

# Booms and Busts in Household Wealth: Implications for Tenth District States

*By Chad R. Wilkerson and Megan D. Williams*

The U.S. stock market and housing market—the two largest sources of U.S. household wealth—have had sizable booms and busts in recent years. This volatility has influenced national consumption trends and had important consequences for states. Some states have become relatively wealthier, affecting both the short- and long-term consumption spending potential of their residents.

Understanding how wealth changes affect state economies could be especially important in 2011 and 2012 given the recent resumption of home price declines in much of the country. Research has shown that consumption can be more sensitive to changes in housing wealth than other types of wealth. While the home price collapse in 2007-09 hurt the Tenth District less than the nation, home price fundamentals in several District states may be more similar to the nation over the next couple of years.

This article examines recent changes in household wealth in Tenth District states and explores how the region is positioned heading forward. The first section estimates the current wealth of District states and traces the evolution of stock market and net housing wealth in the

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District in recent decades. The second section reviews the literature and recent history of consumption effects due to changes in different kinds of wealth. The third section estimates the potential size of consumption wealth effects across states during the recent boom and bust years. The final section investigates the potential for household wealth effects in the District and the nation in the years ahead.

## I. HOUSEHOLD WEALTH IN RECENT DECADES

Wealth accumulation can be important to households for a variety of reasons, both long and short term. These reasons include providing for retirement income, accumulating assets to leave to heirs, building up emergency funds, or even spending on current consumption. This section estimates and tracks the recent history of financial and housing wealth of Tenth District states.

### *Constructing state wealth estimates*

Household wealth data for states (similar to the national data found in the Federal Reserve's Flow of Funds accounts) are not available. Stock market-related wealth and net housing wealth, however, can be estimated at the state level. These two types of wealth account for the majority of overall net household wealth. They are often more volatile than most other types of wealth and thus have more potential to affect overall economic activity.<sup>1</sup>

State estimates for stock market wealth are produced by combining data from two separate sources. Specifically, each state's share of U.S. dividend income from the U.S. Bureau of Economic Analysis' (BEA) Regional Economic Accounts can be applied to the Federal Reserve's U.S. Flow of Funds totals for corporate equities, mutual funds, and pension fund reserves held by households and nonprofits. This approach assumes dividend receipts across states reflect holdings of all types of financial assets, which is a strong assumption. Case and others (2005) used a similar approach, applying state shares of mutual fund holdings to all types of financial assets. Similar data, however, are not available for recent time periods. The only other approach to estimating state financial wealth depends on gaining special access to proprietary data (Zhou).

State estimates of net housing wealth are made by subtracting an estimate of state mortgage debt from an estimate of gross state housing wealth. In line with Case and others' methodology, gross housing wealth is estimated by applying the Federal Housing Finance Agency's (FHFA) state home price indexes to annual state estimates of single-family housing stock, made by the U.S. Bureau of the Census. The base price used for each state is the median home price by state in the 2000 census. State housing liabilities are estimated by multiplying state data on total housing-related debt per each house with a first mortgage by the number of first mortgages outstanding.<sup>2</sup>

### *How wealthy are Tenth District states?*

As of the fourth quarter of 2010, estimated per capita net housing and stock market wealth in the Tenth District as a whole was nearly as high as in the nation (Chart 1). Net housing-related wealth was slightly less in the District as a whole than in the nation, while stock market-related wealth was greater in the District. Total per capita wealth in the region was about 98 percent of the national average, but the variation across District states was considerable, both in total wealth and in the breakdown between financial and housing wealth.

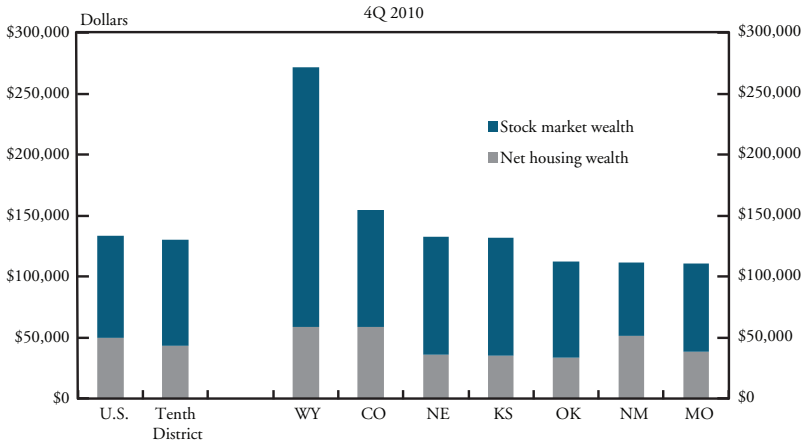
The wealthiest District states are *Wyoming* and *Colorado*. Per capita stock market-related wealth in Wyoming is more than twice that of the nation or any other District state. Wyoming is one of just a few states without a personal or corporate income tax, making it an attractive place to hold financial wealth. Stock market wealth in Colorado also exceeds the national average, as above-average incomes may allow for more financial wealth accumulation. In addition, per capita net housing wealth in both Colorado and Wyoming is more than 20 percent higher than in the nation, reflecting relatively high home prices.

In *Nebraska* and *Kansas*, per capita net household wealth is similar to that of the nation. This similarity stems from greater holdings of stock market-related wealth, as housing wealth in both states is well below the national average, given below-average home prices. Per capita incomes in both states slightly exceed the national average, which may account for stronger per capita financial wealth.

Wealth in the remaining District states—*Missouri*, *New Mexico*, and *Oklahoma*—is slightly lower than in the nation. In New Mexico, below-

Chart 1

## PER CAPITA STOCK MARKET AND NET HOUSING WEALTH



Sources: BEA, FHFA, Census Bureau, LPS; MBA

average stock market wealth is partly offset by above-average housing wealth. New Mexico has the lowest per capita income in the region, though, which may constrain financial wealth accumulation. In Oklahoma and Missouri, low housing wealth accounts for the bulk of lower per capita wealth numbers, as stock market-related wealth is only slightly lower than in the nation. Home prices in the two states are among the lowest in the nation.

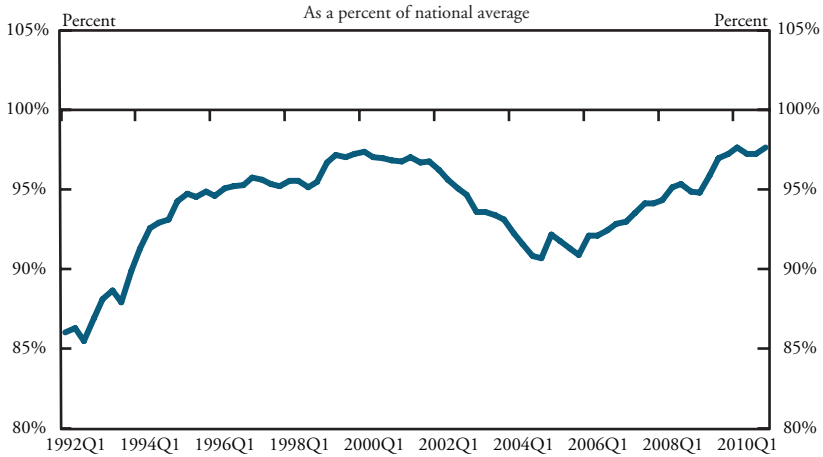
### *How has District wealth evolved in recent decades?*

Per capita net household wealth is nearly as high in the Tenth District as in the nation, but this has not always been the case. As recently as 2005—at the height of the housing boom—District household wealth was only about 90 percent of the national average (Chart 2). Two decades ago, following the farm, energy, and real estate busts of the 1980s, that figure was only about 85 percent. Only from 1999 to 2001, prior to the recent housing boom, has District household wealth approached current levels.

A breakdown of household wealth into stock market-related wealth and net housing wealth reveals that both types of wealth have been responsible for the District's recent relative improvement (Chart 3). While stock market wealth in the District has closely tracked the na-

Chart 2

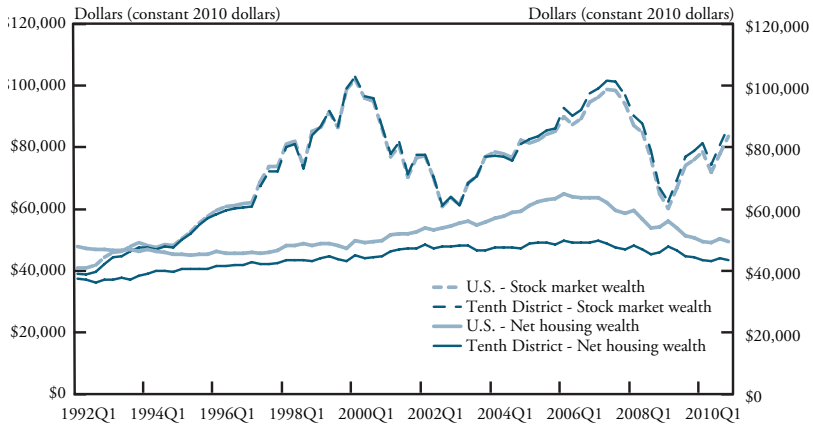
REAL PER CAPITA STOCK MARKET AND NET HOUSING WEALTH IN TENTH DISTRICT STATES



Sources: BEA, FHFA, Census Bureau, LPS, MBA

Chart 3

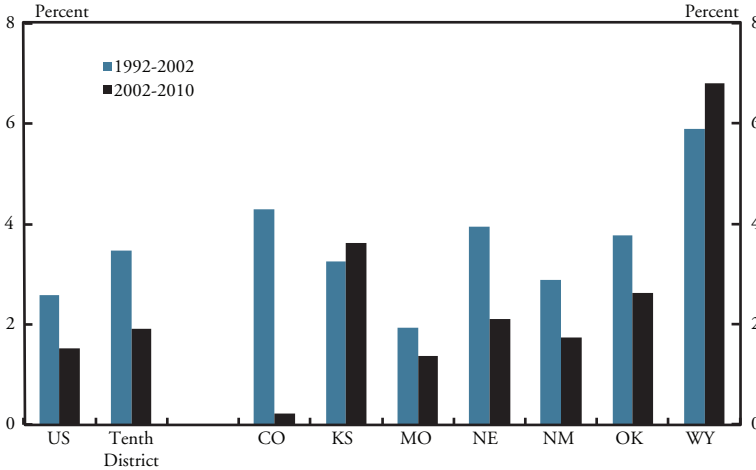
REAL PER CAPITA STOCK MARKET AND NET HOUSING WEALTH



Sources: BEA, FHFA, Census Bureau, LPS, MBA

Chart 4

### REAL PER CAPITA NET HOUSEHOLD WEALTH GROWTH (ANNUALIZED)



Sources: BEA, FHFA, Census Bureau, LPS, MBA

tion over the past two decades, a small gap opened from 2005 to 2007 that largely persists today. One possible explanation is that employment and incomes (and thus likely retirement savings) grew faster in the District than in the nation during that period.<sup>3</sup>

Net housing wealth has been steadier in the District than in the nation over the past two decades, especially during the recent housing boom and bust. Rapid increases in national net housing wealth during the mid-2000s temporarily increased the average net worth of U.S. households relative to District households. The collapse in home prices that began in 2007, however, has been nearly three times greater in the nation than the District, allowing District housing wealth to catch back up.

Most District states have contributed in some way to the convergence of the region's overall per capita net worth with national levels. Since 1992—the first year for which full data are available for states—only Missouri's overall wealth has grown slower than the national average (Chart 4). Most other District states posted stronger net household wealth growth than the nation both before and after 2002, when the recent wealth boom began. The exception is Colorado, where household wealth has essentially been flat since 2002 due to sluggish or declining home prices.

Growth in household wealth over the past two decades has been particularly strong in Kansas, Nebraska, Oklahoma, and Wyoming. Hit hard by the agricultural and energy crises of the 1980s, these states had more room to rebound in the 1990s. Their stronger growth, however, persisted through the 2000s. Since 2005, home prices in these states have been much steadier than in the nation. Wyoming also continued to gain financial wealth during the period.

## II. ECONOMIC EFFECTS OF CHANGES IN HOUSEHOLD WEALTH

Though the effects of wealth accumulation are primarily long term, wealth can also affect economic activity in the short term. Indeed, national consumption and income data suggest that during the 2000s wealth had a sizable effect on U.S. consumption. More rigorous studies have also shown that changes in household wealth—especially housing-related wealth—can measurably influence household consumption.

### *Evidence and research on consumption wealth effects*

Economic theory suggests that household consumption patterns often react to changes in household wealth (Benjamin and others, Case and others).<sup>4</sup> For example, as financial or housing assets grow, households may choose to spend some of their capital gains on current or near-term consumption. They might also choose to do so without actually realizing these gains—by borrowing against the assets. Conversely, as wealth declines, households may choose to save more of their incomes to replenish wealth losses.

A comparison of basic U.S. income and consumption data from the 2000s suggests the nation experienced sizable wealth effects on consumption during that decade, both positive and negative. From mid-2001 to mid-2005, for example, real personal consumption expenditures in the country rose at an annual rate of 3.4 percent, even though annual gains in real disposable income averaged just 2.4 percent. Then, from mid-2005 to mid-2009, real annual U.S. consumption growth averaged only 0.8 percent, despite 2.1 percent average annual gains in real disposable income. Presumably, consumers drew on their wealth to increase consumption from 2001 to 2005 and increased savings to replenish wealth in 2005-09.

Table 1

## RECENT ESTIMATES OF HOUSING AND FINANCIAL WEALTH EFFECTS ON CONSUMPTION

Study	Time period studied	Change in consumption per \$1 change in:	
		<i>Housing wealth</i>	<i>Financial wealth</i>
Carroll and others (2011)	1960-2004	\$0.09	\$0.04
Zhou (2010)	2001-2005	\$0.06	\$0.00
Leonard (2010)	1952-2005	\$0.10	\$0.02
Bostic and others (2009)	1989-2001	\$0.06	\$0.02
Case and others (2005)	1982-1999	\$0.07	\$0.02
Benjamin and others (2004)	1952-2001	\$0.08	\$0.02
Average of six studies		\$0.08	\$0.02

A number of previous studies have found statistically significant effects of wealth changes on U.S. consumption. Several recent studies suggest that a \$1 increase in housing wealth leads to an increase in consumption of 6 to 10 cents (Table 1). This compares to an average increase in consumption of only about 2 cents per dollar of additional financial wealth.

Some studies have found the largest consumption effects to occur with a lag. Zhou (2010), for example, found evidence of larger effects after lags of as long as nine months for financial wealth changes and two years for housing wealth changes. Similarly, Carroll and others (2011) found that a \$1 increase in housing wealth leads to only about 2 cents of additional consumption in the following quarter, while the total eventual effect equals about 9 cents.

There are several reasons that changes in housing wealth could have a larger effect on consumer spending than financial wealth. A sizable portion of stock market-related wealth is in restricted retirement or pension accounts, making it inaccessible or accessible only by paying substantial fees. Capital gains taxes on stocks may also result in less use of such wealth for current consumption. In addition, housing-related wealth in the United States has generally increased, perhaps providing a sense of “permanence” in capital gains from this type of wealth. The rise in availability of home equity loans in recent decades has also likely played a role in increasing consumption, as have U.S. tax laws that tend to favor holding housing-related debt over other kinds of debt. Both of these factors perhaps make extracting equity from housing more palatable than doing so from other types of assets.



Wealth effects may also differ depending on whether wealth is rising or falling. Leonard (2010), for example, suggested the housing wealth effect was larger in absolute terms after 2005 than in the years leading up to 2005, as households during the housing bust may have come to expect home prices would continue to fall. Households may thus have reduced consumption even more than they expanded it during the boom years.

Past examples of large declines in state housing wealth also suggest that recoveries from such episodes can be painfully slow and damaging to local economies (Wheelock and others). Prior to 2007, nominal home prices in the United States as a whole had not fallen for many decades. However, at various times between 1980 and 1998, 15 states experienced nominal home price declines of more than 10 percent. In almost all cases, employment growth in the state lagged national growth during the period. This experience could be especially relevant to the 27 states that have experienced double-digit nominal home price declines since 2006.

### *Comparisons with the 1997-2002 wealth boom and bust*

Recent experience provides some evidence on the relative effects of changes in housing wealth and financial wealth on consumption. The boom and bust in U.S. household wealth from 2002 to 2009 was sizable, but its scale was not unprecedented. The overall boom and bust from 1997 to 2002 was comparable. In both instances, real per capita household wealth grew about 40 percent before declining about 25 percent.

A key difference between the two episodes, however, is that the household wealth decline in the earlier episode was almost completely financial—net housing wealth actually continued to rise moderately in 2000 and 2001 even as stock prices fell. As such, the negative impact on consumption was likely much smaller than in the more recent episode. Indeed, Benjamin and others (2004) found that the positive wealth effect from the modest increase in housing wealth in 2000-01 was enough to offset the negative wealth effect from the much more substantial decline in stock-market-related wealth. By contrast, declines in wealth from 2007 to 2009 occurred in both housing and stock market wealth, putting sizable downward pressure on consumption and thus on overall economic growth.

Another key difference between the two episodes was the regional variation in wealth changes was considerably larger during the more recent episode. Specifically, the standard deviation in changes in wealth across states was nearly 75 percent higher in the second episode. These overall regional differences were driven primarily by differing trends in housing wealth, as financial wealth grew fairly similarly across the country. As such, wealth effects on consumption were likely much more geographically diverse across the nation from 2002 to 2009 than from 1997 to 2002.

### III. STATE WEALTH EFFECTS IN THE RECENT BOOM AND BUST

Changes in household wealth played an important role in U.S. consumption patterns during the last decade. In the boom years of 2002-07, Tenth District states likely experienced positive wealth effects, although most District states had a much milder boost from home prices than the nation. Similarly, during the wealth bust of 2007-09, consumption in most District states likely suffered less than in the nation. Both disposable income and housing wealth held up better in the District than the nation, while stock market wealth fell similarly.

#### *State consumption wealth effects: The boom*

In contrast to the nation, reliable consumption data at the state level are not available. Some studies have estimated state consumption, however, using various sources (Case and others; Rapach and Strauss). The quality of the data used, though, and the difficulty of measuring some types of consumption at the state level, leave these estimates open to criticism (Zhou). For example, a good deal of consumption, especially in tourism-driven states, can come from out-of-state residents. Thus, comparing wealth estimates for residents of a state with consumption estimates for spending in the state—either by residents or nonresidents—can be problematic.

To avoid this problem, past estimates of national consumption wealth effects are applied to state wealth and income data.<sup>5</sup> This approach provides a sense of the potential overall scale of the wealth effects, both current and future, in some states relative to others during the boom and bust years. The effects can be compared to changes in states' disposable

incomes—typically the primary driver of consumption trends—to show their relative importance in recent years. Thus, the wealth effects estimated in Chart 5 might be more accurately described as potential determinants of consumer spending beyond disposable income. A drawback of this approach, however, is that it fails to recognize that wealth effects across states likely vary. Moreover, it estimates consumption effects contemporaneously with wealth changes, although some research has shown that effects occur with lags of a year or more.

Based on this approach, estimates of potential wealth effects on consumption were sizable during both the boom and bust of the 2000s. During the boom, for the nation as a whole, housing and financial wealth each contributed about a half a percentage point to consumption (Chart 5). This finding is consistent with actual national data for the period showing that consumption outpaced incomes by about 1 percent.

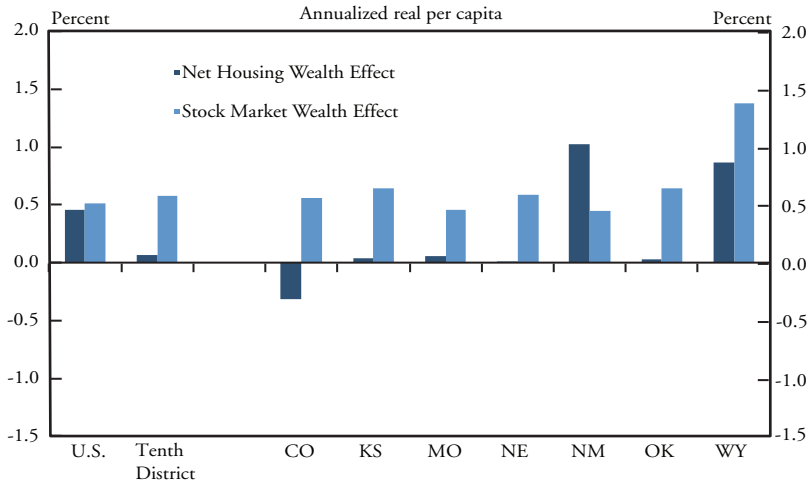
The scale of potential wealth effects varied greatly across states. In eight states the combined potential wealth effect during the boom—for stock market wealth plus net housing wealth—was actually larger than growth in personal disposable income (Appendix 1 estimates potential wealth effects for all states). This group of states was led by Oregon, where potential wealth effects were more than double disposable income gains. At the other extreme, Michigan had a negative overall potential wealth effect during the period. Modest home price declines in that state more than offset the positive wealth effect of stock market gains.

In the Tenth District during the period, overall consumption growth was likely less than in the nation, due to smaller potential wealth effects. Disposable income grew nearly as fast as in the nation, and the region's estimated positive stock market effects on wealth were slightly larger than in the country as a whole. However, the District likely did not experience a housing wealth effect, so any extra consumption beyond income gains would have been funded out of stock market-related gains, reduced savings rates, or other sources of wealth or borrowing.

To be sure, the potential drivers of consumption in District states varied during the boom. For example, the potential housing wealth effects in both New Mexico and Wyoming were larger than in the nation. However, wealth effects were likely relatively less important to overall consumption and economic growth in both states as their disposable incomes also outpaced that in the nation. Wyoming also

Chart 5

### POTENTIAL WEALTH EFFECTS ON CONSUMPTION, Q3 2002 TO Q2 2007



Sources: BEA; FHFA; Census Bureau; LPS; MBA

had a larger potential stock market wealth effect. The Plains states—Kansas, Missouri, Nebraska, and Oklahoma—all had virtually no housing wealth effect. Gains in stock market wealth may have led consumers to spend beyond their incomes in these states, but likely not by wide margins. The same is true for Colorado, which likely had a slightly negative housing wealth effect during the period, as the state recovered from the technology bubble and bust earlier in the decade.

How do these estimates measure up against how state economies actually performed during the period? Again, comparing these effects with actual state data is difficult due to the lack of reliable state estimates for consumption. One potential basic measure of comparison, however, is changes in employment. Looking across all states, changes in employment from 2002 to 2007 are slightly more correlated with changes in disposable income plus wealth effects than simply with changes in disposable income alone.<sup>6</sup> In addition, the ranking of Tenth District states in terms of per capita job growth was the exact same as the ranking of

change in disposable income plus wealth effects but differed slightly from the ranking based on growth in disposable income alone.

*State consumption wealth effects: The bust*

Although the wealth effects during the 2002-07 boom were positive, the wealth effects during the subsequent bust of 2007-09 were negative—and sizable. At the national level, the potential housing wealth effect on consumption was greater than -1.0 percent annually, while stock market losses potentially reduced consumption by an additional 0.5 percent (Chart 6). Real per capita disposable income in the nation was essentially flat over the period, so reductions in consumption likely came largely via negative wealth effects.

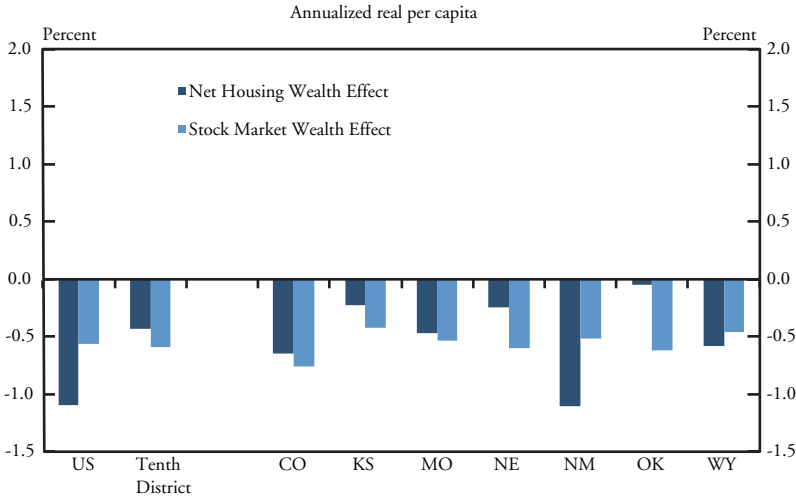
During the downturn, the estimated wealth effects were negative in all 50 states. Every state likely experienced negative wealth effects from the stock market, and all states but North Dakota and South Dakota had at least slightly negative housing wealth effects (Appendix 2). In some states, the potential negative wealth effect was especially large. The overall negative wealth effects on consumption were estimated to exceed 4 percent per year in Arizona, California, Florida, Hawaii, and Nevada. In eight other states, the annualized negative wealth effects exceeded 2 percent, while in 12 states, the negative wealth effects were less than 1 percent.

In all Tenth District states, estimated negative wealth effects were less than in the nation—although in some cases only marginally. In addition, disposable incomes held up better in the District than the nation, further softening the blow of the recent recession. Colorado and New Mexico experienced negative potential wealth effects nearly as large as the nation from mid-2007 to the end of 2009, driven by housing wealth declines in New Mexico and financial wealth declines in Colorado. In Missouri and Wyoming, potential negative housing and stock market wealth effects were about 0.5 percent each. In Kansas, Nebraska, and Oklahoma, housing wealth fell only marginally, while stock market losses likely provided moderate negative drags on state consumption.

As during the boom years, comparing total ability to consume by state with actual changes in employment for the period shows similarities. In descending order, Colorado, Missouri, and New Mexico had the biggest employment declines. This order was the same for the percent

Chart 6

## POTENTIAL WEALTH EFFECTS ON CONSUMPTION, Q2 2007 TO Q4 2009



Sources: BEA; FHFA; Census Bureau; LPS; MBA

decline in wealth plus disposable income but different from the order of declines in disposable income alone. The remaining District states experienced smaller job losses and smaller potential consumption declines.

In sum, during the household wealth boom and bust years of 2002 to 2009, households in the Tenth District likely remained more able to consume than households in the nation. Slightly stronger disposable income growth in the District certainly played a role, but relative changes in wealth also likely contributed to stronger consumption growth.

#### IV. RECENT AND FUTURE WEALTH EFFECTS IN DISTRICT STATES

Consumption patterns from 2002 to 2009 changed significantly due to wealth effects. Since then, wealth has been more stable in both the District and the nation. In late 2010 and early 2011, however, U.S. home prices began declining again, and many analysts expect the declines to persist. Housing sector data suggest that downward pressure on house prices will likely be milder in the District than the nation. Still, some District states could see a measurable slowdown in consumption growth beginning this year.

### *State wealth effects in 2010*

For the country as a whole, estimated potential wealth effects were relatively small in 2010, especially compared to income gains during the year. Per capita disposable income grew nearly 2 percent, while the estimated stock market wealth effect was 0.2 percent and the estimated housing wealth effect was -0.1 percent. In addition, no state's overall estimated potential negative wealth effects exceeded 1.2 percent, and no state's positive wealth effects exceeded 0.5 percent. As such, growth in disposable income was almost certainly the primary driver of changes in consumption across the country in 2010.

In the Tenth District, the overall potential wealth effect in 2010 was likely close to zero. Stock market-related wealth effects were slightly positive, offsetting the slightly negative net housing wealth effects. Indeed, among District states, only New Mexico's estimated wealth effect exceeded plus or minus 0.3 percent. Sizable declines in home prices in New Mexico could have shaved more than a percentage point from consumption gains in that state.

### *Factors affecting District wealth heading forward*

Wealth effects may not be so benign in 2011. Although forecasting stock market wealth is impractical given the volatility of equity prices and various factors affecting them, a good deal of information is available about housing markets across the country. Some forecasters expect U.S. home prices to drop more than 5 percent in 2011 before stabilizing near the end of the year.<sup>7</sup> The likely reasons include both actual decreases in national home prices in the first few months of 2011 and the still-sizable overhang of unsold houses across the country. Home price declines of this magnitude would typically be associated with negative impacts on U.S. consumption of well in excess of 0.5 percent. Depending on what happens to stock prices in 2011, such a negative housing wealth effect could provide a sizable damper on national economic activity.

Though Tenth District housing markets have held up much better than the nation in recent years, some states in the region may be more susceptible to negative housing wealth effects now than during the early years of the home price bust. As in the nation, home prices in most District states resumed falling in the fourth quarter of 2010, and the pace of decline accelerated in several states in the first quarter of 2011 (Chart 7). Unsold home inventories also remain elevated across the

Chart 7  
 QUARTERLY CHANGE IN HOME PRICES

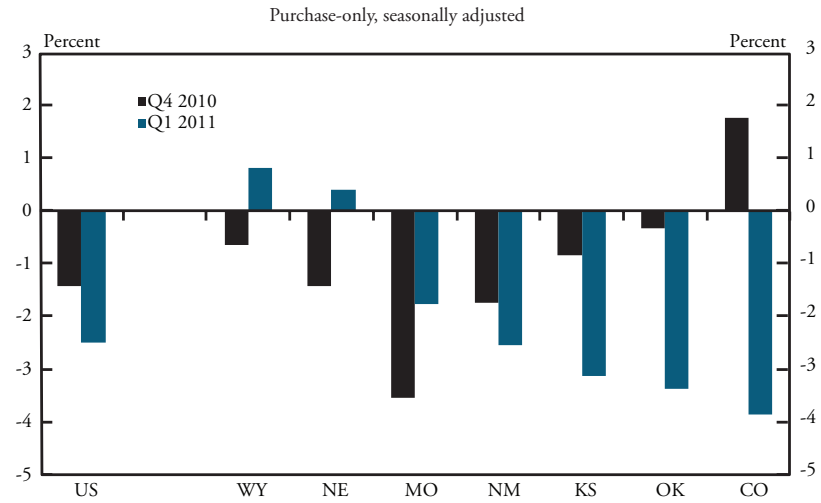


Chart 8  
 MONTHS SUPPLY OF UNSOLD HOMES

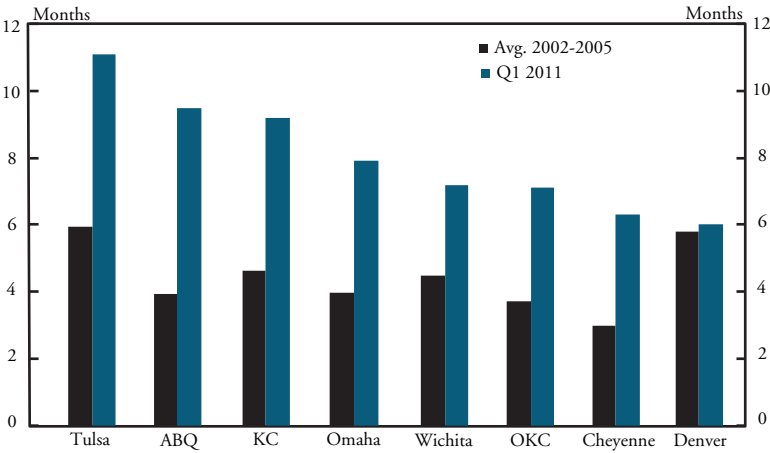
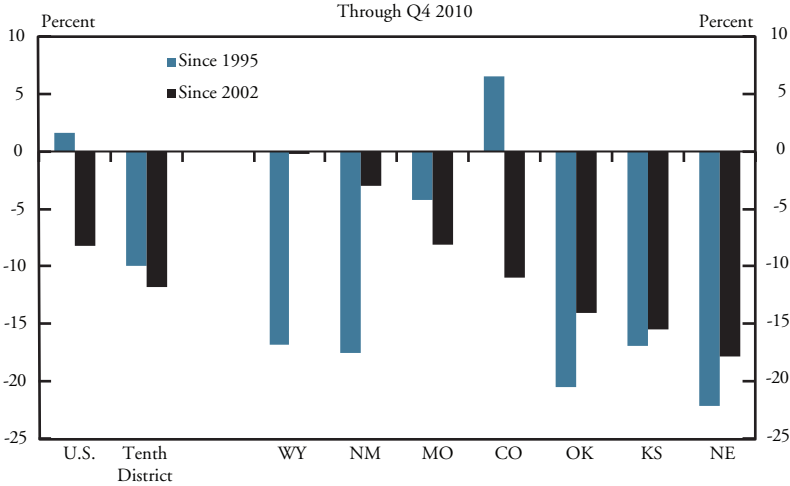




Chart 9

GROWTH DIFFERENCE BETWEEN REAL PER CAPITA DISPOSABLE INCOME AND REAL HOME PRICES



Sources: FHFA, U.S. Bureau of Economic Statistics

District compared with before the housing boom, according to statistics from local realtor associations (Chart 8). Excess supplies in most large cities of the region are fairly similar to those in the rest of the nation after being smaller in recent years.

Still, longer-term prospects of home prices appear somewhat better in the District than the nation. One measure of long-term fundamentals in housing markets for which data are available at the state level is the ratio of home prices to incomes. Since 2002, real home prices in the region have grown considerably less than real disposable incomes—to a greater extent than in the nation as a whole (Chart 9). In fact, since 1995, home prices across the nation have grown more than 5 percent faster than incomes. In the District, meanwhile, home prices have outpaced incomes only in Colorado.

V. SUMMARY AND CONCLUSIONS

Overall household wealth has grown faster in the Tenth District than in the nation both over the last few years and the last two decades.

As a result, most District states' actual or potential consumption has become relatively stronger, in both the short and long term. Four states in particular—Kansas, Nebraska, Oklahoma, and Wyoming—have recently experienced significantly more growth in wealth than the nation.

Research has shown that changes in wealth—especially changes in housing-related wealth—can have a measurable effect on near-term consumption. Although wealth grew faster in the District than the nation in the 2000s as a whole, District wealth was less subject to wide swings. The housing boom and subsequent bust were both milder across much of the District. Thus, the potential wealth effects on consumption were smaller in the District.

At the end of 2010, however, home prices both nationally and regionally began sliding again. Market fundamentals suggest that prices may continue to fall in many areas. Given the national scale of the expected home price declines, the negative impact on consumption could be sizable—both across the nation and in some District states.

*Appendix 1*POTENTIAL SOURCES OF CONSUMPTION GROWTH,  
Q3 2002 TO Q2 2007

Annualized real per capita percentage growth

	Disposable Personal Income	Net Housing Wealth Effect	Stock Market Wealth Effect	Total Wealth Effect
U.S.	1.9	0.5	0.5	1.0
Alabama	2.2	0.2	0.5	0.7
Alaska	1.9	0.9	0.6	1.5
Arizona	2.2	1.8	0.5	2.4
Arkansas	2.7	0.2	0.9	1.1
California	2.2	2.7	0.6	3.3
Colorado	1.1	-0.3	0.6	0.3
Connecticut	2.5	0.6	0.7	1.4
Delaware	1.2	1.1	0.2	1.3
District of Columbia	4.3	2.6	0.4	3.0
Florida	2.8	2.1	0.9	3.0
Georgia	0.9	0.1	0.4	0.5
Hawaii	3.8	5.6	0.6	6.2
Idaho	1.9	0.7	0.7	1.5
Illinois	1.6	0.4	0.5	0.9
Indiana	0.8	-0.1	0.3	0.1
Iowa	1.6	0.0	0.4	0.4
Kansas	2.2	0.0	0.7	0.7
Kentucky	1.3	0.1	0.3	0.4
Louisiana	4.6	0.5	0.7	1.2
Maine	1.4	0.9	0.3	1.2
Maryland	2.2	2.0	0.4	2.4
Massachusetts	1.8	0.3	0.5	0.8
Michigan	0.0	-0.4	0.3	-0.1
Minnesota	1.5	0.3	0.5	0.8
Mississippi	2.7	0.2	0.4	0.6
Missouri	1.1	0.1	0.5	0.5
Montana	2.9	0.9	1.1	2.0
Nebraska	2.0	0.0	0.6	0.6
Nevada	2.8	1.7	0.7	2.3
New Hampshire	1.6	0.5	0.3	0.8
New Jersey	2.0	1.5	0.4	1.9
New Mexico	2.4	1.1	0.5	1.5
New York	2.8	1.2	0.7	1.9

*Appendix 1 continued*

	Disposable Personal Income	Net Housing Wealth Effect	Stock Market Wealth Effect	Total Wealth Effect
North Carolina	104	0.3	0.5	0.8
North Dakota	3.4	0.4	0.5	1.0
Ohio	0.7	-0.2	0.3	0.1
Oklahoma	2.9	0.0	0.7	0.7
Oregon	1.0	1.9	0.6	2.5
Pennsylvania	1.6	0.7	0.4	1.1
Rhode Island	2.0	1.3	0.2	1.5
South Carolina	1.6	0.2	0.5	0.7
South Dakota	2.9	0.1	0.9	1.1
Tennessee	1.3	0.2	0.3	0.5
Texas	2.4	0.0	0.5	0.5
Utah	1.7	0.8	0.6	1.3
Vermont	2.3	1.4	0.5	1.9
Virginia	2.6	1.3	0.5	1.7
Washington	2.2	1.7	0.9	2.6
West Virginia	1.4	0.3	0.3	0.6
Wisconsin	1.0	0.4	0.4	0.8
Wyoming	4.7	0.9	1.5	2.4

*Appendix 2*POTENTIAL SOURCES OF CONSUMPTION GROWTH,  
Q2 2007 TO Q4 2009

Annualized real per capita percentage growth

	Disposable Personal Income	Net Housing Wealth Effect	Stock Market Wealth Effect	Total Wealth Effect
U.S.	0.0	-1.1	-0.6	-1.7
Alabama	0.2	-0.3	-0.5	-0.8
Alaska	1.0	-0.8	-0.4	-1.2
Arizona	-1.5	-3.9	-0.7	-4.6
Arkansas	0.7	-0.4	-0.6	-1.0
California	-0.8	-5.7	-0.6	-6.3
Colorado	-0.6	-0.6	-0.8	-1.4
Connecticut	-0.5	-1.2	-0.6	-1.8
Delaware	-0.4	-1.3	-0.6	-1.8
District of Columbia	2.6	-2.0	-0.4	-2.4
Florida	-0.7	-4.0	-0.9	-4.9
Georgia	-1.2	-0.9	-0.7	-1.6
Hawaii	0.5	-4.3	-0.6	-4.9
Idaho	-1.7	-1.2	-0.7	-1.9
Illinois	0.2	-1.1	-0.6	-1.7
Indiana	-0.2	-0.3	-0.5	-0.8
Iowa	1.2	-0.1	-0.6	-0.7
Kansas	1.1	-0.2	-0.4	-0.7
Kentucky	1.0	-0.2	-0.5	-0.7
Louisiana	-0.1	-0.2	-0.2	-0.5
Maine	1.2	-1.0	-0.5	-1.5
Maryland	1.0	-2.5	-0.6	-3.1
Massachusetts	0.4	-1.5	-0.7	-2.2
Michigan	0.0	-1.1	-0.4	-1.4
Minnesota	-0.1	-1.2	-0.7	-1.8
Mississippi	0.0	-0.3	-0.5	-0.7
Missouri	0.1	-0.5	-0.5	-1.0
Montana	0.8	-0.7	-0.7	-1.4
Nebraska	0.6	-0.2	-0.6	-0.8
Nevada	-2.9	-4.8	-0.7	-5.5
New Hampshire	-0.7	-1.4	-0.4	-1.9
New Jersey	-0.3	-2.0	-0.5	-2.5
New Mexico	1.2	-1.1	-0.5	-1.6

*Appendix 2 continued*

	Disposable Personal Income	Net Housing Wealth Effect	Stock Market Wealth Effect	Total Wealth Effect
New York	0.2	-1.3	0.6	-2.0
North Carolina	-0.4	-0.5	-0.6	-1.1
North Dakota	3.5	0.1	-0.4	-0.3
Ohio	0.4	-0.5	-0.5	-1.0
Oklahoma	0.9	0.0	-0.6	-0.7
Oregon	0.0	-2.6	-0.5	-3.1
Pennsylvania	1.0	-0.7	-0.6	-1.2
Rhode Island	0.9	-2.2	-0.6	-2.8
South Carolina	0.1	-0.5	-0.5	-1.1
South Dakota	1.1	0.0	-1.0	-1.0
Tennessee	-0.2	-0.4	-0.3	-0.7
Texas	0.8	-0.1	-0.2	-0.3
Utah	-0.9	-1.8	-0.7	-2.5
Vermont	1.1	-0.7	-0.6	-1.3
Virginia	0.3	-1.4	-0.5	-1.9
Washington	0.6	-2.2	-0.6	-2.8
West Virginia	2.1	-0.4	-0.4	-0.7
Wisconsin	0.4	-0.6	-0.6	-1.1
Wyoming	1.5	-0.6	-0.5	-1.0

## ENDNOTES

<sup>1</sup>At the national level, stock market and housing wealth account for more than three-fifths of all the wealth of households and nonprofits, which are combined in the data. Households account for about 90 percent of the wealth of the combined household and nonprofit sectors. The primary types of household assets omitted in this article include consumer durable goods, household bank deposits, credit market instruments, and equity in noncorporate businesses. The primary excluded household liability is non-mortgage consumer credit.

<sup>2</sup>Data on state housing debt comes from Lender Processing Services, while number of mortgages data by state comes from the Mortgage Bankers Association.

<sup>3</sup>For example, total nonfarm employment in the District at the end of 2010 was at about 98 percent of 2006 levels, compared with about 96 percent in the nation as a whole.

<sup>4</sup>The availability of credit can also affect consumption, as clearly evidenced in recent years, although credit availability depends at least in part upon collateral assets.

<sup>5</sup>Specifically, the average housing (\$0.08) and financial wealth (\$0.02) effects of the six studies cited in Table 1 are used for wealth effects. Some recent studies suggest the housing wealth effect may be larger in downturns, so the estimates during the bust may understate the effect.

<sup>6</sup>Specifically, the correlation coefficient of employment with disposable incomes plus wealth effects (0.73) is slightly higher than the correlation between employment and disposable income alone (0.71). These correlations look at just the contemporaneous effects on consumption. Another potential comparison measure for states is with estimates of retail sales. Several past researchers have cautioned against using the available estimates on state retail sales, for a variety of reasons (see especially Zhou). But, like employment, changes in state retail sales data from Claritas from 2002 to 2007 are more highly correlated with changes in disposable incomes plus wealth effects (0.34) than with changes in disposable incomes alone (0.27). In addition, Zhou found larger effects on consumption after a lag than contemporaneously.

<sup>7</sup>For example, Fiserv Case Shiller expected a 5.5 percent decline from third quarter 2010 to third quarter 2011. Similarly, Global Insight's forecast as of Q2 2011 called for a 7 percent decline from the end of 2010 to the end of 2011.

## REFERENCES

- Benjamin, John D., Peter Chinloy, and G. Donald Jud. 2004. "Real Estate Versus Financial Wealth in Consumption," *Journal of Real Estate Finance and Economics*, vol. 29, no. 3, pp. 341-354.
- Bostic, Raphael, Stuart Gabriel, and Gary Painter. 2009. "Housing Wealth, Financial Wealth, and Consumption: New Evidence from Micro Data." *Regional Science and Urban Economics*, vol. 39, pp. 79-89.
- Carroll, Christopher D., Misuzu Otsuka, and Jiri Slacalek. 2011. "How Large Are Housing and Financial Wealth Effects? A New Approach." *Journal of Money, Credit and Banking*, vol. 43, no. 1, pp. 55-79.
- Case, Karl E., John M. Quigley, and Robert J. Shiller. 2005. "Comparing Wealth Effects: The Stock Market Versus the Housing Market." *Advances in Macroeconomics*, vol. 5, no. 1, pp. 1-30.
- Leonard, Jeremy A. 2010. "The Impact of the Housing Market Boom and Bust on Consumption Spending." *Business Economics*, vol. 45, no. 2, pp. 83-93.
- Rapach, David E., and Jack K. Strauss. 2006. "The Long-Run Relationship Between Consumption and Housing Wealth in the Eight District States." Federal Reserve Bank of St. Louis, *Regional Economic Development*, vol. 2, no. 2, pp. 140-47.
- Wheelock, David C. 2006. "What Happens to Banks When House Prices Fall? U.S. Regional Housing Busts of the 1980s and 1990s." Federal Reserve Bank of St. Louis, *Review*, vol. 88, no. 5, pp. 413-429.
- Zhou, Xia. 2010. "Essays on U.S. State-Level Financial Wealth Data and Consumption Data," submitted dissertation, Johns Hopkins University, October.