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Technology Capital and the U.S. Current Accounts*

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ABSTRACT

The rate of return on capital of U.S. foreign subsidiaries has been much higher than the rate of return on capital of U.S. affiliates of foreign companies. Over the period 1982–2005, the U.S. Bureau of Economic Analysis (BEA) estimates that the difference in returns, after subtracting taxes, averaged 6.3 percent per year. One explanation explored in this paper is the fact that multinationals make large intangible investments that affect profits but are excluded from BEA capital stock measures. Differences in *reported* returns on foreign direct investment (FDI) could exist if there were differences in the timing and magnitude of these foreign intangible investments. We explore this possibility using a growth model with two types of intangible capital: plant-specific intangible capital and *technology capital*. Technology capital is accumulated know-how from investments in research and development (R&D), brands, and organizations that can be used in as many available locations as firms choose. As countries open up, there are gains to foreign direct investment with more locations available in which to put technology capital. We choose parameters of our model to mimic the U.S. current accounts and find that the mismeasurement of incomes and capital stocks accounts for a little over half of the difference in reported returns.

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1. Introduction

Over the period 1982–2005, the U.S. Bureau of Economic Analysis (BEA) estimates that foreign subsidiaries of U.S. companies earned on average 9.3 percent per year after taxes while subsidiaries of foreign companies operating in the United States earned on average only 3.0 percent. These series are displayed in Figure 1.[1] The figure shows that the differences in these returns are both large and persistent. Furthermore, when compared to estimates of returns on capital located in the United States, the returns of U.S. subsidiaries abroad are 4 to 5 percentage points higher, and the returns of foreign subsidiaries in the United States are 1 to 2 percentage points lower. With roughly 30 percent of corporate profits coming from abroad, there is much interest in understanding why U.S. subsidiaries appear to do so much better than their parents and so much better than foreign affiliates in the United States.

In this paper, we show that large and persistent differences in returns can arise in the BEA's *reported* returns because of an unavoidable problem in measuring foreign profits and capital stocks. The accounting profits of foreign subsidiaries include rents on intangible capital and exclude certain intangible investments that can be expensed from profits. The BEA capital stock includes only tangible capital. Thus, the BEA methodology of dividing after-tax accounting profits by the stock of tangible capital yields a return for the foreign subsidiary that is not equal to the economic return.[2]

Two types of intangible capital are important for foreign operations of multinationals.

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[1] The U.S. return is *direct investment receipts* from Table 1 of the U.S. International Transactions divided by the *U.S. direct investment position at current cost* from Table 2 of the U.S. International Investment Yearend Positions. The foreign return is analogous: direct investment payments divided by the foreign direct investment position at current cost.

[2] The BEA introduced an alternative measure for returns starting in 1982 with the direct investment position *at market value* instead of *at current cost* in an attempt to deal with the fact that firms have intangible stocks; they found a return differential of 5.4% for 1982–2005. Although we use a model with intangible capital, we do not use the alternative measure of returns since it is not consistent with our theoretical measure.

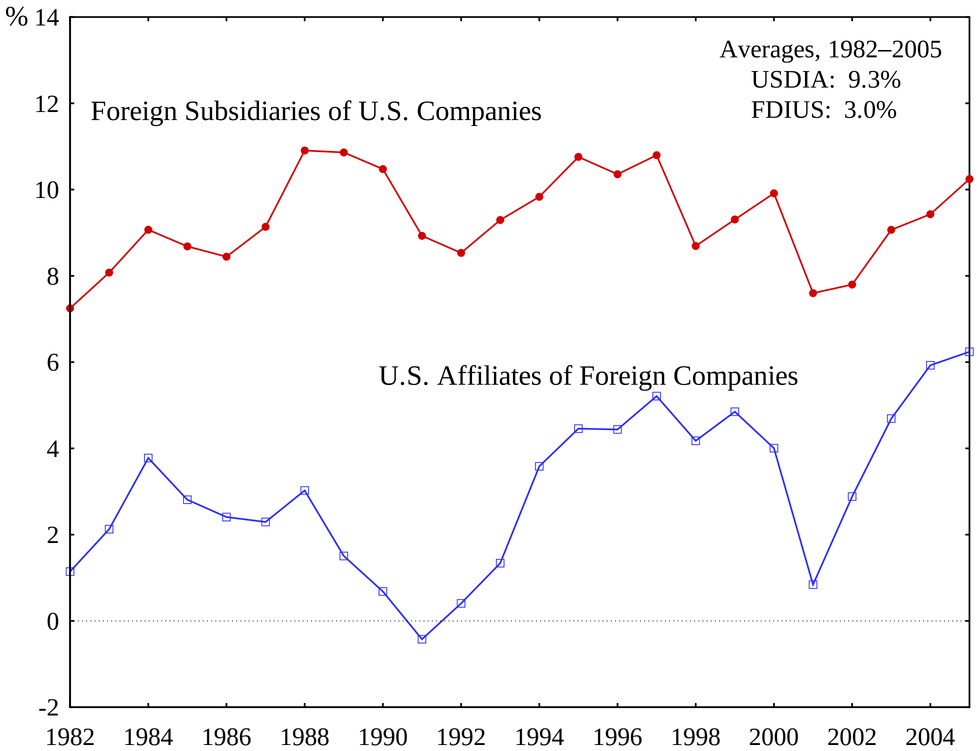

Figure 1. BEA Rates of Return on Foriegn Subsidiary Capital

Multinationals have know-how from intangible investments in R&D, brands, and organizational knowledge that can be used in as many locations in which firms have access, both at home and abroad. We call the stock of this know-how *technology capital*. A good example is a multinational's brands. A cup of Starbucks coffee cannot be exported from Seattle to Beijing; but Starbucks can set up operations in Beijing. When technology capital is used in foreign subsidiaries, this capital earns rents that are included in foreign profits. Multinationals also make intangible investments that are specific to a location or plant. We call the stock of these investments *plant-specific intangible capital*. This intangible capital stock affects foreign profits in two ways. First, it earns rents, and these rents increase the profits of foreign subsidiaries. Second, intangible investments are (for the most part) expensed, and any expenses made abroad lower foreign profits.

If the magnitudes of intangible rents and expenses are different for U.S. and foreign companies, then their foreign subsidiary returns should be different. In this paper, we explore the possibility that the magnitudes are different because of the timing of foreign direct investments. Evidence from the U.S. international accounts dating back to 1960 shows very different patterns for direct investment of U.S. companies abroad and direct investment of foreign companies in the United States. U.S. foreign direct investments abroad have been large and have been increasing at a steady pace. On the other hand, foreign direct investments in the United States were negligible until the late 1970s and then started increasing rapidly. The different patterns imply differences in the timing of intangible investments and profits arising from those investments.

We explore the quantitative importance of these differences by developing a multicountry general equilibrium model with a role for FDI and applying the same methodology as the BEA to report time series in the domestic and national accounts. In our model world, *actual* after-tax returns on *all* investments are equated, and there is no uncertainty. All differences in *reported* returns are due to differences in the timing and magnitude of profits from foreign intangible investments. We find that abstracting from intangible investments has large consequences for the reported rates of return on U.S. foreign subsidiaries and U.S. affiliates of foreign companies. We estimate that the mismeasurement accounts for a little over half of the *reported* 6.3 percent average FDI return differential for the period 1982–2005.

Our estimate is based on computed equilibrium paths for the United States and an aggregated rest of world with exogenous variables of the model chosen so that secular trends in the model's trade balance and foreign incomes mimic their analogues in U.S. current accounts over the full sample 1960–2005. The model generates the same magnitude of declines in the trade balance and net portfolio income and the same magnitude of increases in foreign direct incomes as observed in U.S. current accounts. The model also generates a comparable increase in the U.S. consumption share of GDP and a comparable decline in the U.S. share of world GDP.

The key parameters for generating the observed patterns in net factor incomes for the United States over the period 1960–2005 are the countries' *degree of openness* to foreign multinationals' technology capital. How open countries are depends on the degree to which foreign multinationals technology capital is allowed into a country to be used in production by the foreign multinationals. In a country that is closed, only domestic firms operate; there is no FDI income, and FDI returns are zero. As countries open up, there is a gain to FDI because companies have technologies that can be operated in any country permitting foreign FDI and at any location within a country.

In our theory, different timing of countries opening up to foreign technology capital is the crucial factor for differential returns on FDI. Countries that open first do relatively less investment in technology capital because they allow in technology capital from other countries. Thus, an implication of our theory is that U.S. companies should be more technology capital intensive than foreign companies who did less FDI. Differences in rents from technology capital is one source of differences in returns. A second source is the timing of expensed investments. When foreign multinationals were increasing their U.S. foreign direct investment in the late 1970s, it is likely that intangible investments rose along with tangible investments. Increased investment in plant-specific intangible capital, which is expensed abroad, lowers reported FDI income and, therefore, returns.

Graham and Marchick (2006) argue that one important factor for the fact that there was little foreign direct investment in the United States until the late 1970s was legislation concerning national security. During WWI, the Trading with the Enemy Act (TWEA) of 1917 allowed the U.S. president to seize title of foreign assets in an "international emergency." This permitted the United States to seize German and British capital. In 1977, the act was amended by the International Emergency Economic Powers Act (IEEPA), which stipulated conditions of an international emergency and took away the right to transfer title of foreign assets to the United States in such an emergency.

The model that we develop has efficient domestic and international goods and asset markets. Multinationals are price-takers using different technologies in competitive markets to produce a single composite good that is freely shipped anywhere in the world. All investments, whether at home or abroad, earn the same rate of return. We abstract from financial market and trade barriers to isolate the impact of intangible investments on the international accounts.[3] We find that our model economy, when parameters are based on U.S. observations, is successful in mimicking the trends in both the domestic and international accounts observed between 1960 and 2005.

The paper is organized as follows. Section 2 describes the theory we use. We first derive the aggregate production function for a closed economy with technology capital and then extend the derivation to the multicountry case. We then use the aggregate production functions in a general equilibrium model and show how to match it up with the U.S. international accounts. In Section 3, we choose parameters based on U.S. data and then compare equilibrium paths of our model with U.S. data. Conclusions are in Section 4.

[3] Caballero et al. (2006) and Mendoza et al. (2006) develop general equilibrium models with financial frictions to estimate the effects on the current accounts of unanticipated capital liberalizations. Fogli and Perri (2006) estimate the impact of lower U.S. business cycle volatility. None of these papers consider the impact of unmeasured investments.

2. Theory

In this section, we describe a multicountry general equilibrium model that builds on McGrattan and Prescott (2007). We begin by describing the technologies available to multinationals. We then describe the problems faced by citizens in the different countries. Finally, we describe how BEA accountants would record transactions with the data from our model economy.

2.1. Technologies

A country's stock of *technology capital* is the number (or measure) of technologies owned by its multinationals. A *technology* is a production unit that can be operated in any country and at any location within a country. An example of such a technology is a company brand or patent that can be used—with inputs of tangible capital, plant-specific intangible capital, and labor—in many locations simultaneously. The number of locations in a country is proportional to its population.

We start by describing production in one country and then extend the analysis below to a multicountry world.

Single-Country Production

We model a country as a measure of locations. Firms choose locations in which to set up operations and use their technology capital. Production also requires inputs of labor, tangible capital, and plant-specific intangible capital. For simplicity assume that z is a composite of these three factors of production. One unit of technology capital and z units of the composite input at a given location produces $y = g(z)$. Consider the case of brand equity with units of technology capital indexed by m. For ease of exposition, assume for now that m is discrete and that $m = 1$ is the Walmart brand, $m = 2$ is Home Depot brand, etc. The number of locations constrains the number of operations for each brand. In other words, Walmart can operate only one store per location, and Home Depot can operate only one store per location. It may be the case that both Walmart and Home Depot have stores at the same location.

We want to derive the total output for a country with locations N, technology capital stock M, and composite input Z. Now, we treat the number of locations and the number of technologies as real variables and choose $z : [0, N] \times [0, M] \rightarrow I\!R_+$ to solve

$$Y = F(N, M, Z) = \max_z \int g(z(n, m))\, dn\, dm \qquad \text{subject to} \int z(n, m)\, dn\, dm \leq Z.$$

We put conditions on $g(\cdot)$ so that there is an optimal plant size. Specifically, we assume that it is increasing and strictly concave.

Given the properties of $g(\cdot)$, the maximal production allocation requires that all brands be operated in all locations, with an equal amount of the composite input in each of the NM production units. Thus, the aggregate production function is $F(N, M, Z) = NMg\,(Z/(NM))$. Suppose that $g(z) = Az^{1-\phi}$, where A is a parameter determining the level of technology and $\phi \geq 0$. The aggregate production function in this case is

$$Y = F(N, M, Z; A) = A(NM)^{\phi} Z^{1-\phi}. \tag{2.1}$$

Below we assume that A may vary by country. The aggregate product F displays constant returns in the two factors of production M and Z: $F(N, \lambda M, \lambda Z) = \lambda F(N, M, Z)$. Notice, if $\phi = 0$, then (2.1) nests the standard specification which is linear in Z.

Multicountry Production

In the multicountry case, the only factor that can be used both at home and abroad is technology capital (e.g., brands). Let i index the country where production is occurring, and let j index the country of origin of the multinational. The number of locations of country i is N_i. The technology capital used by multinationals from j is M^j. The composite capital-labor input in country i used to produce output with technology capital of multinationals from j is Z_i^j. With these inputs, we write total output in country i as

$$\begin{aligned} Y_i &= \sum\nolimits_j F(N_i, M^j, Z_i^j; A_i, \sigma_i) \\ &= A_i (N_i M^i)^\phi (Z_i^i)^{1-\phi} + \sum\nolimits_{j \neq i} A_i \sigma_i (N_i M^j)^\phi (Z_j^i)^{1-\phi}, \end{aligned} \tag{2.2}$$

which is the sum of outputs of all multinationals, where A_i is the technology parameter for multinationals from i operating in country i, and $A_i \sigma_i$ is the technology parameter for foreign multinationals operating in i with $\sigma_i \leq 1$. If we maximized (2.2) subject to the constraint that the sum of composite inputs does not exceed the total in country i, $\sum_j Z_i^j \leq Z_i$, then the total (maximal) output is

$$Y_i = A_i [N_i (M^i + \sigma_i^{\frac{1}{\phi}} \sum\nolimits_{j \neq i} M^j)]^\phi Z_i^{1-\phi}. \tag{2.3}$$

This expression facilitates comparison to the closed economy case. If $\sigma_i = 0$, (2.3) is equivalent to (2.2).

Degree of Openness

As before, we include the technology parameter A_i which is common to all production units. In the multicountry case, there is an additional parameter in the specification of the production technology in (2.2), namely σ_i. The parameter σ_i is a measure of *the degree of openness of country* i. A value of 1 implies a country is totally open—so domestic and foreign firms have the same opportunities in country i. A value less than 1 implies that domestic and foreign firms are not treated equally. In particular, there are costs to foreign firms, and these costs have the same effect as if they had lower TFP than domestic firms.[4]

[4] A natural extension of this model would include industries, some of which are permitted to operate and some of which are blocked.

Another interpretation of openness is possible if we set $\omega_i = \sigma_i^{1/\phi}$ and rewrite (2.3) as follows:

$$Y_i = A_i[N_i(M^i + \omega_i \sum\nolimits_{j \neq i} M^j)]^\phi Z_i^{1-\phi}. \tag{2.4}$$

Here, ω_i can be interpreted as the fraction of foreign technology capital permitted to be brought in and used by foreign multinationals. If ω_i is equal to zero, costs are infinite and no foreign firms are permitted. This is the closed-economy case. As we noted before, in this case, country i has constant returns in technology capital and the composite input Z. If ω_i is greater than 0, the sum of output across the open countries is greater than the sum of output for the same countries if they were closed. It is *as if* there were increasing returns when in fact there are none.

This scale effect is more evident if we rewrite (2.4) in terms of *effective technology capital*. Let M_i be the effective capital *used* in country i, that is $M_i = M^i + \omega_i \sum_{j \neq i} M^j$. Substituting this into (2.4) yields the same expression as (2.1). The difference is that the effective capital stock is larger when countries are open.

Composite Input

The composite capital-labor input in country i is modeled as a Cobb-Douglas technology,

$$Z_i^j = (K_{T,i}^j)^{\alpha_T} (K_{I,i}^j)^{\alpha_I} (L_i^j)^{1-\alpha_T-\alpha_I} \tag{2.5}$$

with inputs of *tangible* capital, $K_{T,i}^j$, plant-specific *intangible* capital, $K_{I,i}^j$, and labor L_i^j.

Multinationals own the technologies that we have described above. Households own equity of these multinationals. We turn next to a description of the problems solved by each.

2.1.1. Multinationals

The stand-in multinational from j maximizes the present value of the stream of dividends:

$$\max \sum\nolimits_t p_t (1-\tau_d) D_t^j, \tag{2.6}$$

where dividends are the sum of dividends across all operations in all countries indexed by i and are given by $D_t^j = \sum_i D_{it}^j$ with

$$D_{it}^j = (1-\tau_{p,it})(Y_{it}^j - W_{it}L_{it}^j - \delta_T K_{T,it}^j - X_{I,it}^j - \chi_i^j X_{M,t}^j) - K_{T,i,t+1}^j + K_{T,it}^j, \tag{2.7}$$

$\chi_i^j = 1$ if $i = j$ and 0 otherwise, $X_{I,i}^j$ is investment in plant-specific capital which is split among locations in country i that j operates, and X_M^j is the technology capital investment of multinational j used in all locations in which j operates. The output produced by j in country i is given by $Y_i^j = F(N_i, M^j, Z_i^j; A_i, \sigma_i)$, which is defined in (2.2) with Z_i^j defined in (2.5). The wage rate in country i is W_i and is the same rate paid by all multinationals operating in i.

Dividends for j are equal to worldwide after-tax profits less net investment of tangible capital, $\sum_j (K_{T,i,t+1}^j - K_{T,it}^j)$. (The latter is called *undistributed profits* in the U.S. NIPA accounts and *reinvested earnings* in the U.S. International Transaction accounts.) Taxable profits are equal to sales less expenses, where the expenses are wage payments, tangible depreciation, and expensed investments on plant-specific intangible capital and technology capital. Taxable profits in country i are taxed at rate $\tau_{p,i}$. We assume that multinationals do not engage in transfer pricing to avoid taxation.[5]

The capital stocks of the multinational next period are given by

$$K_{T,i,t+1}^j = (1-\delta_T) K_{T,it}^j + X_{T,it}^j$$

[5] Evidence of Bernard et al. (2006) and estimates of the U.S. Department of the Treasury (1999) suggest that corporate tax revenues lost to transfer pricing are small, on the order of 1 to 2 percent of corporate tax liabilities.

$$K^j_{I,i,t+1} = (1-\delta_I)K^j_{I,it} + X^j_{I,it}$$

$$M^j_{t+1} = (1-\delta_M)M^j_t + X^j_{M,t}.$$

Here, we assume that depreciation rates can differ for the three types of capital.

2.1.2. Households

The stand-in household in country i chooses consumption, hours of work, and next period asset holdings to solve

$$\begin{aligned} &\max \sum_t \beta^t U(C_{it}/N_{it}, L_{it}/N_{it} + \bar{L}_{nb,it}/N_{it})N_{it} \\ &\text{subject to} \quad \sum_t p_t[(1+\tau_{ci})C_{it} + \sum_j V^j_t(S^j_{i,t+1} - S^j_{it}) + B_{i,t+1} - B_{it}] \\ &\qquad\qquad \leq \sum_t p_t[(1-\tau_{li})W_{it}L_{it} + (1-\tau_{d,t})\sum_j S^j_{it}D^j_t + r_{b,t}B_{it} + \kappa_{it}] \end{aligned}$$

where C_i is total consumption of households in i, N_i is the total population in i, L_i is the labor input in the business sector, $\bar{L}_{nb,i}$ is the labor input in the nonbusiness sector, S^j_i is holdings of equities from j which have a price V^j and dividend D^j per share, B_i is holdings of debt which earns interest at rate r_b. Taxes are levied on consumption at rate τ_{ci}, labor at rate τ_{li}, and dividends at rate τ_d.[6] Transfers plus nonbusiness income less nonbusiness investment is summarized by κ_i.[7]

We assume that the number of locations in country i is proportional to the population of i. Without loss of generality, we use a proportionality constant of 1 and therefore use N_{it} to denote *both* the number of locations and the number of people in i. The motivation for this choice is that expanding markets requires more consumers.

[6] The dividend tax rate does not depend on i. If it did, we would need to allow for clientele effects.

[7] Activity in the nonbusiness sector is added (and treated exogenously) in order to ensure that the NIPA aggregates are of the right order of magnitude.

We abstract from uncertain events since we are interested in secular trends. Thus, the returns on household assets are equal in equilibrium and their composition of their portfolio is not uniquely determined. When choosing parameters, we pre-set debt holding and foreign share holdings and let equilibrium conditions determine the total net worth of households.

2.2. Comparison of BEA and Model Accounts

We want to compare the time series for our model world economy with those published by the BEA. To do so, we have to construct variables comparable to those that are reported in the BEA national and international accounts.

We start with the national accounts and in particular gross domestic product (GDP). GDP for country i at date t is given by

$$\text{GDP}_{it} = C_{it} + \sum\nolimits_j X^j_{T,it} + \bar{X}_{nb,it} + NX_{it} \tag{2.8}$$

where NX_i is net exports of goods and services by country i. Here, we are assuming that C includes both private and public consumption expenditures and $\bar{X}_{nb}$ includes all non-business investment expenditures of households, nonprofit institutions, and governments. Another way to calculate GDP is by adding up all domestic incomes. Specifically, if we sum up compensation of households ($W_i L_i$), total before-tax profits of businesses operating in i, $(Y_i - W_i L_i - \sum_j(\delta_T K^j_{T,i} + X^j_{I,i}) - X^i_M)$, tangible depreciation ($\sum_j \delta_T K^j_{T,i}$), and total nonbusiness value added ($\bar{Y}_{nb,i}$), we have GDP from the income side:

$$\text{GDP}_{it} = Y_{it} + \bar{Y}_{nb,it} - X^i_{M,t} - \sum\nolimits_j X^j_{I,it}. \tag{2.9}$$

This has to be equal to product in (2.8). From (2.8) and (2.9), it is easy to calculate net exports as total output—business plus nonbusiness—produced in country i less the sum of consumption and all investments.

Given that we are interested in measurement, it is worth noting that GDP for country i, as defined in (2.9), is *not* a measure of production of country i in the model economy. In the model economy, total production in country i is $Y_i + \bar{Y}_{nb,i}$. GDP is lower because some investments are expensed.

Next, consider adding flows from and to other countries. The BEA's measure of GNP is the sum of GDP plus net factor income from abroad.[8] Net factor receipts (NFR) are the sum of FDI income of multinationals and portfolio equity and debt income of households:[9]

$$\mathrm{NFR}_{it} = \sum_{j \neq i} \{D^i_{jt} + K^i_{T,j,t+1} - K^i_{T,jt}\} + \sum_{j \neq i} S^j_{it} D^j_t + \max(r_{b,t} B_{it}, 0). \tag{2.10}$$

Analogously, net factor payments (NFP) from i to the rest of the world are the sum of FDI income of foreign affiliates in i sent back to foreign parents and portfolio incomes from stocks and bonds of country i that are sent to investors outside of i:

$$\mathrm{NFP}_{it} = \sum_{j \neq i} \{D^j_{it} + K^j_{T,i,t+1} - K^j_{T,it}\} + \sum_{j \neq i} S^i_{jt} D^i_t + \max(-r_{bt} B_{it}, 0). \tag{2.11}$$

Adding net factor income to net exports and to GDP, we have the current account (CA) and GNP, respectively:

$$\mathrm{CA}_{it} = NX_{it} + \mathrm{NFR}_{it} - \mathrm{NFP}_{it}$$

$$\mathrm{GNP}_{it} = \mathrm{GDP}_{it} + \mathrm{NFR}_{it} - \mathrm{NFP}_{it}.$$

The net factor income flows (in (2.10) and (2.11)) are used by the BEA to construct rates of return on capital in foreign subsidiaries. There are several problems with these measures of income, however. First, a substantial part of net investment (reinvested earnings) is not included. In the case of income from foreign direct investment, only net

[8] Here, we abstract from wage compensation from abroad because it is negligible in the U.S. accounts.

[9] Equity holdings are categorized by the BEA as direct investment when the ownership exceeds 10 percent. Otherwise it is categorized as portfolio income.

investment in tangible capital is included. In the case of portfolio income, no net investment is included. Second, even if all net investment were to be included, income from *the same* investment of technology capital is made in different geographic locations.

To illustrate the problem, we construct returns on foreign direct investment using the BEA methodology for the following simple example with two "countries": the United States indexed by u and the rest of world indexed by r. For now, we assume that they have constant and equal tax rates on corporate profits given by τ_p. In this case, the *actual* returns that U.S. multinationals earn on their three types of investments are:

$$r_{Tt} = (1-\tau_p)\left(\alpha_T(1-\phi)Y^u_{rt}/K^u_{T,rt} - \delta_T\right)$$

$$r_{It} = \alpha_I(1-\phi)Y^u_{rt}/K^u_{I,rt} - \delta_I$$

$$r_{Mt} = \phi(Y^u_{ut} + Y^u_{rt})/M^u_t - \delta_M,$$

which follows from the maximization problem in (2.6). These returns are equated in equilibrium and, therefore, we can write $r_t = r_{Tt} = r_{It} = r_{Mt}$, where r_t is the common rate of return on all investments in the model's world economy.

Reported returns of U.S. subsidiaries from the rest of the world are equal to the FDI income (dividends plus reinvested earnings) divided by the tangible capital stock of U.S. multinationals abroad:

$$\begin{aligned} r_{\text{FDI},t} &= \left(D^u_{rt} + K^u_{T,r,t+1} - K^u_{T,rt}\right)/K^u_{T,rt} \\ &= (1-\tau_p)\left(Y^u_{rt} - W_{rt}L^u_{rt} - \delta_T K^u_{T,rt} - X^u_{I,rt}\right)/K^u_{T,rt} \\ &= (1-\tau_p)\left((\phi + (1-\phi)(\alpha_T+\alpha_I))Y^u_{rt} - \delta_T K^u_{T,rt} - X^u_{I,rt}\right)/K^u_{T,rt} \\ &= r_t + (1-\tau_p)\frac{(r_t+\delta_M)M^u_t - \phi Y^u_{ut} + r_t K^u_{I,rt} - K^u_{I,r,t+1} + K^u_{I,rt}}{K^u_{T,rt}} \end{aligned} \quad (2.12)$$

which are not equal to r_t when either plant-specific intangible capital or technology capital is nonnegligible. Interestingly, the reported return *can be higher or lower* than the actual return. It is higher if the net investment of U.S. foreign subsidiaries in plant-specific intangible capital, $K^u_{I,r,t+1} - K^u_{I,rt}$, is not too large. It is lower otherwise.

The question we address in the next section is, How large is the impact of this mismeasurement when the model is parameterized to mimic U.S. time series?

3. Quantitative Predictions for the United States

In this section we parameterize our model for the United States and the *rest of world* and use it to make predictions of secular trends in income, assets, and returns of foreign subsidiaries. In the Data Appendix, we provide detailed information about our data, which is primarily from the U.S. accounts compiled by the BEA. For the rest of world, we only use data on transactions with the United States and a measure of total GDP from the Conference Board and Groningen Growth and Development Centre (GGDC) (2007). In computing total GDP, we restrict the rest of world to regions doing nonnegligible trade and FDI with the United States. The list of these regions and the countries within is provided in the Data Appendix.

3.1. Model Inputs

Table 1 summarizes the parameters held constant when computing the equilibrium paths of our model. Table 2 summarizes all time-varying parameters. The latter are smoothed series to allow us to focus on trends.

Populations and total factor productivities are assumed to grow over time at rates γ_N

and γ_A, respectively. Trend growth rates are assumed to be the same for both the United States and rest of world. Trend growth in population is set at 1 percent per year and trend growth in total factor productivity at 1.2 percent per year. These rates, along with income shares in Table 1, imply a growth rate of 3 percent per year for output,

$$\gamma_Y = (1+\gamma_N)^{\frac{1-\phi(\alpha_T+\alpha_I)}{\phi(1-\alpha_T-\alpha_I)}}(1+\gamma_A)^{\frac{1}{\phi(1-\alpha_T-\alpha_I)}} - 1,$$

on a balanced growth path. We do allow for deviations from trend through variations in the relative size of the rest of world to the United States, which we describe below.

Utility is logarithmic with the weight on leisure equal to 1.32. The discount factor is chosen so that the average real interest rate is slightly above 4 percent.

The income shares in the business sector imply that the total share to capital is 35 percent.[10] We chose the three capital shares so that the model generates investment shares and equity market values that are consistent with U.S. data at the beginning of the sample. Specifically, the model generates (*i*) a total measured investment share of GDP around 27 percent in 1960, which is consistent with a measure of NIPA investment that includes consumer durables and government investment; (*ii*) a ratio of investment in technology capital to GDP of 6 percent in 1960, which is chosen to be slightly higher than the ratio of U.S. R&D and advertising expenditures to GDP, since we do not have direct measures of investments in organization know-how; and (*iii*) a market value of U.S. business—corporate plus noncorporate—of 1.5 GDP in 1960, which is consistent with the Flow of Funds market values.[11]

The depreciation rate for tangible investment is set at 5 percent and is consistent with

[10] When comparing the model to data, we compare multinationals in the model to all businesses in the economy.

[11] The National Science Foundation reports U.S. R&D expenditures of 2.6 percent times GDP in 1960. The U.S. Bureau of the Census (1965) reports estimates of U.S. advertising expenditures of 2.3 percent times GDP in 1960, with 1.4 percent at the national level and 0.9 percent at the local level.

BEA tangible investments and fixed capital stocks. Depreciation rates for plant-specific capital and technology capital are set at 0 and 8 percent, respectively. Unfortunately, we do not have direct measures of all intangible investments and stocks that can guide the choice of depreciation rates. We chose a higher estimate for technology capital than plant-specific intangible capital due to the fact that part of this capital is R&D. The BEA estimates a depreciation rate for R&D of 15 percent. Organizational capital, in our view, decays more slowly, and therefore we did not use the higher BEA R&D rate.

The initial technology parameters $A_{i,0}$ are set so that GDP in the United States is 32 percent of world GDP. This is consistent with the GGDC data in 1960 for the countries listed in Appendix A. We normalize $A_{u,0}$ to 1 without loss of generality.

Parameters of the nonbusiness sector were set at U.S. levels. These include the fraction of time to nonbusiness activity at 6 percent, the nonbusiness investment share of GDP at 15 percent, and nonbusiness value-added as a share of GDP at 32 percent.

In choosing tax rates, we fixed the two that have little impact on capital returns, namely τ_c and τ_l, and set them equal to estimated rates for the United States. Although some countries, such as those in Europe, have higher consumption tax rates than labor tax rates, what is relevant is the intratemporal tax wedge, $1-(1-\tau_l)/(1+\tau_c)$. For our parameter choices, this wedge is equal 35 percent. (See McGrattan-Prescott (2006) for details on these tax measures.)

Table 2 reports all time-varying parameters used to compute the model's equilibrium paths. The first two columns have time-varying tax rates on dividends and profits. Because the United States taxes worldwide incomes, the relevant tax rates for U.S. foreign direct investment are U.S. rates.

The dividend tax rate is based on estimates in McGrattan and Prescott (2003, Figure 1). The only difference is that we smoothed the time series because we are interested in predicting secular movements in the data. Similarly, we smoothed our estimate of the profits tax rate which is equal to the tax liability of corporations divided by corporate profits (with the Federal Reserve Bank profits subtracted from both the numerator and denominator). We assume the same rates apply to both corporate and noncorporate business income.

The last five columns of Table 2 contain time-varying inputs that are set so as to generate time series for U.S. current accounts that match up—at least secularly—with the actual accounts. The first of these are the openness parameters $\{\sigma_{rt}\}$ and $\{\sigma_{ut}\}$ that determine how open the rest of world is to U.S. multinationals and how open the United States is to foreign multinationals, respectively. These parameters are crucial for determining the level of incomes of foreign direct investment. If they are equal to zero in all periods, there is no FDI income at all. To generate the patterns of U.S. time series, with U.S. FDI receipts higher than FDI payments, it was necessary to set $\sigma_{rt} > \sigma_{ut}$ for all years we considered. We also chose a path for σ_{ut} that was increasing faster than σ_{rt} during the second half of our sample to capture the faster growth in income of U.S. affiliates of foreign companies which occurred after the passing of the International Emergency Economic Powers Act in 1977.

The *relative size* in Table 2 is the size of the rest of world relative to the United States and is given by

$$\text{Relative size} = \left(\frac{A_{rt}}{A_{ut}}\right)^{1-(1-\phi)(\alpha_T+\alpha_I)} \left(\frac{N_{rt}}{N_{ut}}\right). \tag{3.1}$$

Size is a measure of effective persons. In McGrattan and Prescott (2007), we show that the size of a country is what is relevant for GDP and productivity. In other words, a country that has a large population but a very low total factor productivity can have a lower GDP than a less populous country that is more productive. In terms of the exercise of fitting the current accounts, the relative size is most important for the trade balance since variations in relative GDPs requires that goods be shipped to smooth relative per capita consumptions.

There is not a unique way to choose the four series in (3.1) so as to generate the patterns in the U.S. current accounts. It could be that the population in the rest of the world (as defined in Appendix A) rose relative to the United States or its TFP rose relative the U.S. TFP. To ease computation, we set N_{ut} equal to the trend growth rate of population, A_{rt}/A_{ut} to the initial ratio of 0.37, and then varied N_{rt} so as to generate the right trends in the U.S. trade balance. It turns out that the implied series for N_{rt}/N_{ut} (and thus the relative size reported in Table 2) over the period 1960–2005 is similar to GGDC series for the relative populations. The GGDC data show a rise of 16 percent in the rest of world population relative to the U.S. population between 1962 and 1990 and a subsequent fall. The series for relative size that we use increases 16 percent between 1960 and 1990 and 5 percentage points more before falling in 2001—implying that a rise in relative TFPs played only a modest role and not until after 1990.

The last two columns in Table 2 are per-capita U.S. debt B_{ut}/N_{ut} and the U.S. holding of foreign shares S^r_{ut}. Technically, these are not exogenous parameters. However, because households are indifferent to the composition of their portfolios, we need to pre-set two of the three asset holdings and allow the third to be endogenously determined. We do this in such a way as to match the secular movements in interest net income and total portfolio net income.

3.2. The United States, 1960–2005

We now use our parameterized model economy to study the United States international accounts over the period 1960–2005. We first show that the model incomes and products exhibit the same level and trends as in U.S. domestic and international data. Then we compare the capital stocks in foreign subsidiaries and returns on these stocks with BEA estimates using their methodology. We find that the BEA mismeasurement of intangible earnings and stocks accounts for a little over half of the 6.3 percent difference in reported rates of return on direct investment.

3.2.1. Incomes

Averages over the period 1960–2005 for the broad categories of GNI are displayed in Table 3 for the actual and predicted U.S. accounts. This table shows that our choices of parameters yield good agreement on average between the U.S. and model components of gross national income. In both theory and data, consumption is about 74 percent of GNI on average over the sample. Business tangible investment is close to 12 percent of GNI. The share of nonbusiness investment in the model is set so that it is 15 percent of GDP which is close in magnitude to GNI throughout the sample. Net exports is about -1 percent of GNI on average.

On the income side, the model generates the right split between business and nonbusiness income. We can further break down business income into capital and labor income if we know how much of intangible investments are expensed by owners of business and how much by shareholders. In McGrattan and Prescott (2006), we assumed that half was expensed by each. If we assume the same split here, then the model's average business labor income, capital income, and depreciation relative to U.S. GNI are equal to 0.452, 0.15, and 0.073, respectively. For the United States, the corresponding figures are close: 0.456, 0.148, and 0.072 times U.S. GNI.

The final component of U.S. GNI is net factor income from the rest of world. Here again, there is good agreement between average U.S. levels and the model's predictions. Net portfolio income, which is non-FDI equity and interest receipts less payments, is $-.2$ percent of GNI for both the United States and the model. We do not report the subcategories of portfolio income because of the fact that household portfolio composition is not determined in theory. The foreign direct investments, on the other hand, are, and we show both receipts and payments. U.S. receipts have averaged 1.1 percent of GNI while payments have averaged .2 percent of GNI. The model prediction is very close to this, with 1.2 percent in receipts and .2 percent in payments. Adding up domestic income and net income from the rest of world gives us GNI in the last row of the table.

Figure 2 shows the model predictions for U.S. FDI receipts from their subsidiaries, U.S. FDI payments from U.S. affiliates to their parents, and the U.S. trade balance. These fit the secular trends by construction since we chose the inputs in Table 2 to generate comparable trends.[12] Most noteworthy is the fact that the model can replicate these trends. If we set $\phi = 0$ as in the standard growth model, we could not generate the U.S. patterns.

Figure 3 shows the portfolio net income component of the U.S. current accounts in the top panel. This includes both dividends from foreign equities and interest on external debt. In the lower panel, we show the interest income to highlight the fact that the model matches both the debt and equity components of income.

[12] In doing so, we put no weight on the 2004 and 2005 U.S. FDI receipts, which were temporarily high due to a one-time-only tax rate reduction allowed by the American Jobs Creation Act (AJCA) of 2004. Faust, Gleckman, and Barrett (2004) estimated that $300 billion would be repatriated under section 965 of the Internal Revenue Code that was added by the AJCA.

In Table 4, we show that the model also does well in predicting trends in U.S. consumption share and the U.S. share of world GDP. In the table, we report the shares for 1960 and 2005. The U.S. consumption share of GDP is close to 72 percent in 1960 for both the model and the data. By 2005, the observed share was 6.4 percentage points higher. The model predicts a rise of 5.2 percentage points. Many have interpreted this rise as a sign that U.S. households are "saving too little." This is not the case in the model since nothing prevents households from smoothing consumption optimally. Furthermore, there is a lot of new investment occurring as the world opens to foreign direct investment.

The U.S. share of world GDP declines between 1960 and 2005. In the model, this is due to the fact that the relative size of the rest of world is rising. The observed decline is 5.8 percentage points, which is very close to the model's prediction of 5.5 percentage points.

In summary, the model does a remarkably good job generating trends in domestic and international incomes and products that are close to those observed in the United States. We therefore regard the model as a useful framework to assess the puzzling patterns in U.S. foreign capital stocks and returns. We turn to this next.

3.2.2. Assets and Returns

Figure 4 shows the time series for capital stocks in foreign subsidiaries. The only stocks reported are tangible stocks. Panel A displays the BEA data. Panel B displays the model's equilibrium paths. We see from the BEA data that stocks of U.S. foreign subsidiaries were about 6 percent of U.S. GNP in 1960 while the stocks of U.S. affiliates were less than 2 percent of U.S. GNP. Stocks of affiliates remained low until the second half of the 1970s and then rose rapidly, nearly to the level of U.S. foreign subsidiaries by 2005. As a result, the net position first rises and then falls roughly in half.[13]

The model is able to capture the rise and fall in the net asset position, but the level of the capital stock in U.S. subsidiaries is higher than predicted. Thus, if we compare the BEA returns and the model returns, we find that the U.S. rate of return on direct investment abroad is lower than the BEA estimate. In Figure 5, we display the same returns as earlier (see Figure 1) along with the model returns. The BEA reports an average return on U.S. subsidiary capital of 9.3 percent. The model estimate is 6.7 percent on average, 2.6 percentage points below the BEA's. Notice, however, that the model does well in fitting the returns on foreign capital in the United States. The average return for U.S. affiliates was 3.0 percent while the model predicts 3.4 percent. Our estimates imply that the mismeasurement of intangible incomes and stocks accounts for a little over half of the return differential reported by the BEA.

The average true rate of return on foreign direct investment in the model economies—both the United States and rest of world—is 4.2 percent over the 1982–2005 period. The fact that the BEA methodology yields an estimate of 6.7 percent for U.S. capital is due to the fact that multinationals are earning rents on their technology capital. But foreign multinationals are also earning rents on technology capital. So why is there a difference in returns? The main difference is the expensing of plant-specific capital. Foreign direct investment—both tangible and intangible—is negligible for foreign companies at the beginning of our sample and then increases rapidly. The expensing of intangible capital lowers their profits and implies a lower return than U.S. capital abroad. In terms of equation

[13] In McGrattan and Prescott (2005), we capitalized the income of U.S. foreign subsidiaries in order to estimate the fundamental value of U.S. corporations including their operations abroad. We estimated the value of the stock of foreign subsidiaries—net of foreign stocks in the United States—at close to 0.3 times GNI for the 1990s. Similar calculations were made by Hausmann and Sturzenegger (2006). The inconsistency between our estimate of the net asset position and the BEA's was a motivating factor for the current study.

(2.12), the net investment term $K^u_{I,r,t+1} - K^u_{I,rt}$ that is subtracted from income is large.

3.2.3. Discussion

We have shown that abstracting from intangible investments has large consequences for reported capital stocks and returns. Much of the unreported capital, however, is not categorizable as "domestic" or "foreign" on one side of a net asset position. Technology capital is global by nature, and it is large. In our model economy for the period 1960–2005, we find that the reproducible stock of technology capital of U.S. companies, K^u_M, averages 0.49 times U.S. GDP, and its market value accounts for 12 percent of the total market value of U.S. corporate and noncorporate businesses.[14]

How then should we evaluate the performance of our economy or the wealth of our nation? From the standpoint of the model economy we study, what matters is consumption and hours. These are data that we observe.

4. Conclusion

We develop and use a multicountry model to show that abstracting from intangible investments has large consequences for the rates of return on U.S. foreign subsidiaries and U.S. affiliates of foreign companies. We estimate that over half of the difference between returns on direct investment of the United States and returns on direct investment in the United States is due to the accounting of intangible investments.

Our paper considers one factor leading to differences in domestic and foreign rates of return. Other factors that we abstract from may also have played a role. These include

[14] The market value of technology capital in period t is equal to its end of year reproducible cost times its price, $(1 - \tau_{d,t})(1 - \tau_{p,t})$.

transfer pricing by multinationals to avoid U.S. taxation, different risk characteristics of U.S. and foreign projects, and financial market frictions in foreign countries. We also may have built in too much symmetry in our modeling of the United States and the rest of world. If, for example, there are differences in technology-capital intensities between countries, we would expect larger differences in returns.

The model that we use does a remarkably good job generating trends in domestic and international incomes and products that are close to those observed in the United States. The model time series display large declines in the U.S. trade balance and the reported U.S. net asset position despite the fact that goods and asset markets are perfectly efficient. Thus, one of the main lessons we take from our study is that care must be taken when drawing inference from the international accounts. They can appear to have unsustainable trends when in fact there are none.[15]

[15] See Backus et al. (2006) and Obstfeld and Rogoff (2006) for two sides of the debate concerning the sustainability of the U.S. current accounts.

A. Data Appendix

The data sources for this study are listed below. After each source we note the specific tables that we use and where we use them.

National Income and Product Accounts, 1960–2005

- Tables 1.1.5, 2.5.5, 3.1, 3.5. Gross domestic product and components are used to construct averages in the top panel of Table 3 and in Table 4. Adjustments are made so that the income and product measures are comparable in the theory and data. Specifically, consumption taxes and intermediate financial services are excluded from value added and all expenditures on fixed assets are treated as investment. See McGrattan and Prescott's (2006) Appendix A for details.
- Table 1.7.5. Gross national income is used when constructing all averages in Table 3 and in Figures 2–4.
- Table 1.13. National income by sector is used to construct business and nonbusiness income in the middle panel of Table 3. In the nonbusiness sector, we include households, nonprofits, general government, and government enterprises.
- Tables 1.14, 3.2. Gross value added of domestic corporations is used to construct the tax rate on profits (with the Federal Reserve profits excluded) in Table 2.
- Table 4.1. Net exports and net factor incomes are used to construct averages of the current account components in the top and bottom panel of Table 3. The net exports series is also shown in Figure 2.
- Table 5.7.5. Private inventories are added to fixed assets for estimating tangible capital stocks and their depreciation rates.

Fixed Assets, 1960–2005

- Tables 1.1, 6.1. Current-cost net stocks by owner and by sector are used to adjust measures of consumption and investment in Table 3 and to estimate tangible capital stocks and their depreciation rates.

International Transactions Accounts, 1960–2005

- Table 1. U.S. direct investment receipts and payments are plotted in Figure 2 and used to construct the rates of return in Figures 1 and 5. Portfolio incomes plotted in Figure 3 are determined residually by subtracting direct investment incomes from net factor incomes in NIPA.

International Investment Position of the U.S. at Yearend, 1976–2005

- Table 2. Direct investment positions at current cost are plotted in Figure 4 and used to construct the rates of return in Figures 1 and 5.

Flow of Funds Accounts for the United States, 1960–2005

- Tables L123, B100. Corporate and noncorporate equity values are used to estimate the initial business market value. Land values are added to fixed assets for estimating tangible capital stocks and their depreciation rates.

GGDC Total Economy Database, 1960–2005

- GDP in constant 1990 dollars is used to construct U.S. share of world GDP in Table 4 using the list of countries below as rest of world.

Rest of world regions and countries

- Canada
- *Western Europe*: Austria, Belgium, Cyprus, Denmark, Finland, France, all Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom
- *Eastern Europe*: Albania, Bulgaria, Czechoslovakia, Hungary, Poland, Romania, Yugoslavia
- *Latin America and Other Western Hemisphere*: Argentina, Barbados, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, Guatemala, Jamaica, Mexico, Peru, Puerto Rico, St. Lucia, Trinidad and Tobago, Uruguay, Venezuela
- *Asia*: China, Hong Kong, Japan, Singapore, S. Korea, Taiwan
- *Oceania*: Australia, New Zealand

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TABLE 1. Model Constants

Parameter	Expression	Value
Growth Rates		
Population	γ_N	.01
Technology	γ_A	.012
Preferences		
Discount factor	β	.98
Leisure weight	ψ	1.32
Income Shares		
Tangible capital	$(1-\phi)\alpha_T$	.223
Plant-specific intangible capital	$(1-\phi)\alpha_I$	.056
Technology capital	ϕ	.070
Labor	$(1-\phi)(1-\alpha_T-\alpha_I)$	.651
Depreciation Rates		
Tangible capital	δ_T	.05
Plant-specific intangible capital	δ_I	0
Technology capital	δ_M	.08
Initial Technology Levels		
United States	$A_{u,0}$	1.0
Rest of World	$A_{r,0}$	.37
Nonbusiness Sector		
Fraction of time at work, $i=1,2$	$\bar{L}_{nb,i}/N_i$	.06
Nonbusiness investment, $i=1,2$	$\bar{X}_{nb,i}/\text{GDP}_i$	.15
Nonbusiness value-added, $i=1,2$	$\bar{Y}_{nb,i}/\text{GDP}_i$	.32
Fixed Tax Rates		
Tax rates on labor $i=1,2$	$\tau_{l,i}$	.31
Tax rate on consumptions, $i=1,2$	$\tau_{c,i}$	.066

TABLE 2. Model Time-Varying Inputs

	Tax rates		Openness			Per	US
					Relative	Capita	Foreign
Year	Dividends	Profits	ROW	US	Size	US Debt	Shares
1960	.400	.408	.840	.690	3.91	0	.010
1961	.400	.407	.841	.690	3.93	0	.010
1962	.400	.406	.842	.691	3.95	0	.010
1963	.400	.405	.842	.692	3.97	0	.010
1964	.400	.404	.843	.692	3.99	0	.010
1965	.400	.403	.844	.693	4.01	0	.010
1966	.400	.402	.845	.694	4.03	0	.010
1967	.400	.400	.846	.695	4.05	0	.010
1968	.400	.399	.846	.696	4.08	0	.010
1969	.400	.397	.847	.697	4.01	0	.010
1970	.400	.396	.848	.698	4.12	0	.010
1971	.400	.394	.849	.699	4.14	0	.010
1972	.399	.392	.850	.700	4.16	0	.010
1973	.399	.391	.850	.702	4.18	0	.012
1974	.398	.389	.851	.703	4.20	0	.013
1975	.397	.386	.852	.705	4.22	0	.014
1976	.396	.384	.853	.707	4.24	0	.016
1977	.393	.382	.854	.709	4.27	0	.017
1978	.388	.380	.854	.711	4.29	0	.019
1979	.381	.377	.855	.713	4.31	0	.020
1980	.370	.375	.856	.715	4.33	0	.022
1981	.355	.372	.857	.718	4.35	0	.023
1982	.333	.369	.857	.721	4.37	−.010	.025
1983	.306	.367	.858	.723	4.39	−.031	.026
1984	.276	.364	.859	.727	4.41	−.053	.028
1985	.246	.361	.860	.730	4.43	−.074	.029
1986	.219	.358	.861	.733	4.46	−.096	.031
1987	.197	.356	.861	.736	4.48	−.117	.032
1988	.182	.353	.862	.740	4.50	−.139	.034
1989	.171	.350	.863	.744	4.52	−.160	.035
1990	.164	.348	.864	.748	4.54	−.170	.037
1991	.159	.345	.865	.752	4.56	−.180	.038
1992	.156	.343	.865	.756	4.58	−.190	.040
1993	.155	.340	.866	.760	4.60	−.200	.041
1994	.154	.338	.867	.764	4.62	−.210	.043
1995	.153	.336	.868	.768	4.65	−.220	.044
1996	.153	.334	.869	.772	4.67	−.230	.046
1997	.152	.332	.869	.776	4.69	−.240	.047
1998	.152	.330	.870	.780	4.71	−.250	.049
1999	.152	.328	.871	.784	4.72	−.260	.050

TABLE 2. Model Time-Varying Inputs (cont.)

	Tax rates		Openness			Per	US
					Relative	Capita	Foreign
Year	Dividends	Profits	ROW	US	Size	US Debt	Shares
2000	.152	.327	.872	.788	4.72	-.270	.052
2001	.152	.325	.873	.792	4.73	-.280	.053
2002	.152	.323	.873	.796	4.72	-.290	.054
2003	.152	.322	.874	.799	4.72	-.300	.056
2004	.152	.321	.875	.803	4.71	-.310	.057
2005	.152	.320	.876	.806	4.69	-.320	.059
2006	.152	.319	.877	.809	4.66	-.330	.060
2007	.152	.317	.877	.812	4.64	-.335	.062
2008	.152	.317	.878	.815	4.62	-.337	.063
2009	.152	.316	.879	.818	4.60	-.338	.065
2010	.152	.315	.880	.821	4.57	-.340	.066
2011	.152	.314	.881	.823	4.55	-.342	.068
2012	.152	.313	.881	.825	4.53	-.343	.069
2013	.152	.313	.882	.827	4.50	-.345	.071
2014	.152	.312	.883	.829	4.48	-.347	.072
2015	.152	.312	.884	.831	4.46	-.348	.074
2016	.152	.311	.884	.833	4.43	-.350	.075
2017	.152	.311	.885	.834	4.41	-.350	.077
2018	.152	.310	.886	.836	4.39	-.350	.078
2019	.152	.310	.887	.837	4.37	-.350	.080
2020	.152	.310	.888	.838	4.34	-.350	.081
2021	.152	.310	.888	.839	4.32	-.350	.083
2022	.152	.309	.889	.840	4.30	-.350	.084
2023	.152	.309	.890	.841	4.27	-.350	.086
2024	.152	.309	.891	.842	4.25	-.350	.087
2025	.152	.309	.892	.843	4.23	-.350	.089
2026	.152	.308	.892	.844	4.20	-.350	.090
2027	.152	.308	.893	.844	4.18	-.350	.090
2028	.152	.308	.894	.845	4.16	-.350	.090
2029	.152	.308	.895	.845	4.14	-.350	.090
2030	.152	.308	.896	.846	4.11	-.350	.090
2031	.152	.308	.896	.846	4.09	-.350	.090
2032	.152	.308	.897	.847	4.07	-.350	.090
2033	.152	.307	.898	.847	4.04	-.350	.090
2034	.152	.307	.899	.847	4.02	-.350	.090
2035	.152	.307	.899	.848	4.00	-.350	.090
2036	.152	.307	.899	.848	3.98	-.350	.090
2037	.152	.307	.899	.848	3.95	-.350	.090
2038	.152	.307	.899	.849	3.93	-.350	.090
2039	.152	.307	.899	.849	3.91	-.350	.090

TABLE 3. U.S. and Model Components of U.S. GNI, 1960–2005
(Averages, All Relative to GNI)

Variable	Data	Model
Domestic Product		
Consumption	.738	.735
Investment	.266	.268
Business tangible	.114	.119
Nonbusiness	.152	.149
Net Exports	−.010	−.011
Gross Domestic Product	.993	.992
Domestic Income		
Business income	.677	.675
Nonbusiness income	.316	.317
Gross Domestic Income	.993	.992
Net Income From Rest of World		
Portfolio income (net)	−.002	−.002
Direct investment receipts	.011	.012
Less: Direct investment payments	−.002	−.002
Net Factor Income	.007	.008
Gross National Income	1.000	1.000

TABLE 4. U.S. and Model Consumption and GDP Shares, 1960 and 2005

Variable	Data	Model
U.S. Consumption Share of GDP		
1960	72.3	72.1
2005	78.7	77.3
U.S. Share of World GDP		
1960	31.7	31.8
2005	25.9	26.3

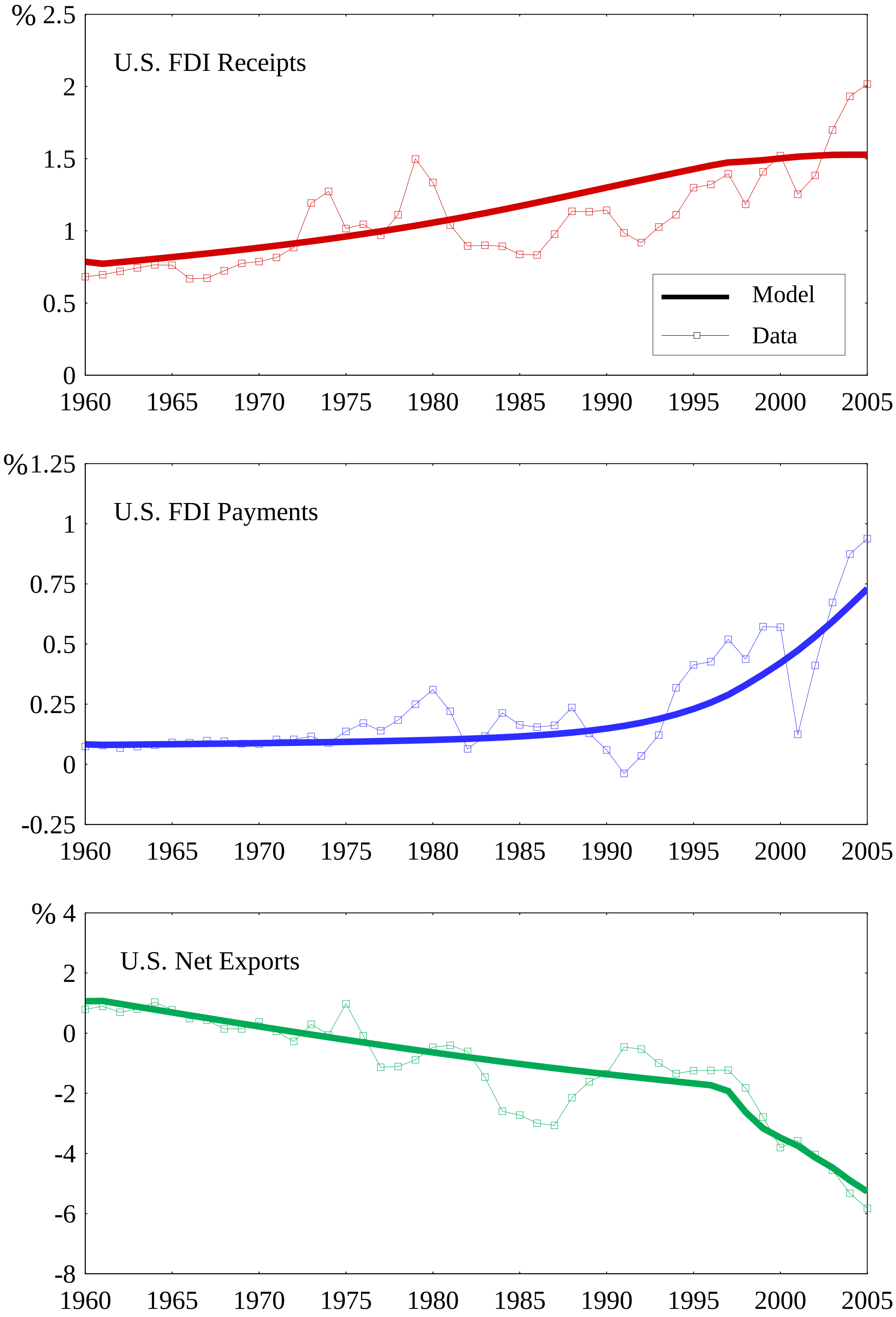


FIGURE 2. BEA AND MODEL COMPONENTS OF THE U.S. CURRENT ACCOUNTS (AS A PERCENT OF U.S. GNI)

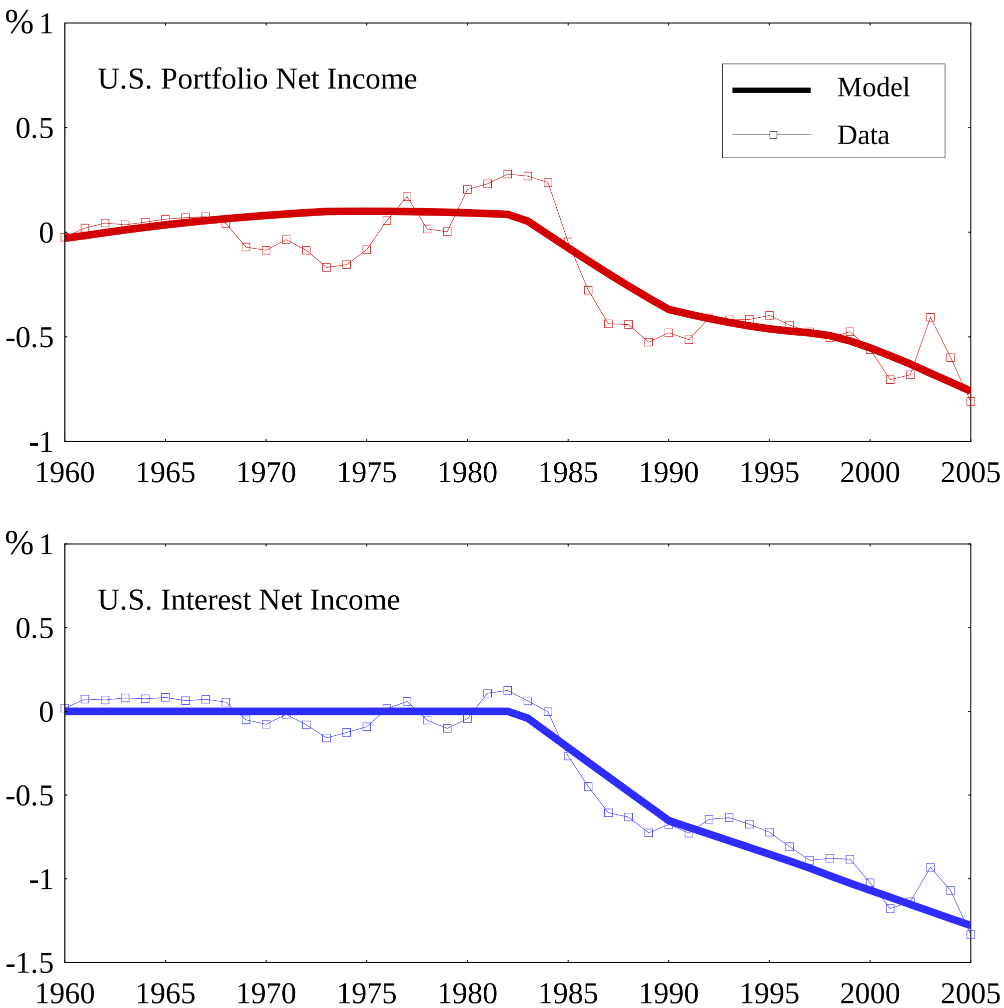
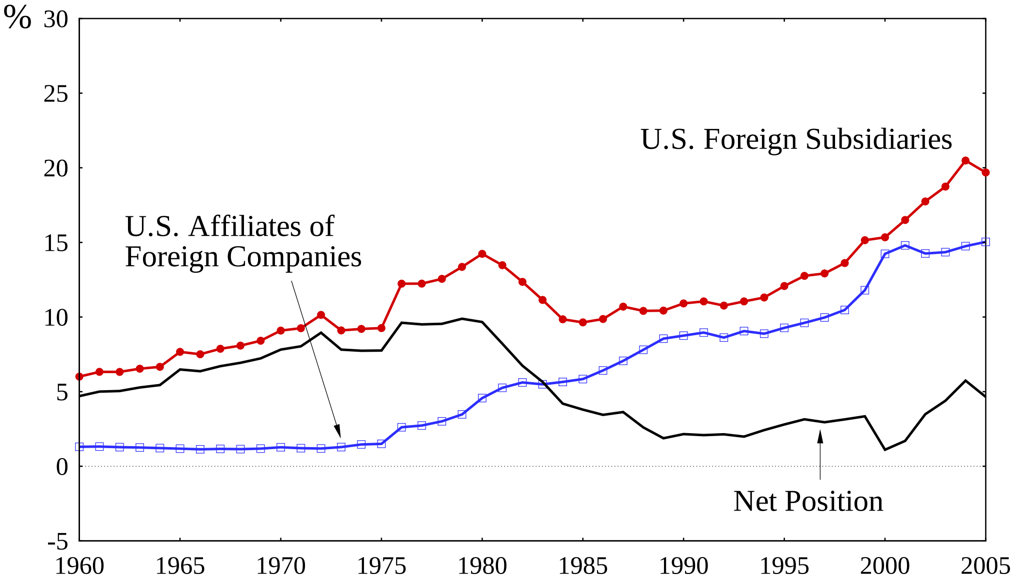
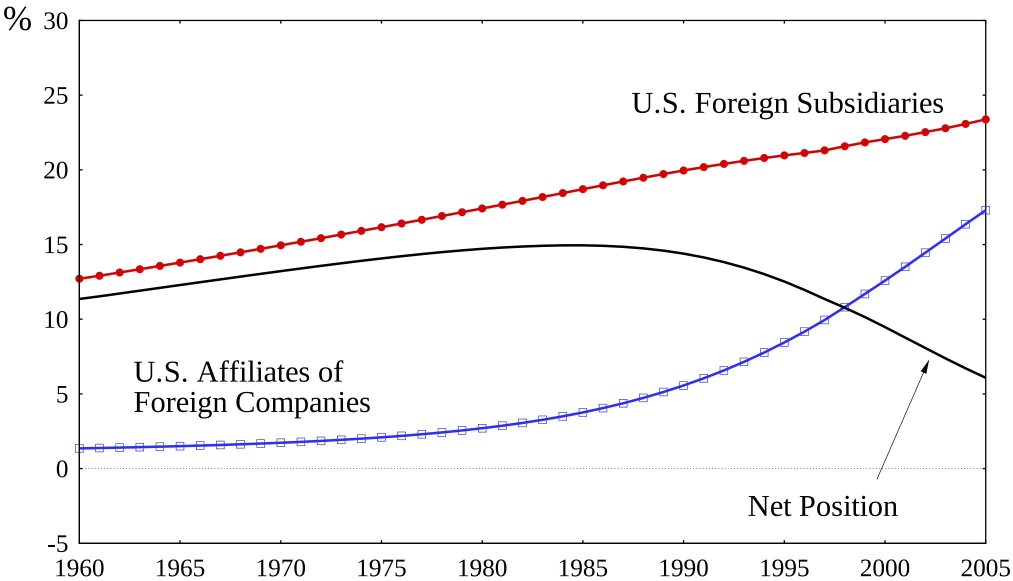


Figure 3. BEA and Model Portfolio Income of the U.S. Current Accounts (Total and Interest Component, as a Percent of U.S. GNI)



A. BEA



B. Model

Figure 4. Tangible Capital Stocks in Subsidiaries
(as a Percent of U.S. GNI)

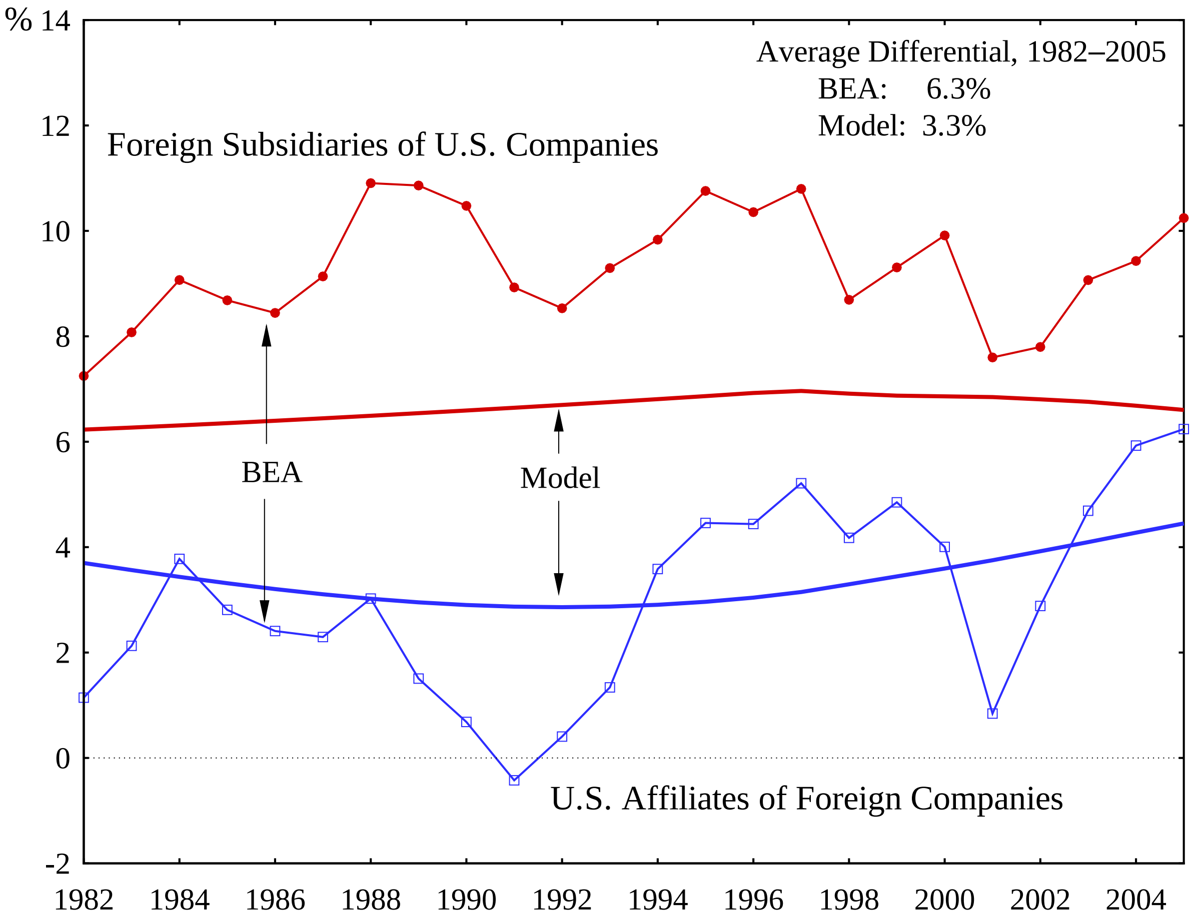


Figure 5. BEA and Model Rates of Return on Subsidiary Capital