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THE MARGINAL PRODUCTS OF RESIDENTIAL AND NON-RESIDENTIAL CAPITAL THROUGH 2009

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The authors appreciate comments on related work from economists at the Federal Reserve Board. Updates of these estimates will be provided on Mulligan's blog www.panic2008.net. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

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ABSTRACT

Estimates of the marginal product of capital can help forecast economic growth, test competing business cycle theories, and perform cost-benefit analysis. This paper presents annual and quarterly estimates of the marginal product of capital in the U.S. separately for the residential and non-residential sectors. The two sectors had positively correlated marginal products until the 2000s, when the residential marginal product fell during the housing boom, and rose during the housing bust. By the end of 2009, the residential MPK was back to the level of the 1990s. Although off its lows, the non-residential MPK is still below its historical average.

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An online appendix is available at:
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I. Introduction

Economic theory suggests that marginal product of capital series might help predict economic growth forward one or two years, even under abnormal conditions such as wartime or depression. In some situations, the marginal product of capital is an essential ingredient in cost-benefit analyses (Harberger 1968; Byatt, et al., 2006; Mityakov and Ruehl, 2009). Evidence on the marginal product of capital can also help test various explanations for business cycles, and help identify causes and consequences of the recent housing "bubble." The purpose of this paper is to produce annual and quarterly estimates of the marginal product of capital (net of depreciation), one each for the residential and nonresidential sectors of the U.S. economy.

By definition, the marginal product of capital net of depreciation is the change in net domestic product (NDP) during the accounting period (e.g., one quarter) that would result from an increase in the beginning-of-period capital stock of $1 worth of capital. In particular, the additional $1 of capital would have the same composition as the rest of the capital stock. For example, if the economy's capital consisted of 400 identical structures and 100 identical vehicles, each of which cost $2 to acquire, then the marginal product of capital would be the extra NDP attained by starting the quarter with 400.4 identical structures and 100.1 identical vehicles (that is, $0.80 worth of structures and $0.20 worth of vehicles).

Suppose that origins of the current recession could be traced back to limits on the supply of aggregate investment due to a "credit crunch." In fact real investment fell through the first year and a half of this recession, but the credit crunch theory says that the marginal product of capital would rise as a consequence of the increased cost of capital faced by those with new capital projects. Alternatively, financial crisis or something else could reduce labor usage more directly, and, given the complementarity of labor and non-residential capital in production, non-residential investment would

merely respond to *low* marginal products of capital, thereby putting the non-residential capital stock on a path that is consistent with a lesser amount of labor usage (Mulligan, 2010).

The marginal product of capital is also interesting as an aggregate leading indicator of business conditions, which is the motivation for its use in a number of studies (e.g., Feldstein and Summers (1977), Auerbach (1983)). This relationship alone may make it a predictor of subsequent economic growth.

Additionally, Fisherian consumption-saving theory suggests that the marginal product of capital, or variations of it, should predict consumption growth. In a Robinson Crusoe economy, the consumer would save for the future by reducing current consumption and using the proceeds to build capital assets. She would then use the marginal product and capital gains from those assets to add to consumption in the future. Because the saving decision is made in the present while the principal and interest are spent in an uncertain future, the incentive to save depends on, among other things, the expected marginal product and expected capital gains. The current marginal product itself helps predict the incentive to save only to the extent that it is closely related to the expected sum of future marginal product and capital gains. For this reason, we present measures of the marginal product that might be more indicative of those expected gains, and (consistent with national accounting practices: see Fraumeni, 1997) measures of depreciation that reflect expected depreciation and obsolescence, rather than actual depreciation and obsolescence.

Section II presents our methods for calculating annual marginal products, and discusses the findings for 1930-2009. Section III presents the methods and results for quarterly postwar marginal products through 2009-IV. In order to isolate some of the possible determinants of measured marginal products, Section IV compares them with average products. Section V concludes, and Appendices record the time series values discussed in the body of the paper.

II. Aggregate Annual Marginal Products

In a competitive capital market with constant returns to scale, the marginal product of capital is simply the income accruing to domestically employed capital divided by the amount of capital employed at the beginning of the accounting period, valued at replacement cost. Computing this measure entails a couple of minor hurdles. First, the location of capital income may not match the location of capital. For example, national income is the income of citizens, while the capital stock, measured as accumulated domestic investment, comprises the capital located on home soil, regardless of the nationality of its owners. We account for this by focusing on domestic measures of both the income and stock of capital, or estimating them when necessary.

Second, national accounts do not disaggregate non-corporate business incomes into labor and capital income. We account for this by assuming that the capital income share for non-corporate business is the same as for corporate business. Third, neither government capital income nor government nonresidential capital is recorded in the national accounts. Thus, our non-residential estimates consider private sector stocks and flows only.

A final hurdle arises because capital income is a flow, the price level of which changes throughout the accounting period. To account for this in our calculation of annual real capital income, we discount time t flows back to the t-1 price level using the annual PCE deflator.

The period t net-of-depreciation marginal product of residential capital MPH_t is calculated using three entries from the NIPAs (the PCE deflator, nominal net housing value added[2], and nominal compensation of employees in housing) and one entry from the fixed asset tables (current-cost stock of residential structures):

$$MPH_t = \frac{(\text{PCE housing services})_t - (\text{housing intermediates})_t - (\text{residential structures depreciation})_t}{(\text{residential structures, current cost})_{t-1}} \frac{P_{t-1}}{P_t}$$

$$P_t \equiv (\text{PCE deflator})_t$$

[2] Net housing value added is not available for the most recent year. We estimate it by taking the average of the quarterly values that we estimate for the quarterly series—see Section III.

where net housing value added is the difference between PCE housing services and housing intermediates.[3]

The period *t* net-of-depreciation marginal product of private nonresidential capital is calculated using one entry from the fixed asset tables and seven entries from the NIPAs:

$$MPK_t = \frac{\alpha_t \left[NI_t + NFI_t - Egov_t \right] P_{t-1} / P_t - H_{t-1} MPH_t}{(\text{private non-residential capital, current cost})_{t-1}}$$

$$\alpha_t \equiv 1 - \frac{(\text{Compensation of Private Sector Employees})_t}{NI_t - Egov_t - (\text{Proprietor's Income})_t}$$

$$NI_t \equiv (\text{National Income})_t$$

$$NFI_t \equiv (\text{Net Factor Income paid to the rest of the world})_t$$

$$Egov_t \equiv (\text{Compensation of Government Employees})_t$$

$$H_{t-1} \equiv (\text{residential structures, current cost})_{t-1}$$

α is capital's share of factor income, so α times private national domestic income (NDI – Egov) is private domestic capital's income.[4] The term in square brackets is the income accruing to domestically and privately employed nonresidential capital.

Figure 1 displays both the residential and nonresidential net-of-depreciation marginal products of capital (MPKs), calculated as outlined above. From the late 1950s through the late 1970s, the two series display strong positive correlation, with a smaller degree of correlation during the 1980s and 1990s. However, starting in 2001, the series display strong negative correlation.

The non-residential MPK has many ups and downs. Prior to the most recent cycle, the postwar residential MPK series seems to have only five phases in 70 years: a downward trend in the 1930s and 1940s, an up trend 1948-64, a downtrend 1964-80, an up trend 1980-92, and a flat period during the 1990s.

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[3] Following Feldstein, Dicks-Mireaux, and Poterba (1983), our concept of the marginal product of capital is gross of direct and indirect taxes, including property taxes. Since we have calculated net marginal product of residential (non-residential) capital by making subtractions from output (national income), rather than additions to capital income, we do not have to add property taxes "back in."

[4] Proprietor's income is assumed to be divided among capital and labor in the same proportions as is private domestic non-proprietor's income, which implies that the non-labor share of private domestic income can be calculated from private non-proprietor's income.

As shown in more detail in Figure 2, the residential MPK shows a steep decline,[5] while the nonresidential MPK rises during the period of buildup in housing generally associated with the housing "bubble" (2001-2006). Then, after the peak in housing prices, both series change direction, with the nonresidential MPK falling in 2007 for the first time since 2001 and the residential MPK halting its steep four-year decline. These changes coincide with a sharp fall in construction of new housing and a corresponding pickup in investment in nonresidential structures (Mulligan and Threinen, 2008).

III. Quarterly Marginal Products

Parts of the calculations described above can be duplicated directly to produce quarterly series. However, because the BEA estimates capital stocks and certain other series only on an annual basis, quarterly measurement of the marginal products of capital require estimates of the quarterly evolution of those series.

III.A. Residential Capital

Our first step in producing the quarterly residential marginal product of capital series was to estimate the evolution of the net real residential capital stock by quarter. This was done by allocating the annual change in the real net stock in a given year across quarters in the same proportions as real gross residential investment during the same year. The second step was to inflate this real series to create a scaled nominal series, which was done using the residential investment price index. Finally, the annual change in the current cost residential capital stock was allocated across the quarters of a given year in the same proportions as changes in the scaled nominal series (produced in step two) over the quarters of that year.

Furthermore, the annual series lack published values for the most recent year. In order to estimate the real capital stock for the most recent year, it was assumed that a given gross real residential investment in a quarter affected the real net capital stock in

[5] The fall in marginal product of residential capital in 2005 is partly explained by Hurricanes Katrina and Rita, the effects of which should ideally be excluded from estimates of expected marginal product. For this reason, values for the quarterly series below will be interpolated for the year 2005.

the same way during the most recent year as it was estimated to have done in the last published year. That is, for the most recent year,

$$RealResCapStock_t = RealResCapStock_{t-1} + (GrRealResInv_t/GrRealResInv_{t-4}) * (GrRealResInv_{t-4}/TotalResInv) * (\Delta RealResCapStock)$$

where $RealResCapStock_t$ is the real residential capital stock in quarter t, $GrRealResInv_t$ is the gross real residential investment in quarter *t*, TotalResInv is the total real gross residential investment during the most recent published year, and ΔRealResCapStock is the change in the net real residential capital stock between the two most recently published years.

This real series was then inflated using the residential investment price index. Finally, the scaled nominal series was converted to the final estimate by assuming that changes in the scaled series and corresponding changes in the final series occurred in the same proportion during the last published year and the most recent year.

Similar issues affected estimation of the income series. The net housing value added series, which was used in the calculation of annual residential capital income, also appears only on an annual basis. Quarterly housing value added was estimated by allocating the annual net housing value added, less compensation of employees, across the four quarters of a given year in the same proportions as nominal personal consumption expenditures on housing during that year. For quarters of the final year of the series, it was assumed that year-over-year residential capital income increased at the same rate as year-over-year nominal personal consumption expenditures on housing. That is, for the most recent year,

$$ResCapInc_t = ResCapInc_{t-4}*(PCEHousing_t/PCEHousing_{t-4})$$

where $ResCapInc_t$ is the estimated residential capital income in quarter *t* and $PCEHousing_t$ is nominal personal consumption expenditures on housing in quarter *t*.

Finally, net capital income in 2005 (in particular, depreciation) was strongly affected by Hurricanes Katrina and Rita, so estimates produced by the above method would not be a suitable measure of expected capital income for that year. As a result, the marginal products of capital for the four quarters of 2005 are linearly interpolated between 2004:Q4 and 2006:Q1.

III.B. Nonresidential Capital

The quarterly series for the nonresidential marginal product of capital was constructed using the same basic formula as the annual series given above. The numerator of that formula can be applied directly because each of the needed series is available on a quarterly basis. As a result, only the quarterly evolution the nonresidential capital stock series required any modification from the original formula.

This estimation of the quarterly evolution of the net nonresidential capital stock was done in a manner analogous to the approach outlined above for the quarterly residential series. The annual change in the real net stock in a given year was allocated across quarters in the same proportions as real gross nonresidential investment during the same year. Next, this real series was inflated to create a scaled nominal series, which was done using the nonresidential investment price index. Finally, the annual change in the current cost nonresidential capital stock was allocated across the quarters of a given year in the same proportions as changes in the scaled nominal series over the quarters of that year.

As was the case with the residential data, the annual series lack published values for the most recent year. In order to estimate the real capital stock for the most recent year, it was assumed that a given gross real nonresidential investment in a quarter affected the real net capital stock in the same way during the most recent year as it was estimated to have done in the last published year. Finally, the scaled nominal series was converted to the final estimate by assuming that changes in the scaled series and corresponding changes in the final series occurred in the same proportion during the last published year and the most recent year. This is exactly the approach taken with the residential data.

Finally, as with the residential data, capital income in 2005 was strongly affected by extraordinary depreciation associated with Hurricanes Katrina and Rita, so the marginal products of capital for the four quarters of 2005 are linearly interpolated between 2004:Q4 and 2006:Q1.

III.C. Results

Figure 3 displays both the residential and nonresidential net-of-depreciation marginal products of capital on a quarterly basis, calculated as outlined above, since 1947-I. In order to make some of the details more visible, Figure 4 shows the same series for the quarters 1990-I through 2009-IV. As expected, the same general trends that were evident in the annual series appear here. Figure 3 suggests that, with exception of the most recent cycle, the residential MPK does not change as significantly over the business cycle as does the non-residential MPK, but has more significant decade-to-decade changes.[6]

The main facts of note in the quarterly series are, first, that the trends in both series since 2001 have been basically smooth across quarters, with a steady decline in the residential MPK followed by an increase starting in 2006 and the reverse trend in nonresidential MPK. Second, the increase in the residential MPK and the coincident decrease in the nonresidential MPK continued through 2009, although the non-residential MPK has reversed its trend in the two most recently available quarters (2009-III and -IV). The most recent residential MPK is also at least as high as its historical average, and near the highs of the 1990s, which suggests that residential investment may have hit its lows.

IV. Quarterly Average Products

A sector's marginal product of capital is that sector's capital income per dollar of capital, which can be decomposed into the product of the sector's capital share of income

[6] The relative cyclicality of the two series may be due to a greater complementarity of labor with business-sector capital, as opposed to housing.

times the sector's income per dollar of capital. That is, the marginal product of capital is the product of capital's share and the average product of capital.

The average product of capital would be a better indicator of the marginal product of capital when measured capital share fluctuates mainly due to measurement error rather than genuine changes in the returns to labor and capital. For example, at high frequencies there may be lags in the recording of capital or labor income, as with severance payments that are made to a worker after he stops contributing to production. At low frequencies, labor unions may rise or fall, and labor unions may exercise their power by having some of the returns to capital reallocated toward themselves (Leontief, 1946). These are some of the reasons to examine measures of average products in addition to marginal products.

With the quarterly marginal product series already estimated, it is straightforward to compute the net average products of capital (APKs) in the two sectors. For the residential sector, the quarterly net value of housing services (including labor) was estimated using a formula analogous to the one used to estimate the quarterly net value added of housing services from residential capital. The net residential APK is then calculated by dividing this series by the already estimated quarterly residential capital stock.

For the nonresidential sector, we have

$$APK_t = (PNDI_t - ResVA_t) / (\text{private nonresidential fixed asset stock, current cost})_t$$

where APK_t is the period t net average product of nonresidential capital, $PNDI_t$ is the period t private net domestic income, and $ResVA_t$ is the net residential value added (which was produced for the estimation of residential APK as outlined above).

Figure 5 displays both the residential and nonresidential net-of-depreciation average products of capital on a quarterly basis, calculated as outlined above. These series have a stronger correlation than the marginal series during the period from 1960-2000. However, they show the same divergence from 2001-2005 and partial reconvergence since 2006 that the MPK series suggests should have occurred. Additionally, as with the MPK series, the nonresidential APK is presently within its

average range, while the residential APK remains below its average from the past two decades.

V. Conclusions

Over the last ten years, the marginal and average products of residential capital fell, and then increased, as housing construction was booming and busting. In this sense, the residential data suggests that the supply of residential capital shifted along a relatively stable demand for the services of that capital. As indicated by the marginal product of residential capital at the end of 2009, current housing supply seems restricted by comparison with the housing boom (when the residential MPK was low), but fairly normal by comparison with the 1990s when the residential MPK was similar to what is was at the end of 2009.[7] These patterns are consistent with the findings of Davis, Lehnert, and Martin (2008) and others that housing rent-price ratios were low during the housing boom, and with the conclusions that the housing boom was fueled by optimistic expectations, or by easy credit.

The marginal product of non-residential capital was much higher during the housing boom than it was during the recession, when rates of investment in non-residential equipment and software were low. In this sense, the supply of non-residential capital seems less restricted during the recession than it was before. In other words, the recession's investment rates may have been low because of a slack labor market, rather than the other way around (Mulligan, 2010). In any case, the testing of various theories of this recession, and the prior housing cycle, can be enhanced with marginal products data like those shown in this paper.

[7] Conversely, a marginal product of residential capital that significantly exceeded the levels of the 1990s would indicate housing supply conditions that are more restrictive than they were in the 1990s.

Fig 1. The Marginal Product of Capital, 1930-2009

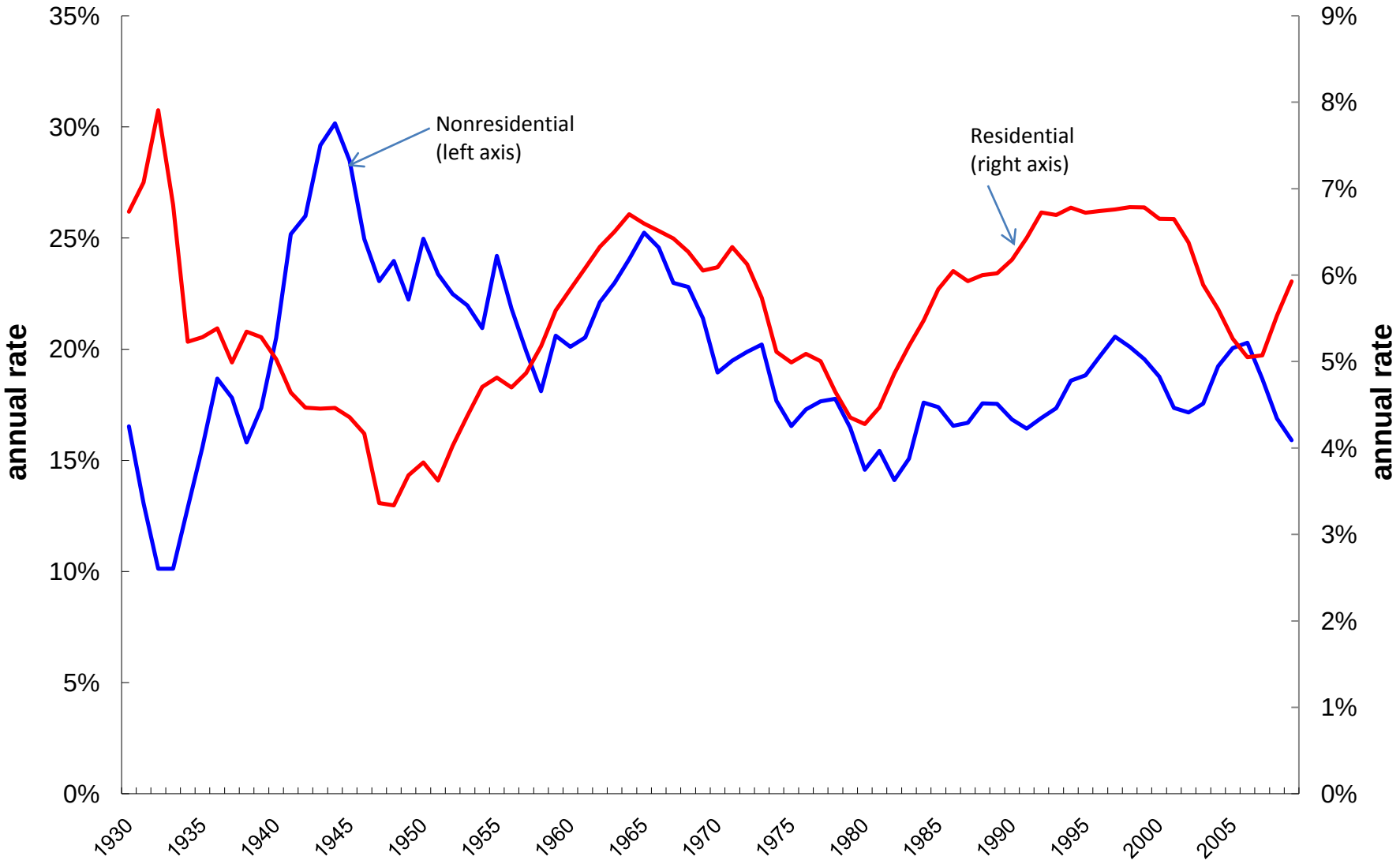

Fig 2. The Marginal Product of Capital, 1980-2009

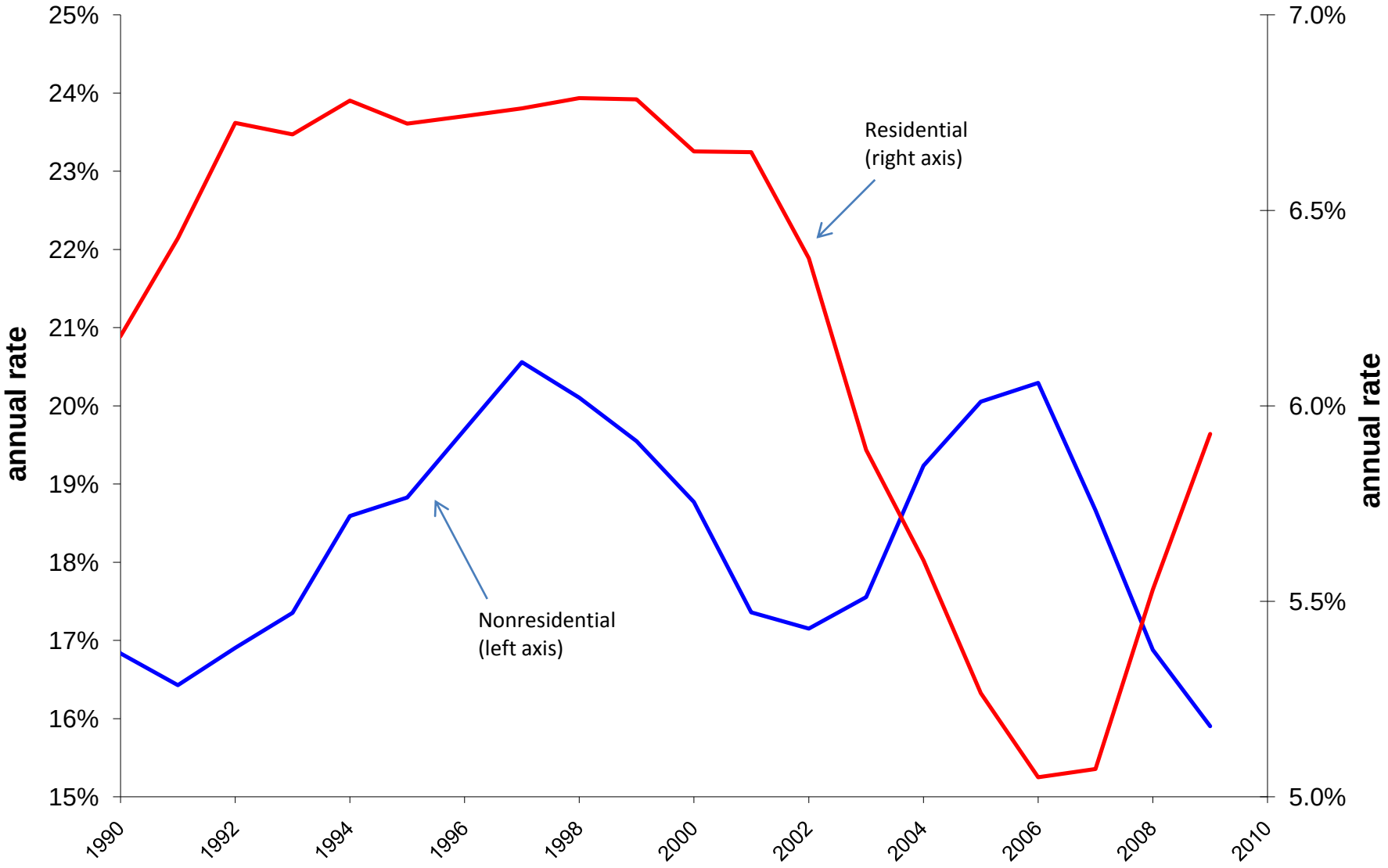

Fig 3. The Marginal Product of Capital, 1948-I through 2009-IV

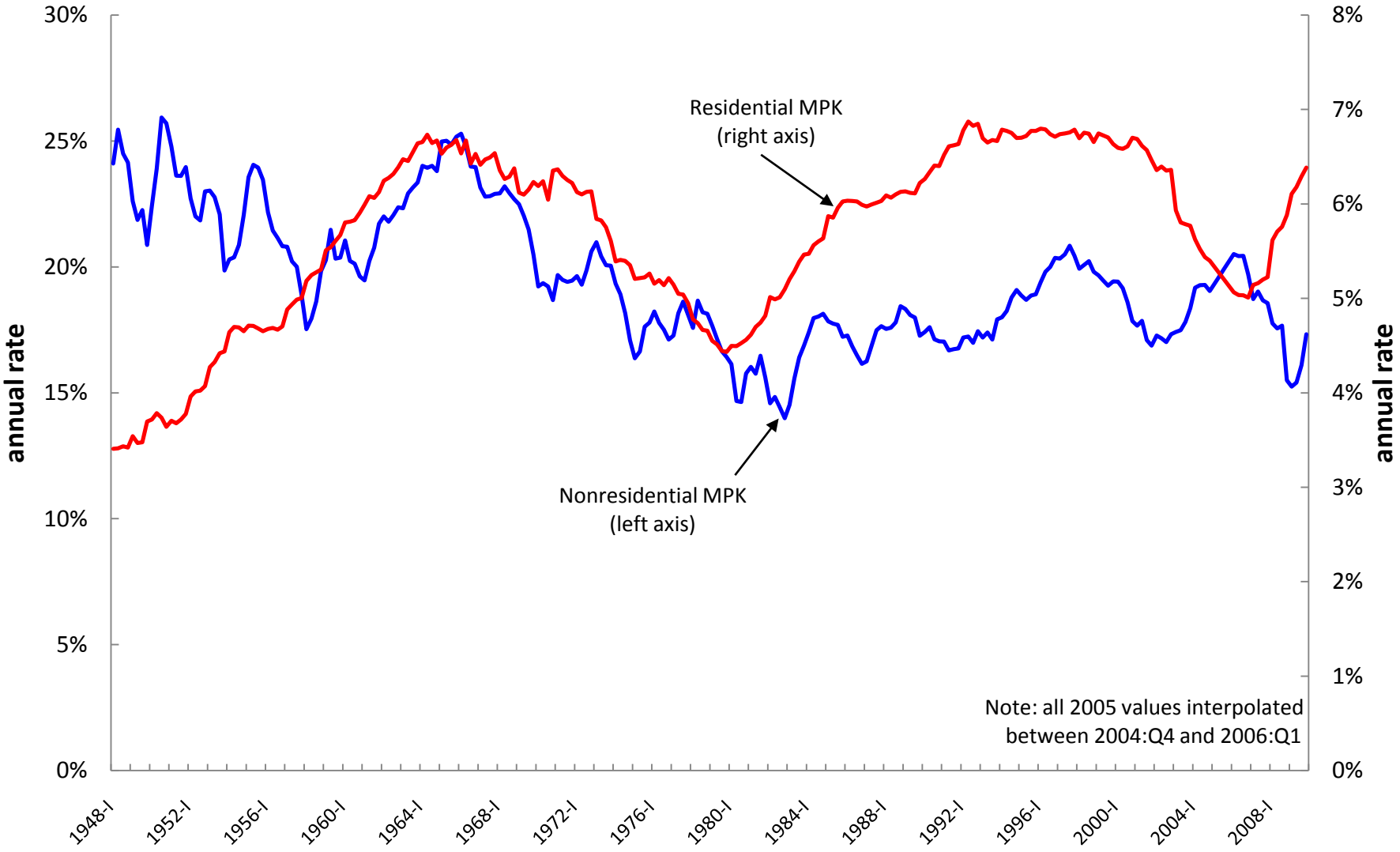

Fig 4. The Marginal Product of Capital, 1990-I through 2009-IV

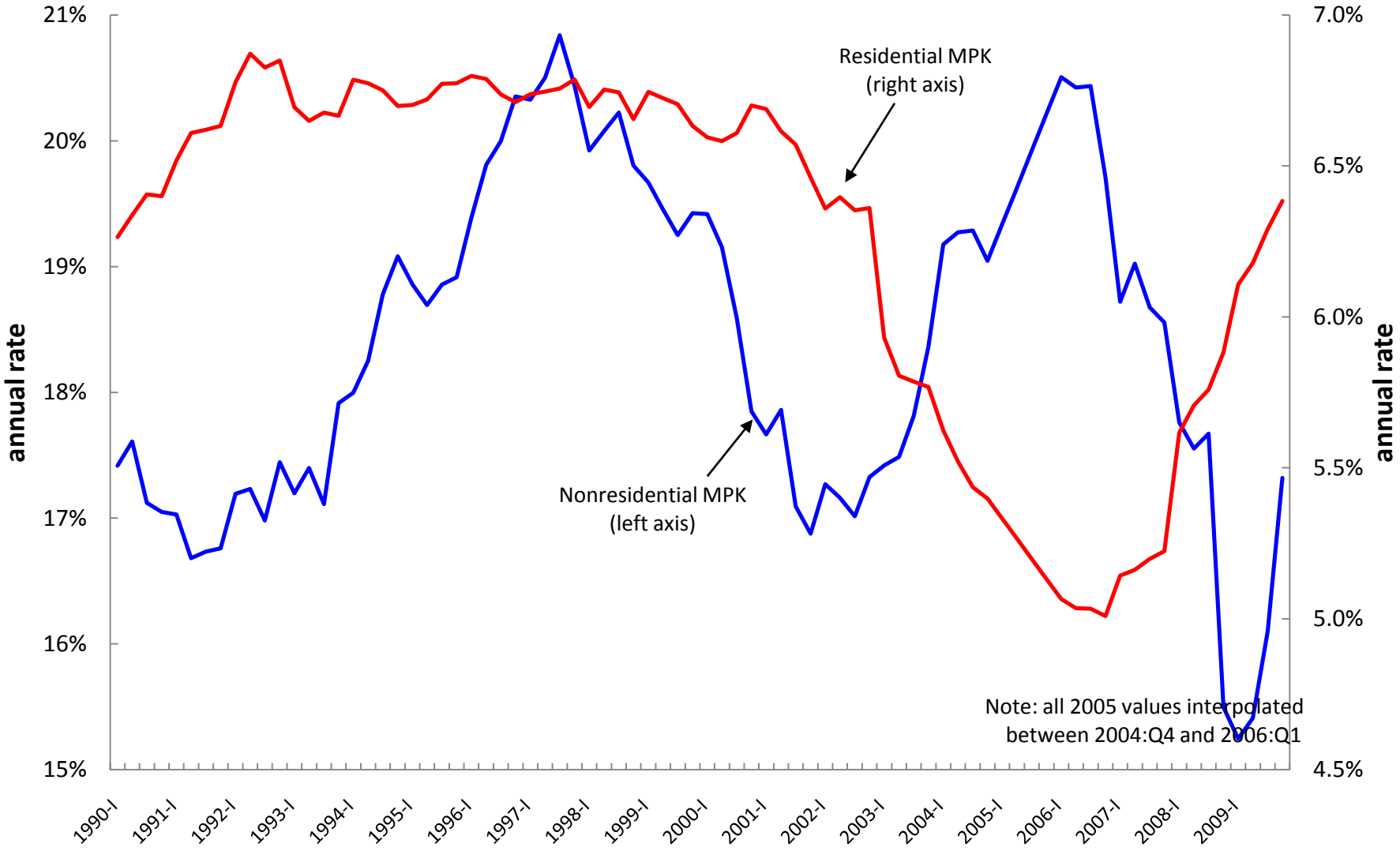

Fig 5. The Average Product of Capital, 1947-I through 2009-IV

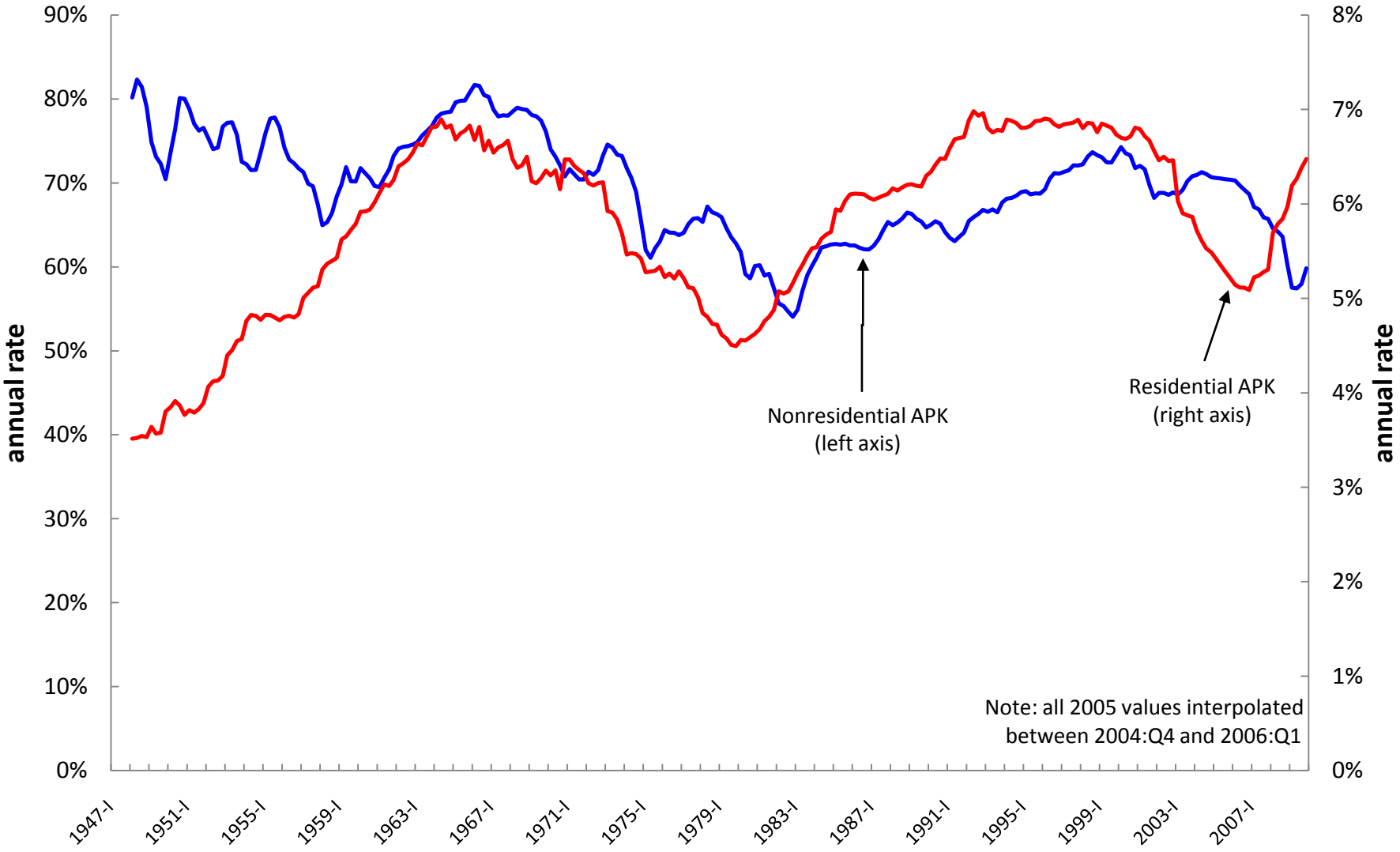

Table 1. Annual MPK and Stocks, by sector, 1930-2009

	Residential		Nonresidential	
Period	MPK	Cap. Stock	MPK	Cap. Stock
1930	6.73%	$119	16.5%	$134
1931	7.07%	$114	13.1%	$127
1932	7.91%	$93	10.1%	$113
1933	6.81%	$84	10.1%	$105
1934	5.23%	$92	12.9%	$106
1935	5.28%	$92	15.6%	$108
1936	5.38%	$94	18.7%	$107
1937	4.99%	$104	17.8%	$118
1938	5.35%	$111	15.8%	$123
1939	5.28%	$113	17.4%	$121
1940	5.03%	$116	20.5%	$121
1941	4.64%	$128	25.2%	$129
1942	4.47%	$139	26.0%	$145
1943	4.45%	$150	29.2%	$154
1944	4.46%	$163	30.2%	$156
1945	4.36%	$174	28.5%	$157
1946	4.17%	$184	25.0%	$172
1947	3.36%	$227	23.1%	$212
1948	3.34%	$267	24.0%	$255
1949	3.68%	$287	22.2%	$280
1950	3.83%	$302	25.0%	$285
1951	3.62%	$339	23.4%	$323
1952	4.03%	$368	22.5%	$352
1953	4.37%	$386	22.0%	$371
1954	4.71%	$400	20.9%	$386
1955	4.81%	$422	24.2%	$396
1956	4.70%	$455	21.8%	$437
1957	4.87%	$477	19.9%	$483
1958	5.18%	$493	18.1%	$515
1959	5.59%	$507	20.6%	$524
1960	5.84%	$529	20.1%	$546
1961	6.08%	$550	20.5%	$557
1962	6.33%	$570	22.1%	$572
1963	6.50%	$591	23.0%	$592
1964	6.70%	$606	24.0%	$613
1965	6.60%	$655	25.2%	$650
1966	6.51%	$695	24.6%	$695
1967	6.42%	$752	23.0%	$757
1968	6.27%	$803	22.8%	$818
1969	6.05%	$887	21.4%	$899
1970	6.09%	$949	18.9%	$990
1971	6.32%	$1,004	19.5%	$1,089
1972	6.13%	$1,129	19.9%	$1,199
1973	5.74%	$1,262	20.2%	$1,305
1974	5.11%	$1,446	17.7%	$1,471
1975	4.99%	$1,645	16.5%	$1,792
1976	5.09%	$1,783	17.3%	$1,974
1977	5.01%	$1,979	17.7%	$2,161
1978	4.65%	$2,310	17.8%	$2,402
1979	4.35%	$2,665	16.5%	$2,727
1980	4.28%	$3,094	14.6%	$3,147
1981	4.47%	$3,488	15.4%	$3,614
1982	4.86%	$3,752	14.1%	$4,088
1983	5.18%	$3,921	15.1%	$4,348
1984	5.47%	$4,078	17.6%	$4,480
1985	5.84%	$4,309	17.4%	$4,747
1986	6.05%	$4,540	16.6%	$5,013
1987	5.93%	$4,903	16.7%	$5,251
1988	6.00%	$5,220	17.6%	$5,534
1989	6.02%	$5,544	17.5%	$5,888
1990	6.18%	$5,849	16.8%	$6,241
1991	6.43%	$6,075	16.4%	$6,571
1992	6.72%	$6,211	16.9%	$6,702
1993	6.69%	$6,553	17.4%	$6,910
1994	6.78%	$6,956	18.6%	$7,222
1995	6.72%	$7,451	18.8%	$7,603
1996	6.74%	$7,785	19.7%	$8,000
1997	6.76%	$8,216	20.6%	$8,382
1998	6.79%	$8,678	20.1%	$8,838
1999	6.78%	$9,249	19.5%	$9,342
2000	6.65%	$9,937	18.8%	$9,892
2001	6.65%	$10,628	17.4%	$10,573
2002	6.38%	$11,420	17.2%	$11,125
2003	5.89%	$12,156	17.6%	$11,552
2004	5.61%	$13,196	19.2%	$11,943
2005	5.27%	$14,781	20.1%	$12,922
2006	5.05%	$16,482	20.3%	$14,071
2007	5.07%	$17,631	18.7%	$15,189
2008	5.53%	$17,851	16.9%	$16,024
2009	5.93%	$17,024	15.9%	$17,182

Note: stocks in billions, at replacement cost, beginning of period

Table 2. Quarterly MPK and Stocks, by sector, 1948-I through 2009-IV

	Residential		Nonresidential			Residential		Nonresidential	
Period	MPK	Cap. Stock	MPK	Cap. Stock	Period	MPK	Cap. Stock	MPK	Cap. Stock
1948-I	3.41%	$267	24.1%	$255	1959-I	5.51%	$507	20.3%	$524
1948-II	3.41%	$272	25.4%	$258	1959-II	5.54%	$513	21.5%	$528
1948-III	3.43%	$277	24.5%	$265	1959-III	5.61%	$519	20.3%	$535
1948-IV	3.42%	$284	24.1%	$274	1959-IV	5.67%	$524	20.4%	$541
1949-I	3.54%	$287	22.6%	$280	1960-I	5.80%	$529	21.1%	$546
1949-II	3.47%	$299	21.9%	$280	1960-II	5.81%	$535	20.2%	$549
1949-III	3.48%	$305	22.3%	$283	1960-III	5.83%	$541	20.1%	$553
1949-IV	3.70%	$294	20.9%	$284	1960-IV	5.91%	$545	19.6%	$555
1950-I	3.72%	$302	22.4%	$285	1961-I	5.99%	$550	19.5%	$557
1950-II	3.78%	$305	23.9%	$288	1961-II	6.08%	$553	20.2%	$560
1950-III	3.74%	$317	25.9%	$295	1961-III	6.06%	$560	20.8%	$563
1950-IV	3.64%	$335	25.7%	$306	1961-IV	6.13%	$566	21.7%	$567
1951-I	3.70%	$339	24.8%	$323	1962-I	6.24%	$570	22.0%	$572
1951-II	3.68%	$351	23.6%	$334	1962-II	6.28%	$576	21.8%	$577
1951-III	3.72%	$358	23.6%	$341	1962-III	6.32%	$582	22.1%	$583
1951-IV	3.78%	$362	24.0%	$346	1962-IV	6.39%	$587	22.4%	$588
1952-I	3.96%	$368	22.7%	$352	1963-I	6.47%	$591	22.3%	$592
1952-II	4.01%	$372	22.0%	$359	1963-II	6.45%	$596	22.9%	$598
1952-III	4.02%	$379	21.8%	$364	1963-III	6.55%	$598	23.1%	$602
1952-IV	4.07%	$385	23.0%	$366	1963-IV	6.64%	$598	23.4%	$608
1953-I	4.27%	$386	23.0%	$371	1964-I	6.66%	$606	24.0%	$613
1953-II	4.33%	$389	22.8%	$373	1964-II	6.73%	$606	23.9%	$620
1953-III	4.42%	$393	22.1%	$378	1964-III	6.64%	$624	24.0%	$631
1953-IV	4.44%	$399	19.9%	$384	1964-IV	6.67%	$633	23.8%	$638
1954-I	4.64%	$400	20.3%	$386	1965-I	6.53%	$655	25.0%	$650
1954-II	4.70%	$402	20.4%	$390	1965-II	6.60%	$660	25.0%	$659
1954-III	4.69%	$407	20.9%	$394	1965-III	6.63%	$666	24.9%	$670
1954-IV	4.65%	$417	22.1%	$393	1965-IV	6.68%	$671	25.2%	$682
1955-I	4.71%	$422	23.6%	$396	1966-I	6.53%	$695	25.3%	$695
1955-II	4.71%	$430	24.0%	$399	1966-II	6.67%	$690	24.8%	$705
1955-III	4.68%	$440	23.9%	$406	1966-III	6.43%	$726	24.0%	$724
1955-IV	4.65%	$449	23.5%	$420	1966-IV	6.53%	$727	24.0%	$737
1956-I	4.68%	$455	22.2%	$437	1967-I	6.41%	$752	23.1%	$757
1956-II	4.69%	$461	21.4%	$451	1967-II	6.47%	$759	22.8%	$770
1956-III	4.67%	$471	21.2%	$458	1967-III	6.49%	$768	22.8%	$784
1956-IV	4.70%	$475	20.8%	$473	1967-IV	6.54%	$779	22.9%	$799
1957-I	4.88%	$477	20.8%	$483	1968-I	6.35%	$803	22.9%	$818
1957-II	4.93%	$479	20.2%	$494	1968-II	6.26%	$824	23.2%	$835
1957-III	4.99%	$484	20.0%	$500	1968-III	6.29%	$838	22.9%	$854
1957-IV	5.00%	$491	18.9%	$507	1968-IV	6.38%	$845	22.7%	$873
1958-I	5.19%	$493	17.5%	$515	1969-I	6.12%	$887	22.5%	$899
1958-II	5.25%	$494	17.9%	$512	1969-II	6.10%	$906	22.0%	$918
1958-III	5.28%	$498	18.6%	$517	1969-III	6.15%	$923	21.5%	$940
1958-IV	5.31%	$502	19.8%	$520	1969-IV	6.23%	$932	20.5%	$963

	Residential		Nonresidential			Residential		Nonresidential	
Period	**MPK**	**Cap. Stock**	**MPK**	**Cap. Stock**	**Period**	**MPK**	**Cap. Stock**	**MPK**	**Cap. Stock**
1970-I	6.19%	$949	19.2%	$990	1981-I	4.61%	$3,488	16.0%	$3,614
1970-II	6.24%	$956	19.3%	$1,013	1981-II	4.70%	$3,571	15.8%	$3,746
1970-III	6.04%	$1,011	19.2%	$1,044	1981-III	4.74%	$3,635	16.5%	$3,869
1970-IV	6.35%	$984	18.7%	$1,062	1981-IV	4.81%	$3,690	15.6%	$3,972
1971-I	6.37%	$1,004	19.7%	$1,089	1982-I	5.01%	$3,752	14.6%	$4,088
1971-II	6.30%	$1,039	19.5%	$1,121	1982-II	4.99%	$3,806	14.8%	$4,180
1971-III	6.25%	$1,070	19.4%	$1,151	1982-III	5.01%	$3,861	14.4%	$4,261
1971-IV	6.22%	$1,101	19.5%	$1,177	1982-IV	5.10%	$3,896	14.0%	$4,314
1972-I	6.12%	$1,129	19.6%	$1,199	1983-I	5.20%	$3,921	14.5%	$4,348
1972-II	6.10%	$1,158	19.3%	$1,230	1983-II	5.29%	$3,955	15.6%	$4,295
1972-III	6.13%	$1,176	19.9%	$1,256	1983-III	5.39%	$3,984	16.4%	$4,279
1972-IV	6.13%	$1,209	20.6%	$1,281	1983-IV	5.46%	$4,023	16.9%	$4,342
1973-I	5.84%	$1,262	21.0%	$1,305	1984-I	5.47%	$4,078	17.4%	$4,480
1973-II	5.82%	$1,295	20.4%	$1,339	1984-II	5.56%	$4,128	18.0%	$4,530
1973-III	5.75%	$1,343	20.1%	$1,383	1984-III	5.60%	$4,186	18.0%	$4,611
1973-IV	5.61%	$1,406	20.0%	$1,431	1984-IV	5.63%	$4,251	18.1%	$4,677
1974-I	5.39%	$1,446	19.3%	$1,471	1985-I	5.87%	$4,309	17.8%	$4,747
1974-II	5.41%	$1,489	18.9%	$1,518	1985-II	5.85%	$4,359	17.7%	$4,809
1974-III	5.40%	$1,533	18.2%	$1,591	1985-III	5.96%	$4,397	17.7%	$4,867
1974-IV	5.35%	$1,593	17.1%	$1,686	1985-IV	6.03%	$4,457	17.2%	$4,935
1975-I	5.21%	$1,645	16.4%	$1,792	1986-I	6.03%	$4,540	17.3%	$5,013
1975-II	5.21%	$1,689	16.6%	$1,860	1986-II	6.03%	$4,629	16.8%	$5,056
1975-III	5.22%	$1,723	17.6%	$1,910	1986-III	6.03%	$4,710	16.5%	$5,124
1975-IV	5.26%	$1,746	17.8%	$1,941	1986-IV	5.99%	$4,808	16.1%	$5,192
1976-I	5.16%	$1,783	18.2%	$1,974	1987-I	5.97%	$4,903	16.2%	$5,251
1976-II	5.19%	$1,807	17.8%	$2,016	1987-II	5.99%	$4,988	16.8%	$5,307
1976-III	5.14%	$1,879	17.5%	$2,061	1987-III	6.01%	$5,061	17.5%	$5,350
1976-IV	5.21%	$1,926	17.1%	$2,108	1987-IV	6.03%	$5,139	17.6%	$5,399
1977-I	5.14%	$1,979	17.3%	$2,161	1988-I	6.09%	$5,220	17.5%	$5,534
1977-II	5.05%	$2,046	18.2%	$2,225	1988-II	6.07%	$5,302	17.6%	$5,633
1977-III	5.04%	$2,125	18.6%	$2,279	1988-III	6.10%	$5,386	17.8%	$5,708
1977-IV	4.95%	$2,219	18.1%	$2,339	1988-IV	6.13%	$5,456	18.4%	$5,778
1978-I	4.78%	$2,310	17.6%	$2,402	1989-I	6.13%	$5,544	18.3%	$5,888
1978-II	4.74%	$2,397	18.7%	$2,473	1989-II	6.12%	$5,620	18.1%	$5,972
1978-III	4.67%	$2,489	18.2%	$2,555	1989-III	6.11%	$5,724	18.0%	$6,055
1978-IV	4.66%	$2,575	18.1%	$2,638	1989-IV	6.22%	$5,779	17.3%	$6,146
1979-I	4.55%	$2,665	17.7%	$2,727	1990-I	6.26%	$5,849	17.4%	$6,241
1979-II	4.51%	$2,745	17.1%	$2,830	1990-II	6.34%	$5,927	17.6%	$6,316
1979-III	4.44%	$2,869	16.7%	$2,937	1990-III	6.41%	$5,981	17.1%	$6,379
1979-IV	4.43%	$2,992	16.4%	$3,045	1990-IV	6.40%	$6,038	17.0%	$6,472
1980-I	4.50%	$3,094	16.1%	$3,147	1991-I	6.52%	$6,075	17.0%	$6,571
1980-II	4.49%	$3,197	14.7%	$3,261	1991-II	6.61%	$6,110	16.7%	$6,671
1980-III	4.53%	$3,290	14.6%	$3,380	1991-III	6.62%	$6,153	16.7%	$6,688
1980-IV	4.56%	$3,384	15.8%	$3,496	1991-IV	6.63%	$6,207	16.8%	$6,698

	Residential		Nonresidential	
Period	MPK	Cap. Stock	MPK	Cap. Stock
1992-I	6.78%	$6,211	17.2%	$6,702
1992-II	6.87%	$6,221	17.2%	$6,762
1992-III	6.83%	$6,326	17.0%	$6,777
1992-IV	6.85%	$6,415	17.4%	$6,856
1993-I	6.69%	$6,553	17.2%	$6,910
1993-II	6.65%	$6,671	17.4%	$7,013
1993-III	6.68%	$6,775	17.1%	$7,085
1993-IV	6.67%	$6,881	17.9%	$7,148
1994-I	6.79%	$6,956	18.0%	$7,222
1994-II	6.77%	$7,086	18.3%	$7,344
1994-III	6.75%	$7,175	18.8%	$7,453
1994-IV	6.70%	$7,304	19.1%	$7,549
1995-I	6.70%	$7,451	18.9%	$7,603
1995-II	6.72%	$7,571	18.7%	$7,706
1995-III	6.77%	$7,640	18.9%	$7,835
1995-IV	6.77%	$7,707	18.9%	$7,932
1996-I	6.80%	$7,785	19.4%	$8,000
1996-II	6.79%	$7,870	19.8%	$8,040
1996-III	6.74%	$7,965	20.0%	$8,081
1996-IV	6.71%	$8,117	20.4%	$8,257
1997-I	6.74%	$8,216	20.3%	$8,382
1997-II	6.75%	$8,317	20.5%	$8,483
1997-III	6.76%	$8,416	20.8%	$8,601
1997-IV	6.79%	$8,551	20.4%	$8,743
1998-I	6.70%	$8,678	19.9%	$8,838
1998-II	6.75%	$8,772	20.1%	$8,881
1998-III	6.74%	$8,908	20.2%	$8,991
1998-IV	6.66%	$9,080	19.8%	$9,156
1999-I	6.75%	$9,249	19.7%	$9,342
1999-II	6.72%	$9,422	19.5%	$9,500
1999-III	6.70%	$9,609	19.3%	$9,613
1999-IV	6.63%	$9,775	19.4%	$9,714
2000-I	6.59%	$9,937	19.4%	$9,892
2000-II	6.58%	$10,168	19.2%	$10,067
2000-III	6.61%	$10,330	18.6%	$10,231
2000-IV	6.70%	$10,476	17.8%	$10,429
2001-I	6.69%	$10,628	17.7%	$10,573
2001-II	6.61%	$10,832	17.9%	$10,635
2001-III	6.57%	$11,027	17.1%	$10,841
2001-IV	6.46%	$11,274	16.9%	$11,023
2002-I	6.36%	$11,420	17.3%	$11,125
2002-II	6.40%	$11,486	17.2%	$11,233
2002-III	6.35%	$11,659	17.0%	$11,286
2002-IV	6.36%	$11,812	17.3%	$11,354
2003-I	5.93%	$12,156	17.4%	$11,552
2003-II	5.80%	$12,540	17.5%	$11,622
2003-III	5.79%	$12,646	17.8%	$11,639
2003-IV	5.77%	$12,836	18.4%	$11,758
2004-I	5.62%	$13,196	19.2%	$11,943
2004-II	5.52%	$13,619	19.3%	$12,123
2004-III	5.44%	$14,027	19.3%	$12,408
2004-IV	5.40%	$14,439	19.0%	$12,653
2005-I	5.33%	$14,781	19.3%	$12,922
2005-II	5.27%	$15,098	19.6%	$13,237
2005-III	5.20%	$15,485	19.9%	$13,496
2005-IV	5.13%	$16,039	20.2%	$13,733
2006-I	5.07%	$16,482	20.5%	$14,071
2006-II	5.03%	$16,896	20.4%	$14,347
2006-III	5.03%	$17,191	20.4%	$14,619
2006-IV	5.01%	$17,369	19.7%	$14,882
2007-I	5.14%	$17,631	18.7%	$15,189
2007-II	5.16%	$17,713	19.0%	$15,456
2007-III	5.20%	$17,735	18.7%	$15,656
2007-IV	5.22%	$17,791	18.6%	$15,831
2008-I	5.62%	$17,851	17.8%	$16,024
2008-II	5.71%	$17,828	17.6%	$16,148
2008-III	5.76%	$17,796	17.7%	$16,405
2008-IV	5.88%	$17,611	15.5%	$16,792
2009-I	6.11%	$17,024	15.2%	$17,182
2009-II	6.18%	$16,760	15.4%	$17,225
2009-III	6.29%	$16,471	16.1%	$17,086
2009-IV	6.38%	$16,352	17.3%	$16,903

Note: see Notes to Table 1

VI. References

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