



Making Retirement A Reality
CFA Society of St. Louis

Retirement Demographics

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These comments do not necessarily represent the views of the Federal Reserve Bank of St. Louis or the Federal Reserve System.

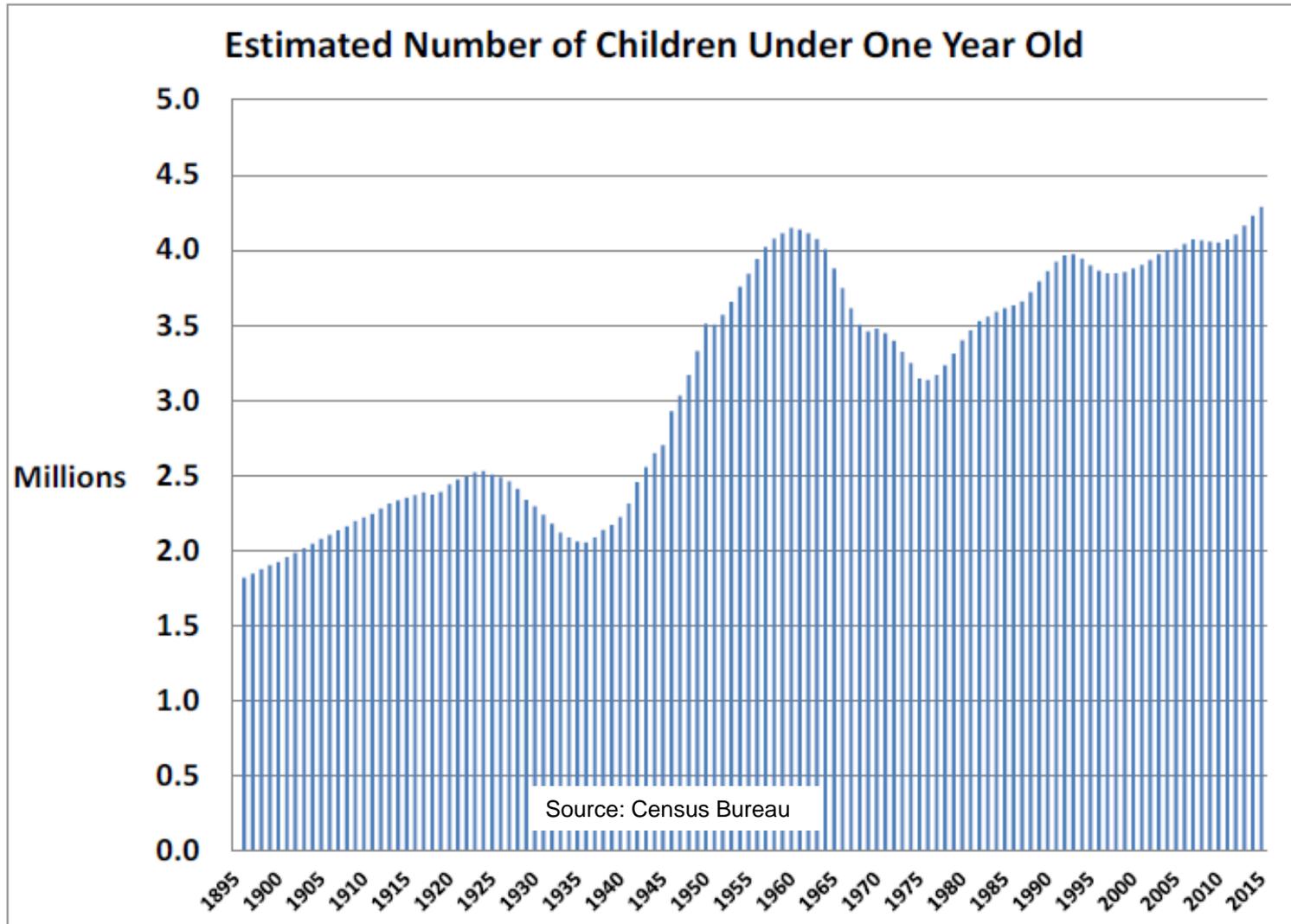


Retirement Demographics

- **Economic impacts of the Baby Boomers**
 - **Economic growth**
 - **Government finances**
- **Financial impacts of the Baby Boomers**
 - **Interest rates and the bond market**
 - **Stock market**
 - **Housing market**
- **Retirement implications**
 - **What is a reasonable expected return on your assets during retirement?**
 - **Putting the “human capital” in your portfolio to work**

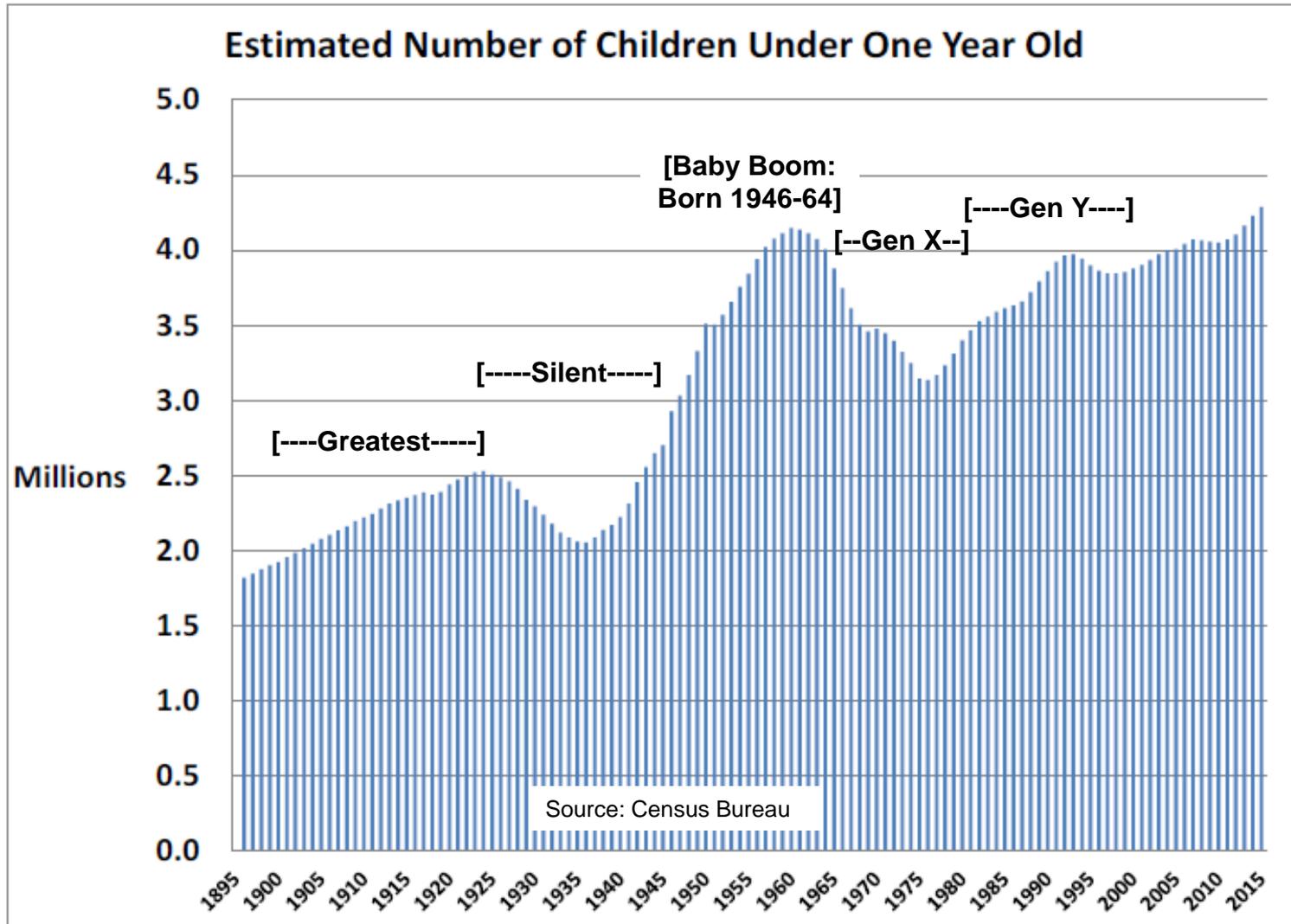


The Baby Boom Was the Largest Demographic Event of the 20th Century





The Baby Boom Was the Largest Demographic Event of the 20th Century

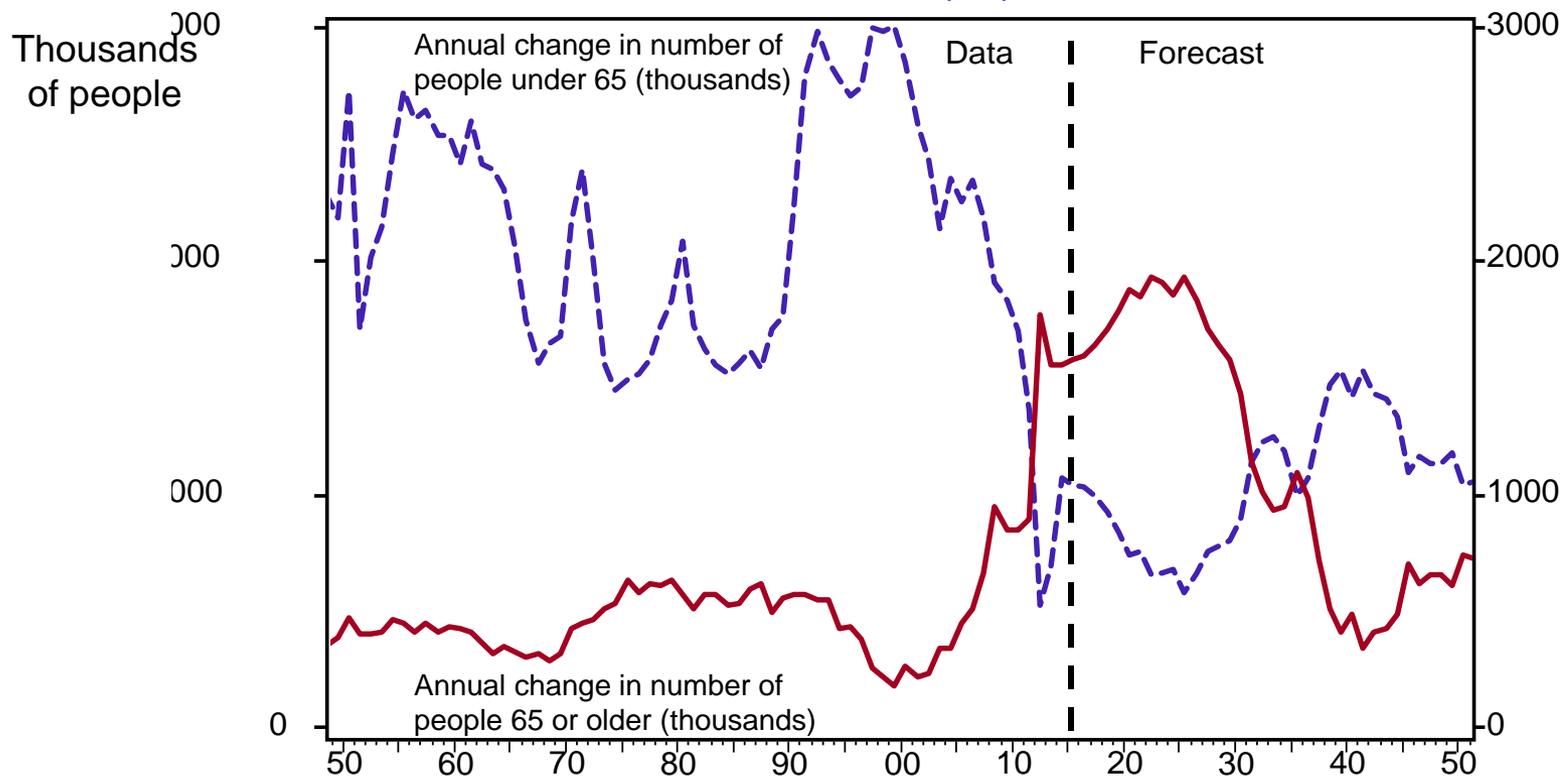




Increase in Senior Population Outstrips Under-65 Growth For the First and Only(?) Time in History

Annual Change in Population Aged 65 or Older
Thousands of people

Annual Change in Population Under 65
Thousands of people



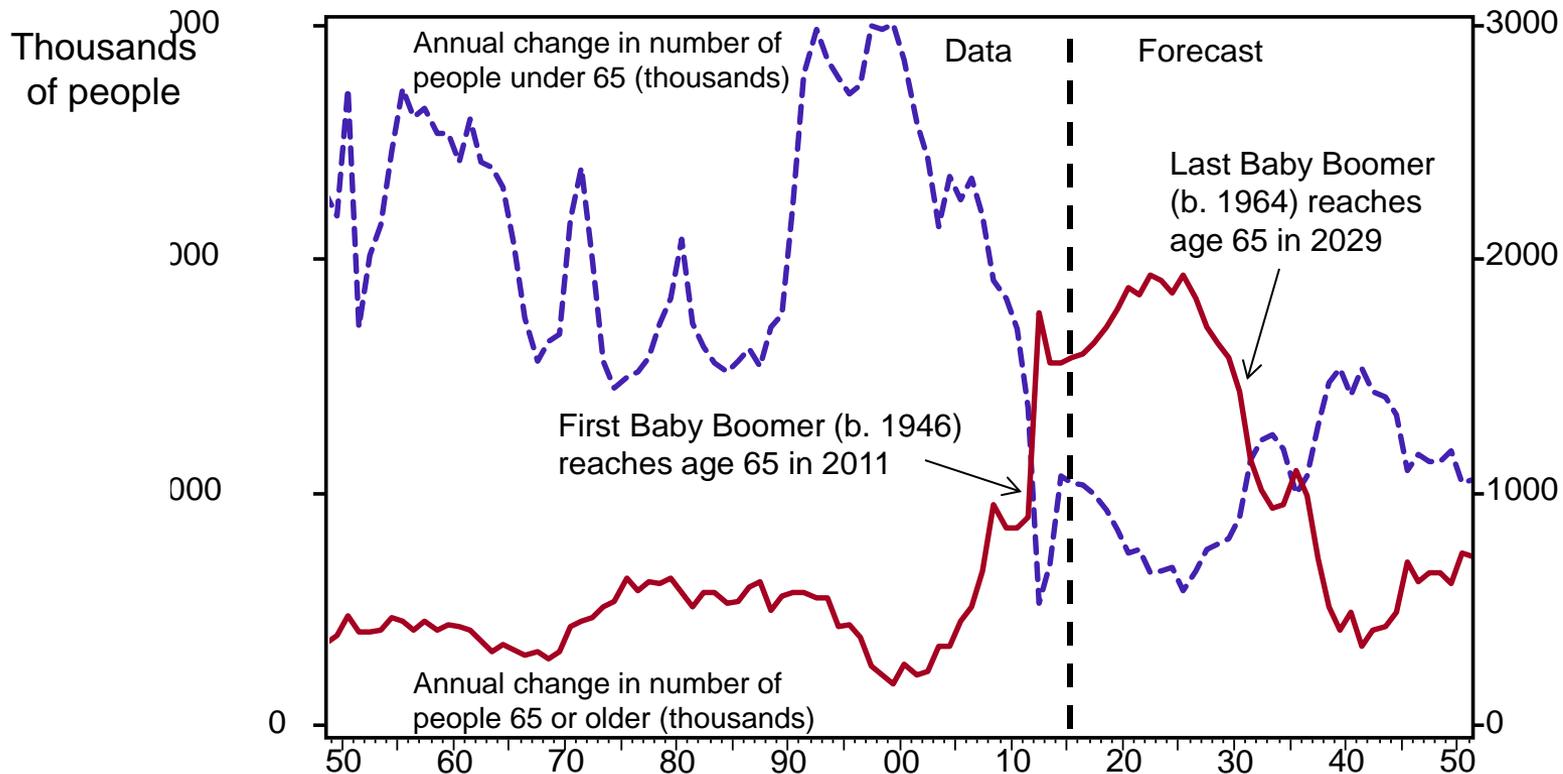
Source: Census Bureau



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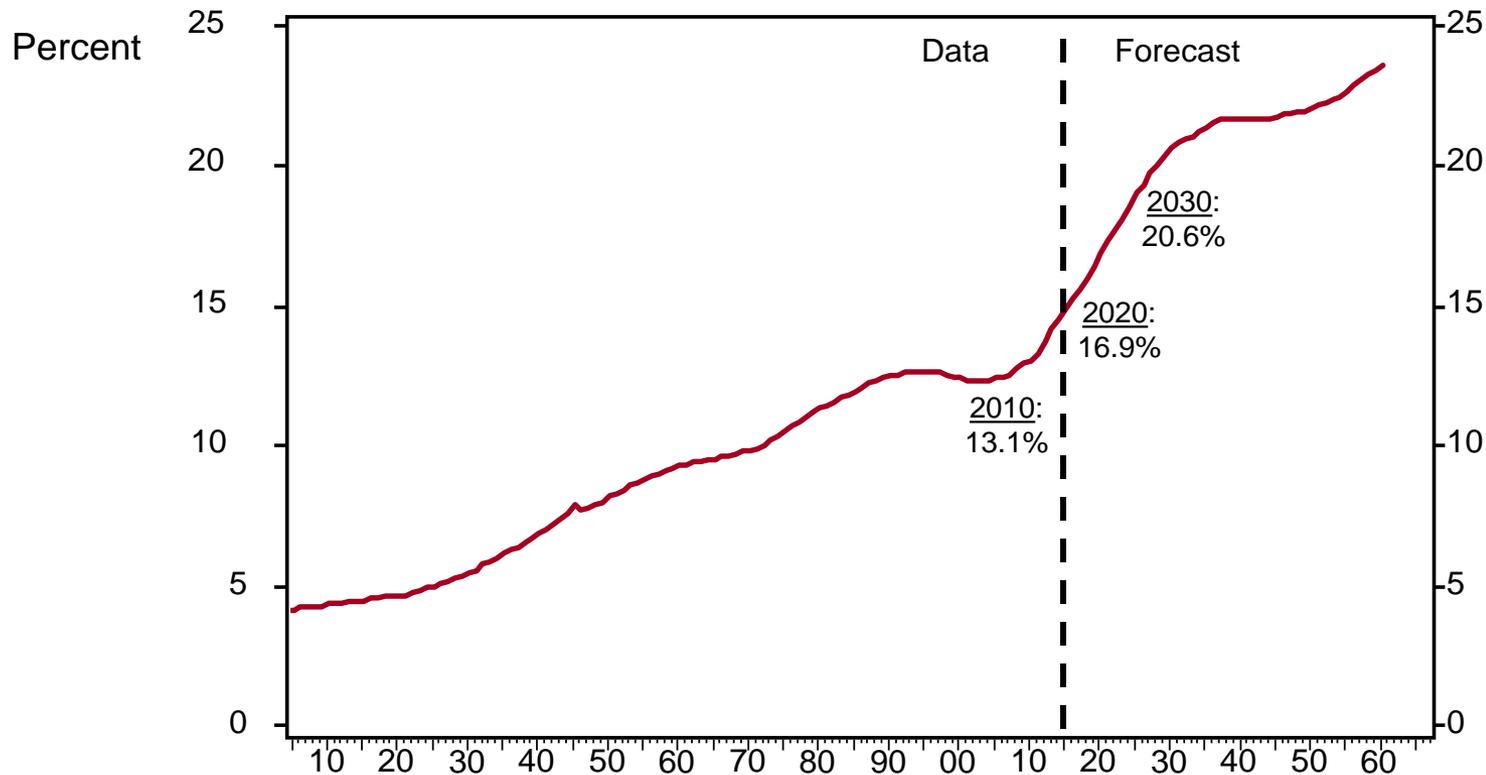
Source: Census Bureau



Baby Boom + Increasing Longevity + Low Birth Rate = Surging Senior Population

Share of Resident U.S. Population Aged 65 or Older

Percent



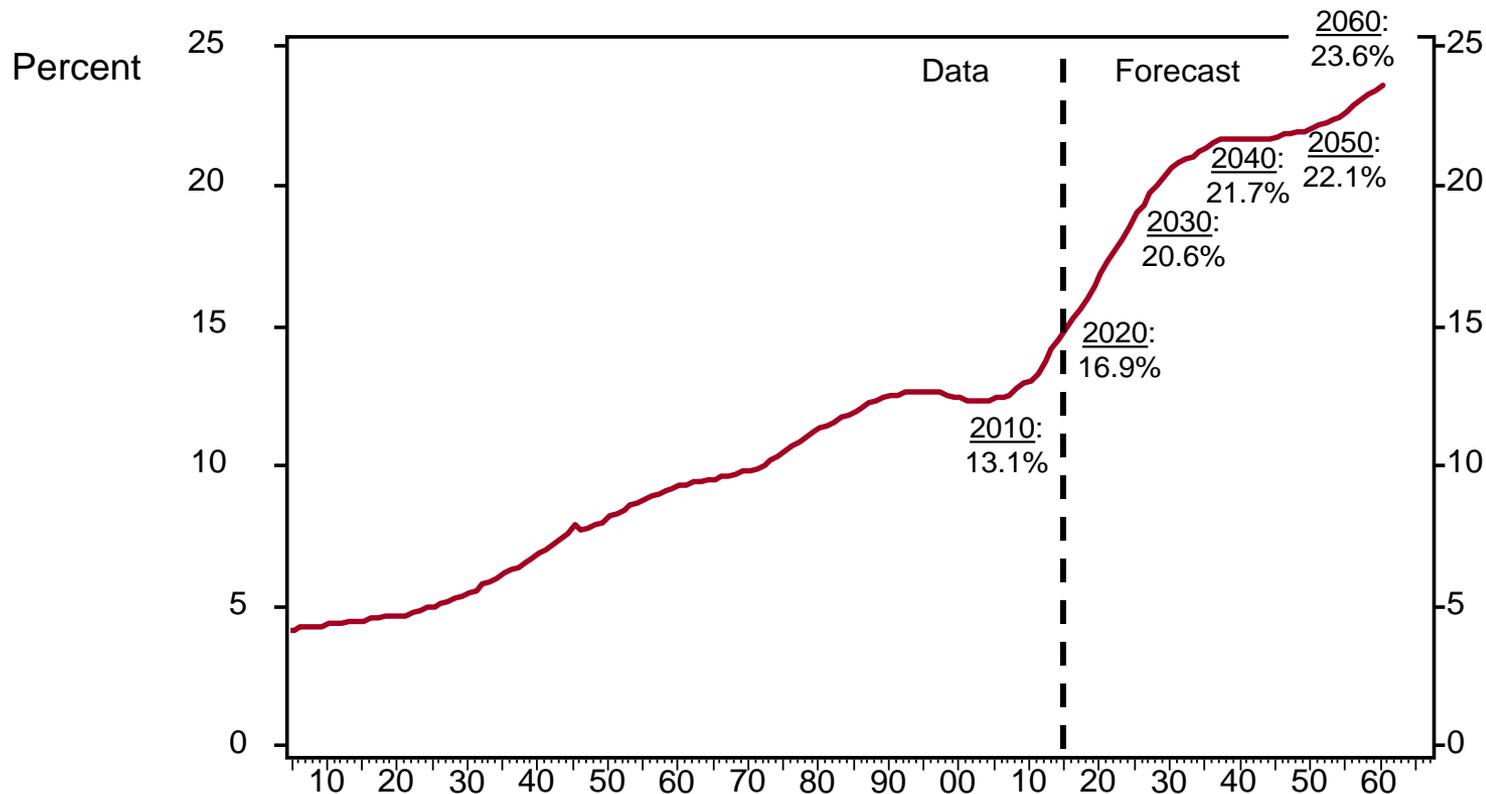
Source: Census Bureau



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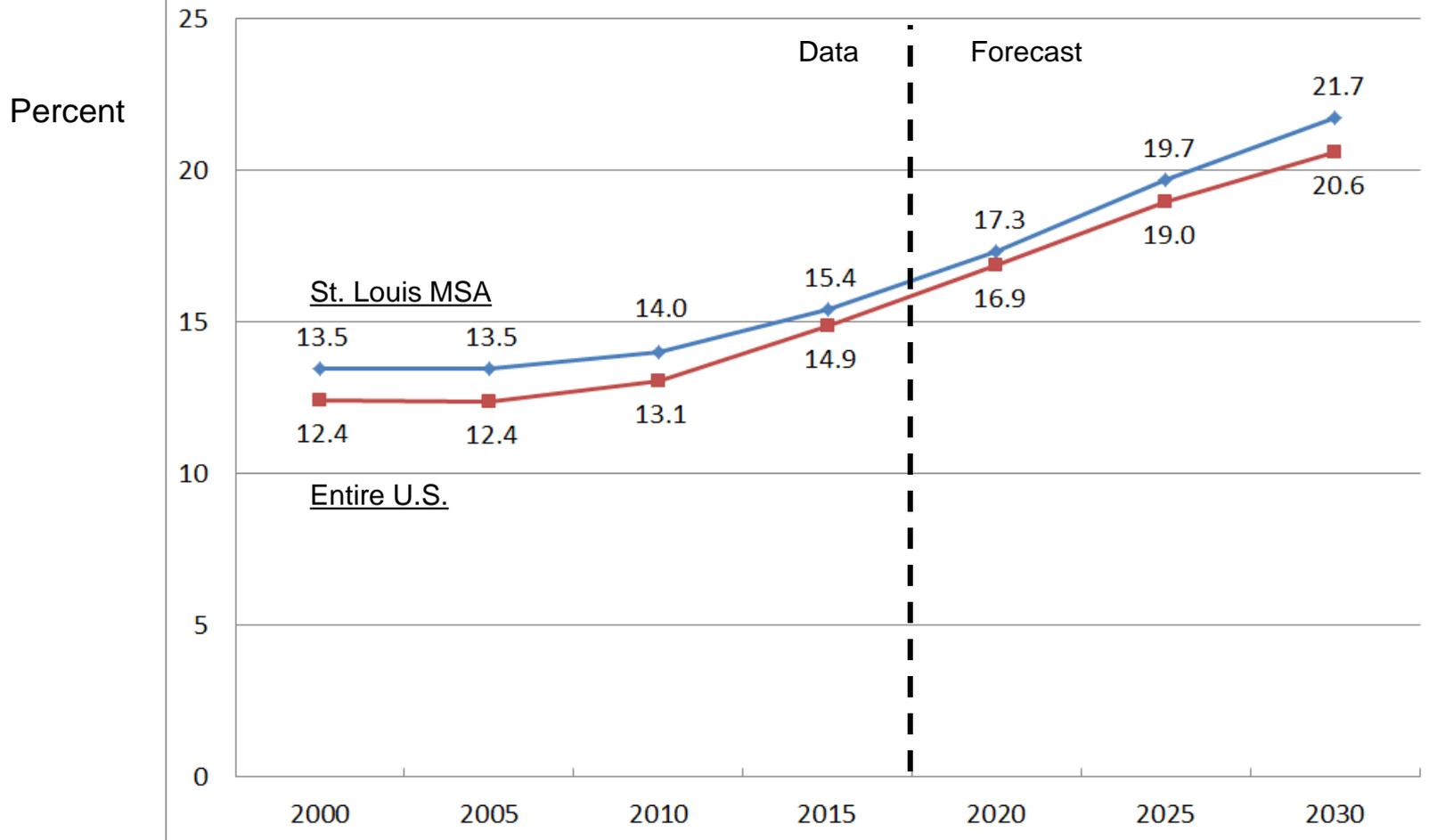


Source: Census Bureau



St. Louis Is Older Than the Nation As A Whole

Share of Population Aged 65 or Older: St. Louis and the U.S.



Sources: Census Bureau; Missouri Office of Administration, Division of Budget and Planning; Data.Illinois.Gov



What About Growth?

OECD Data: 30 Countries, 1960-2013

- **Recent work on links between an aging population and economic performance: J. Yoon, J. Kim and J. Lee, “Impact of Demographic Changes on Inflation and the Macro-economy,” IMF working paper, Nov. 2014.**
- **Robust findings:**
 - **Larger elderly population reduces growth of GDP per capita.**
 - **Larger elderly population reduces investment-to-GDP ratio.**
 - **Larger elderly population reduces inflation.**

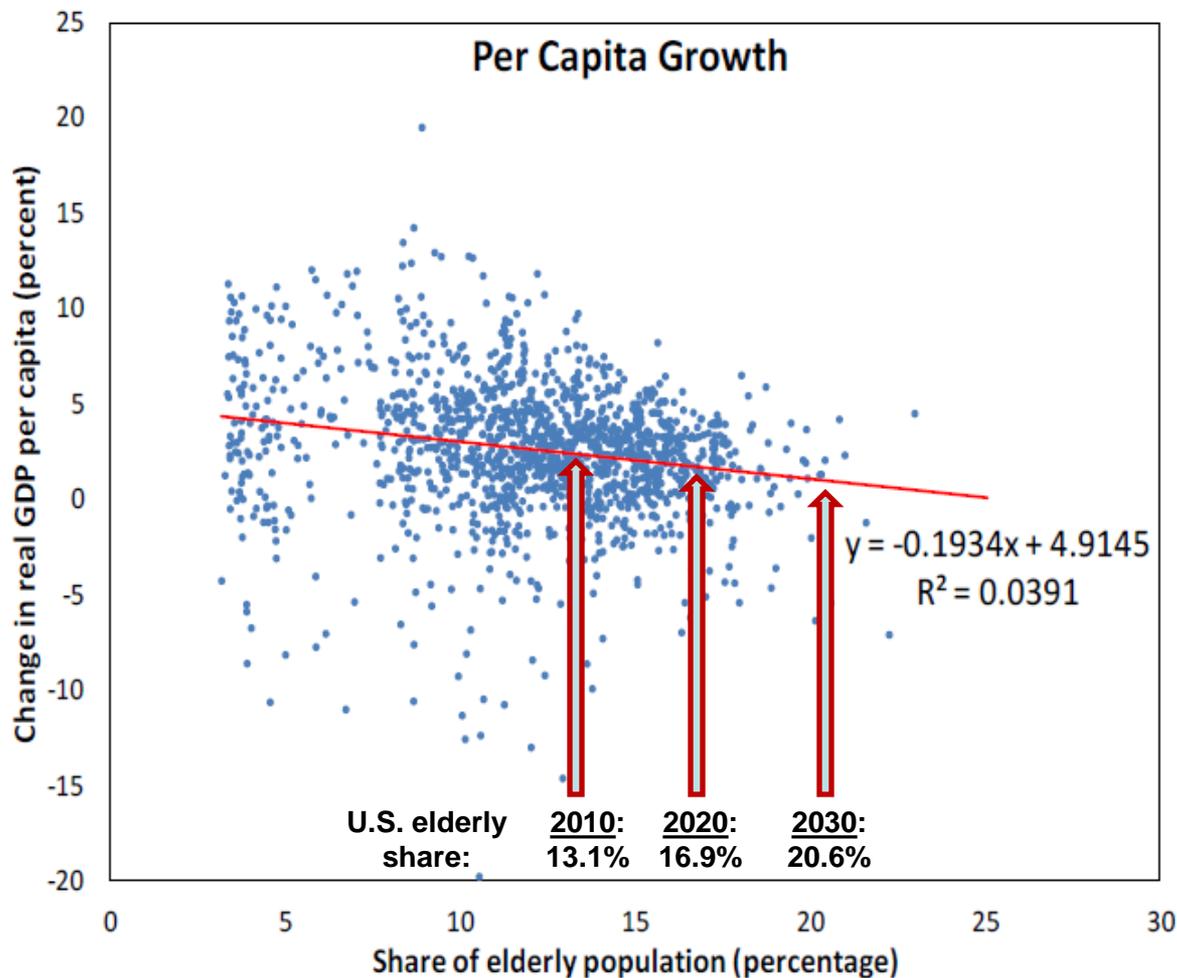
List of Sample OECD countries

United States	Norway	Spain
United Kingdom	Sweden	Turkey
Austria	Switzerland	Australia
Belgium	Canada	New Zealand
Denmark	Japan	Mexico
France	Finland	Korea
Germany	Greece	Czech Republic
Italy	Iceland	Slovak Republic
Luxembourg	Ireland	Hungary
Netherlands	Portugal	Poland



Older Population Reduces Growth: Bivariate Evidence

Sample: 30 countries,
1960-2013





Older Population Reduces Growth: Multivariate Evidence

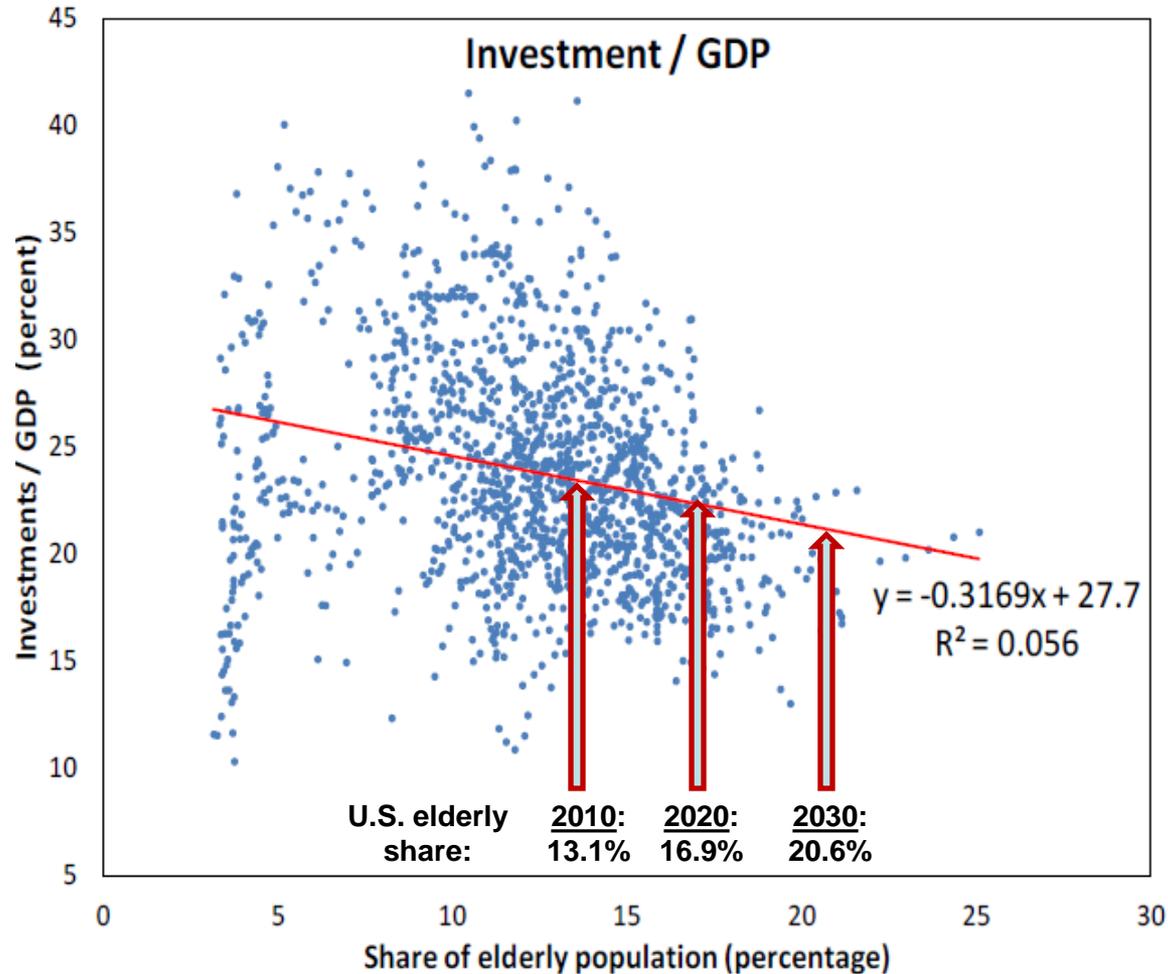
Table 1. Demographic Impact on Growth of Real GDP per capita (PPP-based)

	OECD FE				OECD FE IV 2/			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Population Growth	-0.686 [0.270]		-1.194 [0.018]**	-1.130 [0.031]**	0.075 [0.807]		-0.621 [0.053]*	-0.504 [0.118]
Share of 65 and over		-0.211 [0.002]***	-0.261 [0.000]***	-0.122 [0.349]		-0.590 [0.000]***	-0.614 [0.000]***	-0.365 [0.000]***
Share of 15-64		-0.132 [0.159]	-0.201 [0.037]**	-0.090 [0.372]		-0.159 [0.009]***	-0.192 [0.002]***	0.010 [0.901]
Life expectancy				-0.198 [0.189]				-0.363 [0.000]***
Openness	0.008 [0.276]	0.013 [0.188]	0.019 [0.041]**	0.025 [0.006]***	0.007 [0.331]	0.018 [0.011]**	0.022 [0.004]***	0.033 [0.000]***
Secondary school enrollment	-0.018 [0.116]	0.005 [0.571]	0.006 [0.485]	0.014 [0.132]	-0.040 [0.000]***	-0.002 [0.862]	-0.002 [0.882]	0.015 [0.185]
Budget Balance/GDP	0.091 [0.100]	0.083 [0.135]	0.100 [0.081]*	0.100 [0.070]*	-0.003 [0.956]	0.028 [0.549]	0.044 [0.347]	0.053 [0.258]
Inflation	-0.090 [0.000]***	-0.101 [0.000]***	-0.103 [0.000]***	-0.100 [0.000]***	-0.087 [0.000]***	-0.112 [0.000]***	-0.113 [0.000]***	-0.105 [0.000]***
Investment / GDP	0.272 [0.000]***	0.244 [0.000]***	0.248 [0.000]***	0.244 [0.000]***	-0.105 [0.014]**	-0.179 [0.000]***	-0.178 [0.000]***	-0.188 [0.000]***
Constant	-1.670 [0.309]	7.407 [0.208]	12.862 [0.035]**	17.557 [0.041]**	8.548 [0.000]***	24.193 [0.000]***	26.897 [0.000]***	35.604 [0.000]***
Observations	1104	1104	1104	1104	1072	1072	1072	1072
Number of ifscodes	30	30	30	30	30	30	30	30
R-squared	0.177	0.185	0.199	0.203				



Older Population Reduces Investment: Bivariate Evidence

Sample: 30 countries,
1960-2013





Older Population Reduces Investment: Multivariate Evidence

Table 2. Demographic Impact on Current Account, Savings, and Investment

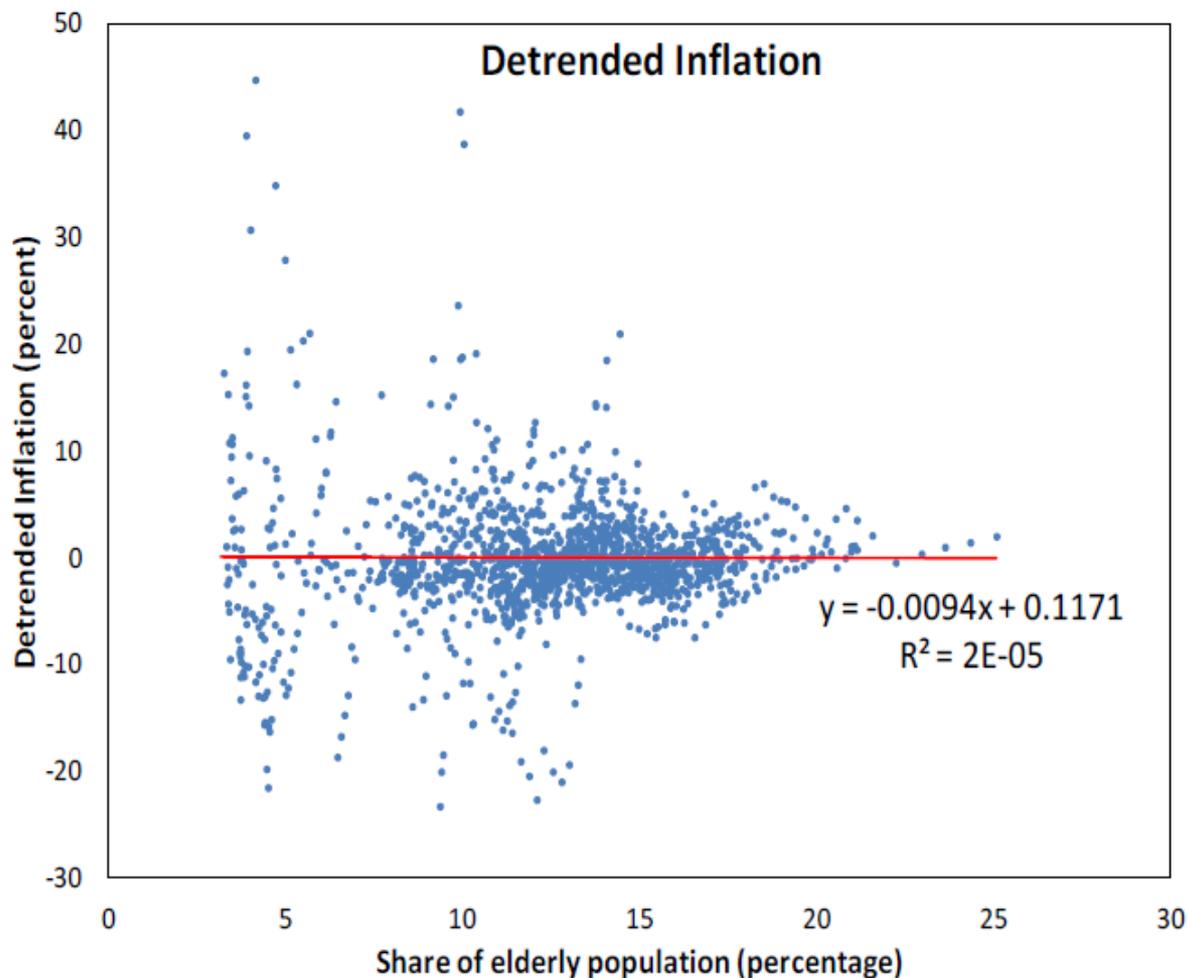
	OECD				OECD		
	CA/GDP (1)	S/GDP (2)	I/GDP (3)		CA/GDP (7)	S/GDP (8)	I/GDP (9)
Population Growth	-0.397 [0.603]	-0.776 [0.277]	-0.185 [0.836]	Population Growth	-0.654 [0.380]	-0.876 [0.258]	-0.021 [0.981]
Share of 65 and over	-0.372 [0.141]	-0.942 [0.001]***	-0.486 [0.043]**	Old Dependency	-0.162 [0.215]	-0.560 [0.000]***	-0.332 [0.006]***
Share of 15-64	0.246 [0.163]	0.012 [0.951]	0.249 [0.219]	Young Dependency	0.143 [0.080]*	0.019 [0.829]	-0.121 [0.173]
Life expectancy	0.379 [0.180]	0.428 [0.019]**	-0.210 [0.327]	Life expectancy	0.448 [0.133]	0.368 [0.038]**	-0.339 [0.148]
Budget Balance/GDP	0.109 [0.215]	0.399 [0.000]***	0.313 [0.000]***	Budget Balance/GDP	0.115 [0.184]	0.398 [0.000]***	0.306 [0.000]***
NFA / GDP	0.026 [0.009]***	0.028 [0.000]***	0.002 [0.652]	NFA / GDP	0.026 [0.009]***	0.029 [0.000]***	0.002 [0.566]
TOT change	0.110 [0.001]***	0.063 [0.001]***	-0.049 [0.043]**	TOT change	0.108 [0.001]***	0.063 [0.001]***	-0.048 [0.044]**
GDP growth	-0.106 [0.195]	0.180 [0.027]**	0.255 [0.000]***	GDP growth	-0.109 [0.185]	0.180 [0.025]**	0.259 [0.000]***
Openness	0.033 [0.105]	0.005 [0.754]	-0.024 [0.209]	Openness	0.033 [0.109]	0.004 [0.811]	-0.025 [0.208]
Constant	-9.447 [0.484]	2.229 [0.824]	31.270 [0.006]***	Constant	-36.980 [0.097]*	5.890 [0.672]	61.560 [0.002]***
Observations	1163	1121	1163	Observations	1163	1121	1163
Number of ifscodes	30	29	30	Number of ifscodes	30	29	30
R-squared	0.184	0.439	0.383	R-squared	0.188	0.431	0.379
RMSE	3.157	2.889	2.834	RMSE	3.149	2.909	2.844

Source: J. Yoon, J. Kim and J. Lee, "Impact of Demographic Changes on Inflation and the Macroeconomy," IMF working paper, Nov. 2014.



Older Population Reduces Inflation: Bivariate Evidence

Sample: 30 countries,
1960-2013





Older Population Reduces Inflation: Multivariate Evidence

Table 4. Demographic Impact on Inflation

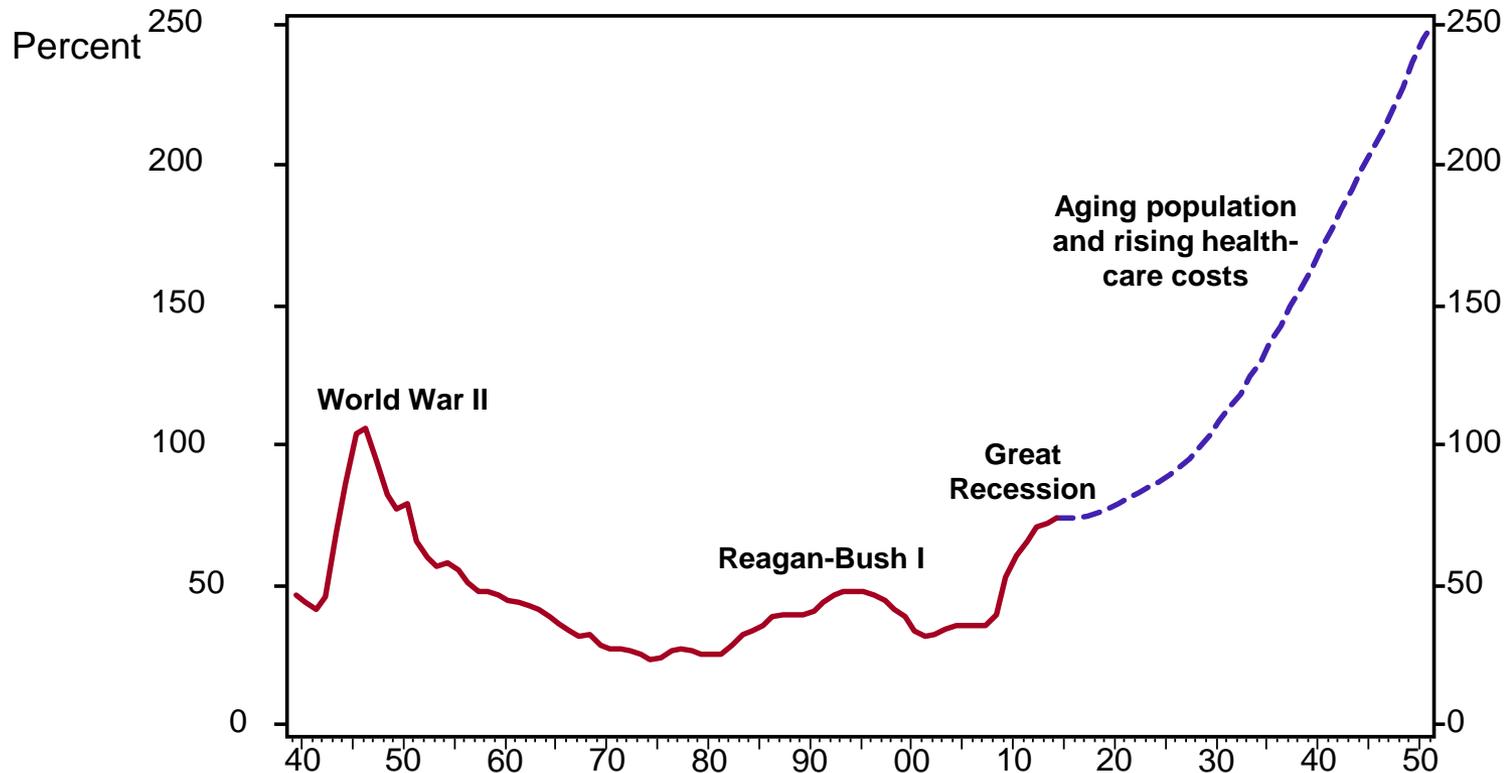
	OECD				
	(1)	(2)	(3)	(4)	(5)
Population Growth	0.339 [0.715]	0.524 [0.577]		0.549 [0.570]	0.317 [0.764]
Share of 65 and over		-0.176 [0.009]***	-0.125 [0.013]**	-0.137 [0.006]***	-0.416 [0.008]***
Share of 15-64			-0.101 [0.226]	-0.103 [0.233]	-0.330 [0.037]**
Life Expectancy					0.304 [0.043]**
TOT change	-0.145 [0.005]***	-0.144 [0.005]***	-0.145 [0.005]***	-0.144 [0.005]***	-0.143 [0.005]***
GDP growth	-0.750 [0.000]***	-0.795 [0.000]***	-0.799 [0.000]***	-0.802 [0.000]***	-0.784 [0.000]***
M2 growth	0.192 [0.000]***	0.183 [0.000]***	0.180 [0.001]***	0.180 [0.001]***	0.176 [0.000]***
Budget Balance Chg.	0.129 [0.051]*	0.153 [0.022]**	0.153 [0.033]**	0.158 [0.018]**	0.150 [0.022]**
Constant	-0.053 [0.910]	2.418 [0.060]*	8.443 [0.149]	8.739 [0.151]	4.132 [0.255]
Observations	1167	1167	1167	1167	1167
Number of ifscode	30	30	30	30	30
R-squared	0.212	0.216	0.217	0.217	0.222
RMSE	5.235	5.227	5.223	5.223	5.209



Aging U.S. Population Drives CBO Forecast of Rising Federal Debt

Federal Debt Held by the Public Relative to GDP
Percent

CBO 'Alternative Fiscal Scenario': Fed'l Debt Held by Public Relative to GDP
Percent





Economic and Financial Impacts of the Baby Boomers

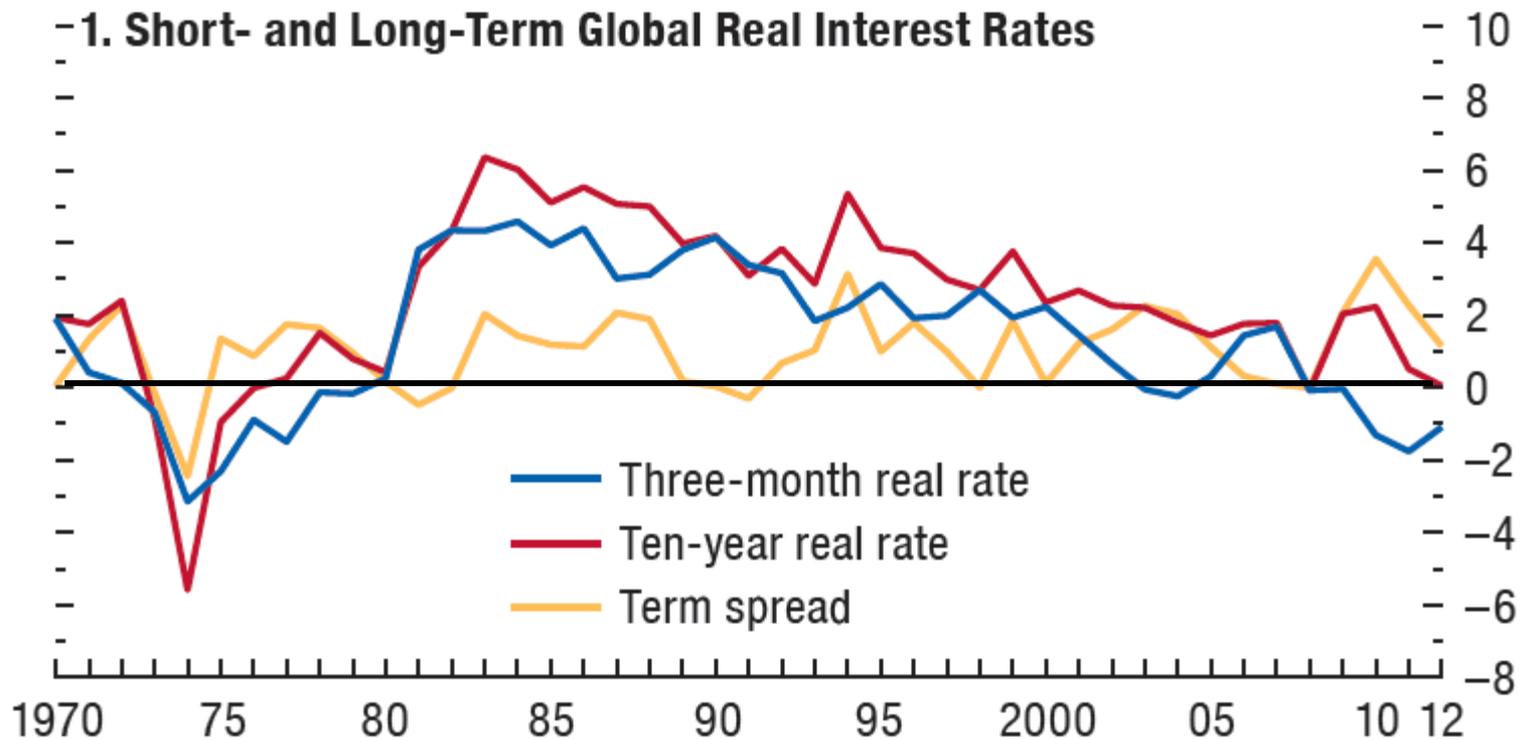
- **An older U.S. population will result in**
 - **Slower growth of per-capita income**
 - **Less investment**
 - **Lower inflation**
 - **Rapidly rising national debt**

- **The slow-growing labor force (due to our low birth rate) will reduce the overall growth rate of the economy and make our fiscal challenges more serious.**

- **What does this all this mean for interest rates and other financial markets?**



Global Real Interest Rates Have Declined For 30 Years—Does Aging Trump Deficits?



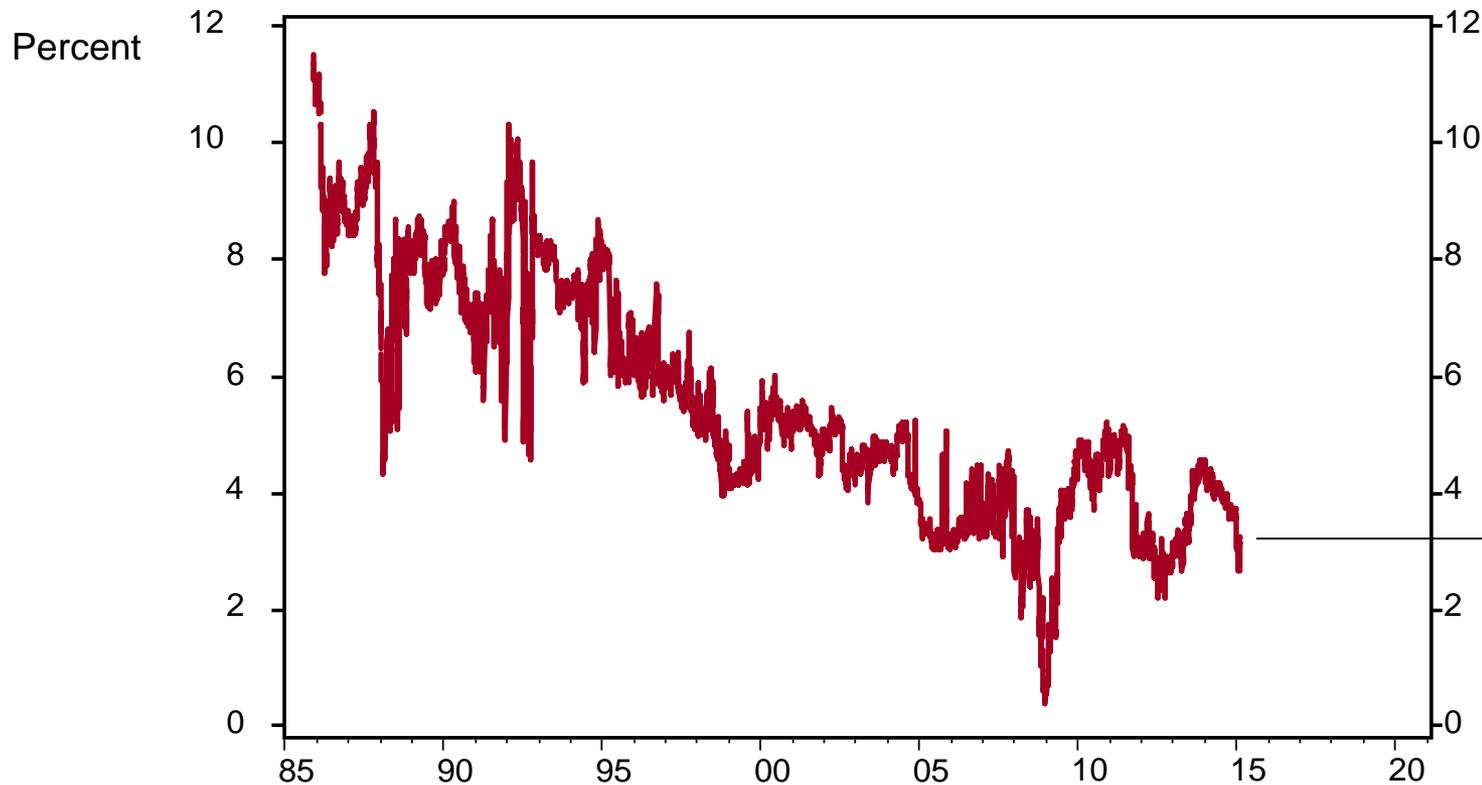
Sample: GDP-weighted average for all countries in IMF International Financial Statistics database.



Investors Expect Low Interest Rates in the U.S. As Far As the Eye Can See

30-Years Forward 3-Month T-Bill Yield

Percent



Feb. 20, 2015:
3.26% short-term Treasury yield implied in Feb. 2045

Source: Federal Reserve Board

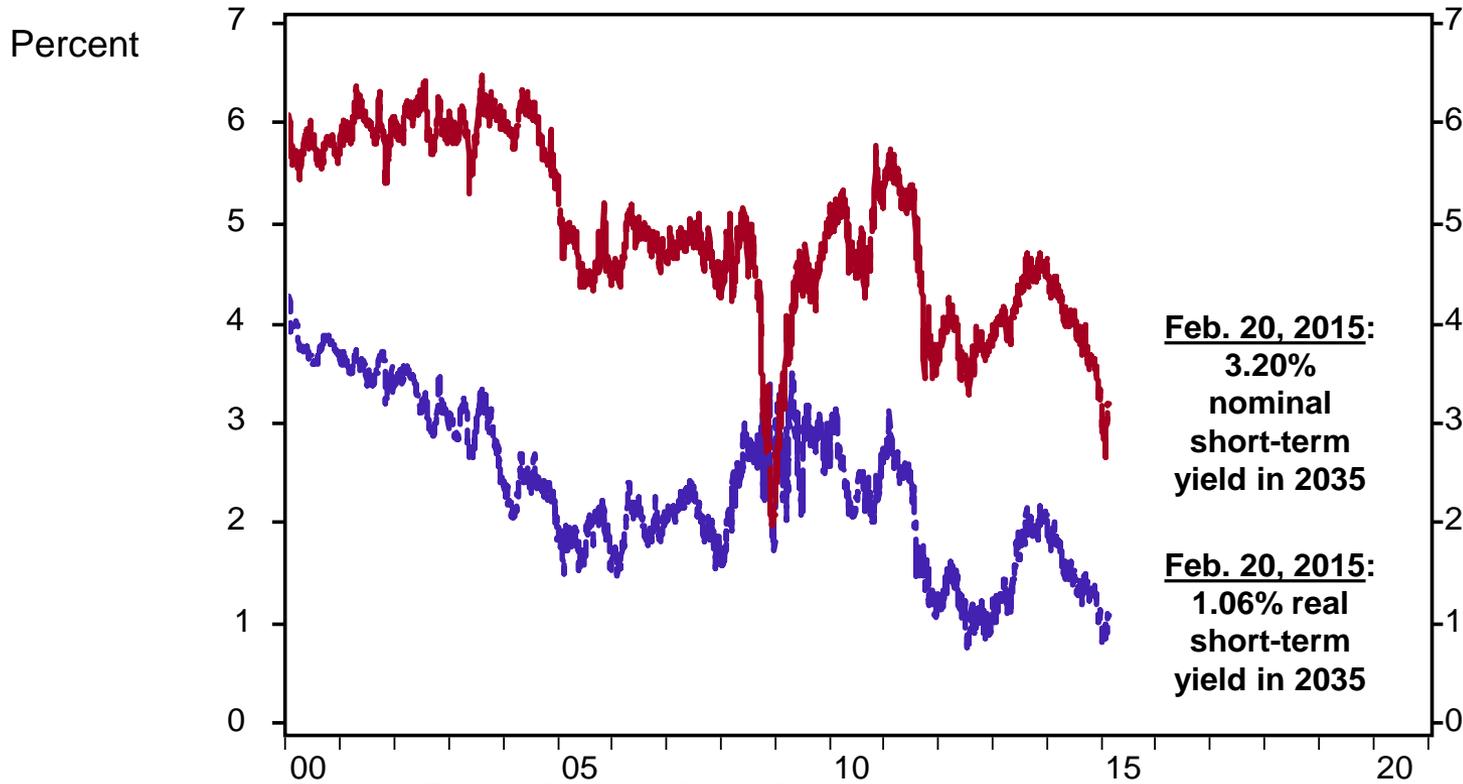
Daily data through Feb. 20 2015



Most of the Decline In Rates Has Been in the Real Component

20-Years Forward 3-Month T-Bill Yield
Percent

20-Years Forward Inflation-Adjusted 3-Month T-Bill Yield
Percent



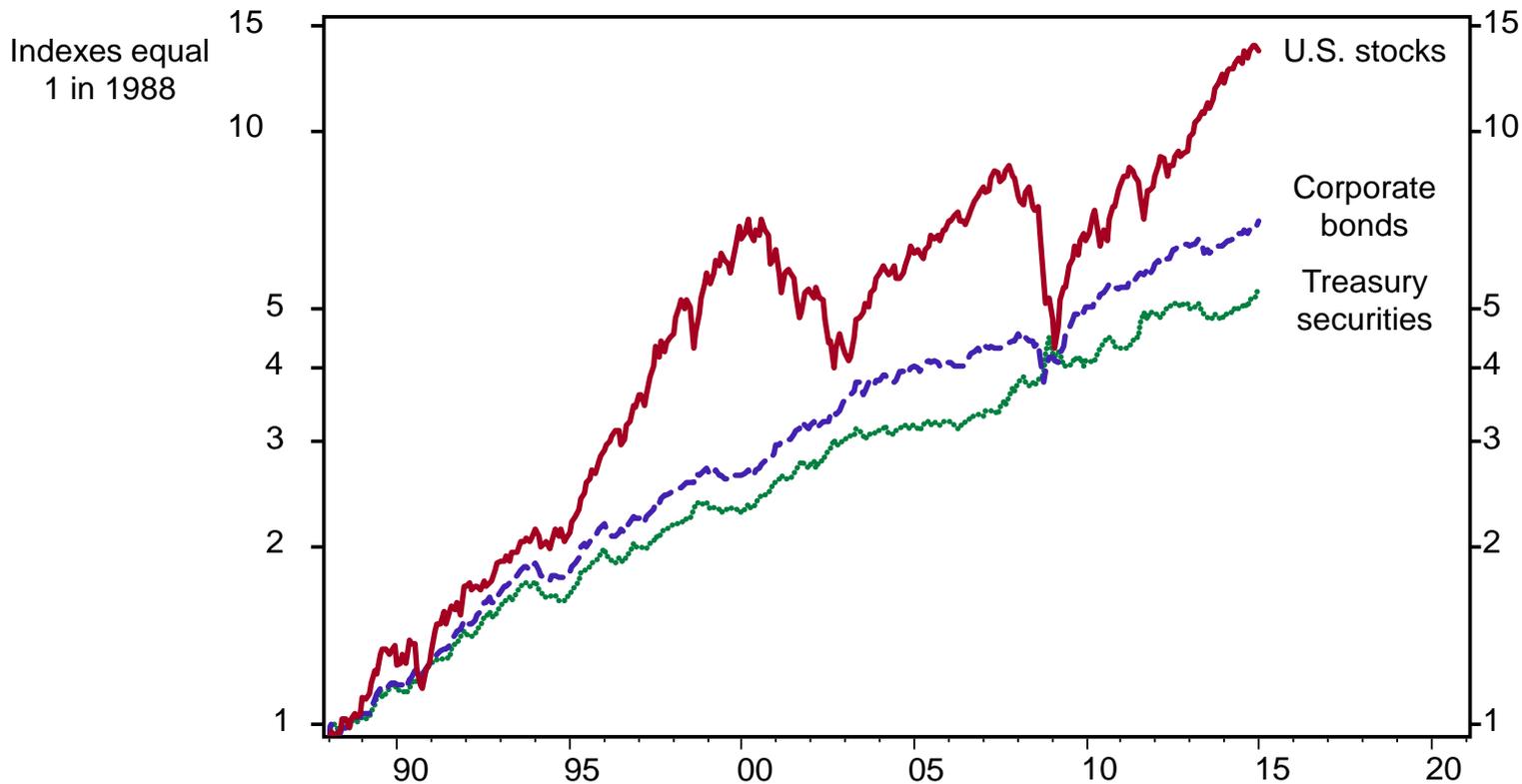
Source: Federal Reserve Board

Daily data through Feb. 20 2015



Can Stocks and Bonds Deliver Returns Comparable to Past Performance?

Wilshire 5000 Stockmarket Total-Return Index
Merrill Lynch Corporate-Bond Total-Return Index
Ryan Labs Treasury-Market Total-Return Index



Source: Dow Jones, Ryan Labs, Merrill Lynch

Monthly through Jan. 2015



Can Stocks and Bonds Deliver Returns Comparable to Past Performance?

- **Returns as high as before? Almost certainly not!**
 - **Valuations have expanded dramatically.**
 - **Future economic growth is likely to be significantly slower.**
- **A “golden age” of high asset returns likely is nearing its end.**

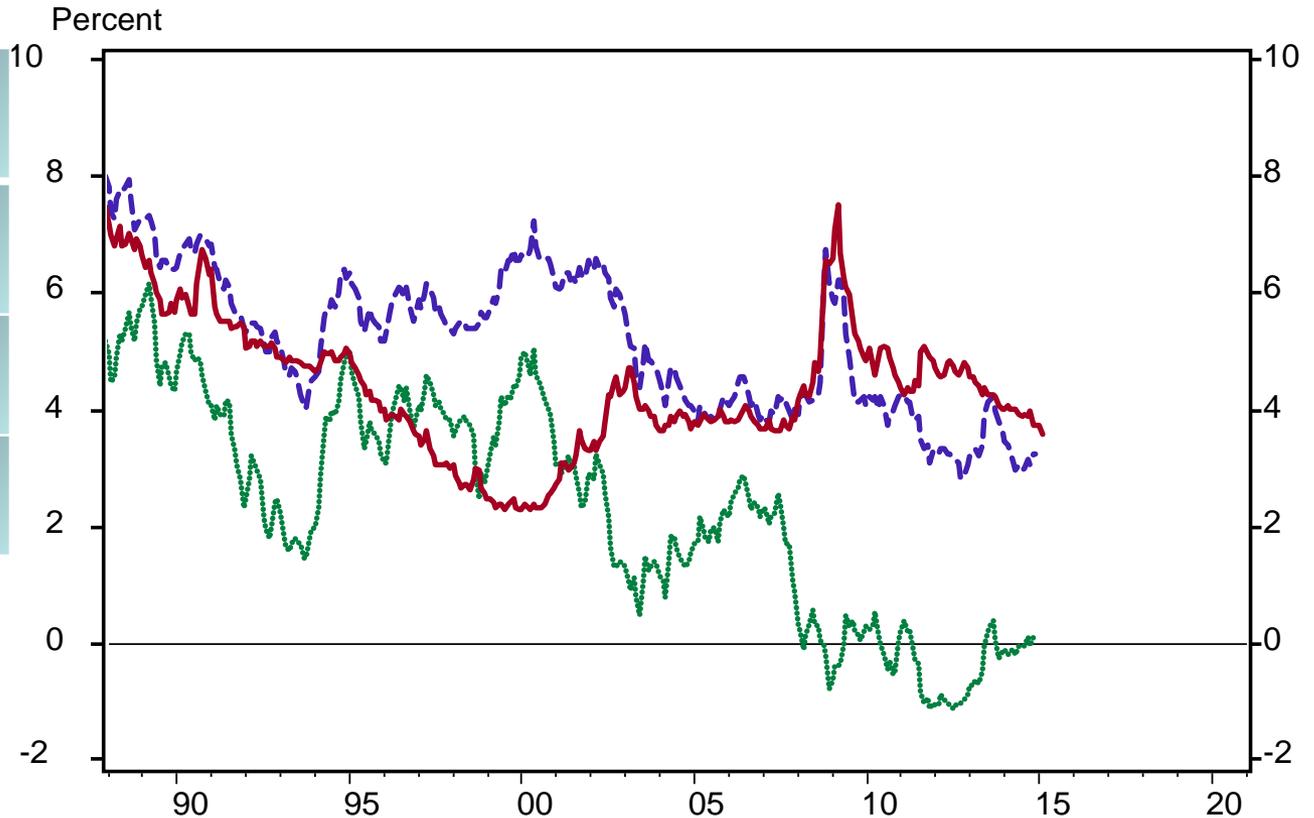
<i>Average annualized returns or changes</i>	Jan.1988 – Jan. 2015	My forecast for 2015-25
Wilshire 5000 stockmarket total return	10.4%	??
Merrill Lynch corporate-bond total return	7.6%	??
Ryan Labs Treasury-market total return	6.5%	??
Nominal GDP (period is Q4.1987 thru Q4.2014)	4.8%	??
PCE inflation (period is Q4.1987 thru Q4.2014)	2.2%	??



Prospective Returns on U.S. Stocks and Bonds Are Much Lower Now

S&P500 Earnings Yield (inverse of Case-Shiller cyclically adjusted PE ratio)
 Real BAA Corporate-Bond Yield (deflated by 5-year moving-avg inflation)
 Real 5-Year Treasury Yield (deflated by 5-year moving-avg inflation)

Prospective real yield on:	Jan. 1988	Jan. 2015
S&P 500 (based on CAPE)	7.2%	3.7%
BAA corporate bond	7.8%	3.3%
5-year Treasury	4.9%	0.2%



Source: Dow Jones, Ryan Labs, Merrill Lynch, BEA Monthly through Jan. 2015



Can Stocks and Bonds Deliver Returns Comparable to Past Performance?

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 - **Valuations have expanded dramatically.**
 - **Future economic growth is likely to be significantly slower.**
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<i>Average annualized returns or changes</i>	Jan.1988 – Jan. 2015	My forecast for 2015-25
Wilshire 5000 stockmarket total return	10.4%	6%
Merrill Lynch corporate-bond total return	7.6%	3%
Ryan Labs Treasury-market total return	6.5%	2%
Nominal GDP (period is Q4.1987 thru Q4.2014)	4.8%	3 to 4%
PCE inflation (period is Q4.1987 thru Q4.2014)	2.2%	2%



Why We Should Expect Lower Investment Returns in the Future

- 1. Slower economic growth**
- 2. High current asset valuations**
- 3. Higher taxes, perhaps focused on investment earnings**
- 4. What about housing as an investment?**



The Death of Homeownership Has Been Exaggerated

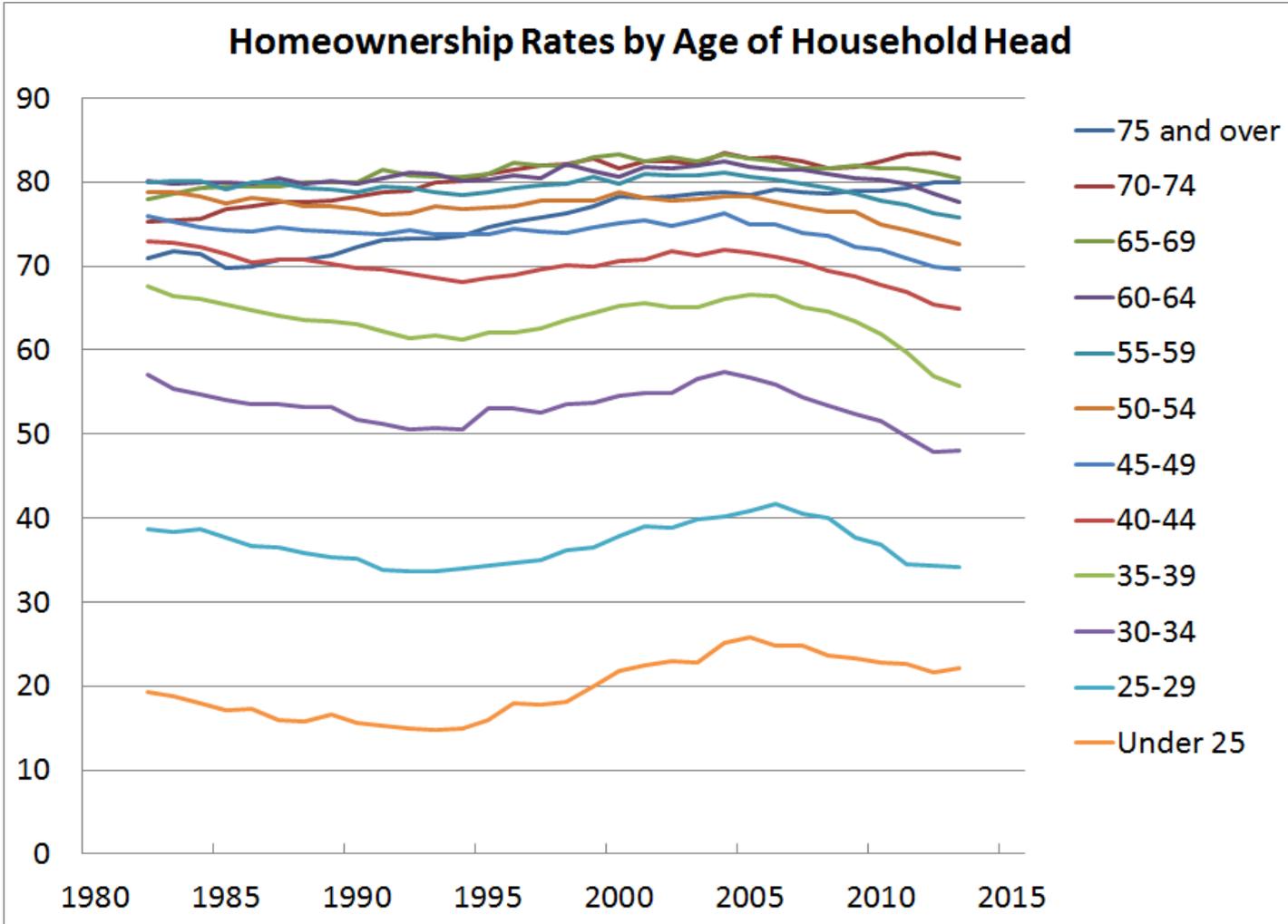
- **Across the entire population, overwhelming majorities of every major demographic group want to be homeowners.**
- **There is very little association between local housing-market conditions experienced during the recent boom-bust cycle and changes in attitudes toward homeownership.**
- **Close to 90 percent of people under 45 expect to buy a home at some point in the future.**
- **Aspirations to own a home are higher among historically disadvantaged minorities than among whites and Asians, despite a 30-percentage-point homeownership-rate gap.**

Sources: Eric S. Belsky, "The Dream Lives On: The Future of Homeownership in America," Harvard Joint Center for Housing Studies working paper, Jan. 2013; and Rachel B. Drew, "Believing in Homeownership: Behavioral Drivers of Tenure Decisions," Harvard Joint Center for Housing Studies working paper, May 2014.



Homeownership Rates Increase With Age

Percent

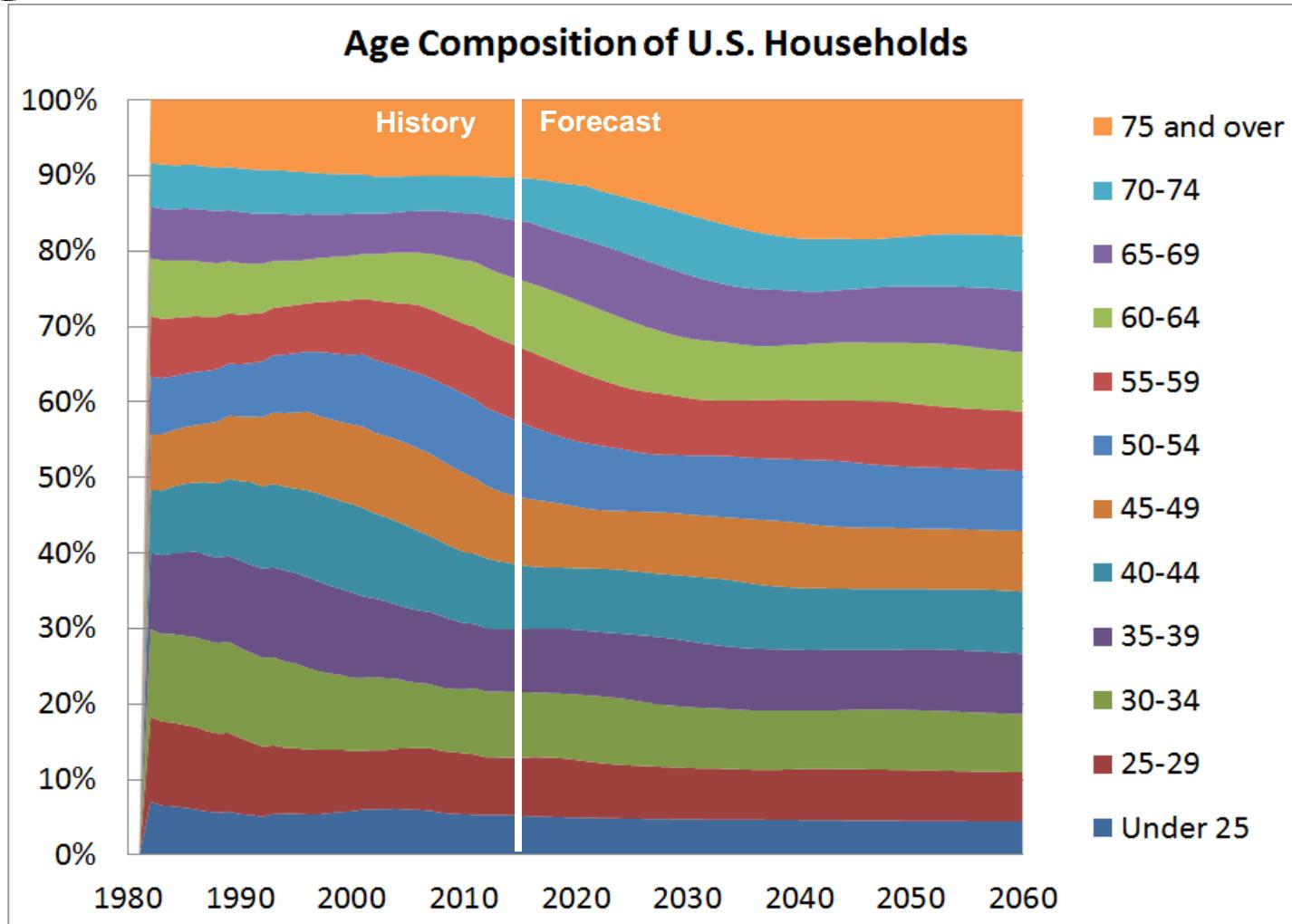


Source: Census Bureau

Annual data through 2013



Population Aging Will Be Rapid and Permanent

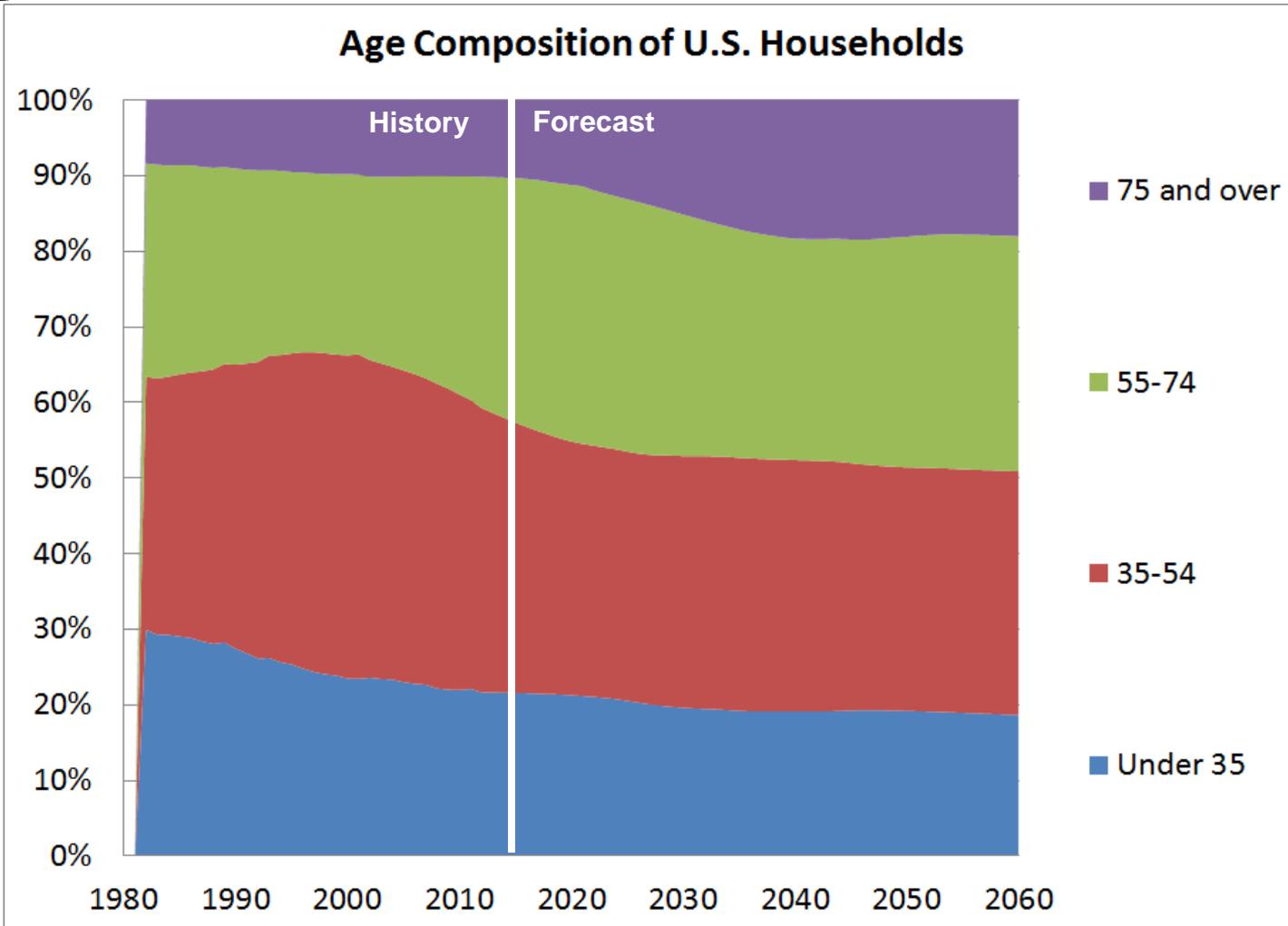


Source: Census Bureau

Annual data through 2013; projections through 2060



Population Aging Will Be Rapid and Permanent



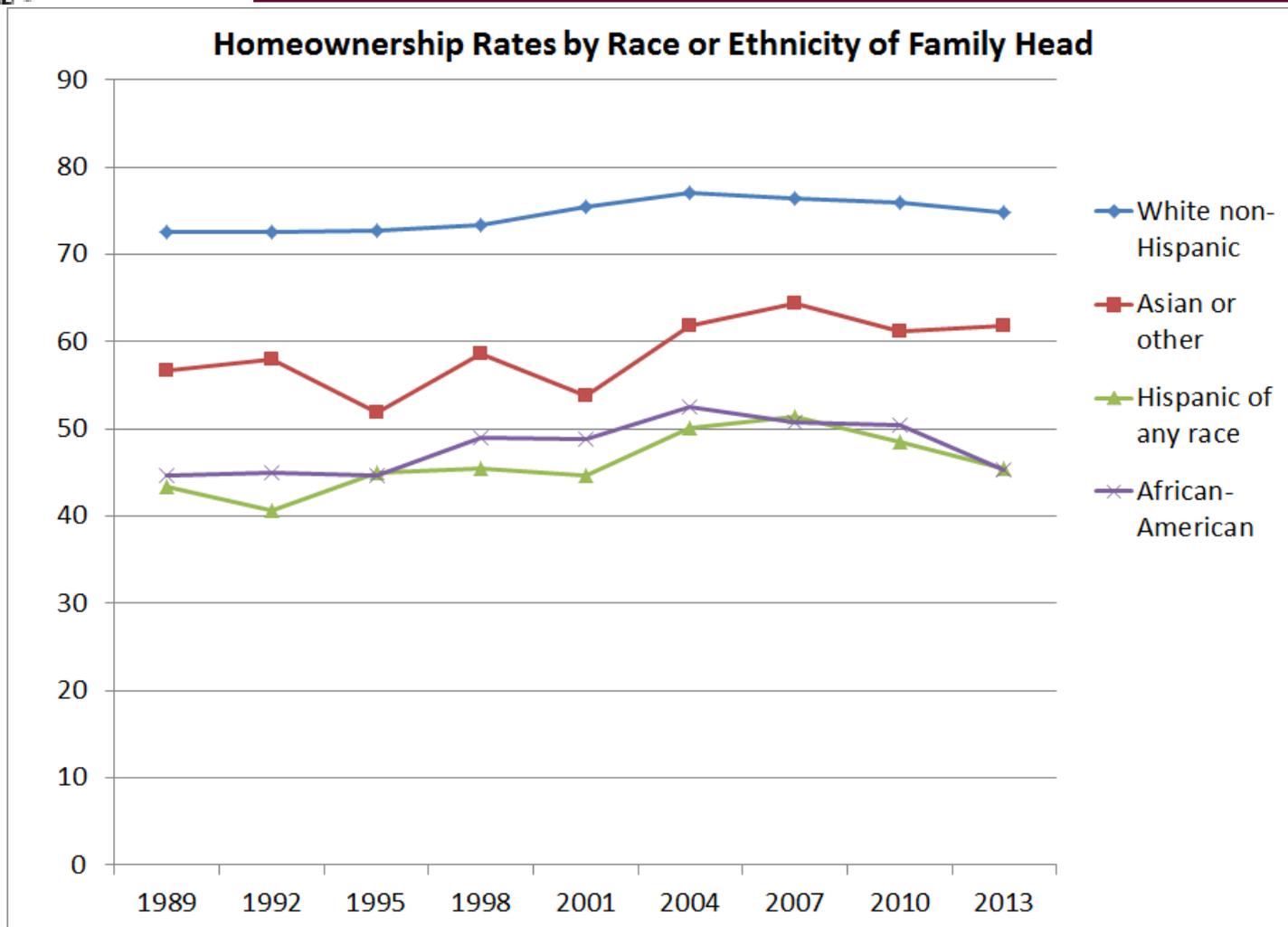
Source: Census Bureau

Annual data through 2013; projections through 2060



Minority Homeownership Rates Are Lower Than That of Whites

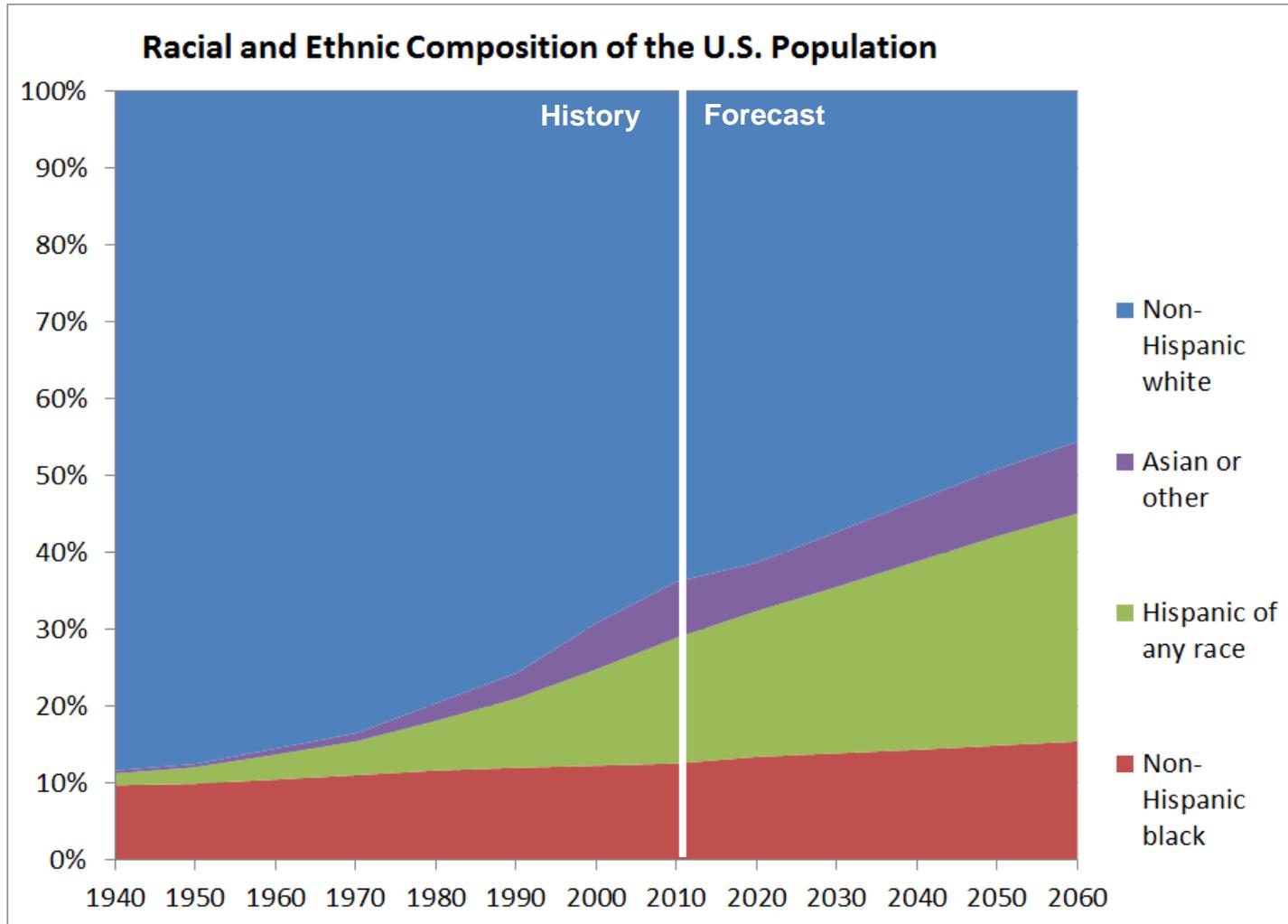
Percent



Source: Federal Reserve Board, Survey of Consumer Finances



Racial and Ethnic Composition of the Population is Changing Rapidly



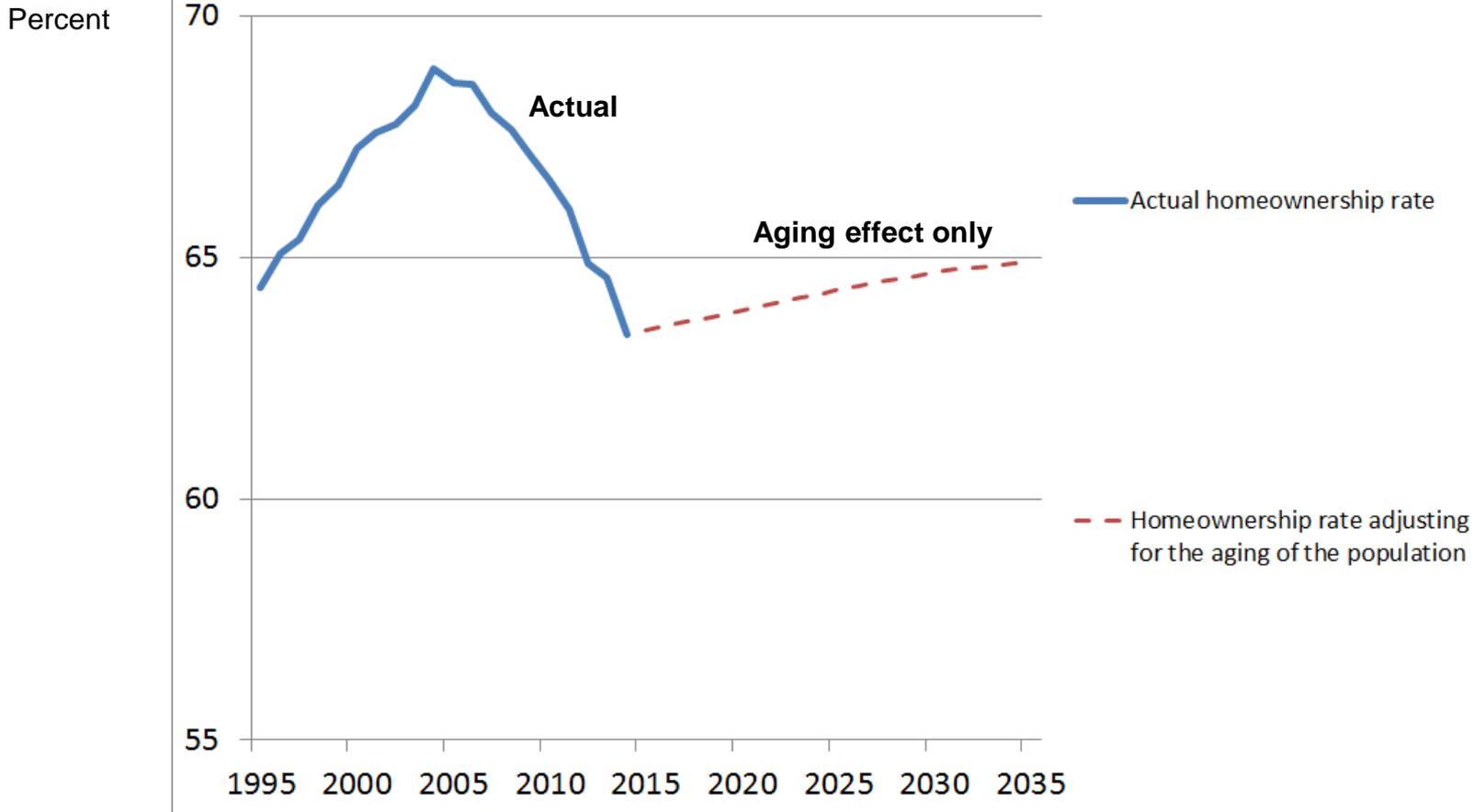
Source: Census Bureau

Annual data through 2013; projections through 2060



The Aging Population Should Lift the Homeownership Rate...

U.S. Homeownership Rate: Projections Based on the Changing Age and Racial and Ethnic Composition of the Population



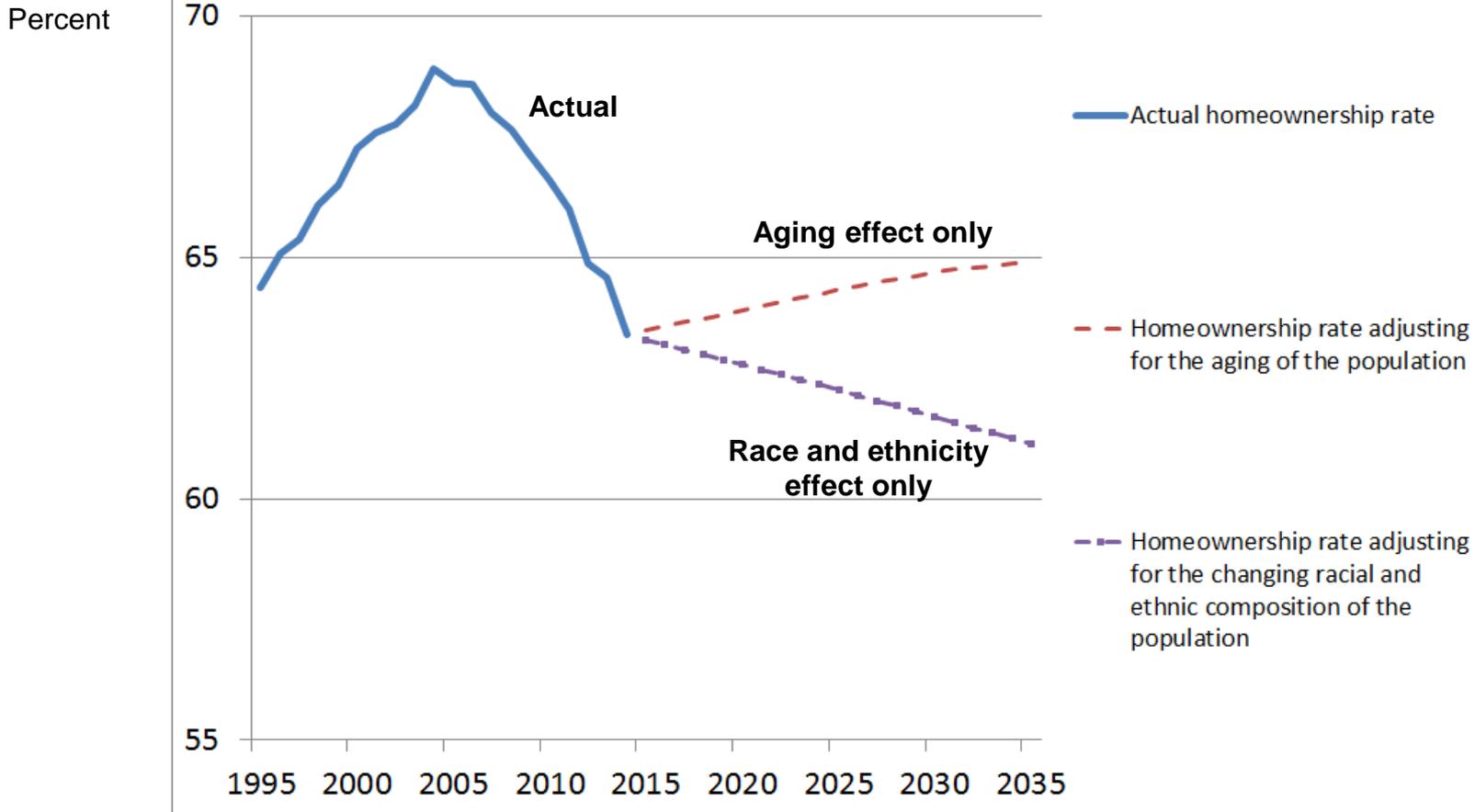
Source: Census Bureau

Annual data through 2014; projections through 2035



But Faster-Growing Parts of Population Have Low Homeownership Rates

U.S. Homeownership Rate: Projections Based on the Changing Age and Racial and Ethnic Composition of the Population



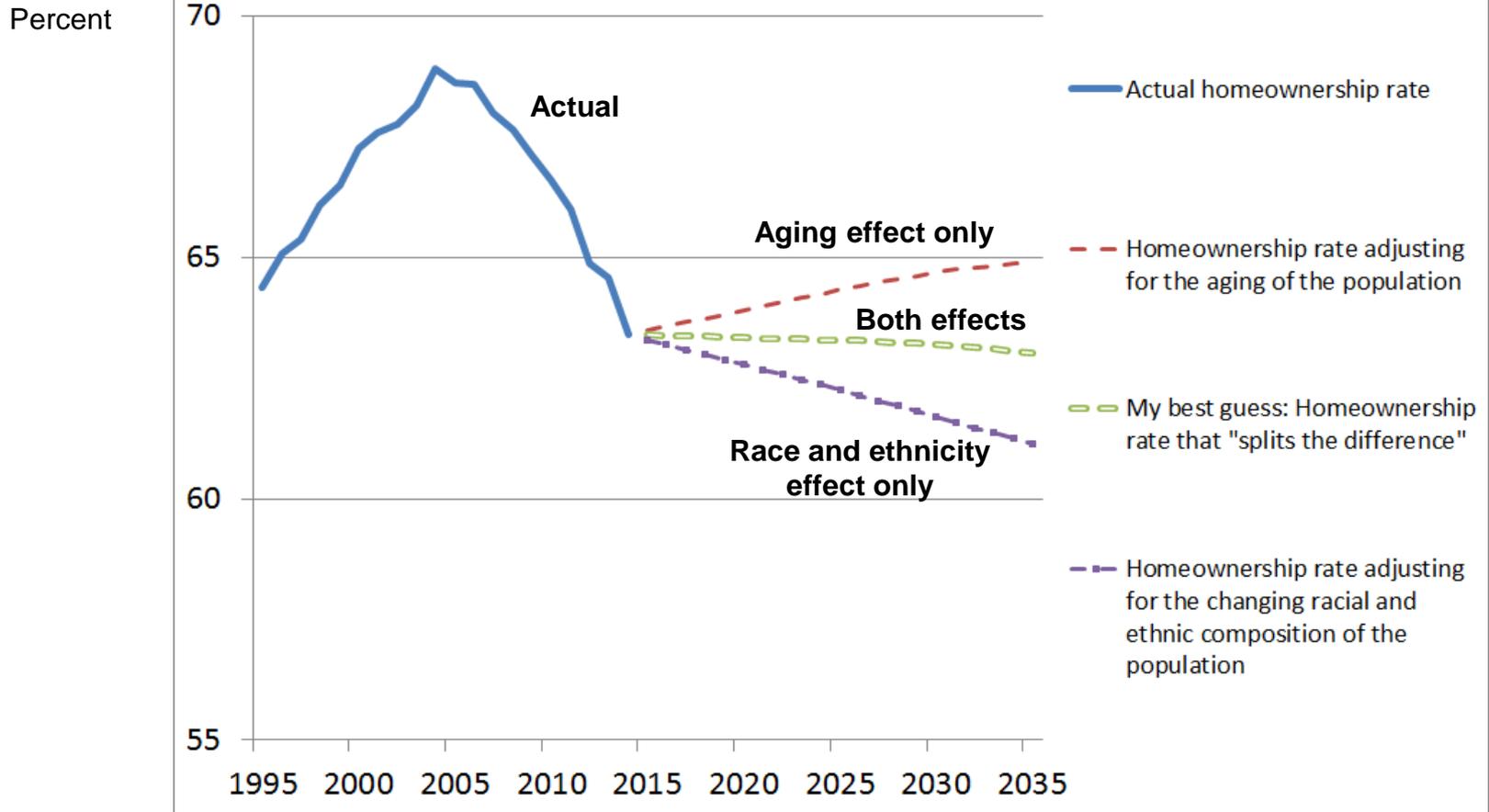
Source: Census Bureau

Annual data through 2014; projections through 2035



My Best Guess: National Homeownership Rate Won't Change Much

U.S. Homeownership Rate: Projections Based on the Changing Age and Racial and Ethnic Composition of the Population



Source: Census Bureau

Annual data through 2014; projections through 2035



Whither House Prices?

Slow Growth

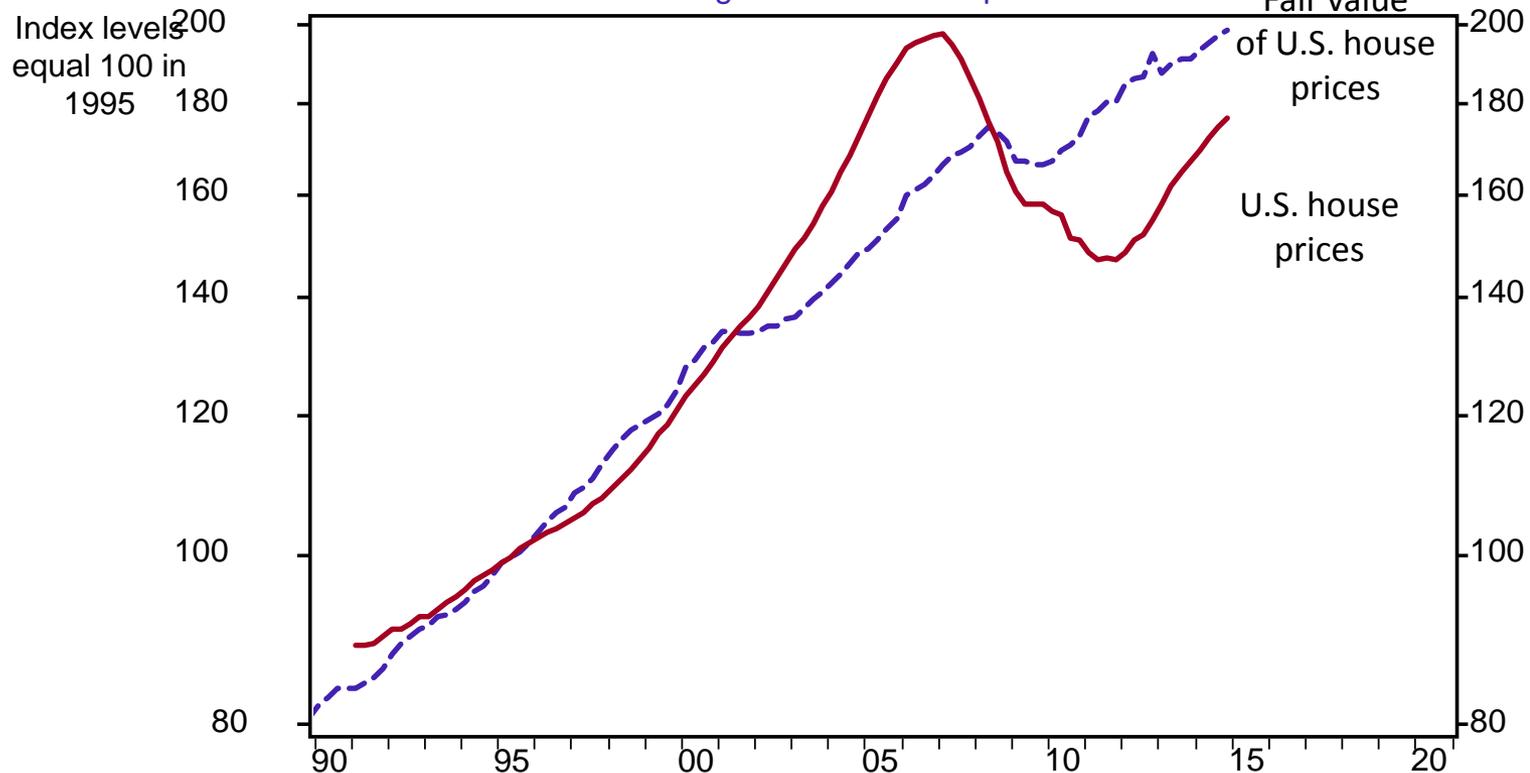
<i>Average annualized returns or changes</i>	Q4.1994 – Q4.2004	Q4.2004 – Q4.2014	My 10-year forecast, 2015-25
U.S. house prices (FHFA expanded-data HPI)	5.8%	0.3%	3 to 4%
U.S. per-capita personal income	4.3%	2.9%	2 to 3%
St. Louis house prices (FHFA expanded-data HPI)	5.2%	-1.0%	1 to 3%
St. Louis per-capita personal income	4.0%	2.7%	1.5 to 2.5%
PCE inflation	1.9%	1.9%	2%



U.S. House Prices Have Some Room to Grow

U.S. House-Price Index (FHFA Expanded-Data HPI)
Average level in 1995 equals 100

U.S. Per-Capita Personal Income
Average level in 1995 equals 100

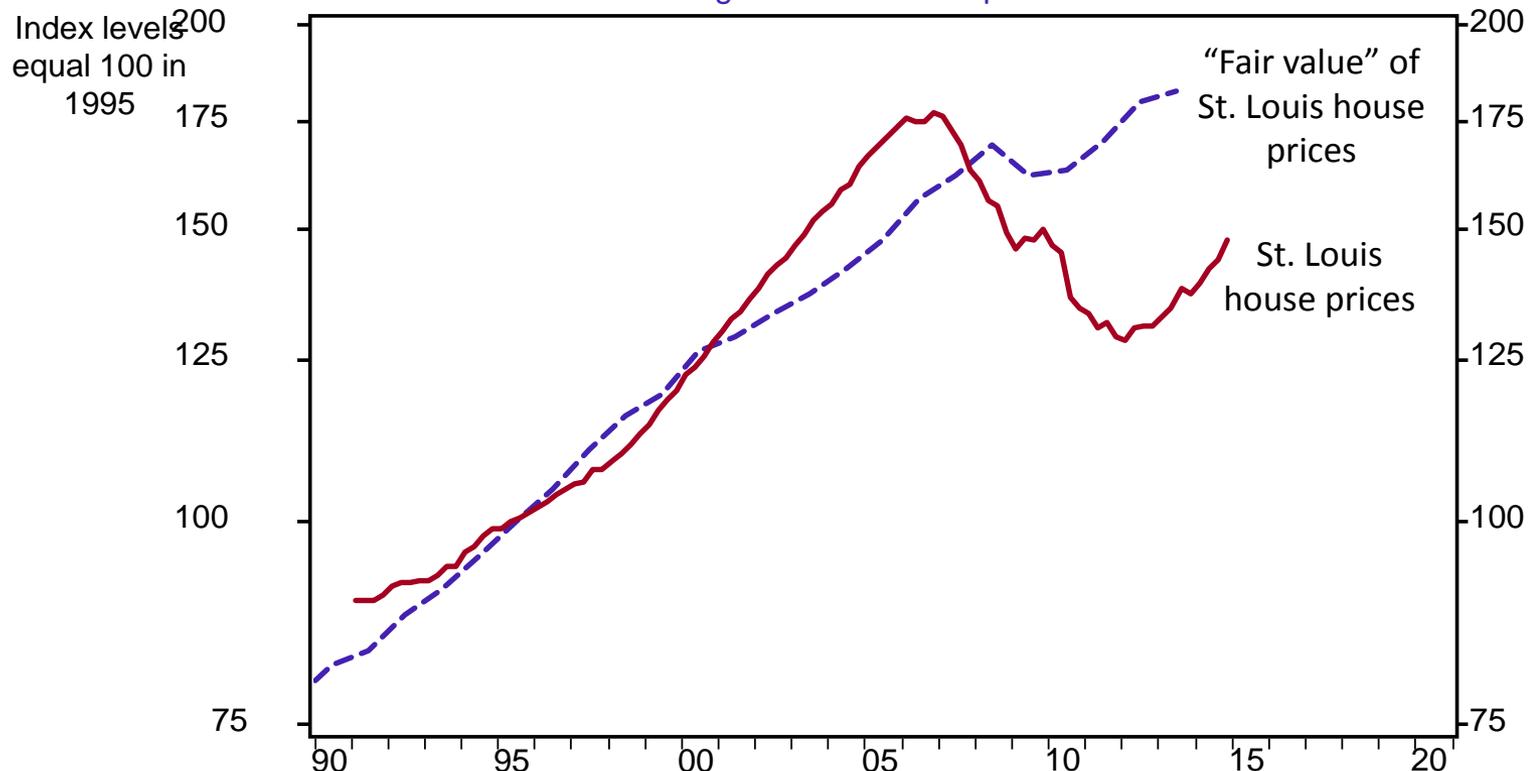




St. Louis House Prices Look Cheap— And Likely to Stay That Way

St. Louis MSA House-Price Index (FHFA Expanded-Data HPI)
Average level in 1995 equals 100

St. Louis MSA Per-Capita Personal Income
Average level in 1995 equals 100





Retirement Implications

- **What is a reasonable expected return on your assets during retirement?**
 - **Stocks 5 to 7%**
 - **Bonds 2 to 3%**
 - **Cash 1 to 2%**
 - **Housing 1 to 3% (St. Louis)**
 - **Inflation 2%**

- **Putting the “human capital” in your portfolio to work**
 - **Save and invest smarter: Plan for low returns.**
 - **Work longer: Earn more, less need to draw on retirement savings.**



In Sum: Retirement Demographics

- **The Baby Boomers added to the economy's growth for decades and now will subtract from growth.**
- **Our long-term fiscal challenges are manageable if we all pay more taxes (and control outlays, of course).**
- **Returns on investment are likely to be lower across the board.**
- **Don't forget your human capital when planning your long-term financial future.**