Over-Investment and the Economic Crisis of 2008

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1. Introduction

There is widespread agreement that a severe financial and real sector crisis began in 2008, starting in the US and quickly spreading to much of the global economy. There are various views of the underlying cause of the crisis in the real sector. One common view is that the severity of the real sector crisis is a result of the financial sector crisis, with frequent citations to a recent historical study that found that recessions associated with financial crises have been relatively severe (Reinhart and Rogoff 2009). Often paired with this view is an explanation of the financial crisis as deriving primarily from bank deregulation and its consequences. Thus, this "financial cause" theory of the current real sector crisis locates the ultimate cause in bank deregulation, which suggests that renewed financial regulation might be sufficient to forestall similar episodes in the future.

This paper argues that the real sector crisis that began in 2008 -- the so-called "Great Recession" -- is not primarily a result of the banking collapse. Instead, it argues that both real and financial sector crises stemmed from the same underlying causes, which are found in the entire set of features of neoliberal capitalism. Kotz (2009a, 2010) makes arguments for this view, citing three key developments in neoliberal capitalism that led to both the financial and real sector crises: a rising gap between profits and wages, a financial sector disposed to engage in speculative and risky activities, and a series of asset bubbles of growing size. The earlier papers suggested that these three features led both to an over-investment crisis in the real sector and a collapse of the major financial institutions. However, the two previous studies did not present a detailed empirical analysis of the emergence of the real sector crisis in the US, which is necessary to determine whether over-investment was indeed the cause of the real sector crisis. This paper seeks to provide such an analysis.

Section 2 explains what is meant by the over-investment crisis tendency. Section 3 analyzes the rate of profit and its determinants in the period leading up to the crisis. Section 4 analyzes

aggregate demand and its components in the period prior to the crisis. Section 5 examines the behavior of aggregate demand and related factors since the recession began. Section 6 offers concluding comments.

2. The Over-Investment Crisis Tendency

The Marxist crisis theory literature has identified several crisis tendencies, or crisis causes, that are rooted in the capitalist system. Much of the crisis theory literature has focused on three crisis tendencies: underconsumption, the rising organic composition of capital (often called the tendency of the rate of profit to fall), and the profit squeeze resulting from a declining reserve army of labor. Those three crisis tendencies can arise independently of whether the capital is assumed to be entirely circulating capital or partly fixed and partly circulating capital. A fourth crisis tendency, over-investment, is based specifically on the (realistic) assumption that a major part of the capital in the economy is fixed capital lasting for many production periods.

Over-investment is a crisis tendency in which too much fixed capital is produced relative to demand in the economy as a whole, leading to a declining capacity utilization rate which reduces the rate of profit. One type of over-investment derives from excessive competition among capitalists, as each invests in fixed capital aiming to increase market share, but they cannot all increase market share since the sum of market shares in any industry must add up to 100%.[1] Another possible source of over-investment is some condition that causes final demand to temporarily rise above its normal level, spurring creation of growing productive capacity which, once final demand falls to its normal level, will turn out to be excess productive capacity.

This second type of over-investment results from a large asset bubble. Such a bubble can lead households to engage in debt-financed consumer spending as the bubble increases their paper wealth. As household consumer demand rises above its normal relation to household income, firms produce a growing level of fixed capital to satisfy the elevated consumer demand. A large asset

bubble can also stimulate firms to elevate investment spending by inducing a kind of euphoria and optimism about future profit and demand. Unrealistic expectations about future profit and demand can lead to the creation of excessive productive capacity, which, if the expectations are indeed unrealistic, will cause the rate of utilization of fixed capital to decline, which depresses the profit rate. Once the asset bubble deflates, as all asset bubbles eventually must, and consumption declines relative to household income while investment expectations reverse, a large amount of excess capacity is suddenly revealed, which can rapidly decrease the profit rate and directly depress the incentive to invest for some time. This feature of bubble-induced over-investment -- a prolonged depression of the incentive to invest once the crisis has begun -- makes this particular crisis tendency one that can produce a severe and long-lasting real-sector crisis.

Both types of over-investment -- the type resulting from excessive competition and the type due to a large asset bubble -- stem from the same underlying feature of capitalism, which is its unplanned character. Capitalist firms must invest individually without knowledge of the plans of other capitalists or of the firm's potential customers. Capitalism lacks a mechanism to guide the creation of new productive capacity in the economy as a whole in line with demand growth.

This paper presents a case that the current real sector crisis in the U.S. economy is due to the bubble-induced over-investment crisis tendency. In what follows, we will examine the behavior of the rate of profit and the components of aggregate demand to determine whether they fit the over-investment crisis tendency. A confirmation of bubble-induced over-investment has the following requirements: 1) a large asset bubble that inflates during the economic expansion and whose collapse sets off the recession; 2) consumer spending (hereafter C) plays the leading role in the expansion, rising above its normal relation to disposable income due to the effects of the asset bubble; 3) business fixed investment (hereafter BFI) eventually also expands relatively rapidly; 4) in the late expansion, when the profit rate starts to decline, the decline is primarily due to a falling rate of

utilization of fixed capital; 5) as the bubble reaches its peak and starts to deflate, consumer spending declines markedly, moving downward toward a normal relation to income; 6) BFI next starts to decline and does so rapidly as the bubble deflation and its effects on consumer and investment demand reveal a large amount of excess capacity.

3. The Rate of Profit and the Real Sector Crisis in the U.S.

The U.S. economy expanded from 1991-2000, followed by a mild and brief (8 months long) recession in 2001. After November 2001 the U.S. economy expanded until it reached an official business cycle peak in December 2007. The following recession began gradually, picking up steam only in the third quarter of 2008. The rate of profit started falling prior to the business cycle peak, as it has in every business cycle expansion since 1950 except for one.[2] As figure 1 shows, the rate of profit rose from 2001 to 2004, after which it declined through 2007. In 2005-06 the decline was gradual, accelerating in 2007.[3]

The average profit rate is a key factor determining the ups and downs of a capitalist economy. A rising profit rate encourages accumulation and economic expansion, while a declining profit rate tends to eventually depress accumulation and lead to a downturn in production. By decomposing the profit rate into its determinants, we can find evidence about the underlying economic forces that reduced the rate of profit and led to a recession. Following a methodology pioneered by Weisskopf (1979) and also used in Kotz (2009b), we decompose the profit rate as follows:

$$r = \left(\frac{P}{NW}\right) = \left(\frac{P}{Y}\right) \times \left(\frac{Y}{TA}\right) \times \left(\frac{TA}{NW}\right) \qquad (1)$$

where r = rate of profit, P = profit, NW = net worth, Y = net output, and TA = tangible assets.[4]

The first term on the right hand side of equation 1, P/Y, is the share of profit in income. The second term, Y/TA, is the ratio of output to means of production, whose variation over short periods

of time mainly indicates changes in the utilization rate of the stock of means of production.[5] The third term, TA/NW, is a financial ratio whose changes result from changes in the degree of leverage (debt over total assets) and the degree of "financialization" (the ratio of financial assets to total assets), where increased leverage increases TA/NW (and hence the profit rate) while increased financialization decreases TA/NW (and hence the profit rate).

If over-investment is the cause of a crisis, we should see a decline in the ratio Y/TA prior to the crisis as the major factor contributing to a declining rate of profit. Table 1 shows the change in the three factors determining the rate of profit during 2004-07, the period in which it declined up to the cycle peak in 2007. Slightly over 70% of the decline in the profit rate is accounted for by a 17.5% decline in Y/TA over the period. This was by far the steepest decline in Y/TA prior to a peak year since 1948.[6] The profit share also declined over the period by 5.5%, accounting for 22.3% of the profit rate decline. A decline in the third variable, TA/NW accounted for a small 13.9% of the profit rate decline.[7]

Profit and wages do not exhaust net output. To take account of this, we further decompose the profit share as follows:

$$\left(\frac{P}{Y}\right) = 1 - \left(\frac{W}{Y}\right) - \left(\frac{T}{Y}\right) - \left(\frac{i}{Y}\right) \qquad (2)$$

where W = employee compensation, T = profit tax plus indirect taxes, and i = net interest.[8]

Table 2 shows the movement of the profit share and the 3 variables that account for its movements. Like equation 1, equation 2 is an identity, since output is the sum of the other variables.[9] Since equation 2 is additive rather than multiplicative, the appropriate method to assess changes in the variables uses the concept of "contribution share," where the contribution share of each variable on the right side of equation 2 to the change in P/Y is the change in the variable divided by the change in P/Y. The sum of the contributions shares should add to the 100%.

From table 2 we see that the decline in the profit share was not due to a rise in the wage share, which fell over the period. This is not surprising, given the weakness of labor in the neoliberal era and especially in the 2000s.[10] The profit share fell due to rising taxes and rising interest payments, which outweighed the effect of the falling wage share. The rising taxes are surprising -- we have no explanation for why taxes on the nonfinancial corporate business sector rose in that period. The rising interest costs are consistent with the trend in interest rates during 2004-07. However, the main factor accounting for the fall in the rate of profit was the steep fall in Y/TA, which is consistent with the over-investment crisis tendency.[11]

A huge real estate bubble arose in the U.S. economy during this expansion, which is a necessary condition for bubble-induced over-investment. Figure 2 shows what is perhaps the best measure of a housing bubble -- the ratio of the House Price Index to Homeowners Equivalent Rent. The latter variable represents the economic value of owning a home. From 1982 to 2000 that ratio rose and fell with the business cycle. However, instead of declining in the 2001 recession and the relatively sluggish recovery years immediately following 2001, the ratio rose at an accelerating pace starting in 2001. By 2006 it had reached 157.1, which was 39.1% above its average level of 112.9 during 1982-2000. According to one estimate, about $8 trillion of the total $20 trillion value of U.S. housing in 2007, or 40%, was bubble-inflated fictitious wealth (Baker, 2007). All of the institutions of neoliberal capitalism created conditions conducive to the growth of large asset bubbles -- and such bubbles were the only means available to resolve the central macroeconomic contradiction of neoliberal capitalism between favorable conditions for profit-making and unfavorable conditions for realizing the growing profits, which would require growing final demand (Kotz, 2009a). To see the effects of the real estate bubble on the macroeconomy, we turn to an examination of aggregate demand and its components in the 2000s expansion.

4. Aggregate Demand and the Expansion of 2002-07

As table 3 shows, the expansion of 2002-07 was not a vigorous one, with GDP rising at an annual rate of 2.6% per year. The expansion was led by C, which grew 0.3 percentage points faster than GDP and contributed 78.4% of the total GDP growth over the period (see table 4). C grew faster than GDP in every year of the expansion except 2004, when C growth was 0.1 percentage point below the GDP growth rate. BFI also grew faster than GDP, by 0.6 percentage points, but due to its smaller size it contributed only 14.4% of GDP growth. Residential investment (RI) was a wash, ending up virtually where it began at the start of the expansion. Total government purchases grew faster than GDP, at 3.8% per year, contributing 13.6% of GDP growth, most of which was due to increased military spending. Although exports grew as rapidly as imports, since the latter was much greater than the former at the start of the period, the difference between them grew, subtracting 9.7% of total GDP growth from GDP growth over the period.

The expansion had three distinct phases: 2002-03, 2004-05, and 2006-07.[12] In phase 1 GDP growth was quite slow, averaging 2.2% per year. In phase 2 it was more robust, at 3.3% per year. In the final phase 3 growth slowed to 2.3%.

Phase 1 -- sluggish growth, 2002-03: This was the period of sluggish recovery from the 2001 recession. Consumption growth contributed more than 100% of GDP growth in 2002 and 78.8% in 2003 (calculated from table 4). This is historically unusual for the beginning of an expansion -- normally BFI leads the early expansion. However, that was not the case in this expansion. In 2002-03, BFI remained depressed, falling sharply in 2002 and barely rising in 2003. This is consistent with the aftereffects of a previous crisis of over-investment in 2000-01 (Kotz, 2003). Also, from figure 1, the profit rate recovered only modestly in this phase, providing little incentive for investment. With interest rates very low, RI grew rapidly in this period. Falling net exports were a significant drag on growth.

Phase 2 -- robust growth, 2004-05: Consumer spending growth sped up in this period. It

grew slightly more slowly than GDP in 2004 and 0.3 percentage points faster than GDP in 2005. Except for 2004, C remained the leading sector, contributing 75.5% of GDP growth in 2005. BFI began to grow rapidly in this phase, at over 6% per year. The profit rate rose sharply in 2004 and fell only slightly in 2005. The sum of business and residential investment contributed 31.4% of GDP growth in 2004 and 24.2% in 2005.

Phase 3 -- slowing growth, 2006-07: GDP growth slowed down in this phase, to 2.7% in 2006 and 1.9% in 2007. Consumer spending continued to lead GDP growth, while BFI continued to grow rapidly as well, at 7.9% in 2006 and 6.7% in 2007, despite the falling rate of profit. The smaller RI turned strongly negative in 2006 and more strongly negative in 2007.

How can we explain the leading role of consumer spending in this expansion? Table 5 shows the growth rates of personal income and its components. In the first year of the expansion, 2002, the Bush Administration tax cuts, despite being aimed primarily at the rich, did reduce taxes for a large part of the population, and as a result that year disposable personal income rose by 3.3% despite total pre-tax personal income barely rising by 0.6%.[13] That year consumer spending grew by 2.7%, a rate faster than GDP growth, yet households had sufficient income to raise their saving rate.

Then in 2003 consumer spending moved above disposable personal income and remained above it through 2005. During that 3-year interval, disposable personal income grew at only 2.4% per year while C grew at 3.2% per year. This can be explained by the rapid growth of the real estate bubble during those years, which is shown in figure 2. The real estate bubble, along with the readiness of the financial system to extend credit based on it, supported a rapid increase in household borrowing. As figure 3 shows, household debt rose from 89.3% of disposable income in 2000 to 120.7% in 2005. Households extracted an amount of gross equity from their homes, primarily through second mortgage loans, of 10.3% of disposable income in 2004 and 9.2% in 2005 (Greenspan and Kennedy 2007). As figure 4 shows, in 2005 C reached 95.1% of disposable income,

up from 92.9% in 2002 -- 95.1% was the highest percentage of disposable income since 1938.[14]

The above evidence suggests that the potential problem of inadequate aggregate demand growth that arises in neoliberal capitalism was solved during this period by household borrowing based on a real estate bubble. Not only did C not lag behind GDP, C led GDP growth. The expansion was led by a level of consumer spending that was elevated beyond its normal relation to household income. This is a condition that leads to a crisis of over-investment, which becomes fully manifest when the bubble bursts and C returns to a normal relation to disposable income.

In 2006 the unemployment rate fell below 5%, and in that year wages and salary disbursements rose by 3.6%, property income rose even faster, and disposable income rose by 4.0% (see Table 5). The real estate bubble continued to inflate, at a slower pace, for most of 2006, and household debt continued to rise relative to disposable income, but in that year C, while still rising faster than GDP, rose slower than disposable income. In 2007, the final year of the expansion, C rose slightly faster than disposable income and significantly faster than GDP. Nevertheless, in 2006-07 C fell by only one percentage point relative to disposable income, to 94% of disposable income (Figure 4), a rate greater than any year since 1947 (except for the higher rate in 2005).

It was noted above that BFI growth remained rapid in 2006 and 2007. Figure 5 shows the rate of capital accumulation from 1948-2009. That rate reached a peak in the mid 1960s, thereafter trending downward through the early1990s. It rose rapidly in the 1990s as first a new technology wave stimulated investment, followed by further stimulation from a rapidly rising rate of profit and a huge stock market bubble (Kotz, 2003). Accumulation fell very rapidly from 2000 to 2002, from about 4.5% to under 2.0% of the capital stock. Then it revived through 2007, reaching almost 3% of the capital stock. We noted before that the ratio Y/TA fell significantly from 2004-07. The U.S. economy had produced the conditions for a crisis of over-investment by 2007: 1) A huge asset bubble, along with a freely lending financial sector and a large part of the population desperate to

maintain its living standard in the face of stagnating or declining pay, had pushed consumption as a percentage of disposable income to its highest since 1939; 2) BFI had risen relatively robustly from 2003-2007 despite declining capacity use, stimulated by the growth of consumption and the effects on expectations from the asset bubble. All that was needed to set off the crisis of over-investment was the bursting of the real estate bubble, which took place in 2006-07.

4. The Real Sector Crisis

The real estate bubble reached its peak in 2006 or 2007, depending on which index is consulted. The Federal Housing Finance Agency produces several indexes of house prices. One is the "Estimated Mean House Price" for one-unit non-condominium properties, a quarterly index. As figure 6 shows, the growth in this index slowed toward the end of 2005 and reached its peak in the 3rd quarter of 2006, although its rapid decline did not start until the 4th quarter of 2007. A second index produced by that agency is the more widely cited "House Price Index," which has two versions. Figure 7 shows the version for "all transactions" which supplements sales data with appraisal data. That index did not reach its peak until the first quarter of 2007 and started to fall rapidly only in the second quarter of 2008. It appears that the bubble stopped inflating some time during late 2006 to early 2007.

Table 6, 7, and 8 show the annualized growth rates and contributions for quarterly series, starting in the first quarter of 2007. These tables can be used to analyze the development of the recession over several sub-periods:

Approaching the Peak: 2007-I to 2007-IV. After the first quarter of 2007, C growth fell from 2.4% to 1.4% over the year, remaining below the GDP growth rate for the last three quarters. Table 8 shows that consumption growth in the 4th quarter fell well below growth in disposable income, suggesting that household borrowing was tapering off. In the last quarter of 2007, continuing GDP growth was sustained by continuing strong growth in BFI and a surprising big contribution from net

exports as imports fell sharply (table 7).

Early Recession: 2008-I to 2008-II: In the first half of 2008, GDP basically stalled, falling at an 0.7% rate and then rising at an 0.6% rate. In 2008-I, it was consumption that led the decline, falling at a rate of 0.8% and contributing 77% of the decline in GDP, while BFI continued to grow in the first quarter, although slowly. Falling RI contributed the largest share to the GDP decline in the first quarter. In both quarters, net exports provided the largest boost to GDP growth.

Table 8 shows a very large gap opening up between disposable income and consumption in the first half of 2008. In 2008-II disposable income grew at a 9.2% rate due to large transfer payments and a huge reduction in taxes, but C grew only at a 0.1% rate. The saving rate jumped up, as households appeared to turn from debt-financed consumption to repayment of debt.

Rapid Descent: 2008-III to 2009-I. This 3-quarter long period saw a very rapid decline in GDP, reaching a -6.8% rate in the 4th quarter of 2008. In the summer (3rd) quarter, C fell at the very high rate of -3.5%, contributing 61.5% of the decline in GDP, and it fell almost as fast in the 4th quarter at -3.3% before the decline slowed to a -0.5% rate in the first quarter of 2009. In two of those 3 quarters, C fell much more rapidly than disposable income.

BFI fell remarkably rapidly and at an accelerating pace in this period, reaching a negative 35.2% rate in 2009-I, which was by far the fastest rate of decline for BFI in the postwar period. In the last two quarters of this period, changes in inventories made an unusual large negative contribution, indicating businesses panicked and reduced production by even more than the decline in demand. Federal purchases leaned heavily against this wind in the last two quarters of 2008 although it declined in 2009-I. Net exports also contributed positively to growth as imports fell faster than export.

The Trough: 2009-II. This was the trough of the recession according to the National Bureau of Economic Research. GDP declined at a 0.7% rate, and thereafter it rose. The push toward

recovery came from federal purchases, both military and civilian, which together rose at a 14.9% rate and contributed 1.1 percentage points of growth. Net exports also contributed 1.5 percentage points of growth, as imports continued to fall while exports stabilized.

Recovery: 2009-III to 2010-III. A recovery from a deep recession, once it begins, is normally relatively steep, but this recovery has been tepid. Over the last 5 quarters, GDP grew at a 2.8% rate, and inventory accumulation accounted for more than half of the growth. The recovery began with a shift to growth in C to a 2% rate in the 3rd quarter of 2009, followed by C growth in the range of 0.9% to 2.6%. There was also a direct stimulus from federal purchases in the first and latest quarters in the recovery period. BFI growth was slow to recover, turning positive in 2010-I and growing rapidly since. However, BFI was still 13.5% below its previous peak in 2010-III.

5. Over-Investment and the Crisis

Why was the real sector crisis so deep and the recovery so weak? The evidence we have examined suggests that the US economy experienced a crisis of asset-bubble induced over-investment in 2008, which tends to produce a deep and long-lasting recession. All of the six conditions cited above for a bubble-induced crisis of over-investment were present. While it lasted, the real estate bubble, along with other features of neoliberal capitalism in the US, brought a consumption-led expansion along with significant growth in business fixed investment in the last years. Consumer spending continued its long upward march relative to disposable personal income, as figure 4 shows. Business had not only built sufficient productive capacity to satisfy the growing consumer demand -- it produced more than enough, as the declining ratio Y/TA during 2004-07 indicates.

The real estate bubble stopped growing in 2006-07, at the time when it was reported that the interest rate on many variable rate mortgages issued in 2004 reset to much higher rates. Whatever

the immediate cause might be, like every bubble, the real estate bubble eventually had to deflate. Once it began to deflate, consumption spending began to fall relative to disposable income. Figure 4 shows that in two short years, from 2007-09, the ratio of C to disposable income fell from 94.1% to 90.6%, a level below any since 1992, before the first giant bubble of the neoliberal era. Fifteen years of consumption rising relative to disposable income had been reversed. This process was not a consequence of the condition of the banks limiting their ability to make loans resulting from the financial crisis -- it stemmed from the effects of the collapse of bubble-driven growth on the real sector.

As consumption began to contract, BFI followed closely behind. By 2009 net investment as a share of the net capital stock had fallen to about 0.5%, less than one-third of its previous lowest level since 1948 (see figure 5). Households are under pressure to repay debt, and they have little chance to borrow given the decline in home prices and the precarious job market. Business has a huge overhang of productive capacity and sees no promising demand growth ahead. The industrial capacity utilization rate fell to 67.2% in 2009, which was substantially lower than in any previous year since 1948 -- the next lowest was 70.9% in the deep 1982 recession (Board of Governors of the Federal Reserve System, 2010, Series G.17, Nov. 16). The private sector appears stuck in a long-lasting stagnation, apart from the problems of the financial system. Until something revives the incentive to invest, banks will not see promising opportunities for offering financing for real sector expansion.

While this paper argues that over-investment is the crisis tendency that produced the current real sector crisis, the U.S. economy is at the same time experiencing a broader structural crisis. It appears that this crisis marks the end of the ability of the neoliberal form of capitalism to promote profit-making and accumulation. By itself a crisis of over-investment, while tending to last a long time, would not necessarily spell the end of an epoch. The crisis of 2000-01 was also an over-

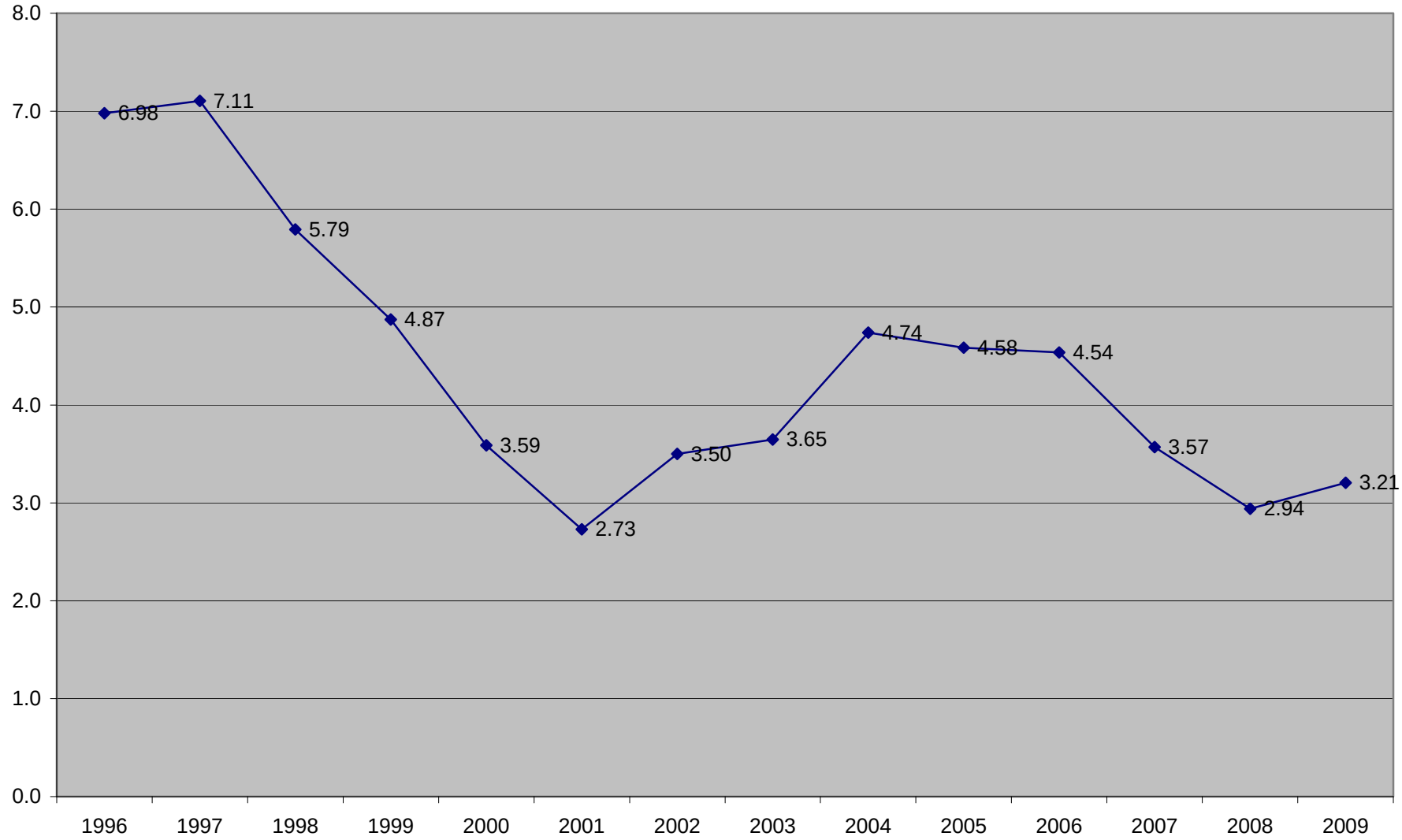
investment crisis, producing several years of depressed investment. However, in 2000 neoliberal capitalism had not yet become exhausted, and one more round of expansion followed. If neoliberal capitalism has indeed reached the end of its ability to promote profit-making and economic expansion, then we can expect a very long-lasting crisis, since the major restructuring that would follow is likely to require some 10 to 15 years, if history is any guide. It took almost 20 years after the last structural crisis of a liberal form of capitalism began, in 1929, before a new viable form of capitalism emerged in the late 1940s.

Appendix: The Rate of Profit

The rate of profit used in this paper is the after-tax profit of the nonfinancial corporate business sector, as a percentage of the net worth of that sector. Flow variables such as profit and output/income are in current dollars. Net worth is at current dollar market value and tangible assets are at current dollar replacement cost. The stock variables net worth and tangible assets are as of December 31 of the preceding year. Thus, the rate of profit for a given year is the flow of profit over the year divided by net worth on the last day of the previous year.

The stock variables net worth and tangible assets are for the nonfarm part of the nonfinancial corporate business sector, since that is what the Fed reports, while the flow variables from the Bureau of Economic Analysis, such as profit and output, are for the entire nonfinancial corporate business sector. The error this mismatch introduces is small -- the agricultural sector contributed 1.5 per cent to the value added in the nonfinancial business sector in 2000, and a large part of the agricultural sector is noncorporate.

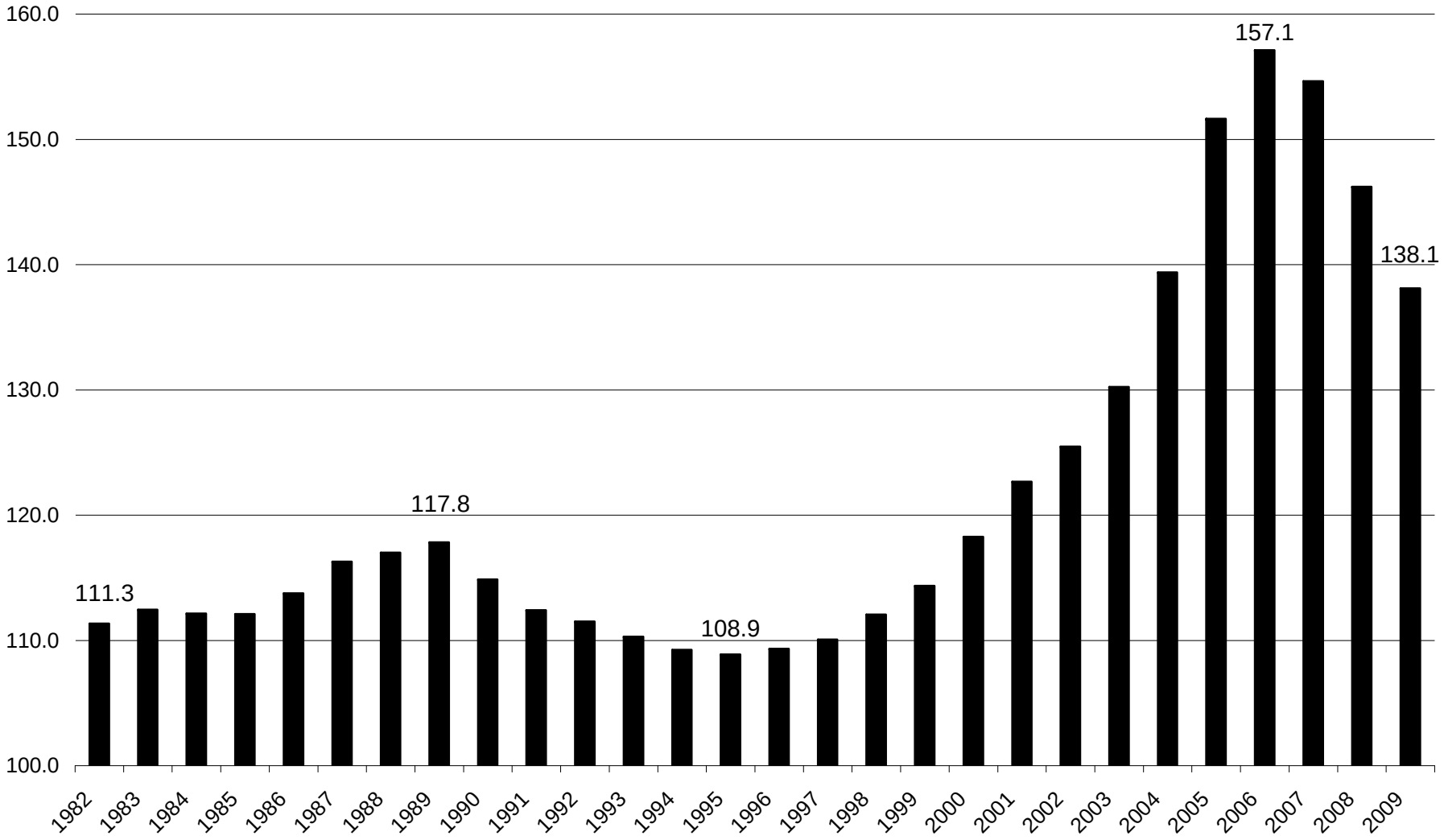
Figure 1. After-Tax Rate of Profit as a Percentage of Net Worth*



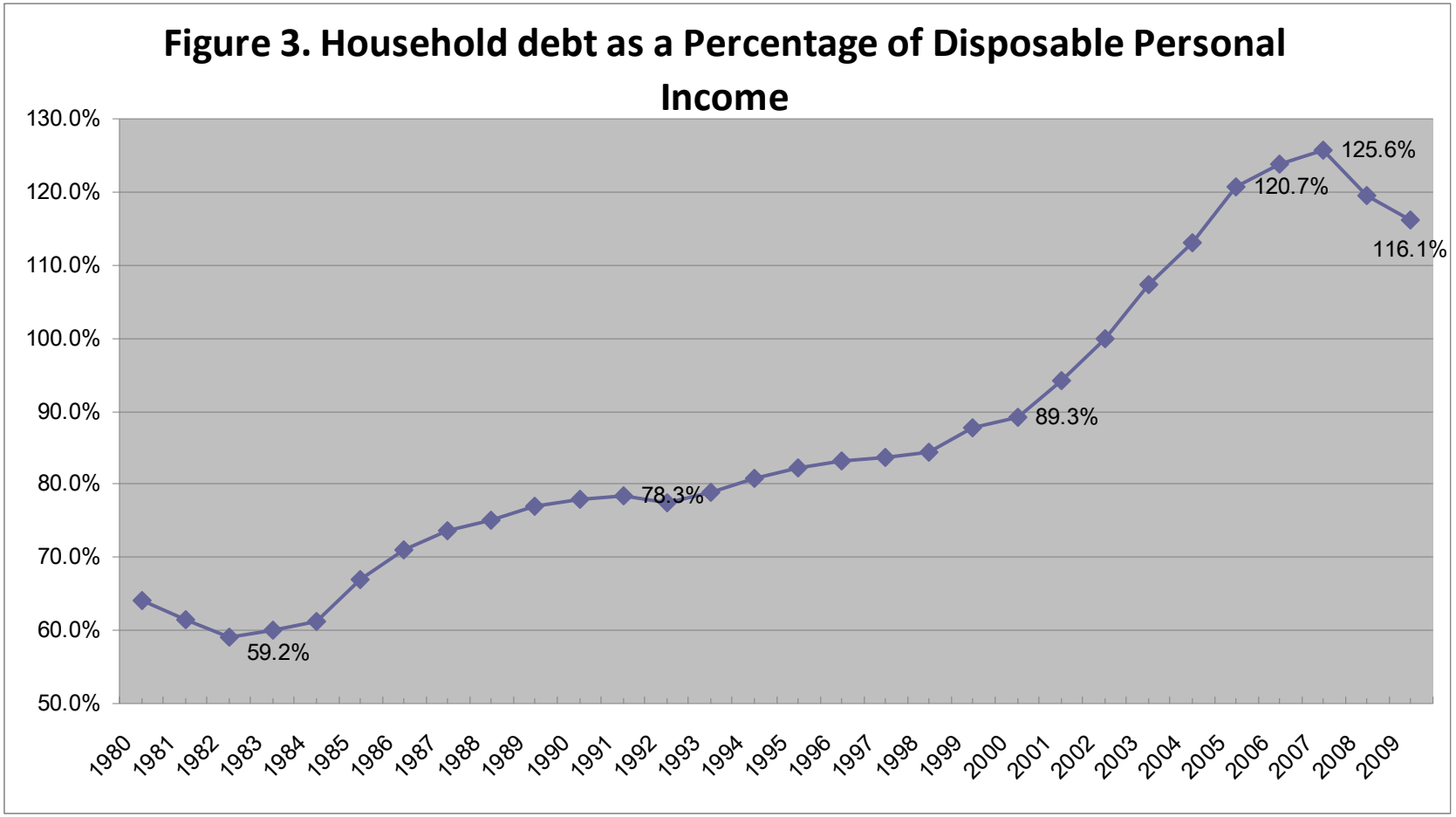
* The rate of profit after taxes and after interest payments for the U.S. nonfinancial corporate business sector.

Source: U.S. Bureau of Economic Analysis (2010, Table 1.14, July 29), Board of Governors of the Federal Reserve System (2010, Table B.102, July 29).

Figure 2. The House Price Index (HPI) Relative to Homeowner's Equivalent Rent (OER)

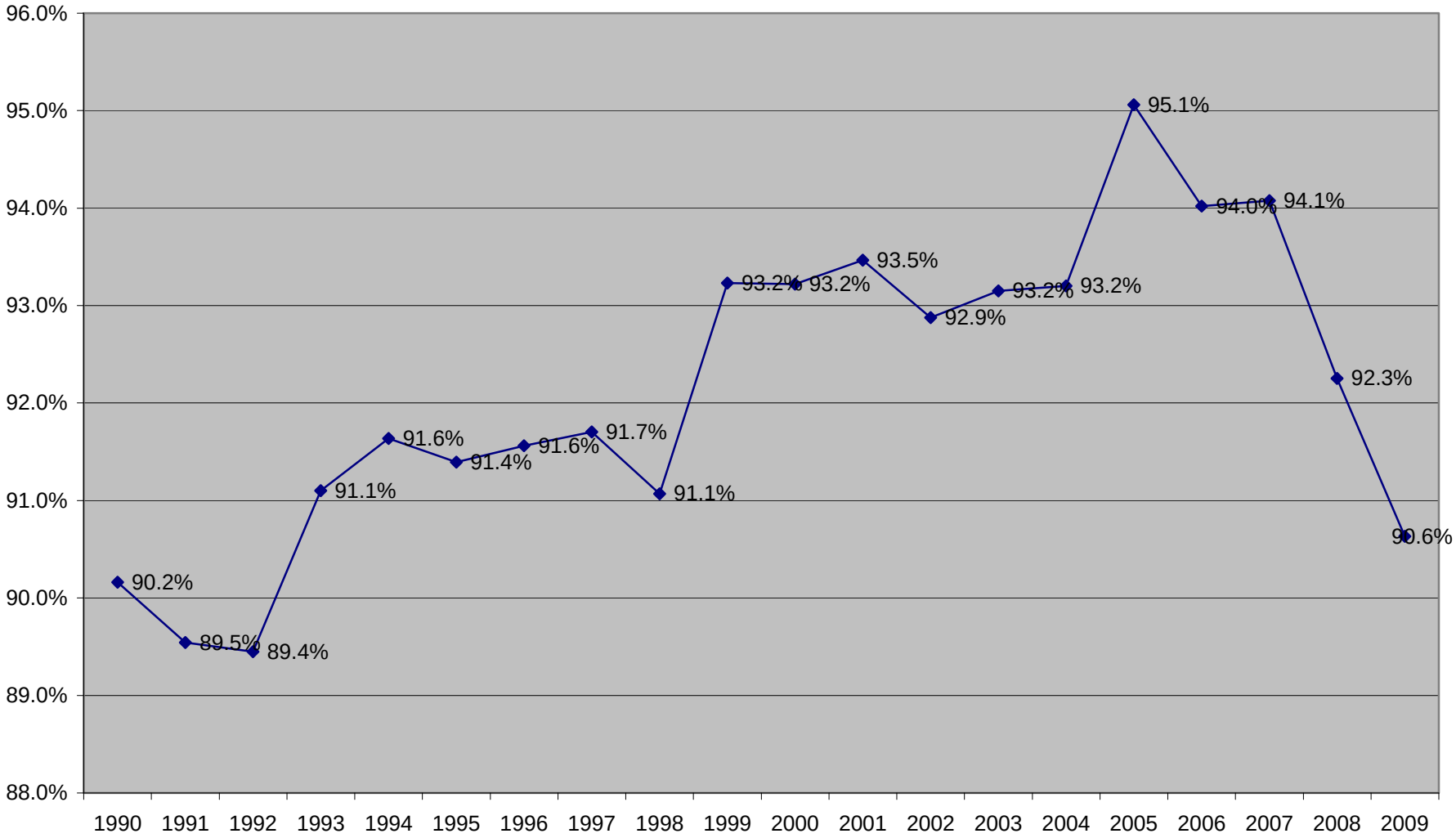


Note: The House Price Index has base year 1980 = 100 and homeowner's equivalent rent has base year 1982 = 100.
Source: Federal Housing Finance Agency (2010, November 19), U.S. Bureau of Labor Statistics (2010).



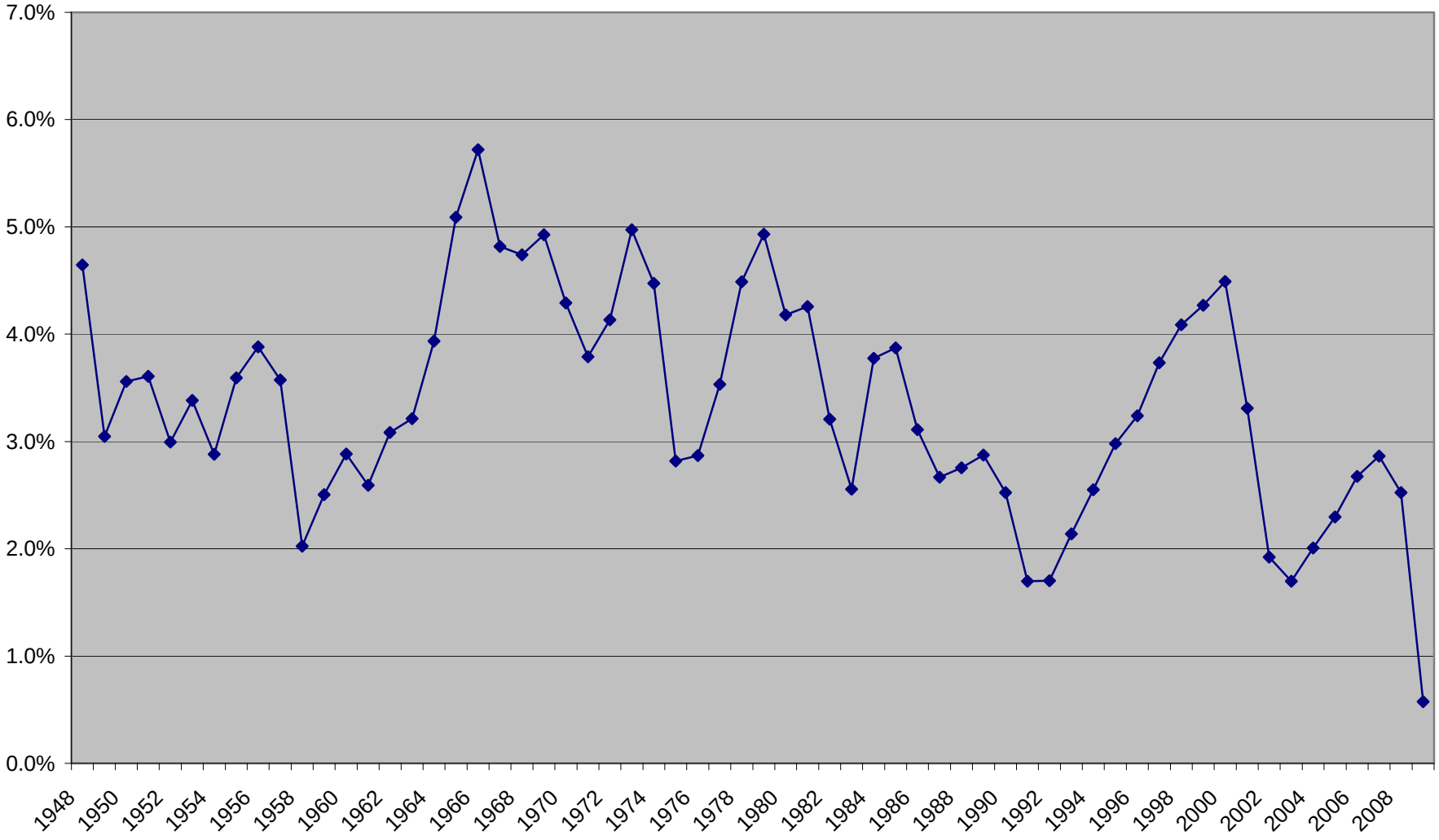
Source: Board of Governors of the Federal Reserve System (2010, Table B.100, November 20) and U.S. Bureau of Economic Analysis (2010, November 11).

Figure 4. Personal Consumption Expenditures as a Percentage of Disposable Personal Income



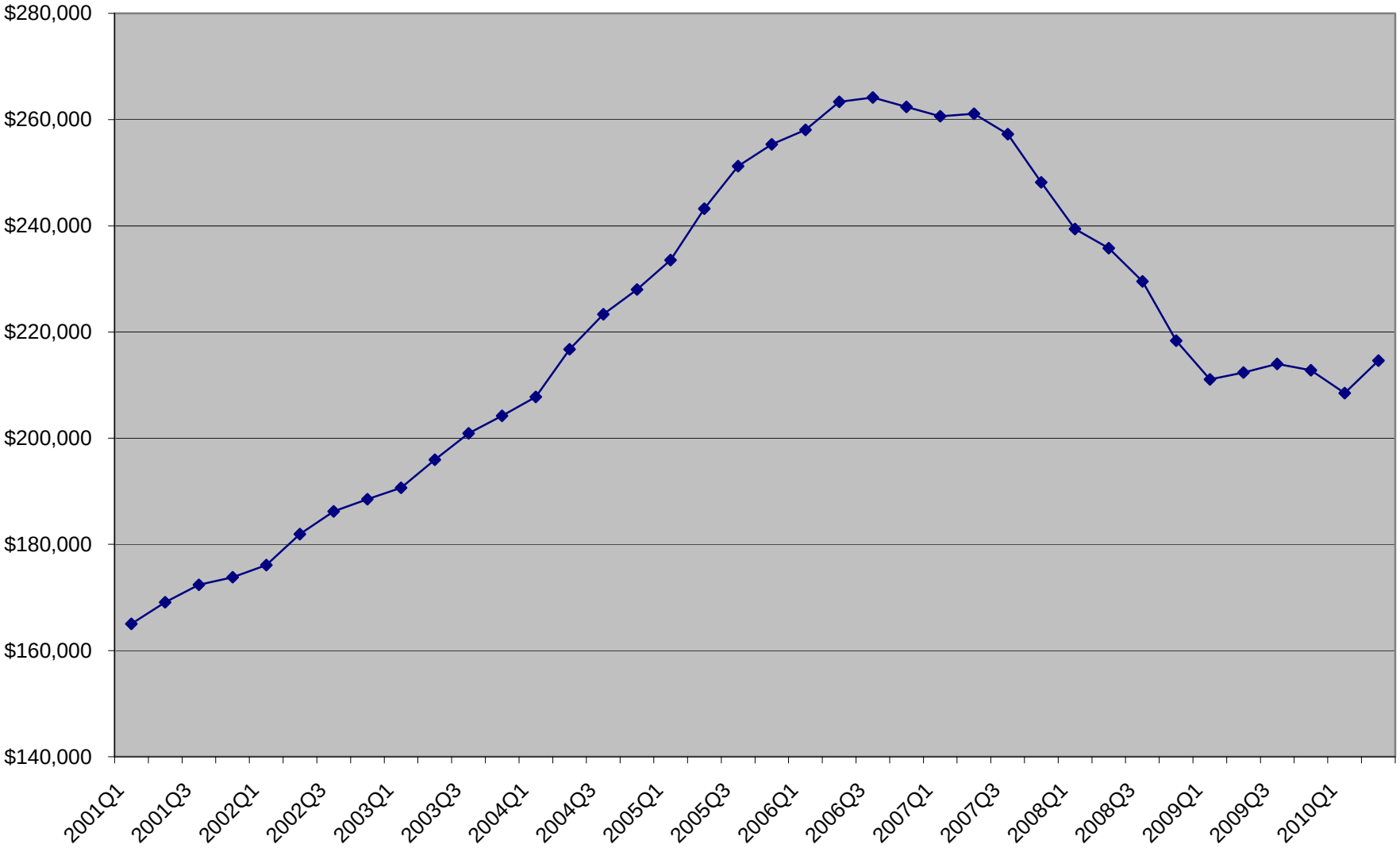
Source: U.S. Bureau of Economic Analysis (2010, Table 2.1, November 11).

Figure 5. Net Nonresidential Fixed Investment as a Percentage of Net Nonresidential Fixed Assets



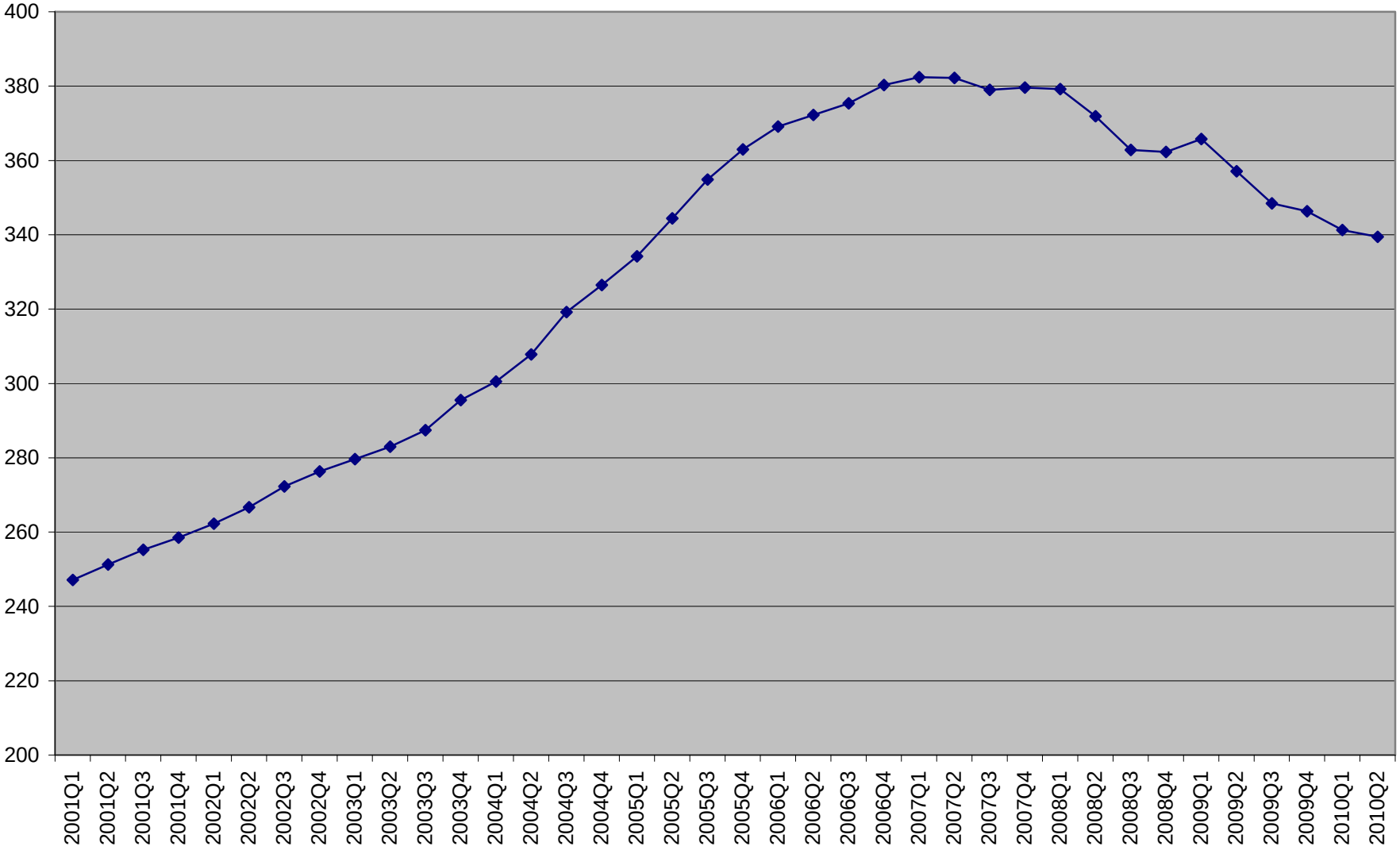
Source: U.S. Bureau of Economic Analysis (2010, Table 5.25 and Fixed Assets Table 1.1, November 11).

Figure 6. Estimated Mean House Price



Source: Federal Housing Finance Agency (2010, November 12).

Figure 7. House Price Index, All Transactions



Source: Federal Housing Finance Agency (2010, November 12).

Table 1. Change in the Rate of Profit and its Components, 2004-07

Variable	Percentage Change in Variable	Percentage Change in Variable as a Share of Percentage Change in r
r	-24.7%	100.0%
P/Y	-5.5%	22.3%
Y/TA	-17.5%	70.8%
TA/NW	-3.4%	13.9%

R = rate of profit
P/Y = share of profit in income (output)
Y/TA = ratio of output to tangible assets
TA/NW = ratio of tangible assets to net worth

Note: The sum of shares does not add exactly to 100% because of the interaction terms.

Source: U.S. Bureau of Economic Analysis (2010, Table 1.14, July 29), Board of Governors of the Federal Reserve System (2010, Table B.102, July 29).

Table 2. Contributions to the Change in the Profit Share, 2004-07

P/Y	100%
W/Y	-340%
T/Y	250%
i/Y	218%

P/Y = share of profit in income
W/Y = share of employee compensation in income
T/Y = share of taxes in income
i/Y = share of interest payments in income

Notes:
1. A positive sign indicates that the change in the variable tended to reduce the profit share, and a negative sign indicates that the variable tended to increase the profit share.
2. The sum of the contributions does not add to 100% because of the omission of business transfer payments and rounding errors.

Source: U.S. Bureau of Economic Analysis (2010, Table 1.14, July 29), Board of Governors of the Federal Reserve System (2010, Table B.102, July 29).

Table 3. Percentage Change in Real Gross Domestic Product and its Components

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2002-07
GDP	4.1	1.1	1.8	2.5	3.6	3.1	2.7	1.9	0.0	-2.6	2.6
Consumption	5.1	2.7	2.7	2.8	3.5	3.4	2.9	2.4	-0.3	-1.2	2.9
Business Fixed Investment	9.8	-2.8	-7.9	0.9	6.0	6.7	7.9	6.7	0.3	-17.1	3.2
Residential Investment	1.0	0.6	5.2	8.2	9.8	6.2	-7.3	-18.7	-24.0	-22.9	0.0
Government Purchases	2.0	3.8	4.7	2.2	1.4	0.3	1.4	1.3	2.8	1.6	1.9
Federal	0.5	4.1	7.3	6.6	4.1	1.3	2.1	1.2	7.3	5.7	3.8
Military	-0.5	3.8	7.4	8.7	5.7	1.5	1.6	2.2	7.5	5.4	4.5
Civilian	2.4	4.6	7.2	2.8	1.0	0.9	3.2	-0.8	6.7	6.5	2.4
State and Local	2.8	3.7	3.3	-0.1	-0.2	-0.2	0.9	1.4	0.3	-0.9	0.9
Exports	8.6	-5.6	-2.0	1.6	9.5	6.7	9.0	9.3	6.0	-9.5	5.6
Imports	13.0	-2.8	3.4	4.4	11.0	6.1	6.1	2.7	-2.6	-13.8	5.6

Note: The growth rate for 2002-07 is the annual compounded rate of change from 2001 to 2007.
Source: U.S. Bureau of Economic Analysis (2010, Table 1.1.1, November 10).

Table 4. Contributions to the Percentage Change in Real GDP

	Contribution, in Percentage Points										Contribution Share
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2002-07
GDP	4.1	1.1	1.8	2.5	3.6	3.1	2.7	1.9	0	-2.6	100.00%
Consumption	3.44	1.85	1.85	1.97	2.42	2.34	2.01	1.65	-0.18	-0.84	78.42%
Business Fixed Investment	1.20	-0.35	-0.94	0.10	0.61	0.69	0.84	0.75	0.03	-1.96	14.36%
Residential Investment	0.05	0.03	0.24	0.40	0.52	0.36	-0.45	-1.05	-1.05	-0.74	0.05%
Change in Inventories	-0.05	-0.92	0.48	0.06	0.42	-0.13	0.07	-0.23	-0.51	-0.55	3.69%
Government Purchases	0.36	0.67	0.84	0.42	0.26	0.06	0.26	0.25	0.54	0.32	13.60%
Federal	0.03	0.24	0.44	0.43	0.28	0.09	0.15	0.09	0.51	0.43	9.54%
Military	-0.02	0.14	0.28	0.36	0.26	0.07	0.07	0.10	0.36	0.27	7.50%
Civilian	0.05	0.09	0.15	0.07	0.02	0.02	0.07	-0.02	0.15	0.16	2.06%
State and Local	0.33	0.43	0.40	-0.01	-0.02	-0.03	0.11	0.17	0.04	-0.11	4.03%
Exports	0.91	-0.61	-0.20	0.15	0.89	0.67	0.93	1.02	0.72	-1.18	23.00%
Imports	-1.76	0.41	-0.46	-0.60	-1.55	-0.94	-0.98	-0.45	0.46	2.32	32.71%
Net Exports	-0.85	-0.20	-0.65	-0.45	-0.66	-0.27	-0.05	0.57	1.18	1.13	-9.71%

Note: The contribution share for 2002-07 is the percentage of total GDP growth over the period contributed by each component of GDP.
Source: U.S. Bureau of Economic Analysis (2010, Table 1.1.2, November 10, and 1.1.6, November 12).

Table 5. Growth Rates of Real Personal Income and its Components

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Personal income	5.6	1.8	0.6	1.4	3.3	2.5	4.6	2.9	0.7	-1.9
Wage and salary disbursements	5.6	0.7	-0.4	0.8	2.9	2.0	3.6	3.0	-1.1	-4.5
Supplements to wages and salaries	5.5	4.9	7.0	8.1	1.8	2.9	0.8	-0.4	1.3	1.5
Property income[a]	6.1	0.4	-2.6	-0.8	5.1	2.6	8.5	3.0	1.0	-6.8
Personal current transfer receipts	3.4	7.7	6.5	2.6	2.8	3.5	3.5	4.2	5.8	13.3
Less: Contributions for government social insurance, domestic	4.1	1.9	1.1	1.6	3.5	2.4	2.8	1.3	-0.4	-1.9
Less: Personal current taxes	8.6	-1.7	-16.1	-6.7	2.1	12.0	8.9	7.1	-6.5	-20.9
Equals: Disposable personal income	5.1	2.4	3.3	2.5	3.4	1.3	4.0	2.3	1.7	0.6
Personal consumption expenditures	5.1	2.7	2.7	2.8	3.5	3.4	2.9	2.4	-0.3	-1.2
Gross Domestic Product	4.1	1.1	1.8	2.5	3.6	3.1	2.7	1.9	0	-2.6
Personal saving as a percentage of disposable personal income[b]	2.9	2.7	3.5	3.5	3.4	1.4	2.4	2.1	4.1	5.9

Note: The GDP price index for consumer spending was used to deflate the income variables in this table, except for GDP.
a. Property income is the sum of rent, interest, dividends, and proprietors' income.
b. This variable is not a growth rate.
Source: U.S. Bureau of Economic Analysis (2010, Tables 2.1, 1.1.1, 1.1.4, November 11).

Table 6. Percentage Change in Real Gross Domestic Product and its Components, Quarterly at Annual Rates

	2007-I	2007-II	2007-III	2007-IV	2008-I	2008-II	2008-III	2008-IV	2009-I	2009-II	2009-III	2009-IV	2010-I	2010-II	2010-III
GDP	0.9	3.2	2.3	2.9	-0.7	0.6	-4.0	-6.8	-4.9	-0.7	1.6	5.0	3.7	1.7	2.0
Consumption	2.4	1.5	1.7	1.4	-0.8	0.1	-3.5	-3.3	-0.5	-1.6	2.0	0.9	1.9	2.2	2.6
Business Fixed Investment	6.8	11.1	9.4	5.7	2.0	-1.6	-8.6	-22.7	-35.2	-7.5	-1.7	-1.4	7.8	17.2	9.7
Residential Investment	-16.4	-12.0	-24.1	-29.3	-27.9	-14.0	-22.6	-32.6	-36.2	-19.7	10.6	-0.8	-12.3	25.7	-29.1
Government Purchases	-0.5	3.4	3.5	1.2	2.3	3.3	5.3	1.5	-3.0	6.1	1.6	-1.4	-1.6	3.9	3.4
Federal	-4.8	7.1	9.6	1.1	6.9	7.8	14.2	8.1	-5.0	14.9	5.7	0.0	1.8	9.1	8.8
Military	-7.2	8.3	10.2	0.0	6.8	6.9	19.7	5.2	-8.4	16.8	9.0	-2.5	0.4	7.4	8.5
Civilian	0.5	4.7	8.2	3.4	6.9	9.6	3.0	14.8	2.6	10.9	-0.9	5.6	5.0	12.8	9.6
State and Local	2.1	1.3	0.2	1.3	-0.3	0.8	0.3	-2.4	-1.7	1.0	-1.0	-2.3	-3.8	0.6	-0.2
Exports	6.4	6.8	15.8	11.6	5.7	13.2	-5.0	-21.9	-27.8	-1.0	12.2	24.4	11.4	9.1	5.0
Imports	4.6	4.6	5.0	-10.6	-1.4	2.9	-0.1	-22.9	-35.3	-10.6	21.9	4.9	11.2	33.5	17.4

Source: U.S. Bureau of Economic Analysis (2010, Table 1.1.1, November 10).

Table 7. Contributions to the Percentage Change in Real GDP, Quarterly at Annual Rates, in Percentage Points

	2007-I	2007-II	2007-III	2007-IV	2008-I	2008-II	2008-III	2008-IV	2009-I	2009-II	2009-III	2009-IV	2010-I	2010-II	2010-III
GDP	0.90	3.20	2.30	2.90	-0.70	0.60	-4.00	-6.80	-4.90	-0.70	1.60	5.00	3.70	1.70	2.00
Consumption	1.64	1.08	1.20	0.98	-0.54	0.08	-2.46	-2.26	-0.34	-1.12	1.41	0.69	1.33	1.54	1.79
Business Fixed Investment	0.75	1.23	1.06	0.67	0.25	-0.16	-1.00	-2.84	-4.49	-0.72	-0.13	-0.10	0.71	1.51	0.91
Residential Investment	-0.91	-0.62	-1.24	-1.43	-1.23	-0.53	-0.84	-1.18	-1.22	-0.54	0.25	-0.02	-0.32	0.55	-0.80
Change in Inventories	-0.49	0.90	-0.28	-0.77	-0.49	-0.48	-0.12	-2.31	-1.09	-1.03	1.10	2.83	2.64	0.82	1.44
Government Purchases	-0.09	0.64	0.66	0.24	0.44	0.65	1.04	0.31	-0.61	1.24	0.33	-0.28	-0.32	0.80	0.68
Federal	-0.33	0.48	0.64	0.08	0.47	0.55	1.00	0.61	-0.40	1.11	0.45	0.01	0.15	0.72	0.71
Military	-0.34	0.38	0.47	0.01	0.32	0.34	0.93	0.28	-0.45	0.85	0.48	-0.13	0.02	0.40	0.46
Civilian	0.01	0.10	0.18	0.07	0.15	0.21	0.07	0.33	0.06	0.26	-0.03	0.14	0.13	0.32	0.25
State and Local	0.25	0.16	0.02	0.16	-0.04	0.10	0.04	-0.30	-0.21	0.13	-0.12	-0.29	-0.48	0.08	-0.03
Exports	0.71	0.76	1.71	1.32	0.67	1.61	-0.66	-3.03	-3.61	-0.08	1.30	2.56	1.30	1.08	0.61
Imports	-0.73	-0.75	-0.84	1.89	0.18	-0.57	0.03	4.53	6.48	1.55	-2.67	-0.66	-1.61	-4.58	-2.61
Net Exports	-0.02	0.01	0.87	3.21	0.84	1.04	-0.63	1.50	2.88	1.47	-1.37	1.90	-0.31	-3.50	-2.01

Source: U.S. Bureau of Economic Analysis (2010, Table 1.1.2, November 10).

Table 8. Growth Rate of Real Personal Income and its Components, Quarterly at Annual Rates

	2007-I	2007-II	2007-III	2007-IV	2008-I	2008-II	2008-III	2008-IV	2009-I	2009-II	2009-III	2009-IV	2010-I	2010-II	2010-III
Personal income	3.4	0.8	1.6	2.1	1.4	0.7	-4.6	3.1	-6.7	1.7	-4.1	-0.2	1.6	4.1	1.1
Wage and salary disbursements	5.9	-1.6	0.5	1.8	0.6	-5.6	-4.6	1.6	-12.4	-0.1	-4.3	-1.3	-1.6	3.3	1.4
Supplements to wages and salaries	-2.3	-2.5	0.3	1.3	3.1	-0.3	-0.9	8.5	0.1	1.7	-2.0	0.4	3.2	2.9	1.6
Property income	-3.4	8.8	3.2	1.8	0.7	-1.8	0.5	-2.6	-15.0	-9.0	-5.2	-0.5	3.0	3.6	-1.0
Personal current transfer receipts	13.5	-4.1	2.7	3.7	5.2	29.4	-15.4	15.2	27.0	27.4	-3.0	2.7	8.6	7.5	3.2
Less: Contributions for government social insurance, domestic	4.5	-3.1	-0.4	1.2	3.0	-4.7	-3.5	3.5	-6.1	1.1	-3.2	-0.9	3.3	3.2	1.5
Less: Personal current taxes	15.5	2.5	2.3	1.3	0.8	-46.0	31.9	6.3	-49.2	-30.7	-1.3	-2.6	4.3	1.0	7.0
Equals: Disposable personal income	1.8	0.6	1.5	2.2	1.4	9.2	-8.4	2.7	0.4	5.9	-4.4	0.0	1.3	4.4	0.5
Personal consumption expenditures	2.3	1.5	1.7	1.4	-0.8	0.1	-3.5	-3.3	-0.5	-1.6	2.0	0.9	1.9	2.2	2.6
Gross Domestic Product	0.9	3.2	2.3	2.9	-0.7	0.6	-4	-6.8	-4.9	-0.7	1.6	5	3.7	1.7	2
Personal saving as a percentage of disposable personal income	2.3	2	1.8	2.1	2.7	4.8	3.6	5.2	5.4	7.2	5.6	5.5	5.5	5.9	5.5

Note: The GDP price index for consumer spending was used to deflate the income variables in this table, except for GDP.
a. Property income is the sum of rent, interest, dividends, and proprietors' income.
b. This variable is not a growth rate.
Source: U.S. Bureau of Economic Analysis (2010, Tables 2.1, 1.1.1, 1.1.4, November 11).

References

Baker, Dean. 2007. Midsummer Meltdown: Prospects for the Stock and Housing Markets. Center for Economic and Policy Research, www.cepr.net, August.

Board of Governors of the Federal Reserve System. 2010. Downloaded from http://www.federalreserve.gov/ on various dates.

Brenner, Robert. 2002. *The Boom and the Bubble*. New York: Verso.

Federal Housing Finance Agency. 2010. Housing Price Indexes. Downloaded from http://www.fhfa.gov/ on various dates.

Greenspan, Alan, and Kennedy, James. 2007. Sources and Uses of Equity Extracted from Homes. Federal Reserve Board Finance and Economics Discussion Series No. 2007-20. Available at http://www.federalreserve.gov/pubs/feds/2007/200720/200720pap.pdf.

Kotz, David M. 2010. What Can Cause a System-Threatening Crisis of Capitalism?, *Science and Society*, 74:3, July, 362-279.

_____. 2009a. The Financial and Economic Crisis of 2008: A Systemic Crisis of Neoliberal Capitalism, *Review of Radical Political Economics* 41:3, Summer, 305-17.

_____. 2009b. Economic Crises and Institutional Structures: A Comparison of Regulated and Neoliberal Capitalism in the U.S., in *Heterodox Macroeconomics: Keynes, Marx and Globalization*, by Jonathan Goldstein and Michael Hillard (eds), London and New York: Routledge, 2009, 176-88.

_____. 2003. Neoliberalism and the U.S. Economic Expansion of the 1990s, *Monthly Review* 54:11, April 2003, 15-33.

Reinhart and Rogoff. 2009. The Aftermath of Financial Crises, NBER Working Paper No. w14656, January. Available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1329274.

U.S. Bureau of Economic Analysis. 2010. National Income and Product Accounts. Downloaded

from http://www.bea.gov/ on various dates.

U.S. Bureau of Labor Statistics. 2010. Owner's Equivalent Rent of Primary Residence, U.S. average, downloaded from http://www.bls.gov/ on November 19, 2010.

Weisskopf, Thomas E. 1979. Marxian Crisis Theory and the Rate of Profit in the Postwar U.S. Economy, *Cambridge Journal of Economics* 3:4, December, 341-78.

Notes

1. Brenner (2002) argues that over-investment based on competition among capitalists has been the central cause of crisis in the post-World War II period.

2. The exception was the one-year economic expansion of 1980-81, which was cut short by highly contractionary monetary policy despite a rising rate of profit (Kotz, 2009b).

3. In this study we used the after-tax profit divided by net worth for the nonfinancial corporate business sector. Since the aim was to assess the effect of the profit rate on business fixed investment, the after-tax profit rate seems the right one. Putting net worth in the denominator is justified for indicating the incentive for the firm's owners to invest. The nonfinancial corporate business sector was used for two reasons: 1) conceptual problems with measuring the profit rate for the combined financial and nonfinancial sectors, and 2) series for net worth and for the whole stock of tangible assets, including inventories, are available only for the nonfinancial corporate business sector. Since fixed investment in the financial sector ranged from only 10.9% to 12.8% of fixed investment in the nonfinancial sector during 2000-2009, with no trend over the period, it is reasonable to analyze the changes in total business fixed investment series in relation to changes in the nonfinancial sector profit rate.

4. Our decomposition of the profit rate is not identical to that used by Weisskopf (1979) although the basic approach is the same.

5. The ratio Y/TA is also affected by technological factors, embodied in the Marxist concept of organic composition of capital. However, over short periods of a few years one would expect technological changes affecting Y/TA to be far outweighed by changes in the utilization rate of fixed capital. Actual data for the capacity utilization rate for the U.S. economy are produced by the Federal Reserve only for the industrial sector (manufacturing, mining, and power) and its subsectors.

6. The second largest decline in Y/TA occurred in 1997-2000, when it fell by 5.0%.

7. The contribution of TA/NW to the decline in the profit rate was the net effect of a decrease in leverage by the nonfinancial corporate business sector, which tended to decrease r, and a decrease in financialization which tended to increase r.

8. One variable that makes up part of total income has been omitted -- business transfer payments. It is varies little and is small, about 1% of income or less.

9. As was noted above, one component of total income, business transfer payments, has been omitted.

10. During 2004-07, the average real wage of all employees in the nonfinancial corporate business sector declined at an annual rate of 0.20% per year while real output per worker rose by 1.25% per year.

11. Kotz (2009b) identified a decline in the ratio of the consumer price index to the output price index -- which increases the wage share of output -- as another possible indicator of over-

investment, on the grounds that over-investment can lead to an inability of firms to raise output prices in step with increases in the consumer price index. For the period 2004-07 that price ratio did rise but not very rapidly -- at a 0.63% annual rate. Over-investment was manifested in a decline in output (relative to capacity) rather than price weakness in the 2000s. In the two earlier late expansions of the neoliberal era in the late 1980s and late 1990s, Kotz (2009b) found a rapid rate of increase in this price ratio (1.9% per year) to be an important source of the late-expansion profit rate decline.

12. The dating convention used in this paper indicates a growth rate in a variable from one year to the next by the final year. Thus, the GDP growth rate in 2005 refers to GDP growth from its value in 2004 to its value in 2005. A reference to growth over a multi-year period is relative to the base year prior to the start of the period. Thus, the GDP growth rate during 2002-07 refers to the compounded annual GDP growth from base year 2001 to 2007.

13. In 2002 both pre-tax wage and salary disbursements and property income fell while personal taxes declined by 16.1%, as table 5 shows.

14. From figure 4, during the stock market bubble of the second half of the 1990s C rose from 91.4% of disposable income in 1995 to 93.2% in 2000. Then it rose substantially higher in the following real estate bubble.