The Demographic Shift From Single-Family to Multifamily Housing

By Jordan Rappaport

The U.S. housing market boom during the mid-1990s and early 2000s propelled rapid growth in the U.S. economy. Housing demand rose sharply, spurring an unprecedented run-up in house prices and unleashing a torrent of new construction. The subsequent collapse of the U.S. housing market pushed the U.S. and world economies into steep recessions. While construction eventually rebounded—starting in late 2009 for multifamily housing and in mid-2011 for single-family housing—it again slowed during the first half of 2013. The strength of the continuing U.S. economic recovery will depend in part on whether this slowdown proves temporary or longer term.

This article examines forces underlying the housing recovery to determine when sustained construction growth will resume. The analysis suggests that very strong multifamily construction growth is likely to resume by early 2014 and that moderately strong single-family construction growth is likely to resume by early 2015. The longer term outlook is especially positive for multifamily construction, reflecting the aging of the baby boomers and an associated shift in demand from single-family to multifamily housing. By the end of the decade, multifamily construction is likely to peak at a level

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nearly two-thirds higher than its highest annual level during the 1990s and 2000s. Notwithstanding renewed growth, the level of single-family construction is likely to remain moderate. By the end of the decade, it is likely to peak at a level comparable to what prevailed just prior to the housing boom. Thereafter, single-family construction is projected to contract at a moderate rate.

Section I describes U.S. residential construction from 1990 to the present and reviews some key factors that affect housing demand. Section II presents a long-term projection of the number of U.S. households based on demographic trends, predicting a significant slowdown in trend household formation. Section III presents analogous projections showing that the slowdown will primarily affect single-family construction and not multifamily construction. Section IV summarizes the projections and discusses policy implications of the trend shift from single-family to multifamily housing.

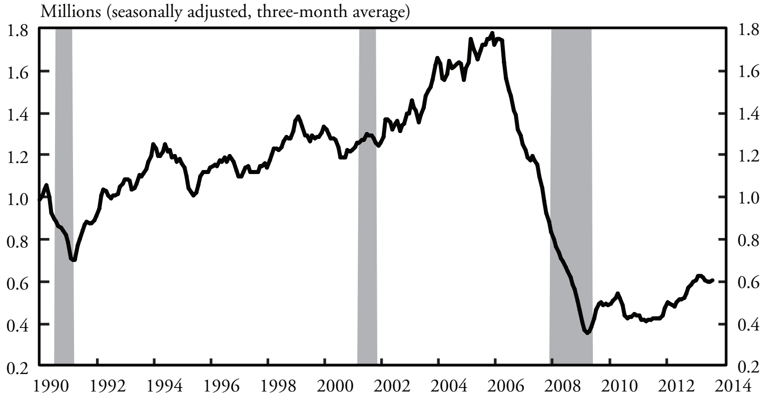
I. RECENT HOUSING CONSTRUCTION AND ITS DETERMINANTS

Housing construction has long been characterized by significant booms and busts. Assessing the causes of these swings requires understanding the main short-run and long-run determinants of housing supply and demand. Those determinants in some cases differ for single-family and multifamily housing, a contrast illustrated by construction of each type in recent decades.

Housing construction since 1990

Single-family and multifamily construction both experience large, long-lasting cycles of expansion and contraction. Typically, however, the two cycles differ significantly from each other. For example, single-family construction grew rapidly during the late 1990s and early 2000s but multifamily construction saw no parallel boom. These two housing subsectors therefore must be analyzed separately. In terms of their contribution to aggregate U.S. output, single-family construction significantly outweighs multifamily construction. From the 1990s through the present, single-family units have accounted for 80 percent of housing starts and 90 percent of the value of new-home construction.

Chart 1
SINGLE-FAMILY HOUSING STARTS



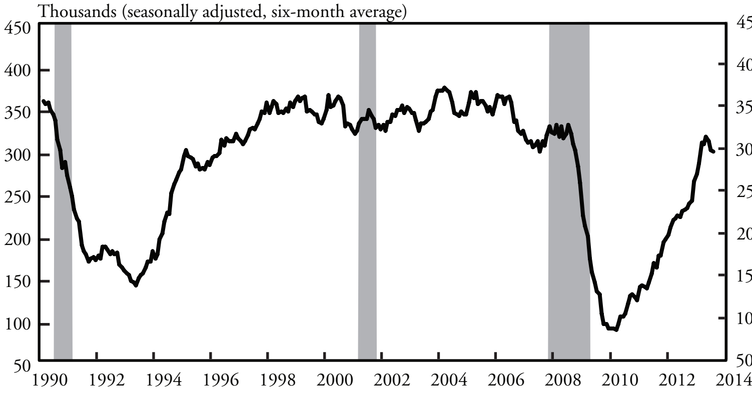
Notes: Shaded areas represent recessions. Housing starts are through August 2013.
Sources: Census Bureau, NBER.

Single-family construction since 1990 can be divided into four periods: pre-boom, boom, crash, and recovery (Chart 1). The pre-boom period from 1990 to 2002 was characterized by several runs of moderate-to-strong construction growth punctuated by several moderate retrenchments. During the boom from late 2001 through late 2005, the growth of single-family starts accelerated to an average annual rate of about 10 percent. During the crash, from late 2005 through early 2009, single-family construction plunged. Starts contracted at an average annual rate of almost 30 percent, with a cumulative decline of more than 70 percent. The post-crash period, from early 2009 through mid-2013, began with a boost from the tax credit for first-time homebuyers followed by an offsetting contraction when the credit expired. Vigorous growth of single-family construction resumed only in mid-2011. But it then paused beginning in early 2013.[1]

Unlike single-family construction, there was no boom in multifamily construction. As a result, multifamily construction since 1990 can be divided into three periods: pre-crash, crash, and recovery (Chart 2). During the long pre-crash period, multifamily construction first fell sharply and then rebounded.[2] Then, from late 1998 through early 2006, multifamily starts remained approximately constant. Although there was no boom in multifamily construction, there was a crash. It began in mid-2006 and significantly accelerated in mid-2008. Over

Chart 2

MULTIFAMILY HOUSING STARTS



Notes: Shaded areas represent recessions. Housing starts are through August 2013.
Sources: Census Bureau, NBER.

the three-and-a-half-year period through the trough in late 2009, multifamily starts fell by three-fourths. But in sharp contrast to weak post-crash growth in single-family starts, multifamily starts rebounded almost immediately. As of mid-2013, they had regained two-thirds of their preceding fall.

The determinants of housing demand

Projecting U.S. housing construction requires projecting the number of occupied housing units, both single family and multifamily. In any year, the sum of single-family and multifamily units is about equal to the number of U.S. households.[3] Year-to-year *changes* in the projected number of households, which is equivalent to net household formation, along with considerations described in the next section, determine the required construction of new housing units.

Over the long term, increases in the number of occupied single-family and multifamily units primarily depend on increases in underlying housing demand. With sufficient time, housing supply will typically adjust to accommodate such increased demand.[4] Over the shorter term, however, the time required to build new housing units may significantly slow the supply response to increased demand.

Housing demand, in turn, depends on several factors. One factor is the price of housing. As relative house prices rise, the number of housing units demanded will fall. Economists typically refer to this as movement along a demand curve rather than a shift in demand itself.[5] Another factor is demographics. At constant house prices, changes in the size and composition of the U.S. population shift the demand for housing units. For example, the growth of the U.S. population over time has increased aggregate demand for housing units. Similarly, the relative increase in the number of households with children during the baby boom shifted relative demand toward larger units. Yet another factor is the business cycle. Households tend to reduce housing expenses when jobs become scarce and increase them when jobs become plentiful. For example, to reduce expenses some households may choose to move from a larger single-family unit to a smaller multifamily one; some young adults may delay moving out of their parents' homes to form their own household; and some existing households may choose to temporarily consolidate by moving in with friends or family.

Finally, such factors as lifetime income, technology, public policy, and preferences can also affect housing demand. For example, long-run trend increases in real income have caused many households to increase spending on housing. This is true even after taking account of demographic, price, and business-cycle factors. Rapid advancements in automobile technology, accompanied by large public investments in highways following World War II, allowed people to live further from where they worked, thus helping fuel demand for single-family housing.[6]

II. PROJECTING THE TREND NUMBER OF U.S. HOUSEHOLDS

The number of households in the United States is a good summary measure of the nation's demand for housing. In fact, the U.S. Census Bureau defines a household as an occupied housing unit. Correspondingly, net household formation—the year-to-year change in the number of U.S. households—can be a good summary measure of changes in aggregate demand for housing, which in turn is a key determinant of residential construction. This section describes a methodology for projecting the trend level of U.S. households, describes this trend from

1990 to 2035, and compares it with the actual number of U.S. households through 2012.

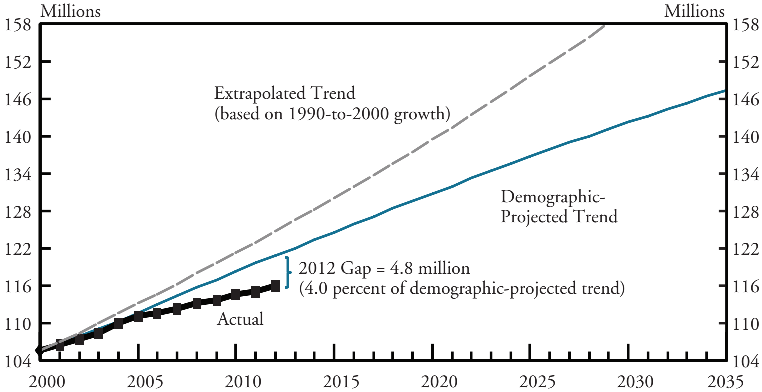
Methodology

The Census Bureau periodically releases projections of the size and composition of the U.S. population by year for a number of decades into the future. The most recent projections extend through 2060 using data from the 2010 decennial census and other domestic and international sources. More specifically, the Census Bureau projects total U.S. population and its breakdown by sex for 20 five-year age groups, from zero to 4 through 95 to 99, and for 100 and older. This breakdown of the population defines 42 different demographic groups. The Census Bureau also reports corresponding historical estimates back to 1950.

Projecting the future number of households first requires estimating the percentage of individuals in each of the 42 demographic groups that lived in households of various sizes in the base year 2000. The choice to use 2000 as the base year reflects that it is the most recent decennial census year in which the level and composition of U.S. households were plausibly close to their long-run trend. For example, in 2000 about 10.2 million females aged 30 to 34 lived in the United States. Of these, about 7 percent lived in one-person households; 20 percent lived in two-person households; 22 percent lived in three-person households; and 50 percent lived in households with more than three people.[7] This calculation of the percentage of individuals living in each household size is repeated for each of the 42 gender-age demographic groups.

The resulting percentages are then applied to the Census Bureau's projected number of persons in each of the gender-age groups in each future year. In other words, the same percentages calculated using the 2000 data are projected to hold in each future year. Continuing with the previous example, the Census Bureau projects that in 2025, 11.7 million females aged between 30 and 34 will live in the United States. Assuming that the same percentage lives in one-person households as did in 2000—7 percent—gives a projection of the number of one-person households in this group in 2025. Similar projections can be made for each demographic group and each household size. The total

Chart 3
TOTAL U.S. HOUSEHOLDS



Sources: Census Bureau, author's calculations.

number of projected households in 2025 follows immediately from calculating the number of persons in each household size.[8]

Projected and actual U.S. households

The projected number of U.S. households based on this demographic methodology is shown in Chart 3 (blue line). The projection should be interpreted as a trend because it does not account for fluctuations in the number of households due to business-cycle conditions. Also shown is the extrapolated trend number of households that would be obtained by holding the rate of household formation at its average level from 1990 to 2000 (gray line). This extrapolation is a reasonable proxy for historical trend household formation and serves as a helpful benchmark for understanding the current shift in trend.

The projected trend of household formation based on demographics (blue line) slows considerably compared to the simple extrapolation of historical household formation (gray line).[9] The flatter projected trend reflects the slowing of underlying U.S. population growth.[10] If, instead, trend household formation were to continue at its recent historical rate, the extrapolated number of households in 2025 would exceed the projected demographic trend by more than 12 million, a 9-percent difference.

In contrast, actual household formation, as estimated by the Census Bureau and shown by the black line, trailed behind projected trend formation considerably from 2006 through 2012, with the black line falling increasingly below the blue line. For four of these six years, actual household formation fell short of its projected trend by at least 500,000. As a result, the actual number of households at the end of 2012 (116 million) was 4.8 million below the projected trend number of households (121 million), a difference of 4.0 percent.

Looking ahead, improving labor market conditions, increases in household wealth, and further appreciation of house prices should gradually push realized household formation above its trend and begin to close the gap between the trend and actual number of households.

III. PROJECTED TREND OCCUPANCY AND HOME CONSTRUCTION

The same demographic methodology used to project the trend number of total U.S. households can also be used to produce separate projections of the trend number of occupied single-family and multifamily housing units. These demographic trends form the basis for projecting future construction. The projections additionally require subjective judgments on the number of vacant units in 2012 that will never be reoccupied, the trend rate at which housing units become uninhabitable, and the year-by-year rate at which the gap between trend and projected occupied units will be closed. Alternative combinations of these judgments determine baseline, optimistic, and pessimistic projections of single-family and multifamily construction from 2013 through 2035.[11] The baseline combinations project relatively weak single-family but relatively strong multifamily construction over the intermediate and long term. Moreover, even the optimistic combination of judgments projects that single-family construction will be weak compared to its historical rate. And even the pessimistic combination of judgments projects that multifamily construction will be strong compared to its historical rate. An important caveat is that these are intermediate and long-run projections. For any specific few years, actual construction may easily fall outside the projected range.[12]

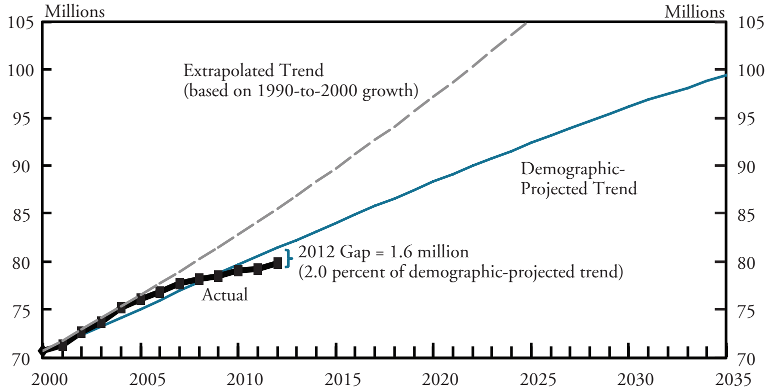
Projected occupied housing units

Projecting the trend number of occupied single-family and multifamily housing units follows a similar methodology to projecting the trend number of total households. Doing so requires calculating the percentage of persons in 2000 in each of the 42 demographic groups living in single-family and multifamily housing units of each possible household size. These percentages are then applied to the Census Bureau projection of the size and composition of the U.S. population in each future year. As above, the projected number of persons in each single-family and multifamily household size immediately converts to the projected number of occupied housing units of each type.

Continuing the example from the previous section, females aged 30 to 34 in 2000 sorted into occupied *single-family* housing units of one, two, and three persons with respective frequencies of 2 percent, 20 percent, and 22 percent. They sorted into occupied *multifamily* housing units of one, two, and three persons with respective frequencies of 5 percent, 7 percent, and 5 percent. These percentages are then applied to the Census Bureau's projection of 11.7 million females aged 30 to 34 in 2025. The same procedure is repeated for the other gender-age demographic groups. The projected trend number of occupied single-family housing units is calculated as the sum of the projected number of people living in one-person single-family units plus one-half of the projected number of people living in two-person single-family units plus one-third of projected number of people living in three-person single-family units and so on. The projected number of occupied multifamily housing units is calculated analogously.

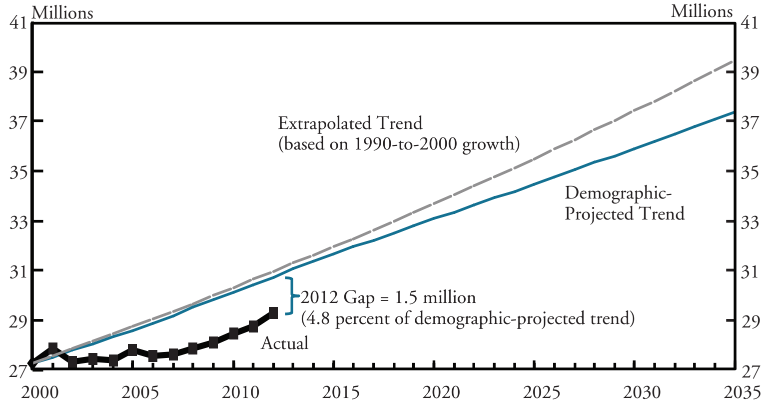
The resulting number of single-family occupied housing units is shown in Chart 4. As for all households, the demographic-projected trend (blue line) grows considerably slower than an extrapolated trend based on the average growth rate from 1990 to 2000 (gray line). In contrast to all households, actual single-family occupied housing units (black line) exceeded their projected trend beginning in 2002 (blue line). The resulting surplus of single-family occupied housing units peaked at 1.1 million in 2004 (just before the peak of the housing boom) and remained above 700,000 as late as 2007. Actual single-family occupied units fell below their projected trend only in 2009,

Chart 4
SINGLE-FAMILY OCCUPIED HOUSING UNITS



Sources: Census Bureau, author's calculations.

Chart 5
MULTIFAMILY OCCUPIED HOUSING UNITS



Sources: Census Bureau, author's calculations.

more than three years into the housing crisis. The ensuing gap continued to widen, eventually reaching 1.6 million units at the end of 2012 (2.0 percent above trend).

The corresponding projected number of multifamily occupied housing units is shown in Chart 5. In contrast to the diverging single-family demographic and extrapolated trends, the multifamily demographic trend (blue line) lies relatively close to the extrapolated trend (gray line). This similarity between the demographic and extrapolated trends reflects the approximate offset of slower population growth by the shift from single-family to multifamily housing.

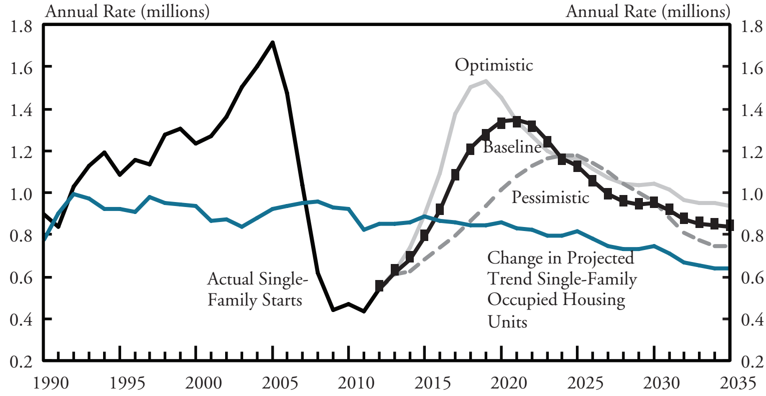
Actual occupied multifamily units (black line) diverged by more than single-family units from their demographic trend (blue line) over the years 2000 to 2012. This divergence reflects three factors. First, during the housing boom, occupancy shifted from multifamily to single-family housing units. The ensuing gap between trend and actual occupied multifamily units widened to 1.4 million by the end of 2006. Second, demand then shifted back toward multifamily living with the onset of the foreclosure crisis, tightening credit conditions, and recession. But, third, the financial crisis and recession also dampened overall household formation. On net, the shift toward multifamily living and the dampening of household formation offset each other. As a result, the numerical gap between trend and actual units at the end of 2012 was almost unchanged from its level just before the crisis.[13] But because multifamily occupied units were already well below trend prior to the housing crisis, the multifamily gap relative to trend at the end of 2012 was more than twice the single-family relative gap (4.8 percent versus 2.0 percent). This larger multifamily gap suggests a considerably stronger outlook for multifamily construction.

Projected single-family construction

As introduced above, using the demographic trends to project future construction requires subjective judgments on three key factors: the number and rate at which vacant housing units become reoccupied, the long-term rate at which units are abandoned (for example, are torn down or become uninhabitable due to physical deterioration), and the rate at which the number of occupied housing units closes the gap to its trend level. A baseline projection for single-family construction combines judgments of the most likely outcomes for each of the three considerations. These baseline judgments imply that single-family construction will peak at a level similar to that just prior to the housing boom and then contract to a low level not seen since the early 1990s.

An alternative optimistic projection combines judgments that each contribute to stronger construction. Lower reoccupancy (and hence higher short-term abandonment) increases required construction. So too does a higher trend rate of abandonment. Faster assumed

Chart 6
PROJECTED SINGLE-FAMILY STARTS



Sources: Census Bureau, author's calculations.

year-by-year closure pulls construction forward in time. An alternative pessimistic projection combines judgments that each contributes to weaker construction: higher reoccupancy, lower trend abandonment, and slower year-by-year closure.[14]

Baseline single-family projection. Chart 6 shows the baseline set of judgments combined with the demographic-projected trend. Together they project relatively moderate levels of single-family construction over the intermediate and long term (black line). Annual single-family starts peak at 1.35 million in 2021, nearly identical to their level at the start of the housing boom in 2002. Thereafter, starts contract. Their projected annual level in 2030, at 950,000, would be the lowest since 1991, a year in which starts reached a trough following a steep downturn. From 2031 onward, starts follow the downward contours of the trend change in occupied single-family units (blue line). Yearly outcomes under the baseline projection are enumerated in Table 1.

During the first few years of the transition back to trend, the gap between trend and projected occupied single-family units actually widens. This divergence reflects that actual single-family construction of 550,000 in 2012 (black line) fell far short of the 850,000 increase in trend occupied units (blue line). Moreover, a significant portion of new construction is required to offset trend abandonment. Only after several years of strong growth is annual single-family construction sufficiently high to begin closing the gap between trend and projected occupancy.[15] Under the baseline judgments, the gap reaches a maximum of 2.4 million units in 2016, a 45-percent deterioration from its level at the end of 2012 (Table 1, columns 5 and 7). The gap moves back below its 2012 level in 2020 and is 98 percent closed by the end of 2030.

Projected single-family construction growth increases from 10 percent in 2014 to a maximum of 18 percent in 2017, after which it gradually slows (Table 1, column 9). Construction begins to decline in 2022 and falls at about 6 percent per year from 2023 through 2027. This decline reflects both slowing trend growth and the slowing transitional growth that arises from the closing of the gap between trend and projected occupied housing units.[16]

Alternative single-family projections. The alternative optimistic and pessimistic projections are respectively shown by the solid and dashed gray trajectories in Chart 6. Corresponding enumerations are shown in Table 2.

The optimistic projection combines the same demographic trend number of occupied single-family units used in the baseline with a lower rate of reoccupancy of units vacant at the end of 2012, a higher trend rate of abandonment, and faster year-by-year closure of the gap between trend and projected occupied housing units. Together, these optimistic judgments project rapidly accelerating single-family construction beginning in 2014. The annual growth rate of single-family starts reaches a maximum of 25 percent in 2017. Annual single-family starts peak at 1.5 million in 2019. While this is below the 1.7 million record high for annual starts in 2005, it nevertheless exceeds starts during all other years except 1977, 1978, and 2004. Growth turns moderately negative in 2020 and remains so through about 2031. In that year, the 2012 gap between trend and actual occupied single-family units is 98 percent closed. Thereafter, the optimistic projection for starts follows the downward contours of the trend change in occupied single-family units (blue line).

The pessimistic projection combines the same demographic trend number of occupied single-family units used in the baseline with a higher rate of reoccupancy of units vacant at the end of 2012, a lower trend rate of abandonment, and slower year-by-year closure of the gap between trend and projected occupied housing units. Together, these pessimistic assumptions imply only slightly positive growth in

Table 1
SINGLE-FAMILY HOUSING STARTS, BASELINE PROJECTED, 1990-2035

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Single-Family Occupied Units				**Single-Family Occupied Unit Gap**			**Single-Family Starts**	
	Demographic Trend	Projected	Trend Increase	Projected Increase	Level Gap (2)-(1)	Change in Gap (4)-(3)	Change From 2012	Projected	Growth Rate
1990	61,200	*60,300*	630**	*660***	-950	30**		*990***	*1%***
2000	70,700	*70,700*	940**	*1,040***	0	90**		*1,140***	*3%***
2005	75,100	*76,100*	880*	*1,070**	990	200*		*1,490**	*7%**
2010	79,800	*79,100*	940*	*620**	-610	-320*		*810**	*-23%**
2011	80,600	*79,300*	830	*150*	-1,290	-680		*450*	*-8%*
2012	81,400	*79,800*	850	*510*	-1,630	-350	0%	*550*	*24%*
2013	82,300	80,400	850	570	-1,920	-290	-18%	620	15%
2014	83,100	81,000	860	650	-2,130	-210	-30%	680	10%
2015	84,000	81,700	890	710	-2,300	-170	-41%	790	15%
2016	84,900	82,500	870	800	-2,370	-70	-45%	910	16%
2017	85,800	83,400	860	920	-2,310	60	-42%	1,080	18%
2018	86,600	84,500	850	1,050	-2,110	200	-29%	1,210	12%
2019	87,500	85,600	840	1,110	-1,850	270	-13%	1,280	6%
2020	88,300	86,800	860	1,170	-1,540	310	6%	1,340	4%

Table 1 Continued

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Single-Family Occupied Units				**Single-Family Occupied Unit Gap**			**Single-Family Starts**	
	Demographic Trend	Projected	Trend Increase	Projected Increase	Level Gap (2)-(1)	Change in Gap (4)-(3)	Change From 2012	Projected	Growth Rate
2021	89,100	88,000	830	1,180	-1,190	340	27%	1,350	1%
2022	90,000	89,100	820	1,150	-860	330	47%	1,330	-2%
2023	90,800	90,200	800	1,070	-590	270	64%	1,250	-6%
2024	91,600	91,200	790	980	-400	190	75%	1,160	-7%
2025	92,400	92,100	810	940	-270	130	83%	1,120	-3%
2030	96,100	96,100	750*	790*	-40	50*	98%	1,000*	-3%*
2035	99,400	99,400	660*	670*	0	10*	100%	860*	-3%*

* Five-year annual average though listed year
**10-year annual average through listed year
Notes: Italics indicate actual outcomes rather than historically estimated or future projected ones. Except when indicated by a percent sign, all units are in thousands. Constructed housing units are assumed to be completed in the same calendar year in which they are started. Growth rates are year over year.

Table 2

PROJECTION COMPARISON, SINGLE-FAMILY STARTS

	(1)	(2B)	(3B)	(4B)	(5B)	(6B)	(2O)	(3O)	(4O)	(5O)	(6O)	(2P)	(3P)	(4P)	(5P)	(6P)
	All	**Baseline Projection**					**Optimistic Projection**					**Pessimistic Projection**				
	Occupied unit demographic trend	Level gap (projected – trend)	Change in gap from 2012	Single-family starts (level)	Single-family starts (growth-rate)	Net out-flow from occupied†	Level gap (projected – trend)	Change in gap from 2012	Single-family starts (level)	Single-family starts (growth rate)	Net out-flow from occupied†	Level gap (projected – trend)	Change in gap from 2012	Single-family starts (level)	Single-family starts (growth rate)	Net out-flow from occupied†
2012	81,400	-1,630	0%				-1,630	0%				-1,630	0%			
2013	82,300	-1,920	-18%	620	15%	50	-1,960	-20%	620	16%	100	-1,880	-15%	610	14%	0
2014	83,100	-2,130	-30%	680	10%	30	-2,220	-36%	730	18%	140	-2,040	-25%	630	3%	-70
2015	84,000	-2,300	-41%	790	15%	70	-2,390	-46%	890	22%	180	-2,210	-35%	680	8%	-30
2016	84,900	-2,370	-45%	910	16%	120	-2,380	-45%	1,090	23%	210	-2,360	-44%	740	8%	10
2017	85,800	-2,310	-42%	1,080	18%	170	-2,110	-29%	1,370	25%	250	-2,460	-50%	800	8%	40
2018	86,600	-2,110	-29%	1,210	12%	170	-1,710	-4%	1,500	9%	250	-2,520	-54%	860	8%	80
2019	87,500	-1,850	-13%	1,280	6%	170	-1,280	22%	1,530	2%	250	-2,520	-54%	930	8%	80
2020	88,300	-1,540	6%	1,340	4%	170	-940	42%	1,450	-5%	260	-2,450	-50%	1,010	8%	80
2021	89,100	-1,190	27%	1,350	1%	170	-700	57%	1,340	-8%	260	-2,290	-40%	1,080	7%	90
2022	90,000	-860	47%	1,330	-2%	180	-520	68%	1,270	-5%	270	-2,070	-27%	1,130	5%	90
2023	90,800	-590	64%	1,250	-6%	180	-380	77%	1,200	-6%	270	-1,790	-10%	1,160	3%	90
2024	91,600	-400	75%	1,160	-7%	180	-280	83%	1,160	-3%	270	-1,500	8%	1,180	2%	90
2025	92,400	-270	83%	1,120	-3%	180	-210	87%	1,160	0%	270	-1,230	25%	1,170	0%	90
2030	96,100	-40	98%	980*	-3%*	190*	-50	98%	1,060*	-2%*	280*	-180	94%	1,050*	-2%*	90*
2035	99,400	0	100%	860*	-3%*	200*	0	100%	960*	-2%*	300*	-10	99%	790*	-2%*	100*

†Net flow from occupied represents units that become vacant or are abandoned

*Five-year annual average through listed year

Notes: Except when indicated by a percent sign, all units are in thousands. Newly constructed units are accounted as directly boosting occupancy without any measured flow. Constructed housing units are assumed to be completed in the same calendar year in which they are started. Growth rates are year over year.

single-family starts in 2014, followed by moderate annual growth of 5 percent to 8 percent from 2015 through 2022 (dashed gray line). Annual single-family starts peak at 1.2 million in 2024, a level that is similar to what prevailed during the mid-1990s. Starts then begin to decline. They contract at annual rates from 4 percent to 8 percent from 2026 through 2032, at the end of which 99 percent of the 2012 gap is closed. As with the baseline and optimistic projections, the pessimistic projection for starts continues to drift downward, paralleling the contours of the trend change in occupied single-family units.

A number of key features distinguish the optimistic, baseline, and pessimistic single-family projections. Most obviously, the hump-shaped profile is the most pronounced under the optimistic combination of assumptions judgments and the least so under the pessimistic ones. More specifically, the optimistic projection is characterized by the fastest initial growth, the highest eventual peak, and the sharpest subsequent contraction. In addition, optimistic single-family starts are projected to peak earliest (2019); baseline starts are projected to peak next (2021); and pessimistic starts are projected to peak last (2024). Beginning in 2031, the annual *level* of single-family starts is always highest under the optimistic forecast and always lowest under the pessimistic forecast. This reflects the assumption that the long-term rate of abandonment is highest under the optimistic assumptions and lowest under the pessimistic assumptions.[17] Prior to 2031, however, the annual level of starts is sometimes highest under the baseline set of assumptions judgments (from 2021 to 2023) and sometimes highest under the pessimistic assumptions judgments (2024 to 2028).

Projected multifamily housing construction

As described in Section I, multifamily construction bounced back strongly following its crash. By the end of 2012, multifamily starts had already recovered more than three-quarters of their cumulative decrease from 2006 to 2009. Correspondingly, 12 percent of the 2009 gap between trend-projected and actual multifamily occupied units had been closed by the end of 2012. Even so, the estimated remaining gap was 4.8 percent, more than twice the comparable single-family gap. As a result, the outlook for multifamily construction is much stronger than for single-family construction.

Table 3

MULTIFAMILY HOUSING STARTS, BASELINE PROJECTION,1990-2030

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		Multifamily Occupied Units			**Multifamily Occupied Unit Gap**			**Multifamily Starts**	
	Demographic Trend	Projected	Trend Increase	Projected Increase	Level Gap (2)-(1)	Change In Gap (4)-(3)	Change From 2009	Projected	Growth Rate
1990	24,700	*24,600*	240**	*180***	-190	-70**		*490***	*1%**
2000	27,300	*27,300*	250**	*270***	0	20**		*270***	*3%***
2005	28,600	*27,800*	260*	*100**	-800	-160*		*340**	*7%**
2006	28,900	*27,600*	300	*-250*	-1,350	-550		*340*	*-2%*
2007	29,200	*27,700*	300	*100*	-1,550	-210		*310*	*-10%*
2008	29,500	*27,900*	310	*230*	-1,640	-90		*280*	*-7%*
2009	29,800	*28,100*	300	*260*	-1,680	-40	0%	*110*	*-61%*
2010	30,100	*28,500*	300	*330*	-1,660	20	1%	*110*	*2%*
2011	30,400	*28,800*	310	*330*	-1,640	20	2%	*180*	*56%*
2012	30,700	*29,300*	320	*480*	-1,480	160	12%	*250*	*39%*
2013	31,100	29,700	310	400	-1,390	90	17%	290	19%
2014	31,400	30,000	310	310	-1,390	0	17%	360	22%
2015	31,700	30,300	290	330	-1,350	30	19%	420	16%
2016	31,900	30,700	290	380	-1,260	90	25%	470	13%
2017	32,200	31,100	290	430	-1,120	140	33%	520	10%
2018	32,500	31,600	290	470	-940	180	44%	560	7%

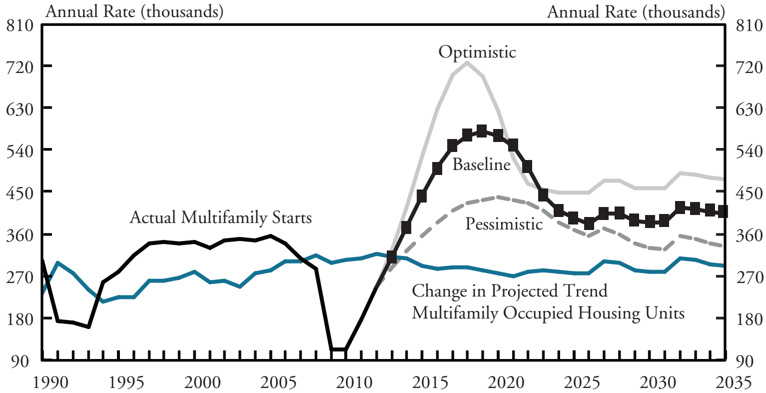
Table 3 Continued

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		Multifamily Occupied Units			**Multifamily Occupied Unit Gap**			**Multifamily Starts**	
	Demographic Trend	Projected	Trend Increase	Projected Increase	Level Gap (2)-(1)	Change In Gap (4)-(3)	Change From 2009	Projected	Growth Rate
2019	32,800	32,100	280	480	-740	200	56%	570	2%
2020	33,100	32,500	280	460	-560	190	67%	560	-2%
2021	33,300	33,000	270	430	-390	160	77%	530	-6%
2022	33,600	33,300	280	390	-280	110	83%	490	-7%
2023	33,900	33,700	280	360	-200	80	88%	460	-6%
2024	34,200	34,000	280	340	-140	60	92%	440	-6%
2025	34,500	34,400	280	320	-100	40	94%	420	-4%
2030	35,900	35,900	290*	300*	-20	20*	99%	410	-1%*
2035	37,400	37,400	300*	300*	0	0*	100%	410	1%*

* Five-year annual average though listed year
**10-year annual average through listed year
Notes: Italics indicate actual outcomes rather than historically estimated or future projected ones. Except when indicated by a percent sign, all units are in thousands. Constructed housing units are assumed to be completed in the same calendar year in which they are started. Growth rates are year over year.

Chart 7

PROJECTED MULTIFAMILY STARTS



Sources: Census Bureau, author's calculations.

Baseline multifamily projection. Chart 7 shows the baseline set of judgments combined with the demographic-projected trend. Together they point to high levels of multifamily construction over the intermediate and long-term future (black line). Table 3 shows the corresponding enumeration. Annual multifamily starts peak at 570,000 in 2019, more than two-thirds above their average level during the late 1990s and early 2000s (Table 3, column 8). Multifamily starts then contract for several years, eventually plateauing at about 400,000 per year from 2026 through 2035. This is still more than 15 percent above average annual starts during the late 1990s and early 2000s.

Under the baseline set of judgments, projected multifamily construction growth slows to 19 percent in 2013, less than half its frenetic rate in 2012 but otherwise quite high (Table 3, column 9). Growth gradually slows to near zero in 2019, and then slows further to an average rate of contraction of about 6 percent from 2021 to 2025. This contraction almost exclusively reflects slowing transitional growth as the gap between trend and forecast occupied multifamily units diminishes. Unlike single-family units, the annual increase in trend occupied multifamily units remains approximately constant over these years. Therefore, once the gap between actual and trend multifamily occupied units has been mostly closed, projected starts are roughly flat.

Alternative multifamily projections. The alternative optimistic and pessimistic projections are respectively shown by the solid gray and dashed gray trajectories in Chart 7. Corresponding enumerations are shown in Table 4.

Similar to the optimistic projection for single-family units, the optimistic multifamily projection combines a lower reoccupancy of vacant units, a higher rate of trend abandonment, and a quicker closing of the gap between projected and trend occupied units. Higher reoccupancy and faster closure pull the surge in construction forward in time and make it considerably steeper. Multifamily starts increase by 24 percent in 2014 and 2015 and by more than 17 percent in 2016 and 2017. Starts peak at 680,000 units in 2018, nearly matching their maximum annual level in the mid-1980s.[18] The gap between trend and optimistic-projected occupied units is 98 percent closed by the end of 2025 (relative to the maximum unit gap in 2009). Thereafter, the optimistic projection of multifamily starts remains about 470,000 through 2035, which is more than 35 percent above their level during the late 1990s and early 2000s.

The pessimistic multifamily projection combines the same demographic trend used in the baseline with an assumed higher reoccupancy rate, lower trend abandonment, and a slower closure of the gap between trend and projected occupied units. Even with these pessimistic judgments, projected growth remains moderately positive. Multifamily starts increase in each of 2014, 2015, and 2016 by 9 percent or more and then in each of 2017 and 2018 by about 5 percent. In 2020, the pessimistic projection of multifamily starts peaks at 420,000 units, a level more than 20 percent higher than annual average multifamily starts during the late 1990s and early 2000s. After falling off moderately, multifamily starts plateau at about 350,000 per year from 2025 to 2035, similar to their level during the late 1990s and early 2000s. By year-end 2031, the gap between trend and pessimistic-forecast occupied units is 98 percent closed. Thereafter, multifamily starts remain about 360,000 per year, about equal to their rate during the late 1990s and early 2000s.

Many key features distinguish the optimistic, baseline, and pessimistic multifamily projections. As with the alternative single-family projections, the hump-shaped multifamily profile is the most pronounced under the optimistic judgments and the least under the pessimistic

Table 4

PROJECTION COMPARISON, MULTIFAMILY STARTS

	(1)	(2B)	(3B)	(4B)	(5B)	(6B)	(2O)	(3O)	(4O)	(5O)	(6O)	(2P)	(3P)	(4P)	(5P)	(6P)
	All	**Baseline Projection**					**Optimistic Projection**					**Pessimistic Projection**				
	Occupied unit demographic trend	Level Gap (projected – trend)	Change In Gap From 2009	Multifamily Starts (level)	Multifamily Starts (growth rate)	Net Outflow From Occupied†	Level Gap (projected – trend)	Change In Gap From 2009	Multifamily starts (level)	Multifamily starts (growth rate)	Net Outflow From Occupied†	Level Gap (projected – trend)	Change In Gap From 2009	Multifamily Starts (level)	Multifamily Starts (growth rate)	Net Outflow From Occupied†
2009	29,800	-1,680	0%				-1,680	0%				-1,680	0%			
2010	30,100	-1,660	1%				-1,660	1%				-1,660	1%			
2011	30,400	-1,640	2%				-1,640	2%				-1,640	2%			
2012	30,700	-1,480	12%				-1,480	12%				-1,480	12%			
2013	31,100	-1,390	17%	290	19%	100	-1,340	20%	310	24%	146	-1,330	21%	280	12%	180
2014	31,400	-1,390	17%	360	22%	-50	-1,430	15%	380	24%	-169	-1,280	24%	310	12%	52
2015	31,700	-1,350	19%	420	16%	-90	-1,400	17%	470	24%	-150	-1,230	27%	350	12%	-10
2016	31,900	-1,260	25%	470	13%	-90	-1,270	24%	570	20%	-151	-1,170	30%	380	9%	-30
2017	32,200	-1,120	33%	520	10%	-90	-1,050	37%	660	17%	-153	-1,100	35%	400	5%	-31
2018	32,500	-940	44%	560	7%	-90	-820	51%	680	3%	-155	-1,000	40%	410	4%	-31
2019	32,800	-740	56%	570	2%	-90	-600	64%	660	-3%	-158	-900	47%	420	2%	-32
2020	33,100	-560	67%	560	-2%	-100	-420	75%	620	-5%	-160	-780	53%	420	0%	-32
2021	33,300	-390	77%	530	-6%	-100	-270	84%	580	-6%	-163	-660	61%	420	-1%	-32
2022	33,600	-280	83%	490	-7%	-100	-180	89%	540	-7%	-165	-560	67%	420	-1%	-33
2023	33,900	-200	88%	460	-6%	-100	-120	93%	510	-5%	-167	-460	72%	410	-2%	-33

Table 4 Continued

	(1)	(2B)	(3B)	(4B)	(5B)	(6B)	(2O)	(3O)	(4O)	(5O)	(6O)	(2P)	(3P)	(4P)	(5P)	(6P)
	All	**Baseline Projection**					**Optimistic Projection**					**Pessimistic Projection**				
	Occupied unit demo-graphic trend	Level Gap (projected – trend)	Change In Gap From 2009	Multifamily Starts (level)	Multifamily Starts (growth rate)	Net Outflow From Occupied†	Level Gap (projected – trend)	Change In Gap From 2009	Multifamily starts (level)	Multifamily starts (growth rate)	Net Outflow From Occupied†	Level Gap (projected – trend)	Change In Gap From 2009	Multifamily Starts (level)	Multifam-ily Starts (growth rate)	Net Outflow From Occupied†
2024	34,200	-140	92%	440	-6%	-101	-70	96%	490	-3%	-169	-380	77%	390	-3%	-33
2025	34,500	-100	94%	420	-4%	-102	-40	98%	470	-4%	-170	-310	81%	380	-4%	-34
2030	35,900	-20	0%	410*	-1%*	-105*	0	100%	470*	-1%*	-175*	-120	94%	360*	-1%*	-35*
2035	37,400	0	0%	410*	1%*	-111*	0	100%	480*	1%*	-185*	-40	98%	350*	1%*	-37*

†Net flow from occupied represents units that become vacant or are abandoned
*Five-year annual average through listed year
Notes: Except when indicated by a percent sign, all units are in thousands. Newly constructed units are accounted as directly boosting occupancy without any measured flow. Constructed housing units are assumed to be completed in the same calendar year in which they are started. Growth rates are year over year.

judgments. The optimistic projection is characterized by the fastest initial growth, the highest eventual peak, and the sharpest subsequent contraction. Multifamily starts peak earliest (in 2018) under optimistic assumptions and much later (in 2020) under pessimistic assumptions.

Beginning in 2023, the annual *level* of single-family starts is always highest under the optimistic forecast, reflecting a higher assumed rate of long-term abandonment. Just prior to this in 2021 and 2022, multifamily starts under the baseline projection modestly exceed starts under the baseline projection. For all years, starts under the pessimistic projection are well below starts under either the baseline and optimistic projections.

IV. CONCLUSION

Understanding the evolving U.S. housing market requires recognizing the ongoing shift from single-family to multifamily housing. To be sure, a number of shorter-term forces are playing a significant role in the current housing market. For example, business cycle factors and some anticipated tightening of monetary policy help account for the pause in construction growth that occurred during the first half of 2013. But over the intermediate and longer term, demographic considerations are likely to dominate. In particular, the slowing of U.S. population growth will put significant downward pressure on both single-family and multifamily construction. The aging of the U.S. population will put further downward pressure on single-family construction but offsetting upward pressure on multifamily construction.

The baseline projections described in this article suggest that construction over the near future will accelerate only moderately for single-family housing but strongly for multifamily housing. Over the intermediate and longer term, even optimistic assumptions project a relatively moderate peak level of single-family construction, which will be followed by a large contraction over many years. Conversely, even pessimistic assumptions project a relatively high peak level of multifamily construction, which will be followed by a decline to a still-high level of construction.

From a monetary policy perspective, incorrectly interpreting weak single-family construction as arising mainly from cyclical forces may motivate unnecessary stimulative measures. Conversely, incorrectly interpreting high levels of multifamily construction as being unsustainable may motivate unnecessary contractionary measures.

From a national fiscal perspective, a change in the U.S. tax code that removes current subsidies to homeownership may introduce undesirable additional downward pressure on single-family construction. But over the longer term, continued large public subsidies to homeownership may stall or delay an inevitable shift away from single-family housing that ultimately may improve the welfare of the majority of U.S. households.

The shift from single-family to multifamily housing also may cause a geographic shift from suburban to city living. For cities, this offers the possibility of revitalization and the shoring up of public finances. But to attract aging suburban households, cities will likely need to offer significant amenities such as safe streets, diverse retail and restaurant options, museums, and venues for theater, music, and sports. Suburbs seeking to retain aging households may need to re-create a range of these urban amenities and enact some rezoning to encourage multifamily construction.

More generally, the projected shift from single-family to multifamily living will likely have many large, long-lasting effects on the U.S. economy. It will put downward pressure on single-family relative to multifamily house prices. It will shift consumer demand away from goods and services that complement large indoor space and a backyard toward goods and services more oriented toward living in an apartment. Similarly, the possible shift toward city living may dampen demand for automobiles, highways, and gasoline but increase demand for restaurants, city parks, and high-quality public transit. Households, firms, and governments that correctly anticipate these changes are likely to especially benefit.

ENDNOTES

[1]Charts 1 and 2, as well as the forecasts presented later in the article, are based on housing starts through the preliminary release for August 2013. The temporary shutdown of the federal government in October 2013 has postponed the release of more recent data until December.

[2]Allowing for an earlier start date, multifamily starts plunged by more than 76 percent from 1985 to 1993. The primary reason was a change to the U.S. tax code that made investment in multifamily units less profitable.

[3]In addition to living in single-family and multifamily units, a relatively small share of households lives in alternative structures. These primarily are mobile homes but also include recreational vehicles, vans, boats, and tents. These alternative types of housing accounted for 6.8 percent of all households in 2000.

[4]Over the long term, aggregate U.S. housing supply can typically increase sufficiently to match increases in aggregate U.S. housing demand without large increases in average house prices. In technical terms, long-run aggregate housing supply is relatively price elastic when the demand for housing units increases above the existing stock of units. Most U.S. metro areas, with the exception of only the most crowded, have sufficient land to accommodate such construction. Indeed, the vast majority of the land area of most metro areas, using boundaries designated by the U.S. Office of Management and Budget, is either agrarian or otherwise sparsely settled (Rappaport). In those metros where long-run demand for housing is increasing, the number of housing units that are eventually constructed depends primarily on the price of land along with physical construction costs.

This long-run ability to accommodate increases in demand does not hold for some specific places *within* many metro areas, which often have little if any undeveloped land. For such places, zoning restrictions and other regulations often prevent increases in the quantity of housing units supplied (Glaeser, Gyourko, Saks, 2005a, 2005b).

For areas of the United States where long-term aggregate demand is falling, the decrease in the number of habitable housing units primarily depends on the physical depreciation of existing units. For vacant units, such depreciation can be very rapid. But the number of vacant units is typically kept moderate by the demand of low-income and immigrant households for low-priced housing (Glaeser and Gyourko). Therefore, housing supply is relatively inelastic to decreases in prices over the short and intermediate terms.

[5]Prices should be interpreted broadly. Most obviously, they include the rental or sales price of a house or apartment. They also include the foregone return a household could earn by choosing to live in a less-expensive unit and investing the difference. More generally, mortgage interest rates, property taxes, homeownership subsidies, and expectations of future house price appreciation also affect the expected resources that must be foregone to live in one housing unit or another.

[6]While shifting geographic preferences may not affect the aggregate number of occupied housing units, they may increase aggregate demand for new housing construction. This may occur, for example, if units abandoned in locations where population is declining require new construction in locations where the population is growing. This pattern would be similar in its effect to a temporary outward shift in housing demand.

[7]The calculation for households with more than three people involves separate calculations of the percentages of each demographic group that live in each different household size, ranging from households of four through households of 20 people or more. In addition, a very small percentage of individuals live in "group quarters," a category that includes dormitories, military barracks, prisons, and nursing homes.

[8]Mankiw and Weil used a similar demographic methodology to forecast falling housing prices during the 1990s. The present approach is simpler because it focuses on the trend number of occupied units rather than realized house prices. A shared vulnerability of the present analysis with Mankiw and Weil is that the trend projections assume that households' demand for housing after controlling for demographics remain unchanged. During the 1990s, the household demand curve for housing arguably shifted considerably outward. At any given price, many households desired to purchase larger, higher-quality houses. As a result, house prices moved strongly upward during the 1990s, rather than downward as was projected.

[9]The demographic methodology, applied backward from 2000 to 1990, projects trend household formation relatively similar to actual household formation during this period.

[10]Recent household formation has actually slowed by less than the slowing of population growth. From 2000 to 2012, the Census Bureau estimates that annualized population growth slowed by 0.34 percentage point (from 1.12 percent to 0.77 percent). Over the same period, demographic-trend household formation slowed by only 0.19 percentage point (from 1.25 percent to 1.06 percent). The smaller slowing of household formation relative to population growth reflects older individuals' tendency to live in smaller households resulting in the distributing of aggregate population over more total households (Paciorek). As described in the next section, it is for this reason that multifamily construction is forecast to grow at a considerably higher rate than single-family construction.

[11]For each required judgment, plausible assumptions could contribute to even stronger construction than implied by the optimistic judgment. Similarly, for each required judgment, plausible assumptions could contribute to even weaker construction than is implied by the pessimistic judgment. The alternative forecasts should be thought of as spanning a range of possible outcomes in which the actual outcome is likely to fall. Year-by-year error bands cannot be estimated because judgments that imply stronger construction in one year often imply weaker construction in some later year.

[12]The core demographic projections also contribute significant uncertainty to the alternative construction forecasts. The projections are based on Census Bureau forecasts of the age and demographic structure of the United States, which are subject to uncertainty. The assumption that the trend number of single-family and multifamily occupied units each equaled their trend in 2000 may be incorrect. The trend projections implicitly assume that relative house prices and rents remain near 2000 levels over the long term. But at the very least, the shift in demand from single-family to multifamily units will put downward pressure on single-family relative to multifamily house prices. More generally, unexpected changes in long-term income growth, technology, preferences, and public policy are each likely to significantly affect the trend number of each type of household. For example, a shift in households' preferences in favor of owning larger, "higher-quality" homes contributed to a large increase in house prices during the 1990s rather than a forecast decline based on demographic considerations (Mankiw and Weil).

[13]Note that the sum of the single-family and multifamily gaps in 2012, 3.1 million, falls considerably short of the 4.8 million gap for all households. The remainder is primarily made up of mobile homes and trailers. While these accounted for just 6.8 percent of occupied housing units in 2000, they are very sensitive to business-cycle conditions and so swing widely around their trend. In 2012, the shortfall of occupied mobile homes and trailers compared with their demographic-projected trend was 20 percent of the latter.

[14]The baseline judgment on reoccupancy is that 200,000 of the estimated 580,000 vacant single-family housing units at the end of 2012 will never be reoccupied. This is equivalent to 35 percent of "surplus" vacant units (the number of vacant units at the end of 2012 above what would be expected if actual occupancy were at its trend level). The corresponding optimistic judgment is that 40 percent of surplus units will never be reoccupied. The corresponding pessimistic judgment is that 20 percent of surplus units will never be reoccupied.

The baseline judgment on trend abandonment is that it equals 0.2 percent of occupied single-family units per year, which approximately equals its imputed average rate during the 1990s. The alternative judgments on trend abandonment are that, optimistically, it could equal 0.3 percent of occupied units per year, and pessimistically, 0.1 percent.

The rate at which the gap between trend and projected units closes requires judgments for each year. The judged closure rate, along with trend abandonment and any reoccupancy, together determine the number of starts for a given year. However the total number of starts over the longer term is pinned down by trend abandonment and reoccupancy only. Hence, relatively strong near-term construction growth implies relatively weak construction growth in later years.

The baseline single-family judgments on closure for each year are chosen to imply moderately-strong construction growth rates for 2013 through 2018. In consequence, construction growth in later years quickly decelerates and turns negative. The optimistic judgments on closure are chosen to imply very strong growth rates from 2013 through 2017. These require rapidly decelerating and negative growth rates in later years. The pessimistic judgments on closure are chosen to extend flat single-family construction growth during the first eight months of 2013 through the end of 2014 and thereafter to imply moderate growth rates from 2015 through 2020. As a result, the subsequent deceleration of single-family construction is relatively extended, and the eventual required contraction is relatively moderate.

The online Appendix includes a more detailed description of the baseline and alternative judgments.

[15]The difference between construction and the increase in occupied units is reflected in Chart 6 by the vertical distance between each of the three forecast lines and the blue line measuring the trend increase in occupied units. For the baseline judgments (black line), forecast starts of 840,000 in 2035 increase actual occupancies by 640,000. The difference of 200,000 units is made up primarily of 180,000 trend abandoned units (based on the 0.2 percent annual rate assumed in the baseline). The remaining 20,000 units represent the additional vacant units require to maintain an assumed 2.5 percent trend vacancy rate.

[16]Slowing transitional growth occurs despite the assumption that the rate at which the gap between trend and forecast units never decreases over time. For example, the baseline forecast gap at the end of 2020 is 1.5 million units. The baseline judgmental assumption is that 22 percent of this gap is closed in 2021. Summed together with trend abandonment and the trend increase in vacant units, this implies single-family construction of 1.35 million in 2021, a 1-percent increase from 2020. The implied gap at the end of 2021 is 1.2 million. The baseline assumed closure rate of 28 percent for 2022 implies single-family construction of 1.33 million, a 2-percent decrease from 2021. As a result, growth slows (and becomes negative) despite an increase in the assumed closure rate. The online Appendix tables report the assumed closure rate for each year under the baseline and alternative judgments.

[17]The higher assumed rate of long-term abandonment under the optimistic combination of forecast assumptions is evident in the higher net flow of units from occupied to vacancy and abandonment. (Table 2, column 6O compared to columns 6B and 6P).

[18]Annual multifamily starts peaked at 700,000 units in both 1983 and 1985. The baseline and alternative assumptions project a wide range of possible growth rates in 2013. The projections are based on a Census Bureau preliminary estimate of starts through August 2013. Monthly multifamily starts are considerably more volatile than single-family starts, in large part due to their "lumpiness." The start of construction on a 50-unit multifamily structure is counted as 50 starts. Hence plausible optimistic, baseline, and pessimistic projections for starts in each of September through December imply widely different 2013 year-over-year growth rates (32 percent versus 26 percent versus 16 percent).

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