Appendix C. Adjustments to the NIPA Data

In this appendix, we describe in detail the adjustments that we made to the data from the U.S. Department of Commerce before we compared these data to our model's estimates. These adjustments are reported in Table 1.

The Data

On the left side of Table 1, we report average values for income, product, and capital of the United States during 1990-99. The table first lists the accounting concepts of the NIPA data. For each category, we report average values relative to GNP. Thus, GNP is normalized to 1. Notice also that the sum of the value added for the corporate and noncorporate sectors is equal to GNP.

Corporate income is domestic income of corporations with operations in the United States. (See U.S. Commerce, various dates, NIPA Table 1.15.) *Noncorporate income* is the difference between gross national income (NIPA Table 1.14) and corporate income. Thus, noncorporate income includes income of households, the government, noncorporate business, and foreign subsidiaries. For compensation in the noncorporate sector, we include total employee compensation and 80 percent of proprietors' income. Profits of the noncorporate sector include profits of foreign subsidiaries, rental income, and 20 percent of proprietors' income.

Total product is the sum of private consumption, public consumption, and investment (NIPA Table 1.1). Investment includes fixed investment and the change in private inventories. Total investment is the sum of investment in three types of capital – measured corporate, unmeasured corporate, and noncorporate. We include net exports in noncorporate investment since production in the rest of the world is included in our model's notion of noncorporate production.

Capital stocks are mid-year stocks of corporate capital, measured and unmeasured, and noncorporate capital. (See U.S. Commerce, various dates, Fixed Assets Table 7 and 9.) These stocks correspond to the investments under 'total product.'

Adjustments

On the right side of Table 1, we provide descriptions and values of the adjustments that we made to the data in order to make them consistent with our theory. We now describe each adjustment.

NIPA includes sales taxes in its measure of private consumption. In our model, we treat consumption as pre-tax, and therefore, we subtract sales taxes from both income and product. On the income side, sales and excise taxes are included in indirect business taxes, 0.057 GNPs in corporate income and 0.022 in noncorporate income. We estimate that of the 0.079 GNPs of total indirect business taxes, 0.047 GNPs is sales or excise taxes, 0.037 in the corporate sector and 0.01 in the noncorporate sector. We attribute the remainder to property taxes. These property taxes appear in the column of adjusted average values.

NIPA does not include a measure of intangible investment because this type of investment is expensed. We estimate it to be 0.019 GNPs. (See Section X of the paper.) We include an estimate of intangible investment in our notion of GNP because it raises both after-tax corporate profits and investment.

We make an adjustment to net interest – in both the corporate and noncorporate sectors. We subtract the part of financial services purchased by businesses that we estimate consists of intermediate financial goods. NIPA treats net interest of financial intermediaries as purchases of services by the lender, typically, the household. The United Nations system of accounts treats it, instead, as purchases of services by the borrower. Thus, in the U.N. system, no entry for imputed interest is made, so imputed interest and consumption services are lower.

Here, we compute lenders' (borrowers') purchases of financial services as the product of the short-term interest rate less interest received and the amount loaned (borrowed).

We assume that all of the NIPA net interest in the corporate sector, totaling 0.015 GNPs, is intermediate services, and we subtract it. We assume that only part of the net interest in the noncorporate sector is intermediate. Net interest in the noncorporate sector is equal to 0.042 GNPs. Of this 0.042 GNPs, we estimate that 0.022 GNPs is intermediate and subtract it from noncorporate income. The remainder is included in noncorporate profits. Most of the 0.022 GNPs adjustment is for services implicitly purchased by homeowners with mortgages. It is the difference in interest paid by people with mortgages and the interest received by households lending to those financial institutions issuing mortgages. The adjustment that we make on the product side is to lower consumption services. We lower it by 0.037 GNPs, which is the sum of 0.015 GNPs and 0.022 GNPs.

Consumer durables are treated as private consumption in NIPA and as investment in our model. Therefore, we add in depreciation of consumer durables. For the 1990-99 period, the average depreciation of consumer durables was equal to 0.063 GNPs. On the income side, this depreciation is added to noncorporate capital consumption. On the product side, it is added to private consumption services. This is the procedure used for housing services which are included in NIPA.

Because profits of foreign subsidiaries are part of rest-of-world profits, and therefore noncorporate profits, we add an estimate of the capital of these foreign subsidiaries to noncorporate capital. Our estimate of the capital in foreign subsidiaries is 0.294. (See Section X of the paper.) To make the depreciation and investment of the noncorporate sector comparable to the capital stock, we add in depreciation and net investment for the foreign subsidiaries. Depreciation is added to noncorporate capital consumption on the income side and to noncorporate investment on the product side. Net investment is added to noncorporate investment and subtracted from private consumption, so that total product does not change. Our estimate for depreciation of foreign subsidiary capital is equal to 0.016 GNPs. Our estimate for net investment is 0.009 GNPs. In making these estimates, we assume that depreciation rates and growth rates are the same at home and abroad.

To noncorporate profits, we add imputed capital services to government capital and to consumer durables. NIPA uses a zero percent interest rate when imputing services to government capital. We instead use the average return on capital in the noncorporate sector. Our estimate of this return is 4.08 percent. (See Section X of the paper.) Our estimate of imputed services is this rate times the net stock of government capital (0.592 GNPs) plus the net stock of consumer durables (0.287 GNPs). Imputed services, therefore, are equal to 0.024 GNPs for government capital and 0.012 for consumer durables, or 0.036 GNPs total. So that income equals product, we add imputed services to government capital to profits in the noncorporate sector and to government consumption. In NIPA, consumer durables are treated as consumption. We instead treat them as investment and impute services to these durables. These imputed consumer durable services are added to profits in the noncorporate sector and to private consumption.

We make several adjustments to the capital stocks. Measured capital is 0.821 GNPs. This measure does not include the value of inventories or land. A separate measure of inventories is, however, available in the NIPA data (Table 5.12). Inventories are equal to 0.161 GNPs. A separate measure of land is not included in the NIPA data, but it is available from the Board of Governors (FR Board, various dates) for nonfinancial corporate business. The difference between real estate values reported by the Fed and nonresidential structures reported in NIPA is 0.06 GNPs. Thus, our estimate of measured capital, with land and inventories included, is 1.042 GNPs.

We make one more adjustment to the corporate capital stock – we include an estimate for the unmeasured intangible capital. Our estimate is 0.645 GNPs. (See Section X of the paper.)