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The Evolution of Real Estate in the Economy

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The Evolution of Real Estate in the Economy

Executive Summary. *While the economy as a whole has been rapidly changing in response to technological innovation, real estate has evolved from a depository of wealth for households and assets for corporations into a major force in the debt and equity markets. In contrast, the role of real estate as a contributor to the nation's output and income has remained steady at approximately 11% of gross domestic product.*

by Dapeng Hu*
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Introduction

The fast growth of the high tech and Internet-related industries has changed the landscape of the economy in the United States. In 1999, the economy completed its tenth consecutive year of expansion, marking the longest expansion in history. As a result, 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 approach to answer these questions is to look back in time and examine the patterns of growth and decline of real estate in various parts of the economy.

This article examines economic indicators to depict the evolution of the real estate industry's role in the economy over time. This examination spans the early 1980s through 1999, a period chosen for two reasons. First, important financial innovations in the real estate industry, such as real estate investment trusts (REITs) and mortgage-backed securities (MBS) occurred during this period. Secondly, this was also the period during which we saw the rapid growth of high-tech industries and the formation of dot-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, Machi and Hopkins (1994) and Miles and Tolleson (1997) provided estimates of the aggregate value of investable real estate assets in public and private markets. In its *America's Real Estate series*, the Urban Land Institute (ULI) also has attempted to calculate and publish such a statistic, which incorporates comprehensive data tables of real estate component

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values. The method used in these articles is a detailed accounting approach. The entire real estate market was divided into two markets, public and private; each of these was further divided into several segments. Data on transactions and flow of funds provided 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 straightforward.

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. It is not surprising that there is a wide range of estimates reflecting the lack of agreement on the true size of the 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 the stock market. In the capital markets, the prominence of 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.

Real Estate in the Economy: Several Indicators

A Flow Measure Value Added in GDP

Exhibit 1 shows 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 service, 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 in the *Federal Reserve Bulletin's Table 1.59 Summary of Credit Market Debt Outstanding*. 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 the 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 grew slightly in the late 1990s. Real estate's share of GDP increased 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. The substantial innovations in real estate finance and insurance must contribute to this growth.

In sum, real estate is as important a part of the economy as ever, in terms of economic flow. Some parts of the industry, especially those related to finance and capital market, have increased share in GDP, while others (*i.e.*, services) have remained

Exhibit 1
Allocation of GDP to the Real Estate Industry

Year	Total GDP	Real Estate Industry		Construction		Real Estate Services		Real Estate Finance and Insurance	
	Dollars	Dollars	Percentage	Dollars	Percentage	Dollars	Percentage	Dollars	Percentage
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	5.3	109.5	1.9
1991	5,916.7	663.2	11.2	228.8	3.8	312.8	5.3	121.5	2.0
1992	6,244.4	672.0	10.8	229.7	3.6	330.0	5.3	112.3	1.8
1993	6,558.1	699.8	10.7	242.4	3.7	338.5	5.2	118.9	1.8
1994	6,947.0	747.4	10.8	268.7	3.8	359.0	5.2	119.7	1.7
1995	7,269.6	796.1	11.0	286.4	3.9	376.1	5.2	133.6	1.8
1996	7,661.6	859.6	11.2	311.9	4.0	400.9	5.2	146.8	1.9
1997	8,110.9	912.5	11.3	328.8	4.0	416.6	5.1	167.1	2.0

Notes: Data sources are National Accounts Data, BEA and the *Federal Reserve Bulletin*. 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.

constant and still others have decreased. However, a different conclusion is reached when we examine the asset base.

Stock Measures Household and Corporate Asset Allocation

Exhibits 2 and 3 document how much of household and nonfinancial corporate assets are allocated to real estate. In both exhibits, total assets refer to all tangible and financial assets held; real estate assets refer to tangible real estate assets only.

From Exhibit 2, we can see that the share of real estate assets held by U.S. 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 about 31% of household and nonprofit assets, but by the end of 1999 that fraction was just less than 23%. Meanwhile, the importance of stocks and mutual funds increased rapidly from 7.5% in the 1985 to 22.7% in 1999. In 1999, stocks and mutual funds became a larger part of household assets than real estate for the

first time. In addition, pension fund reserves also increased rapidly during 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 the range of 0.7 to 1.0 (Mills, 1999), 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. Exhibit 2 shows that stocks and mutual fund holdings have increased from about 7% in 1982 to more than 22% of total wealth in 1999. Stock prices have increased at a much faster rate than home prices, especially in the 1990s. This can be seen in Exhibit 4, which plots the appreciation rate on the Freddie Mac Repeat Sales House Price Index versus the S&P 500 Index. Even if households were to expend the same proportion

Exhibit 2**Real Estate Assets in the Total Wealth of Households and Nonprofit Organizations: 1982–1999**

Year	Dollar Allocation (\$billions)		Percentage Allocation (%)				
	Total Assets	Real Estate Assets	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	22.7	5.8	22.7	21.2	27.6

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. Data sources: Flow of Funds, Z1, and Tables & Survey of Consumer Finance.

Exhibit 3**Real Estate Assets in the Total Wealth of Non-Financial Companies: 1982–1999**

Year	Dollar Allocation (\$billions)		Percentage Allocation (%)		
	Total Assets	Real Estate Assets	Real Estate	Other Tangible Assets	Financial Assets
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

Notes: Data sources are Flow of Funds, Z1, and tables from various years. All dollars are current dollars in billions. Total asset includes all the tangible assets and financial assets. Real estate asset refers to tangible real estate only. Asset values are at market value.

Exhibit 4
House Price Index vs. S&P 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.

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 of investing associated with its rise in the 1990s, make it likely that households have been shifting some money from real estate into stocks to diversify their portfolios. 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 occurs, it is possible that the fraction of household wealth held in real estate will increase.

Finally, the baby-boomer generation may provide another reason for real estate's recent decline in share of 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, individuals will begin to use their savings and wealth for consumption. This will ultimately reduce the demand for stocks and bonds.

Exhibit 3 shows the changes in asset allocation for nonfinancial companies. As with households, there is a declining share for real estate in corporate wealth. In the early 1980s, the fraction of real estate assets held by these companies was as high as about 41%, but by the end of 1990s it dropped to about 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. That is, the values of non-real estate assets simply have appreciated more. Second, there has been a decline in the incentives for nonfinancial companies to hold real estate. A number of researchers including Linneman (1998) and Gyourko and 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

Exhibit 5**Real Estate Debt: Debt Outstanding 1985–1998**

Year	Total Debt Outstanding (\$) (A)	Mortgage Owed by Nonfinancial Sector (\$) (B)	GSEs (\$) (C)	Federal Related Mortgage Pools (\$) (D)	Mortgage Companies (\$) (E)	REITs (\$) (F)	Agency CMOs (\$) ^a (G)	Privately Issued Home MBS (\$) ^b (H)	Non- Agency CMBS (\$) (I)	Debt by Finance Companies for Mortgage (\$) ^c (J)	Total Real Estate Debt (\$) (K)	Real Estate Debt Fraction (%) (L)	MBS Total Debt Fraction (%) (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. 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 columns (B) to (J). MBS debt includes columns (C), (D), (G), (H) and (I).

^aFederally related mortgage pool securities backing privately issued CMOs.

^bPrivately issued mortgage pool securities and privately issued CMOs, not including REITs.

^cEstimated by the Authors. The number equals mortgage asset times debt to total asset ratio in finance companies.

Exhibit 6
Real Estate in the Equity Market: 1985–1999

Date	Total Equity Market Value	Market Capitalization of all REITs	Number of Public REITs
31-Dec-85	2,195,914	7.67	82
31-Dec-86	2,467,299	9.92	96
31-Dec-87	2,467,792	9.70	110
30-Dec-88	2,702,045	11.44	117
29-Dec-89	3,290,805	11.66	120
31-Dec-90	2,970,824	8.74	119
31-Dec-91	3,982,063	12.97	138
31-Dec-92	4,375,079	15.91	142
31-Dec-93	5,020,231	32.16	189
30-Dec-94	4,964,998	44.31	226
29-Dec-95	6,732,165	57.54	219
31-Dec-96	8,237,516	88.78	199
31-Dec-97	10,699,532	140.53	211
31-Dec-98	13,175,871	138.30	210
31-Dec-99	17,642,728	124.26	210

Notes: Dollars in billions. Data sources: CRSP Indices, NASDAQ and NAREIT. The total market value includes total market value at the NYSE, AMSE and NASDAQ.

Real Estate Equity and Debt

This section focuses on the growth of real estate–related equity and debt capital markets. Exhibits 5 and 6 are constructed to examine the evolution of real estate in the capital markets. Exhibit 5 provides annual data on outstanding debt and Exhibit 6 depicts the role of REITs in the stock market.

Exhibit 5 shows a steady increase in the fraction of total outstanding debt 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 MBS, nonagency 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 was about \$11.3 trillion

in 1999. The real estate fraction of total debt outstanding was 35.8% in 1985, while it climbed to 44% in 1999. Excluding mortgage debt owed by households and nonfinancial 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 was only about 8% of total outstanding debt in 1985; it was about 19% 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 the 1980s and early 1990s, home MBS experienced the fastest growth. The issuance of CMBS surged in the 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 CMBS to provide increased liquidity and stability.

Exhibit 6 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 that year. However, the well-known decline in the REIT market is evident beginning in 1998. REITs' equity capitalization, and its fraction of the stock market, has 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 about \$120 billion from about \$138 billion in late 1998. Clearly, there could be huge growth in this market without it ever becoming a significant fraction of the overall stock market.

Conclusion

This article 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 therefore provides more 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, the share of household and corporation assets allocated to real estate are decreasing over time. The strong performance of the stock market, growth in household wealth, the relatively low income elasticity of housing demand, and changes in corporate behavior investment behavior appear to be the major factors influencing this decline. Even so, the role of real estate in the debt and equity markets has increased substantially, indicating the importance of real estate finance innovations.

Note

1. Changes in tax code also may have affected the real estate share changes of the 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 real estate decline.

References

- U.S. Board of Governors of the Federal Reserve System, Flow of Funds Section, *Flow of Funds Accounts of the United States: Flow Outstanding*, Flow of Fund Z1, Washington, DC, 1999.
- Gyourko, J. and Y. Deng, Real Estate Ownership by Non-Real Estate Firms: The Impact on Firm Returns, Working paper, Wharton Zell / Lurie Real Estate Center, University of Pennsylvania, 1999.
- Linneman, P., The Coming Disposal of Corporate Real Estate, *Wharton Real Estate Review*, 1998, 2:2.
- Miles, M. and N. Tolleson, A Revised Look at How Real Estate Compares with Other Major Components of Domestic Investment Universe, *Real Estate Finance*, Spring 1997.
- Miles, M., J. Roberts, D. Machi and R. Hopkins, Sizing the Investment Markets: A Look at the Major Components of Public and Private Markets, *Real Estate Finance*, Spring 1994.
- Mills, E., Truly Smart 'Smart Growth,' *Illinois Real Estate Letter*, University of Illinois at Urbana-Champaign, 1999.
- Urban Land Institute, *Sources, Methods, and Evaluation of Data for America's Real Estate: Natural Resource, National Legacy*, Urban Land Institute website (last viewed June 2000).

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