

Housing and GDP

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Gross Domestic Product, the measure of total production of goods and services in the nation, includes products for current consumption and production of capital goods to be used for future production. Housing is a major part of both current consumption and private investment. In 2000, the combination of consumption and private investment spending on housing represented 14 percent of GDP (Table 1).

Construction of new homes is part of the investment component of GDP. Residential fixed investment (RFI) totaled \$425 billion in 2000, representing 4.3 percent of GDP and 24.1 percent of gross private domestic investment. New conventional single family and multifamily structures accounted for \$249 billion, or 59 percent of RFI. The other major components of RFI include improvements to existing homes (\$102 billion), real estate commissions (\$55 billion), manufactured housing (\$11 billion), and equipment such as appliances for rental housing (\$9 billion).¹ RFI is one of the more volatile components of GDP. Within the past 25 years, the RFI share of GDP has ranged from 3.2 percent in 1982 and 1991 to 5.7 percent in 1978. The most recent peak in that share was in 1999, when it was 4.4 percent.

In general, in the national income and product accounts (NIPA), private investment consists of fixed investment in structures and equipment and of inventory investment. Construction is counted as fixed investment as the work occurs, not when the structure is completed or sold, so builders are not considered to make inventory investments, unless they accumulate materi-

als for future use. The value of investment in new residential structures does not include the value of raw land, but it does include the value of land development.

Unlike the treatment of conventional homes and nonresidential structures, investment in manufactured housing is measured when the completed unit is shipped. It is noteworthy that new conventional single family and multifamily structures outweigh manufactured housing to a much

greater extent in terms of residential investment than in numbers of units. The average new conventional single family unit represents about four times as much investment as the average manufactured housing unit. The average multifamily unit represents about twice as much investment as the average manufactured housing unit.

The data for new conventional homes and improvements in RFI is conceptually the same as in the Census Bureau's reports on the value

Table 1. Housing Components in GDP—2000
(Billions of Current Dollars)

Gross Domestic Product	9,872.9
Gross Private Domestic Investment	1,767.5
Fixed Investment	1,718.1
Nonres Fixed Investment	1,293.1
Nonres Structures	313.6
Nonres Equipment & Software	979.5
Residential Investment	425.1
Share of GDP	4.3%
Share of Gross Private Domestic Investment	24.1%
Residential Structures	415.6
New	363.4
New housing units	259.6
Permanent site	248.8
Single-family structures	220.7
Multifamily structures	28.1
Manufactured homes	10.9
Improvements	102.4
Other\5\	1.4
Brokers' commissions on sale of structures	55.4
Net purchases of used structures	-3.2
Residential equipment	9.4
Personal Consumption Expenditures	6,728.4
Durable Goods	819.6
Nondurable Goods	1,989.6
Services	3,919.2
Housing	958.8
Share of GDP	9.7%
Share of Personal Consumption Expenditures	14.3%
Owner-occupied nonfarm - imputed space rent	702.7
Tenant-occupied nonfarm - rent	209.3
Rental value of farm dwellings	7.7
Other Housing Services	39.1
Residential Investment + Housing Services	1,383.9
Share of GDP	14.0%

Source: U.S. Dept. of Commerce, Bureau of Economic Analysis.

of construction put in place. Currently, the put-in-place value shown for 2000 for single family new homes is higher than the RFI estimate by about \$16 billion, and the put-in-place estimate for residential improvements is higher by about \$7 billion. That's because the current and historical put-in-place numbers have been revised upward, as a result of recent Census Bureau research and changes in methodology.² Although the latest quarterly NIPA data are revised as new information becomes available, major revisions to historical NIPA data are only implemented in "benchmark" revisions every few years. When the next benchmark revision occurs, probably in 2003, it is likely that the RFI estimate for 2000 will be revised upward by more than \$20 billion.

Consumption

Output of the housing sector for consumption consists primarily of the services—the shelter and security—provided by the existing stock of housing. The payment of rent by tenants in rental housing is counted as part of consumer spending on services. In 2000, renters spent \$209 billion for nonfarm housing services. That includes the services of appliances and furniture provided by property owners, but mainly just represents payments for use of the structure. The portion of rents paid in 2000 that is attributable to inclusion of appliances and furniture has been estimated as about \$6 billion. In cases where utilities are also included in the rent paid by renters, the value of those utilities is excluded from the total rent and counted under consumer spending for energy.

The estimated rental value of owner-occupied homes is also counted as consumer spending on housing services. Homeowners are

considered to be renting from themselves. In 2000, imputed rent for nonfarm owner-occupied housing was \$710 billion. The treatment of owner-occupied housing in the NIPA data, with homeowners considered to be businesses renting to themselves, is unique. The purchase by households of consumer durables such as cars, computers, and appliances is treated as current consumption, rather than investment. Arguably, households who buy cars or other durables could be said to be making investments and leasing use of those assets to themselves, but the NIPA data only treat residential structures in that way. In part, that is attributable to the fact that housing is more durable. Also, a shift toward home ownership would otherwise show up as a decline in GDP.

In total, personal consumption expenditures for housing services in 2000 was reported as \$959 billion, representing 9.7 percent of GDP and 14.3 percent of total personal consumption expenditures. In addition to the actual rent paid by tenants in nonfarm rental housing and the imputed rent for nonfarm owner-occupants, that includes actual or imputed rent for farm housing (\$9 billion) and consumer spending for stays in hotels, dormitories and other group quarters (\$39 billion).

It may not really be appropriate to include spending on hotels in the housing category in the estimates personal consumption expenditures, especially since construction of hotels (but not dormitories) is classified as investment in nonresidential structures in the NIPA data, and both transient and long-term group quarters are excluded from a supplementary NIPA table showing housing output. Excluding such spending would reduce the share of 2000 GDP attributable to consumption of housing services from 9.7

percent to 9.3 percent.

Except in cases where appliances or furnishings are included in the rents paid by renters, the value shown for personal consumption expenditures for housing does not include spending for household operations, such as utilities, as well as household purchases of appliances and furnishings. Such spending in 2000 came to \$727 billion.

Capital Stock and Net Investment

Residential structures are among the most durable of investment products. In contrast to commercial motor vehicles and computers with only a few years of useful life, new homes will provide services for many decades. Indeed, with proper maintenance homes can be made to last indefinitely, although functional obsolescence, competition for the land on which structures sit, or natural disasters are likely to make the lives of residential structures finite.

In 1950, there were approximately 46 million housing units in the U.S., and the median age of those homes was 28 years. Nearly two-thirds of the homes in 1950 were still in use 50 years later. Moreover, the rate at which older homes have been taken out of the inventory has slowed markedly since about 1970, with annual net removals declining to less than one-quarter percent of the housing stock during the latest decade.

In recent decades, residential investment represented about one-fourth of total private fixed investment. Because of the durability of residential capital, however, residential structures and equipment, valued at about \$10.47 trillion in 2000, represented about half of the total stock of private fixed capital in the nation.

The "gross" in gross domestic product and gross private domestic

Table 2. Real Depreciation Rates in National Income and Product Accounts

RESIDENTIAL CAPITAL	
1-4 Unit Structures	
New Construction	1.14%
Additions and Alterations	2.27%
Major Replacements	3.64%
5-or-more Unit Structures	
New Construction	1.40%
Additions and Alterations	2.84%
Major Replacements	4.55%
Mobile Homes	4.55%
Other Structures	2.27%
Equipment	15.00%
SELECTED OTHER CAPITAL	
Office, computing	31.00%
Electric Transmission	5.00%
Trucks	19.17%
Office buildings	2.47%
Commercial buildings (x warehouse)	2.62%
General industrial equipment	10.72%

Source: Barbara Fraumeni, "The Measurement of Depreciation," in the *National Income and Product Accounts, Survey of Current Business*, July 1997.

investment refers to the fact that the investment estimates are not adjusted for depreciation. Net domestic product in 2000 was \$8.632 trillion, compared to GDP of \$9.873 trillion, with the difference representing depreciation of \$1.030 trillion for private fixed capital and \$211 billion for government fixed capital. Net private domestic investment was estimated as only \$738 billion, compared to gross private domestic investment of \$1.768 trillion. Depreciation estimates in the NIPA data represent both reductions in the value of those assets that are still in service and removal of assets from service. Normal losses from disasters such as fires are included, although special adjustments are occasionally made for unusual capital-destroying events. Table 2 shows the depreciation rates used by the Commerce Department in their estimates of the nation's capital stock and net investment. These rates are

reasonable, but arbitrary, since there are no reliable measures of the actual rate of decline in values, or even of removals from the stock.

The durability of residential capital means that a larger share of residential investment than of nonresidential investment represents net additions to the stock of capital, rather than simply replacement of worn-out or obsolete capital. In 2000, for example, the Commerce Department estimates that \$265 billion of the \$425 billion in residential fixed investment was net investment, with only \$160 billion of residential capital consumed during the year. Nonresidential fixed investment totaled a whopping \$1.29 trillion, but only \$424 billion of that represented net investment. Where gross RFI represented 24.1 percent of gross private domestic investment, net residential fixed investment represented 35.9 percent of net private fixed investment. Using net

domestic product, rather than GDP, as the measure of total output of the economy, net residential investment represents 3.1 percent of the total, and consumption of housing services represents 11.1 percent.

An average of 1.66 million new housing units per year were produced in the 1990s. That annual output represented about 1.5 percent of the number of existing homes. The average annual value of residential investment represented a somewhat larger 4 percent share of the depreciated value of the existing stock, since new homes are better equipped and more valuable, on average, than existing homes, and residential investment includes improvements to existing homes as well as production of new ones.

The NIPA data described here measure spending on different products. There is also a parallel set of measures of income, where the wages and salaries, rents, and other income flows that result from such spending, and that finance spending, are measured. In those calculations, the imputed rent paid by homeowners is reflected in rental income. But we've already gotten into more detail than busy *Housing Economics* readers can be expected to tolerate.

¹ Appliances purchased by home owners are included in personal consumption expenditures, rather than residential investment.

² See U.S. Bureau of the Census, Value of Construction Put in Place: May 2000 (*Current Construction Reports C30/00-5*, issued July 2000), pp. 1-3 and B1-B2. In estimating construction value for single family homes built for sale, the Census Bureau multiplies average sales price by .8424, to eliminate costs for raw land, marketing cost, closing cost, and moveable appliances. Before the revision, the factor used was .7813. For contractor-built homes, the contract price is multiplied by 1.102, to reflect costs for land development, net of non-construction items. Previously, that factor was 1.019.