The Evolution of Real Estate in the Economy

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Tuesday, April 25, 2000

1. Introduction

The fast growth of high tech and internet-related industries has changed the landscape of the U.S. economy. As the economy completed its tenth consecutive year of expansion in 1999, making this the longest expansion in history, the concept of a "new economy" has become widely accepted. What is the role of real estate in the new economy? How will the real estate industry change in the future? One fruitful approach to answer these questions is to look back in time and examine the growth and decline of real estate in different parts of the economy.

This paper examines economic indicators to show how the role of the real estate industry in the economy has evolved over time. This examination spans the early 1980s through 1999. This period is chosen for two reasons. First, this period witnessed important financial innovations in the real estate industry such as real estate investment trusts (REITs) and mortgage-backed securities (MBS). Second, this period also saw the rapid growth of high tech industries and the creation of '.com' companies.

A few studies have tried to estimate the size of the entire real estate industry or the aggregate value of all real estate assets. Miles et al (1994) and Miles and Tolleson (1997) provided estimates of the aggregate value of investable real estate assets in public and private markets. The Urban Land Institute (ULI) also has attempted to make such a calculation, published in its *America's Real Estat*e series which includes comprehensive data tables of many aspects on real estate values. The method used in these papers is a detailed accounting approach. The entire real estate market was divided into public and private markets and each market was further divided into several segments. Transactions and flow of funds data enable a reasonably accurate estimation of the total value of real

estate in public markets. However, documenting the aggregate value of non-securitized or private market assets is not as straight forward.

This detailed accounting method approach has two disadvantages. First, it requires a huge amount of data which generally are not available either in cross section or over time. For example, commercial real estate is one of the largest components of the private market. However, there is no direct data information on the market value of real estate held by corporations. In addition, previous studies rely heavily on arbitrarily-determined parameters to estimate asset values. These parameters are almost always time-invariant. Given that results are sensitive to these key parameters, the lack of time variation limits the usefulness of the results when examining changes across decades. Not surprisingly, there is a wide range of estimates reflecting the lack of agreement on the true size of real estate pie.

Rather than creating one arbitrarily-determined aggregate number, our approach is to create several indicators based on more reliable data that reflect several aspects of the real estate industry. The aspects include real estate in gross domestic product (GDP) which reflects the annual flow of value added by the real estate industry; real estate's share in the total wealth of households and businesses; real estate in the debt market, and real estate in the stock market.

Our key conclusions include the following. In terms of the value added in GDP, the role of the real estate industry is quite steady over time. About 11% of output each year is attributable to the real estate industry. In terms of household and corporation asset allocations, the importance of real estate has been declining. One of the contributors to this phenomenon is the very strong performance of stock market. In the capital markets, the prominence of real estate investment trusts (REITs) in the stock market has increased since

1985. However it remains a very small fraction of the overall equity market. Finally, the role of real estate in the debt market has steadily increased and the securitization of residential and commercial mortgages has increased real estate's scope in debt markets.

2. Real Estate in the Economy: Several Indicators

2.1 A Flow Measure -- Value Added in GDP

Table 1 reports the allocation of GDP to the real estate industry -- as a whole and for various components of the industry. Following the ULI's approach (ULI, 1998), GDP is allocated to the real estate industry based on the gross output originating from the construction, real estate services, and the real estate finance and insurance sectors. To estimate how much of the output from the finance and insurance sector can be attributed to real estate, we calculate the fraction of outstanding credit that is attributed to mortgages from Table 1.59's *Summary of Credit Market Debt Outstanding* as reported in the Federal Reserve Bulletin. We think this estimate should be viewed as a lower bound. To estimate the output of real estate services, the output from owner-occupied homes is subtracted from total output of the real estate sector.

While the percentage of value added attributed to real estate is fairly steady over time, its importance actually has grown slightly in the late 1990s. Real estate's share of GDP increases from 10.7% in 1993 to 11.3% in 1997. While this may seem fairly trivial, if share is held constant at the 1993 level, real estate's output would be $868 billion lower. In other words, real estate has grown 5% faster than would have been expected if the market structure were unchanged since 1993. This growth can be attributed to the increasing role of

real estate finance and insurance. This should be no surprise given the innovations experienced in the capital markets.

In sum, in terms of economic flows real estate is as important a part of the economy as ever. Some parts of the industry, especially those finance and capital market related, have increased share in GDP, while others (services) have remained constant or even shrunk. As will be seen in the next subsection, a different conclusion is reached when we examine the asset base.

2.2 Stock measures--Household and Corporate Asset Allocation

Tables 2A and 2B document how much of household and non-financial corporate assets are allocated to real estate. In both tables, total assets refer to all tangible and financial assets held and real estate assets refer to tangible real estate assets only.

From Table 2A we can see that the share of real estate assets held by American households was quite steady throughout most of the 1980s, but began declining at the end of the decade. This trend continued through 1999, the last year for which we have data. In the 1980s, real estate assets consistently accounted for 31% of household and nonprofit assets, but by the end of 1999 that fraction was just under 23%. Meanwhile, the importance of stocks and mutual funds increased rapidly from 7.5% in the mid-1980s to 22.7% in the late 1990s. By 1999 stocks and mutual funds became a larger part of household assets than real estate for the first time. In addition, pension fund reserves were also increasing rapidly in this period.

Over the long run, it is not surprising to see the decline in real estate as a depository of household wealth. For households, owner-occupied homes represent the vast majority of

real estate wealth. Because the income elasticity of housing demand has been estimated in a range of 0.7 to 1.0 (Mills, 1999), household spending on housing will increase less than the growth in income. Thus, when household income or wealth increases by 10%, housing expenditure increases by less than 10%.

In addition, the improved condition of financial markets may provide an additional impetus for the declining role of real estate as a mechanism for holding wealth. Table 2A shows that stocks and mutual fund holdings have increased from 7% to over 22% of total wealth from 1982 to 1999. Stock prices have been increasing at a much faster rate than home prices, especially in the 1990s. This can be seen in Figure 1's plot of the appreciation rate on the Freddie Mac repeat sales house price index verses the S&P 500 Index. Even if households were to expend the same proportion of their income on real estate assets each year, the lower return on housing would drive down the fraction of wealth held in such assets. In addition, the lower cost of investing in the stock market, along with the momentum investing associated with its rise in the 1990s, make it likely that households have been shifting some money from real estate into stocks in order to diversify their portfolio. As long as the economy is strong and the stock market performs well, one would expect further declines in the fraction of household assets allocated to real estate (primarily owner-occupied homes). That said, the volatility in the stock market is much higher than in the housing market, and that volatility has been increasing recently. If a major market correction ensues, it is possible that we will see the fraction of household wealth held in real estate increase.

Finally, the baby-boomer generation may provide another reason for real estate's recently declining share in household wealth. As baby-boomers approach retirement age,

they should be focusing on saving more money for retirement. The increase in the pension fund reserves is evidence of this behavior. However, once this group actually enters retirement they will start to consume their savings and wealth. This will reduce demand for stocks and bonds, but that is a long way off.

Table 2B shows the changes in asset allocation for non-financial companies. As with households there is a declining share for real estate in corporate wealth. Back in early 1980s, the fraction of real estate assets held by these companies was as high as 41%, but by the end of 1990s, the fraction had dropped to 28%. This decline was most dramatic in the early 1990s.

The decline reflects the potential influences of at least two factors. First, the decrease in the relative value of real estate naturally reduces the fraction of assets held in real estate. Stated differently, the values of non-real estate assets simply have appreciated more. Second, there has been a decline in the incentives for non-financial companies to hold real estate. A number of researchers, including Linneman (1998) and Gyourko & Deng (1999) have argued that the ownership of too much real estate can and does hurt firms, resulting in lower returns in the long run. Hence, the decline in the share of scarce corporate capital being devoted to real estate may reflect increasingly sound management practice.[1]

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[1] Changes in tax code also may have affected the real estate share changes of late 1980s and early 1990s. The 1986 Tax Reform Act dramatically changed depreciation deductions. The useful life of nonresidential property was extended from 19 years to 31.5 years. The Accelerated Cost Recovery System, which often provided a much larger tax shelter for companies, was replaced by a straight-line depreciation method. In 1993, the useful life of nonresidential property was extended to 39 years. However, the effect of these events cannot account for the persistent decline in share. They may contribute to the real estate share decline in 1987 and 1993, but contribute less to the long-run trends in the real estate declining.

3. Real Estate Equity and Debt

This section focuses on the growth of real estate-related equity and debt capital markets. Tables 3 and 4 are constructed to examine the evolution of real estate in the capital markets. Table 3 documents debt outstanding and Table 4 depicts the role of REITs in the stock market.

Table 3 shows a steady increase in the fraction of total debt outstanding that is real estate-related. Real estate debt is defined as all debt owed by real estate companies or non-real estate companies but for real estate purposes. Using the Federal Reserve Flow of Funds data, this includes mortgage debt (home and commercial), Government Sponsored Enterprise (GSE) securities and collateral mortgage obligations (CMOs), federal government-related mortgage pools, debt owed by mortgage companies and REITs, privately issued home mortgage-backed securities, non-agency commercial mortgage-backed securities (CMBS), and debt owed by banks for mortgage financing. The only parts missing from this calculation are municipal bonds and non-real estate company corporate bonds that are used to finance real estate projects.

Total real estate debt outstanding in 1985 was about $3 trillion, while it is $11.3 trillion in 1999. The real estate fraction of total debt outstanding was 35.8% in 1985. By 1999 it has climbed to 44%. Excluding mortgage debt owed by households and non-financial companies, non-mortgage real estate debt (primarily in bonds, with some commercial loans and commercial papers) increased even more rapidly. In addition, non-mortgage real estate debt in 1985 was only 8% of total outstanding debt. It is almost 20% in 1999. In summary, these results show that in the debt market, real estate is becoming

increasingly important and may in the foreseeable future constitute the majority of the debt market.

One of the most important causes of the growth of real estate debt is securitization. In 1980s and early 1990s, home mortgage-backed securities experienced the fastest growth. The issuance of CMBS surged in 1990s, although there was a break in late 1998 and early 1999. The continued growth in these parts of the market will hinge largely on the ability of the CMBS to provide increased liquidity and stability.

Table 4 turns to the equity market and shows that the REIT share of the equity market increased steadily from 1985 to 1997, with a rapid increase occurring in 1993. Aggregate public REITs capitalization doubled in that year. However, the well known decline in the REIT market is evident beginning in 1998. REITs' equity capitalization as well as its faction of the stock market have declined in recent years. By the end of 1999, the market capitalization of publicly traded REITs was 0.0007% of the whole equity market and the total value declined to 120 billion dollars from 138 billion dollars a year earlier. Clearly, there could be huge growth in this market without it ever becoming a significant faction of the overall stock market.

5. Conclusion

This paper investigates the evolution of real estate in the economy. We focus on several important aspects of the economy, including GDP, household and corporate asset allocations, and the debt and equity markets. We develop indicators for each of these sectors and document the evolution of real estate since early 1980s. While previous efforts have relied on somewhat arbitrary and time invariant estimates, our analysis focuses on individual

markets and provides better accuracy. This focus allows us to see divergent patterns for real estate in different markets.

In terms of annual flows, real estate's share of GDP is quite stable over time. About 11% of new income or output created each year is added by the real estate industry. In contrast, household and corporation asset allocations have shown significantly lower shares for real estate. The strong performance of the stock market, growth in household wealth combined with a relatively low income elasticity of demand for housing, and changed corporate behavior appear to have contributed to this decline. Even so, the values of real estate in debt and equity markets have increased substantially. Securitizations of mortgage and commercial mortgage have made real estate an increasingly important component in debt market.

Reference:

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Table 1. Allocation of GDP to the Real Estate Industry.
        Dollars in Billions

Year	Total GDP	Real Estate Industry		Construction		Real Estate Services		Real Estate Finance and Insurance	
	Dollars	Dollars	Percent	Dollars	Percent	Dollars	Percent	Dollars	Percent
1988	5,049.6	598.4	11.9%	233.4	4.6%	268.5	5.3%	96.5	1.9%
1989	5,438.7	638.8	11.7%	242.2	4.4%	292.7	5.3%	103.9	1.9%
1990	5,743.8	661.4	11.5%	245.2	4.2%	306.7	5.34%	109.5	1.9%
1991	5,916.7	663.2	11.2%	228.8	3.8%	312.8	5.29%	121.5	2.0%
1992	6,244.4	672.0	10.8%	229.7	3.6%	330.0	5.28%	112.3	1.8%
1993	6,558.1	699.8	10.7%	242.4	3.7%	338.5	5.16%	118.9	1.8%
1994	6,947.0	747.4	10.8%	268.7	3.8%	359.0	5.17%	119.7	1.7%
1995	7,269.6	796.1	11.0%	286.4	3.9%	376.1	5.17%	133.6	1.8%
1996	7,661.6	859.6	11.2%	311.9	4.0%	400.9	5.23%	146.8	1.9%
1997	8,110.9	912.5	11.3%	328.8	4.0%	416.6	5.14%	167.1	2.0%

Data source: National Accounts Data, BEA, various years; Federal Reserve Bulletin, Various years.

Note: All dollars are current dollars in billions. GDP is allocated to the Real Estate Industry based on the gross output originating from the construction, real estate services, and real estate finance and insurance sectors (Real Estate Industry = Construction + Real Estate Services + Real Estate Finance and Insurance). To estimate the output of real estate services the output from owner occupied homes is subtracted from total output of the real estate sector. The output of owner occupied homes is estimated from Table 8.19 of the National Income and Product Accounts gross housing product of owner occupied farm and nonfarm housing (lines 89 and 97). To estimate how much of the output from the Finance and Insurance Sector can be attributed to real estate we calculate the fraction of outstanding credit that is attributed to mortgages from Table 1.59 Summary of Credit Market Debt Outstanding as reported in the Federal Reserve Bulletin. All F&I is defined as the sum of reported gross output from Depository Institutions, Nondepository Institutions, Security and Commodity Brokers, Insurance Carriers, and Holding and Other Investment Offices.

Table 2A. Real estate assets in the total wealth of households and non-profit organizations: 1982-1999

	Total asset ($Billion)	Real estate asset ($Billion)	Percentage Allocation (%)				
			Real estate	Other tangible assets	Corporate equities and mutual fund shares	Pension fund reserves	Other financial assets
1982	12,673	3,999	**31.5**	8.3	7.1	10.1	42.9
1983	13,710	4,181	**30.5**	8.1	7.5	11.1	42.6
1984	14,803	4,630	**31.2**	8.1	6.6	11.4	42.5
1985	16,684	5,235	**31.3**	7.8	7.5	12.5	40.8
1986	18,392	5,719	**31.1**	7.7	9.0	12.6	39.4
1987	19,651	6,177	**31.4**	7.9	8.5	12.7	39.4
1988	21,461	6,712	**31.2**	7.8	9.2	12.7	38.9
1989	23,583	7,296	**30.9**	7.7	10.3	13.6	37.4
1990	24,307	7,405	**30.4**	7.9	9.3	14.2	38.0
1991	25,920	7,477	**28.8**	7.6	12.1	14.9	36.3
1992	27,000	7,664	**28.3**	7.6	13.3	15.6	35.0
1993	28,429	7,804	**27.4**	7.6	14.8	16.4	33.6
1994	29,477	8,017	**27.2**	7.7	13.9	16.8	34.2
1995	32,610	8,398	**25.7**	7.3	16.5	17.7	32.7
1996	35,483	8,833	**24.8**	6.9	17.5	18.7	31.9
1997	39,697	9,517	**23.9**	6.4	19.5	19.9	30.2
1998	43,508	10,238	**23.5**	6.1	20.3	20.9	29.1
1999	48,889	11,088	**22.68**	5.8	22.7	21.2	27.6

Data Source: Flow of Funds, Z1. Tables, various years; Survey of Consumer Finance, various years.
Note: All dollars are current dollars in billions. Total asset includes all the tangible asset and financial asset. Real estate asset refers tangible real estate asset only. Asset values are at market.

Table 2B. Real estate assets in the total wealth of non-financial companies: 1982-1999

	Total asset ($Billion)	Real estate asset ($Billion)	Percentage Allocation (%)		
			Real estate fraction (%)	Other Tangible assets fraction (%)	Financial Asset Fraction (%)
1982	6,145	2,514	**40.9**	31.9	27.2
1983	6,463	2,588	**40.0**	31.5	28.5
1984	7,013	2,732	**39.0**	30.9	30.1
1985	7,502	2,854	**38.0**	30.2	31.7
1986	7,838	2,936	**37.5**	30.1	32.4
1987	8,343	3,083	**37.0**	29.9	33.2
1988	9,074	3,288	**36.2**	29.2	34.6
1989	9,620	3,471	**36.1**	29.1	34.8
1990	9,828	3,440	**35.0**	30.0	35.0
1991	9,736	3,254	**33.4**	30.2	36.4
1992	9,723	3,012	**31.0**	31.1	37.9
1993	10,070	2,901	**28.8**	31.3	39.9
1994	10,691	3,074	**28.8**	31.4	39.8
1995	11,494	3,203	**27.9**	31.1	41.1
1996	12,266	3,354	**27.3**	30.4	42.3
1997	13,339	3,756	**28.2**	29.3	42.5
1998	14,251	4,203	**29.5**	28.4	42.1
1999	15,380	4,411	**28.7**	28.2	43.1

Data Source: Flow of Funds, Z1. Tables, various years

Note: All dollars are current dollars in billions. Total asset includes all the tangible asset and financial asset.
Real estate asset refers to tangible real estate only. Asset values are at market value.

Table 3. Real estate debt: Debt outstanding 1985-1998 (Units: $ Billion)

Year	Total debt outstanding	Mortgage Owed by Nonfiancial Sector	GSEs	Federal related mortgage pools	Mortgage companies	REITs	Agency CMOs[a]	Privately Issued Home MBS[b]	Non-Agency CMBS	Debt by finance companies for mortgage[c]	Total real estate debt	Real estate debt fraction (%)	MBS as total debt fraction (%)
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
1985	$8,627	$2,376	$263	$369	$16	$8	$10	$24	$1	$19	$3,085	35.8	7.7
1986	9,804	2,661	278	531	25	13	53	17	2	24	3,604	36.8	9.0
1987	10,816	2,963	308	670	14	21	81	28	4	28	4,118	38.1	10.1
1988	11,855	3,279	353	745	14	25	106	35	7	31	4,594	38.8	10.5
1989	12,822	3,549	378	869	24	27	98	43	10	36	5,035	39.3	10.9
1990	13,745	3,804	398	1,019	24	28	103	55	12	44	5,488	39.9	11.5
1991	14,393	3,954	407	1,156	22	29	89	100	18	44	5,818	40.4	12.3
1992	15,194	4,068	448	1,272	30	28	71	151	29	46	6,143	40.4	13.0
1993	16,165	4,203	529	1,357	30	30	90	184	40	44	6,505	40.2	13.6
1994	17,209	4,372	701	1,472	19	40	110	206	47	47	7,013	40.8	14.7
1995	18,439	4,569	807	1,570	17	45	133	224	54	51	7,469	40.5	15.1
1996	19,766	4,849	897	1,711	21	57	137	259	71	59	8,061	40.8	15.6
1997	21,157	5,138	995	1,826	16	96	141	312	97	63	8,684	41.1	15.9
1998	23,364	5,612	1,274	2,018	18	159	179	403	157	73	9,893	42.3	17.3
1999	25,614	6,238	1,592	2,292	18	167	224	455	198	87	11,271	44.0	18.6

Data source: Federal Reserve Board, Flow of Funds, Z1. Tables, various years.

Note: All dollars are current dollars in billions.
Total debt is the year-end debt outstanding by all households, non-financial corporations, financial sectors, and governments.
Total real estate debt (K) is the summation of the columns of (B) to (J). MBS debt includes columns (C), (D), (G), (H), and (I).
a:Federally related mortgage pool securities backing privately issued CMOs
b:Privately issued mortgage pool securities and privately issued CMOs, not including REITs
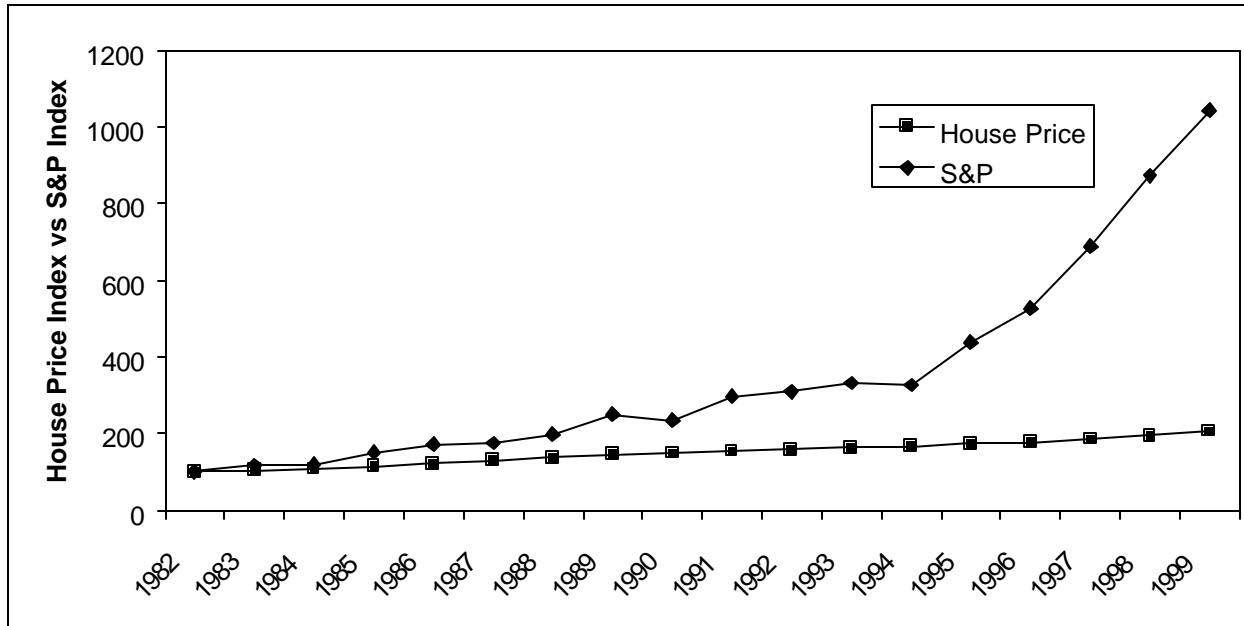c:Estimated by the Authors. The number equals mortgage asset times debt to total asset ratio in finance companies.

Table 4. Real estate in the equity market: 1985-1999

Calendar Date	Total equity market value ($ Billion)	Market capitalization of all REITS ($ Billion)	Number of public REITs	**Fraction of REITs in value (%)**	Fraction of REITS in firm counts (%)
31-Dec-85	2,195,914	7.67	82	**0.00035**	1.3
31-Dec-86	2,467,299	9.92	96	**0.00040**	1.5
31-Dec-87	2,467,792	9.70	110	**0.00039**	1.6
30-Dec-88	2,702,045	11.44	117	**0.00042**	1.7
29-Dec-89	3,290,805	11.66	120	**0.00035**	1.8
31-Dec-90	2,970,824	8.74	119	**0.00029**	1.8
31-Dec-91	3,982,063	12.97	138	**0.00033**	2.1
31-Dec-92	4,375,079	15.91	142	**0.00036**	2.1
31-Dec-93	5,020,231	32.16	189	**0.00064**	2.5
30-Dec-94	4,964,998	44.31	226	**0.00089**	2.8
29-Dec-95	6,732,165	57.54	219	**0.00085**	2.7
31-Dec-96	8,237,516	88.78	199	**0.00108**	2.3
31-Dec-97	10,699,532	140.53	211	**0.00131**	2.4
31-Dec-98	13,175,871	138.30	210	**0.00105**	2.5
31-Dec-99	17,642,728	124.26	210	**0.00070**	2.4

Data source: CRSP Indices, Nasdaq, and NAREIT.
Note: The total market value includes total market value at the NYSE, AMSE, and NASDAQ.

Figure 1. House Price Index vs S&P 500 Index.

Note: Housing price index is from Freddie Mac Repeat Sale Housing Price Index.
Base year is 1982 when both indexes are normalized into 100.