaller than a partial analysis of U.S. demographic trends would suggest. The demographic forces behind this analysis are clear and decisive, so the conclusions are robust with respect to both alternative parameter values in my own analysis and alternative modeling approaches (Cutler et al., 1990, and Masson and Tryon, 1990).

Demographics in developing countries

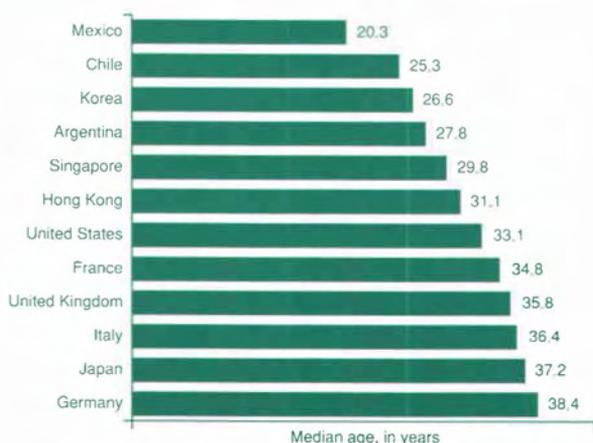
One of the salient trends in the international economy in the past fifteen years has been a move toward greater integration of national capital markets, especially among OECD countries. If this trend continues, the analysis of the previous section may itself be flawed by its omission of new participants in the world capital market. Figure 2 indicates how the results of the previous analysis would change. Relative to other developed countries, the United States is a young nation. If capital flows are largely confined to developed countries, the United States will tend to be a net debtor nation. The median age of the U.S. population is high, however, in relation to the less-developed world. The difference is moderate but significant when comparing the United States with the fast-growing East Asian countries, such as Hong Kong and Singapore. The age differential is dramatic, however, in the case of Mexico and other Latin American countries. The message, then, is clear. If

the process of capital market integration continues so as to include many of the developing countries, demographic forces will serve to support interest rates and raise the international investment positions of the major industrialized countries, including the United States.

Capital demands from newly liberalized countries

Demography is not, of course, the only factor that will affect world capital flows in coming decades. Of particular recent interest are historic economic reforms in Eastern Europe. To gauge the potential significance of these reforms, I used the model to simulate the effect of an economic reconstruction of Eastern Europe. For purposes of simulation, I created a country group that, relative to the collective population of the four major industrialized countries, has an identical age mix but is only one fourth the size to reflect the relative size of the six newly liberalized countries of Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, and Rumania. To simulate reconstruction, I assume that the capital stock of the country group

Figure 2
Median Age of Population in 1990 for Selected Developed and Developing Countries



NOTE: If international borrowing and lending are limited to the developed world, then demographic forces push the United States toward being a debtor nation. The United States is more likely to be a net creditor if developing countries can become more thoroughly integrated into the world capital market.

Figure 3
Simulated Effect of Economic Reconstruction in Eastern Europe on U.S. Net Capital Outflow



NOTE: Economic reforms in centrally planned or less-developed market economies can have a significant effect on the U.S. capital account. Here, reforms that succeed in doubling the East European capital stock over a ten-year period raise U.S. net capital outflows by 1 percent to 2 percent of U.S. GNP.

at the beginning of 1990 is only one-half as large as would be optimal, given the size of its labor force and the prevailing world interest rate. Reconstruction consists of a capital deepening that takes place at a uniform rate over a ten-year period until the year 2000, when capital-labor ratios are equalized.

The effects of the reconstruction are shown in Figure 3. A net demand for capital by East European countries serves to limit the decline in world interest rates. U.S. capital flows move from a deficit in excess of 1 percent of GNP at the end of the 1980s to a surplus of nearly 1 percent of GNP by the end of the century. Without additional stimulus, the U.S. current account then falls back into deficit. By that time, however, the former Soviet Union may be in a position to host foreign investment, with potentially greater consequences for world capital flows.

Does it matter?

A principal lesson of the analysis in my earlier paper was that demographic shifts can



produce large changes in capital flows and other macroeconomic aggregates that have very little consequence for living standards. So long as households plan over their life cycle, does it really matter whether the U.S. international investment position begins to improve this year or in ten years' time? There are at least two reasons for believing that it does.

First, a world capital glut would make it more difficult for members of the U.S. baby boom to prepare for retirement, adding to whatever

burden recent fiscal policy may have left them. Even more threatening, however, is the possibility of rising protectionist pressures should the U.S. trade balance remain in deficit for another ten years. In this light, recent economic reforms in Communist nations and in some Latin American nations, such as Mexico and Chile, take on added significance. Through their effect on world capital markets, these reforms may promote equity across generations of U.S. citizens and help to preserve free international commerce and exchange.

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