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Baby Boomers and Equity Returns: Will a Boom in Retirees Lead to a Bust in Equity Returns?

Vanguard research

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Executive summary. Market commentators have long voiced concern about what they see as a potential headwind to the U.S. stock market in the form of baby boomers' retirement. Specifically, some media analysts worry that baby boomers moving into retirement could put downward pressure on equity returns due to retirement-induced equity sales, leading to a decrease in overall demand for U.S. equities. Similar to the well-publicized conjecture that baby boomer savings helped push up equity returns of the 1990s, it has been surmised that a corresponding period *could* result in which baby boomers push those returns down (e.g., Bakshi and Chen, 1994).

This paper examines conventional wisdom on baby boomer retirement and equity returns. We identify three key factors that contradict the presumption that aging baby boomers' investment behavior is likely to damage stock market returns going forward:

- The specific characteristics of the baby boom generation;
- The globalization of U.S. equity ownership; and

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- The lack of any statically significant relationship between age and equity return.

In the absence of concrete evidence that the baby boomer retirement cycle will alter investors' views of U.S. equity market performance in the near to intermediate term, we would caution investors against making significant changes to their strategic asset allocations in response to the boomers' retirement.

For years, the media have spotlighted the size and distinctiveness of the U.S. baby boomer generation. Some industry commentators have noted the connection between baby boomers' prime working years and the strong U.S. economy and financial markets of the 1990s—and, by association, have concluded that boomers contributed to the positive equity market returns.¹ Similarly, some analysts speculate that the boomers' impending retirement will push the United States into uncharted and potentially detrimental demographic territory. Indeed, on the surface, some data appear to support the view of a changing intergenerational relationship between the size of the U.S. labor force and various age cohorts. Population projections display a stark shift in the age distribution of the population—in which pyramids once representing an age distribution that becomes increasingly younger and a growing labor force are transformed into

pillars (as shown in **Figure 1**) demonstrating the diminishing size of the working-age population in relation to retirees.

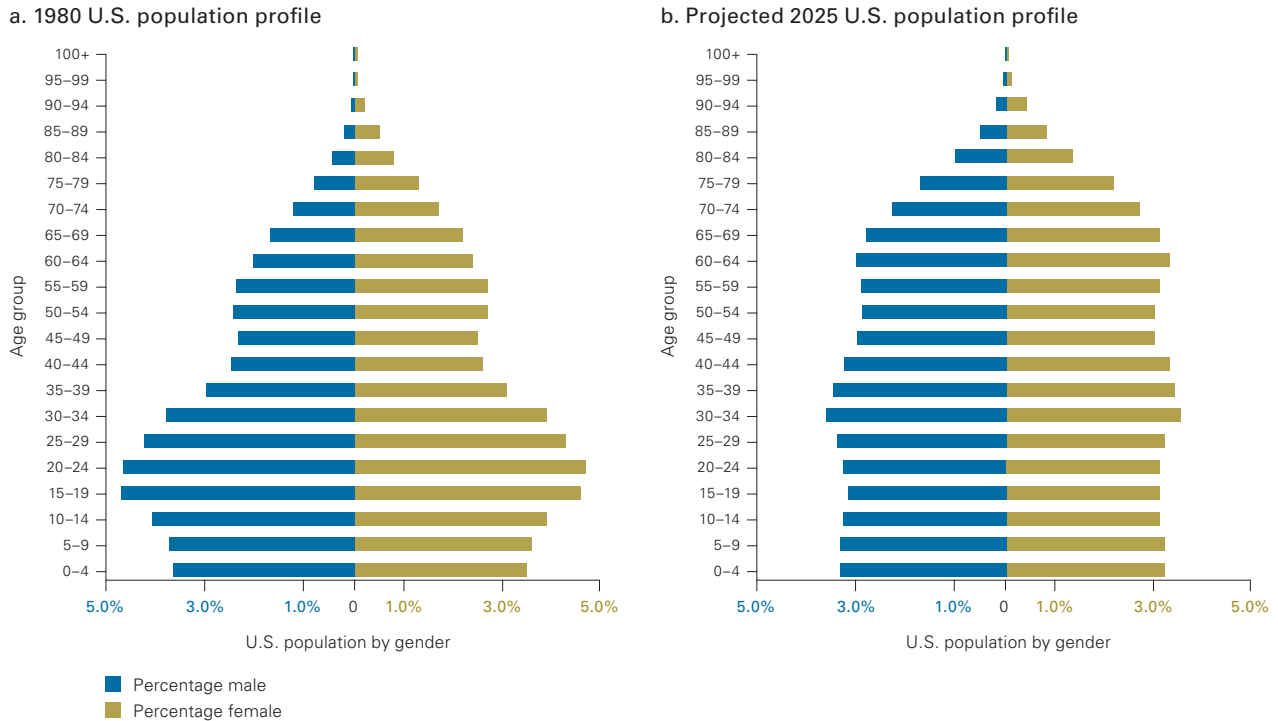
Some investors might anticipate negative pressure on, or even a broad sell-off of, equity prices in the near to intermediate term as baby boomers approaching retirement could be required to liquidate their equity assets for retirement income. However, we view this purported relationship as spurious, for several reasons as discussed in the next section,² including the possibility that other factors are influencing the projected result. Also as we mention later, other factors could be influencing the projected result. A 2006 analysis by the U.S. Government Accountability Office (GAO) of Standard & Poor's 500 Index's stock market returns from 1948 through 2004 supports our stance, pointing out that demographic variables generally accounted for less than 6% of stock market return variability—far less than macroeconomic, financial, and other unexplained variables.

Notes on risk: All investing is subject to risk, including possible loss of principal. Diversification does not ensure a profit or protect against a loss.

¹ The post-World War II baby boom includes those born between 1946 and 1964, according to the U.S. Census Bureau, indicating that the baby boomer cohort is nearing the official retirement age of 65 to 67, depending on the specific year of birth. See Liu and Spiegel (2011), for a recent discussion of this issue.

² Statistically speaking, a spurious relationship is one in which two actions have no direct causal connection, but it is incorrectly inferred that they do.

Figure 1. From pyramid to pillar: Demographic trend of U.S. population by age groups—1980 versus 2025



Note: In Figure 1b, the future level of net international migration affects the number of projected births and deaths, which can affect the population profile as a whole.

Source: U.S. Census Bureau, Population Division. U.S. population data for 1980 (in Figure 1a) are compiled from the Census Bureau's *1980 Census of Population, Volume 1, Characteristics of the Population* (May 1983); the figure aggregates Table 41, "Single Years of Age by Race, Spanish Origin, and Sex: 1980." U.S. population projections for 2025 (Figure 1b) are from the Census Bureau's 2012 National Projections, in "Projections of the Population by Age and Sex for the United States: 2015 to 2060" (NP2012-T12L), Table 12-L (May 2013), derived from an alternative series based on the conservative assumption of low levels of net international migration.

This paper examines data from the Federal Reserve System's most recent *Survey of Consumer Finances* (SCF, 2012) to analyze the composition of baby boomer assets, rather than isolate self-selected variables in a predictive model.³ We also study the relationship between an aging population and equity market returns across 45 countries. Ultimately, we conclude that multiple factors have contributed to what, in our view, are overblown fears of depressed equity prices due to the baby boomer retirement wave.

Generational characteristics

Baby boomers (those ages 46 to 64, based on the 2010 SCF dataset) own a substantial proportion of the U.S. equity market. In total they hold nearly half the U.S. equities counted in the survey (nearly 47%, as shown in **Figure 2**, on page 5), more than five times the 9% owned by the 18 to 45 age cohort. Indeed, investors in the 65 and older age group own the remaining 44% of this generational share.

³ The Federal Reserve's *Survey of Consumer Finances* is conducted every three years by the system's board of governors to provide insight on the financial condition of U.S. families as they undergo economic changes. For the methodology of the SCF, see Kennickell (2000 and 2001) and references cited in both papers.

As mentioned, it has been intuitively assumed that stock market prices are influenced by the supply and demand of equities. That is, when demand for equities is high, prices move up, and when demand for equities is low, prices go down. Therefore, when the baby boomer cohort moves into retirement and decreases its equity allocation, stock prices could decline, *ceteris paribus*—all other things being equal or held constant. This intuition, however, fails to recognize two key factors: first, the concept that all other things will be held equal; and, second, that “other” factors could influence the supply/demand dynamic.⁴ The rest of this paper further explains the factors militating against a significant potential sell-off of equities from baby boomers retiring and then concludes with a look at quantitative metrics corroborating our beliefs.

This paper’s analysis identifies three significant characteristics of baby boom investors that, in our view, should diminish fears that boomers will dramatically divest themselves of U.S. equities.

- ***First, the baby boomer generation spans almost 20 years; therefore, any asset rotation out of equities should be gradual.***

Even if we presume that baby boomers do need to sell equities, there is no reason to expect a sudden spike in outflows. As noted, baby boomers were born over an 18-year time frame, from 1946 and 1964; they are also widely distributed by age across that period. As a result, not all boomers will retire

at the same time, nor will their asset-rotation motives be the same. On average, there should be a gradual shift in the marketplace, depending on life circumstances, which are individualized, exogenous events. The first of the baby boom generation reached age 65 in 2011 (age 59½ in 2005, the earliest age allowed for IRA withdrawals without penalty), and for the 18 years or so following, boomers will be turning 65 at a rate of about 8,000 a day (AARP, 2010).⁵ However, industry statistics show that the majority of investors who own traditional IRAs are unlikely to make a withdrawal from their IRAs before age 70½—once again extending the asset ownership time frame.⁶

- ***Second, the share of equity owned by preretirees (the age of most baby boomers) has been similar over time.***

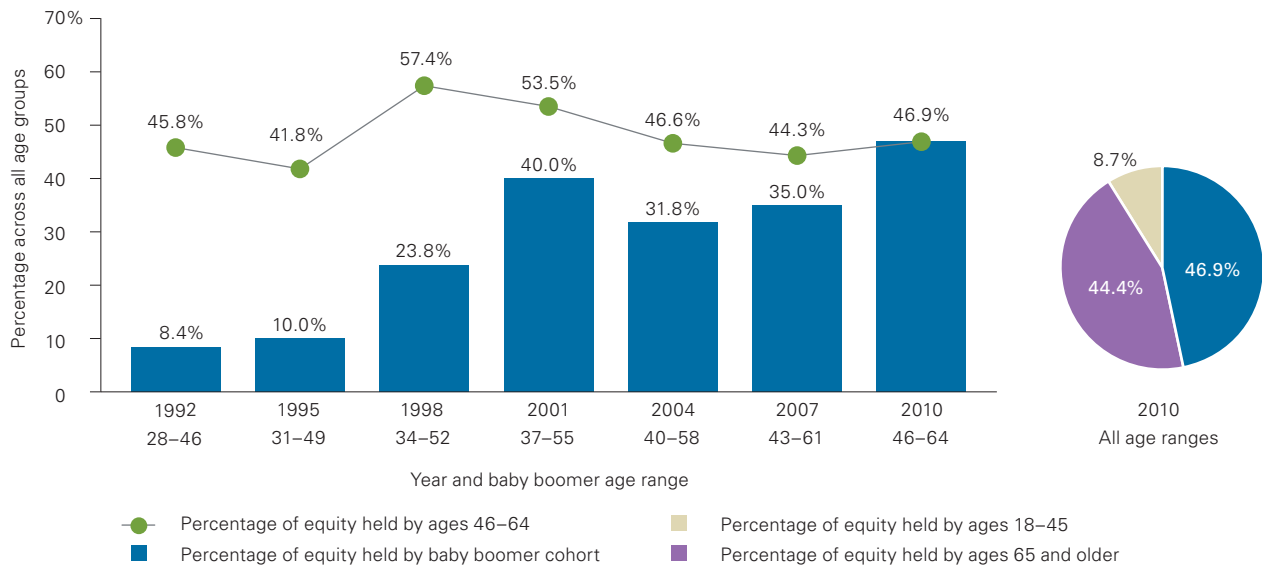
Figure 2 displays the consistent share of ownership by the 46- to 64-year-old age group. Tracing back to 1992 when the baby boomer cohort was 28 to 46 years old, the 46- to 64-year-old age group at that time owned nearly 46% of U.S. equities, only about a 1% difference (a nonstatistically significant change) from what the baby boomer cohort owned as of 2010. Over the 19 years shown in the figure, the percentage of equity held by the 46- to 64-year-old age group has remained near an *average* of 48%, while the baby boomer cohort overall increased its ownership of equities to a close approximation of that average, as expected.

4 The idea that baby boomer equity sales could influence equity market returns is highly predicated on the concept that the number of equity shares outstanding today is constant into the future. Yet, the idea that the number or supply of shares outstanding will remain fixed even for the next 15 years, for instance, is subject to debate. Over the very long term, the capitalization of markets adjusts more due to the number of shares outstanding than as a result of price (Davis et al., 2013). To cite only equity price fluctuations focuses on the demand side of the equation, without adequately accounting for supply fluctuations. For instance, firms could react to an unfavorable pricing environment for their shares by seeking other financing opportunities outside of the equity markets or by buying back shares, which could decrease the aggregate number of shares outstanding and influence returns accordingly. On the other hand, any decrease in demand by baby boomers could be offset by other purchasing groups—possibly other birth cohorts (such as Generation X and Generation Y) or foreign entities.

5 Note that the “normal” retirement age for Social Security increases to 67 for those born after 1960.

6 According to the Investment Company Institute (2013), 21% of households with IRAs took modest withdrawals in 2011. Of those who took a withdrawal, 65% stated they did so to comply with required minimum distribution (RMD) rules.

Figure 2. Baby boomer cohort share of equity is not unusually high



Notes: *Equity* as defined by the Federal Reserve's *Survey of Consumer Finances* (2012) is the total value of financial assets held by households that are invested in direct and indirect stock holdings. "Direct" holdings are those held outside of a managed asset such as mutual funds, trusts, managed investment accounts, annuities, and tax-deferred retirement accounts. Indirect stock holdings include an equity allocation within quasi-liquid accounts such as IRAs, Keoghs, thrift-type accounts, and future and current account-type pensions that allow withdrawals or loans. Data in this figure were filtered based on the age of head of household and then segmented by the case ID's implicate number (set to 1 to avoid inflating the statistical significance of the results).

Sources: Vanguard calculations, using data from *Survey of Consumer Finances* (1992, 1995, 1998, 2001, 2004, 2007, 2010).

During this time, even when the 46- to 64-year-old age group owned approximately 42% to 57% of U.S. equities, we did not experience an equity downturn solely in response to that cohort's retirement. We believe this lack of movement of preretiree ownership of U.S. equities undermines the thesis that the current time is different for baby boomers in terms of their ability to influence U.S. equity returns. Since baby boomer equity ownership on a percentage basis is similar to that of the earlier preretiree group, a unique return pattern brought about by the baby boomer cohort is unlikely.⁷

- ***Third, equity owned by baby boomers is highly concentrated.***

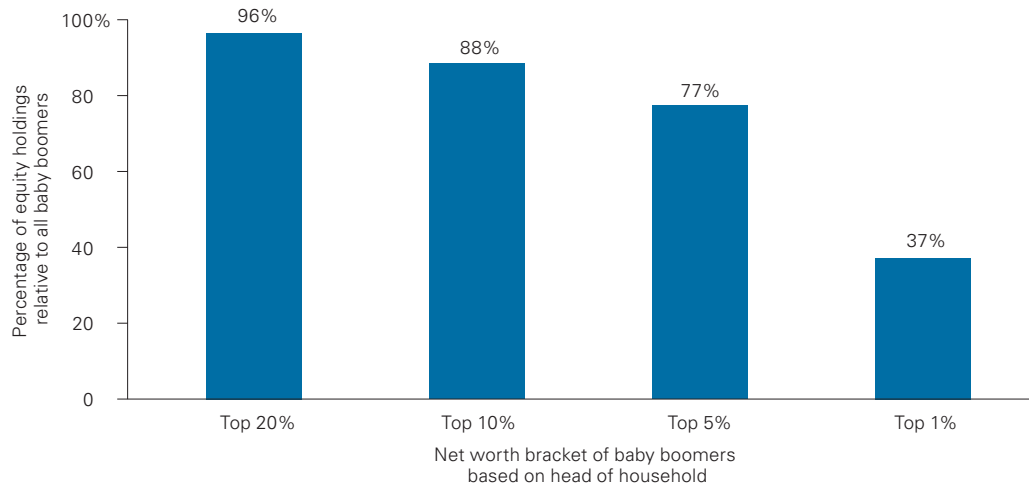
Of the baby boomers who hold equity, we found that assets are highly concentrated among the top 20% of boomers based on net worth.⁸ This group owns 96% of all the equities owned by the baby boomer cohort (see **Figure 3**, on page 6). (The top 5% owns 77% of the equities owned by all baby boomers.)

7 Furthermore, in the Vanguard research paper *Distribution Decisions Among Retirement-Age Defined Contribution Plan Participants*, Utkus and Young (2010) found that older participants terminating from a DC plan in 2008 behaved similarly to retirement-age participants of earlier years, despite the global financial crisis and the severe decline in stock prices in 2008.

8 Net worth is a variable defined in the *Federal Reserve Bulletin* extract data for the *Survey of Consumer Finances* (2012).

Figure 3. Baby boomer equity holdings depend on total net worth

Baby boomer equity holdings are highly concentrated



Notes: See notes to Figure 2 for classification of equity within the *Survey of Consumer Finances* (2012) and explanation of the way data were filtered. Percentage of equity holdings relative to all baby boomers was calculated by summing the total equity in each net-worth bracket and dividing by all the equity held in the baby boomer cohort. Age range of baby boomer cohort in 2010 was between 46 and 64 years of age.

Sources: Vanguard calculations, using data from 2010 *Survey of Consumer Finances*.

The data highlighted in Figures 1, 2, and 3 support three challenges to the alleged link between retiring baby boomers and a steep decline in equity returns. First, baby boomers are *not* a homogenous group; their asset-rotation motives and stages vary; and they cannot be expected to make moves en masse. It's important to recognize that the baby boomer generation as a whole will *gradually* move into retirement because their population distribution by age is widely spread over 19 years (1946–1964). Forty-nine percent of baby boomers are in the “leading” group (55 to 64 years old), and 51% are in the “late” group (46 to 54 years old).⁹ Second, the current share of equity ownership for the baby boomer cohort is not unusually high, and since 1992 the percentage of equity held by the age range of 46 to 64 has been steady, at about 48%,

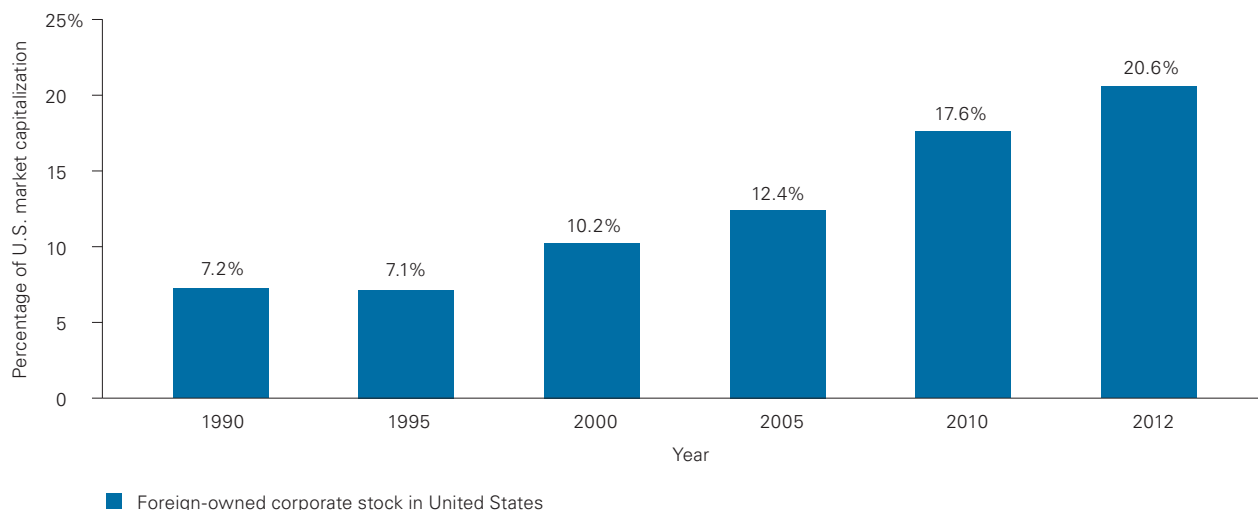
as stated earlier. And, third, since equity ownership is concentrated among those with greater aggregate assets, the portfolio goals of these baby boomers may well be oriented toward estate planning and intergenerational wealth transfers, so long-term equity ownership can greatly benefit long-term portfolio returns.

Another question worth considering is: What is the asset allocation of those in retirement? All baby boomers, regardless of their equity wealth, will face some common questions regarding life circumstances during their retirement that could compel them to alter their asset allocation. Some issues that could arise for the boomers include the risk of outliving their savings, unforeseen health shocks, and potential bequest goals.

⁹ The figures of 49% and 51% are based on 2012 national annual resident population estimates as of July 1, 2012, released in June 2013 by the U.S. Census Bureau, Population Division.

Figure 4. Foreign demand for U.S. equities has persisted

Foreign holdings of U.S. equity as percentage of total U.S. equity market capitalization



Sources: Vanguard calculations, using data from World Bank and U.S. Bureau of Economic Analysis. Total U.S. equity market capitalization was derived from the World Bank database; data on foreign-owned corporate stock in the United States were obtained from the Bureau of Economic Analysis “U.S. Net International Investment Position News Release” for each year cited in this chart (data usually available in June of the following year).

For baby boomers with equity exposure, their holdings may represent a hedge against these risks and encourage them to retain their equity allocation. Indeed, some evidence appears to support this point of view. According to the *Survey of Consumer Finances* (2012: Table 7), equities continue to constitute a sizable portion of financial assets owned by retirees, with those aged 65 or older holding approximately 44% of their financial assets in equities.

Globalization and growth of foreign demand for U.S. equities

In addition to our analysis of the composition of baby boomer assets, we identified a significant growth trend that should not be overlooked as baby boomers move into retirement. Most notable is the

continued and persistent foreign demand for U.S. equities. According to the U.S. Department of the Treasury, net purchases of U.S. equities by foreign institutions have been steadily increasing, with approximately \$109 billion in net foreign purchases in 2012, versus less than \$6 billion in 1980. Net purchases remained positive on an annual basis through the 2007–2009 U.S. economic downturn. Continued globalization is a reminder that U.S. investors are not the only buyers—thus dampening the hypothetical impact of a domestically driven equity sell-off based on baby boomers retiring. **Figure 4** illustrates the percentage of U.S. equities owned by foreign holders. Overseas ownership of U.S. stocks increased by a factor of 3 over the two decades ended 2012—from just 7% in 1990 to nearly 21% by year-end 2012.

How do U.S. labor-force demographics compare to rest of the world?

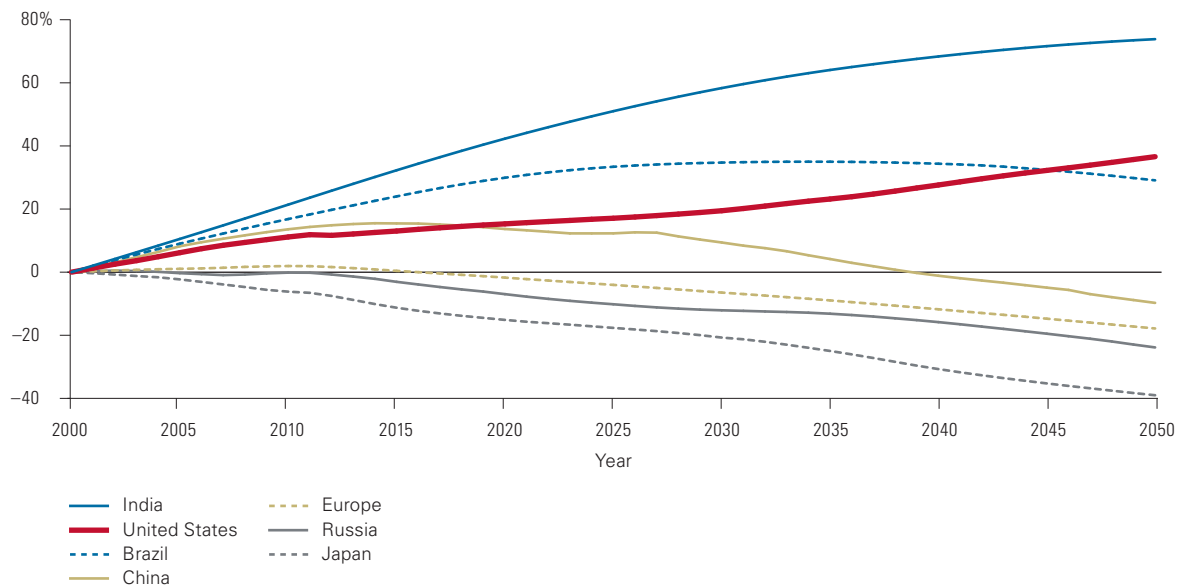
Given that a large portion of the population will be moving into retirement over the next few decades, one may ask how U.S. labor-force demographic trends are faring relative to the rest of the world. **Figure 5** projects labor-force growth for the United States and several other countries for the period 2000–2050.

Figure 5 illustrates two points about what the future may hold. First, labor-force growth is trending *positively* in the United States. Rather than losing working-age individuals on a net basis, the United States is projected to experience an increase.

Second, this growth projection is favorable relative to several other major economies. China, which has benefited from a demographic tailwind in the recent past, is projected to reverse that trend and experience negative labor force growth toward midcentury. Population growth is a key component of aggregate hours worked, directly affecting real gross domestic product (GDP) growth. Another key component in this equation is labor productivity growth. The Congressional Budget Office (2012) has projected U.S. labor productivity growth for 2012–2022 to be roughly in line with that of the past 60 years—not a decrease due to demographics.¹⁰

Figure 5. Projected labor-force growth in United States will outpace that of most countries

Projected cumulative growth in 15 to 64 age group: 2000–2050



Notes: The U.S. Census Bureau's International Data Base population projections, spanning each calendar year shown here through 2050, are projections of the *potential labor-force* (defined as the resident population ages 15 to 64) based on the Census 2000 and projected forward using historical trends in vital statistics and international migration. The Census Bureau relies on data and administrative statistics published by each country.

Source: U.S. Census Bureau, International Data Base.

¹⁰ The CBO (2012) reported annual labor productivity to be 1.8% from 1950 through 2011 and projected it to be 1.7% annually from 2012 through 2022.

Figure 6. No significant relationship exists between proportion of U.S. retirees and long-term stock returns

Time-series correlation between U.S. retirees and long-term stock returns: 5.7%



Notes: U.S. total stock market is represented by a spliced benchmark of the following indexes: Standard & Poor's 90 Index (January 1926 through March 1957), S&P 500 Index (April 1957 through December 1974), Wilshire 5000 Index (January 1975 through April 2005), MSCI U.S. Broad Market Index (May 2005 through June 2013), and CRSP U.S. Total Market Index thereafter. The compiled historical data for U.S. total resident population for ages 65 and older (January 1926 through July 2013) was derived from Moody's Analytics database, at DataBuffet.com.

Sources: Vanguard calculations, using data from U.S. Census Bureau, and Moody's Analytics.

Link between aging population and equity returns?

Although the composition of baby boomer assets and recent paradigm shifts help to nullify gloomy assessments of the effects of an aging population on U.S. equity returns, we also used quantitative metrics to assess the issue of age and long-term equity returns. Even a casual glance at the U.S. experience raises doubts about the claims made by some that an aging population is bearish for U.S. stock returns. **Figure 6** highlights the lack of a relationship between the percentage change in U.S. retirees (aged 65 years and older) and the level of long-term stock returns. Population data, a slow-moving metric, displayed no clear relationship to the frantic peaks and troughs of U.S. stock returns.

We took our analysis a step further by looking at the cross-country relationship between an aging population (change in percentage of population aged

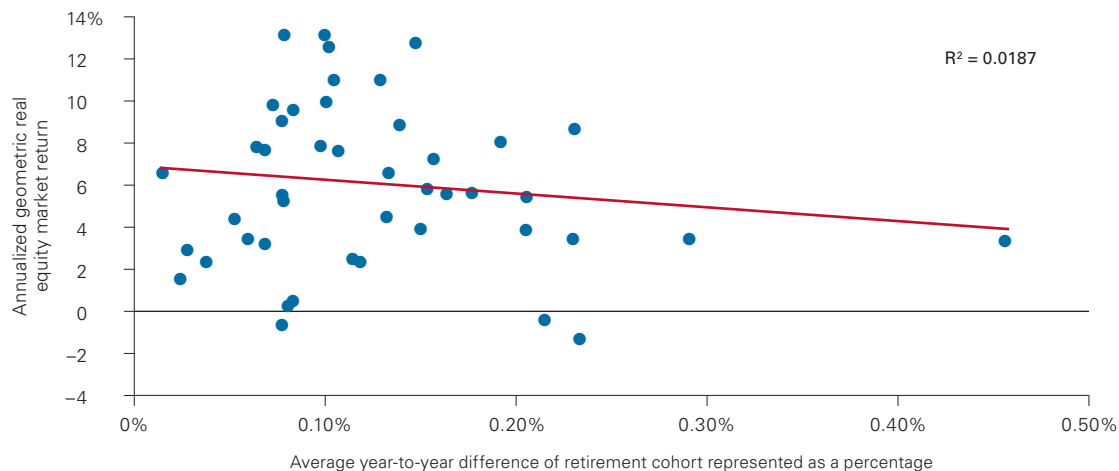
65 and older) and real stock returns. Our results, shown in **Figure 7**, on page 10, confirm the lack of a relationship between these two metrics across 45 developed and emerging economies for various periods starting in 1980. As with all regression-analysis results, if a relationship existed between these two factors, a line in **Figure 7** would be sloped in one direction or another to show either a positive or negative relationship. However, as the data show, the line representing the two factors is relatively flat, indicating that no meaningful relationship exists.

Conclusion

Although striking demographic changes are occurring in the United States as the sizable baby boomer generation ages and life expectancy continues to extend significantly, we find no credible evidence that these changes will negatively affect future stock returns.

Figure 7. Alleged relationship between population changes and inflation-adjusted stock return is weak across countries

Cross-country population changes versus inflation-adjusted stock returns
(country data from 1980, as available, through 2011)



Notes: Figure includes data for 45 developed and emerging market countries. We included all members of the FTSE All World Index, except for Taiwan and United Arab Emirates owing to a lack of either population, equity market, or gross domestic product deflator data. Equity return data are in real local terms, with nominal index returns deflated using each country's respective GDP deflator from the International Monetary Fund database. Time frame for each country depended on availability of real stock-return data ranging from 18- to 31-year periods beginning in 1980. FTSE individual country stock data that were unavailable were spliced with their respective MSCI country index. The retirement cohort is defined as aged 65 or older.

Sources: Vanguard calculations, based on data from International Monetary Fund, MSCI, and FTSE.

As this paper has discussed, numerous factors influence long-term stock returns, and, historically, demographics have contributed only modestly to ultimate stock returns. Specifically, we found three key factors that diminish the probability of a significant and simultaneous equity sell-off by baby boomers. First, although the boomer generation is sizable, it is also like other generations in that it is spread over two decades—significantly reducing the prospect that of all its members will act in concert. Second, the amount of equity owned by preretirees today is, despite the size of the boomer population, similar to that of other previous generations, implying that the impact of these investors might well be similar to that of the past. Third, equity ownership is highly concentrated within the baby boomer cohort, with the wealthiest 10% owning 88% of the generation's stock holdings.

In addition, continued globalization and its impact on stock ownership could further diminish the affect of the U.S. baby boomer generation on future stock

returns. By year-end 2012, nearly 21% of all U.S. stocks were held by foreign investors, compared with just 7% in 1990.

Compounding these findings is that we identified no consistent, long-term relationship between U.S. stock returns and the percentage of the population over age 65. This finding was also true when we assessed the same age-to-stock-returns relationship from a broader set of countries.

As a result, Vanguard suggests that although the ongoing demographic shift in the United States may continue to receive broad news coverage, investors would be well served to ignore the media's claims of a relationship between this shift and future equity returns. Thus, we recommend that investors avoid making hasty changes in their long-term strategic asset allocation in response to baby boomers' retirement.

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