Will the Retirement of Canadian Baby Boomers Deflate Asset Values?

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Abstract: From 1946 to 1964, Canada experienced relatively high fertility rates and the generation born during that period is referred to as baby boomers. The baby boomer generation is significantly larger than preceding and successor generations. During the period 2015 to 2025, many of the baby boomers will cease active paid employment. Various studies suggest that the baby boomers have not saved sufficiently to provide for their retirement. It is anticipated that the baby boomers will have to liquidate some or all of their assets to supplement their retirement income. This research will consider the likely size of the asset liquidation and estimate the impact that an asset liquidation of such magnitude may have on asset prices.

Canada has a relatively well developed system of financial support (SFS), including Old Age Security, Canada/Quebec Pension Plan, Guaranteed Income Supplement, universal health care, and some government-financed long-term care. For this research, it will be assumed that Canadians will rely on the SFS before liquidating their assets. To determine the extent to which assets will be liquidated, Canadians' net income requirements in excess of income from the SFS are estimated. It is assumed that the net income requirements will be met in the following priority order: by registered pension plan income; through liquidation of non-registered and registered savings; and finally by the sale of a home that is owned.

1.0 INTRODUCTION

From 1946 to 1964, Canada experienced relatively high fertility rates and the generation born during that period is referred to as baby boomers. The baby boomer generation is significantly larger than preceding and successor generations. During the period 2015 to 2025, many of the baby boomers will cease active paid employment. Various studies suggest that the baby boomers have not saved sufficiently to provide for their retirement (e.g., CIA 2007).

It is anticipated that the baby boomers will have to liquidate some or all of their assets to supplement their retirement income. This paper estimates the likely size of the asset liquidation and estimates the impact that an asset liquidation of such magnitude may have on asset prices.

Canada has a relatively well developed system of financial support (SFS), including Old Age Security (OAS), Canada/Quebec Pension Plan (C/QPP or CPP if only Canada Pension Plan), Guaranteed Income Supplement (GIS), universal health care, and some government-financed long-term care (LTC). For this research, it is assumed that Canadians will rely on the SFS before liquidating their assets. To determine the extent to which assets will be liquidated, both the income from SFS and the projected expenditures are estimated, in order to produce an estimate of Canadians' net income requirements in excess of income from the SFS. It is assumed that the net income requirements will be met in the following priority order by annuitizing the asset to provide income for the expected remaining lifetime: by registered pension plan income and assets; through liquidation of other non-registered and registered financial assets; and finally by the sale of a home that is owned.

Retired Canadians may be considered to be in three broad groups: those without additional assets who are dependent on the SFS; those with additional assets, which in combination with SFS, are estimated to be within the range of 85% to 115% of adequacy based on life expectancy, assuming reasonably good health; those with additional assets in excess of 115% of adequacy based on life expectancy, assuming reasonably good health. The first group do not have any additional assets to liquidate. The second group will need to liquidate its assets during retirement and the timing may be impacted by health events and so the liquidation may affect asset prices. The third group may liquidate some assets but the liquidation will have a significant discretionary component and so may be less likely to affect

asset prices. The focus of this research will be in identifying the income requirements and required asset sales of those in the second group, who are referred to as the target group.

Since an objective of the research is to estimate the impact on asset prices, the research considers:

- The extent to which the liquidation of savings will impact asset prices;
- The extent to which house sales may be required and may affect prices.

The next subsection outlines the main components of the SFS. Full details can be found in other sources. The second section outlines the data sources, methodology and assumptions used. The study focuses on those attaining age 65 in the period 2016 to 2026. This section shows the projected expenditures, presents the modelling approach used to estimate future net income requirements, and describes the approach used to determine assets of the individuals under consideration. The third section shows the expected shortfall of income over expenditures and the amount of assets required to be liquidated expressed in terms of the single premium of a life annuity, by household type. The fourth section shows the projected liquidation of assets in aggregate for all household types, and discusses the potential impact on asset prices that such liquidation will require, by making comparison to market measures. The fifth section discusses limitations with the methodology and the likely impact of the limitations on the research findings. It also presents areas for future research. The last section summarises the results and presents the conclusions of this research.

1.1 STATE PLANS

For the target group, the main financial components of the SFS are the C/QPP and OAS. These individuals are unlikely to receive GIS, unless their other assets are expended.

The health care and LTC expenses incurred by an individual in retirement to the end of life can vary widely, due to illness severity, the chronic nature of some conditions, and the

number of years lived. Citizens of countries lacking substantive programs of state-provided health care and LTC need to hold a significant contingency reserve due to their financial exposure to the amount and variability of health and LTC expenses. A valuable component of Canadians' support systems is universal health care and some government-financed LTC. These programs permit the individuals to preserve their financial assets while having access to a wide range of medically necessary health care and some LTC. Hence the existence of these programs is important since it reduces the required expenditures of retired Canadians. Once the major component of health care expenses and some LTC expenses are removed as an individual's responsibility for retired Canadians, the expected pattern of expenditure is reasonably stable.

C/QPP is a final average earnings pension plan, paid for by employees and their employers. It covers most working Canadians. It provides a pension based on length of contributory service of approximately 25 per cent of final average earnings up to the Year's Maximum Pensionable Earnings (YMPE), which is approximately the average wage for Canadians. In 2012 the YMPE is $50,100. No pension benefit is earned on earnings in excess of the YMPE, so the pension decreases as a percentage of earnings for those earning in excess of the YMPE. The age of full entitlement is 65; although, individuals may elect to receive their pension, with reduction, as early as age 60, or as late as age 70, in which case the pension would be increased. The pension is indexed to increases in the Consumer Price Index (CPI).

OAS is a demogrant to those of age 65 and over who meet certain residency requirements. At the maximum, it provides an additional benefit of approximately 15 per cent of the YMPE. The pension is indexed to increases in the Consumer Price Index (CPI). It is subject to claw back, a euphemism for tax recovery, at the rate of $0.15 per one dollar of excess income when income exceeds a threshold of $67,668 (in 2011).

GIS is a monthly benefit for those with low income. It will be assumed that the target group in this paper will have sufficient income from other sources that they will not be eligible for GIS.

The sources of retirement savings which the target group may have are registered pension plans (RPP) through their employer, Registered Retirement Savings Plans (RRSPs), a home, and other savings.

2.0 DATA SOURCES, METHODOLOGY AND ASSUMPTIONS

The call for research to which this paper responded, specified the study period to be from 2015 to 2025. Until recently, a full Canadian census has been held in years ending in one, with updates in years ending in six; accordingly population projections are available for the years 2016 to 2026. This paper examines the projected asset drawdown for the period 2016 to 2026.

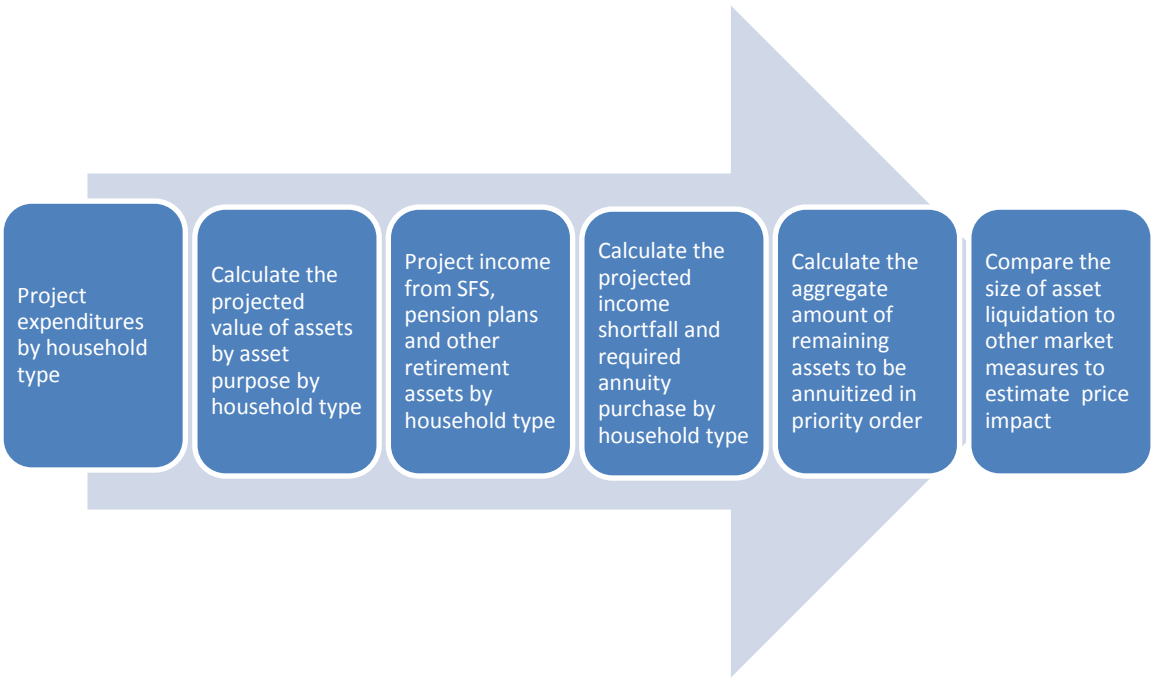
The baby boom generation is usually considered to be those born between 1946 and 1964. If we assume a typical retirement age of 65, then not all of the baby boomers will have retired until 2029. Hence, the requested study period may be too early to project the potential severity of any asset drawdown. The potential shortfall and required asset drawdown was examined by each birth year from 1946 to 1961 at the point that the individual reaches age 65. However, for the purpose of exposition, the results are often shown only for 2016, 2021, and 2026.

This research was performed by the author, and by S. Chitnis and J. Horsted as part of their Master of Science program at the University of Southampton. This paper presents an overview of the research and identifies areas where this research's assumptions diverge from that contained in the students' dissertations. Greater detail on methodology and results for other years can be found in those dissertations.

Much of the historical data is based on reports by Statistics Canada and Service Canada. The assumptions regarding future wage and price inflation follow the assumptions used by the Office of the Chief Actuary in the recent actuarial report on the CPP, i.e., OCA, 2010. Unless specified herein, where other economic assumptions are required they were based on the economic statistics in CIA, 2011.

The research followed the process outlined in the figure below.

Figure 1: Schematic of Research Process



2.1 EXPENDITURE PROJECTIONS

Two studies by Statistics Canada (2005, 2010b) provided the basis for the projection of expenses. Total expenditure data is available for couples both aged 65, single males age 65 and over, and single females age 65 and over. It is assumed that no other dependents will be in these households. Total expenditure includes the total current consumption plus personal taxes, personal insurance payments, pension contributions and donations. Total expenditure was projected forward to the period 2016 to 2026, using the assumed rates of price inflation

presented in the most recent actuarial report on the CPP (OCA, 2010). The base for projection is the spending of those age 65 and over in the base year.

The results of the expense projection by year are shown in the following table.

Table 1: Projected Annual Expenditures for Households Age 65 or Older

Year	Couple	Single Male	Single Female
2016	62,148	34,201	28,059
2017	63,454	34,920	28,648
2018	64,850	35,688	29,278
2019	66,341	36,509	29,952
2020	67,867	37,348	30,641
2021	69,428	38,207	31,345
2022	71,025	39,086	32,066
2023	72,658	39,985	32,804
2024	74,329	40,905	33,558
2025	76,039	41,846	34,330
2026	77,788	42,808	35,120

2.2 PROJECTED INCOME FROM STATE PLANS AND OTHER ASSETS

The CPP and OAS for the period 2016 – 2026 were projected using data available regarding 2011 levels of CPP and OAS (Service Canada, 2011). The basis for projection for CPP was the average level of CPP pension to an individual turning age 65 in 2011. This was projected forward using the wage inflation assumptions in the most recent report on the CPP (OCA, 2010). The basis for projection for OAS was the maximum OAS benefit in 2011. This was projected forward using the price inflation assumptions in the most recent report on the CPP (ibid).

It was also necessary to project any other assets held by the household. Meh et al. (2009) show the value of total wealth held by Canadians in 1999 and 2005, in constant 1999 dollars. As the expenditure data is in current dollars, the values in Meh et al. (ibid) were converted to current dollars by multiplying by the CPI index from 1999 to 2005. Additional explanation regarding the asset values is provided in the next two sections.

The data in Meh et al. (ibid) is summarized in various ways. There is a breakdown of assets by asset purpose, i.e., retirement, business equity, real estate and financial assets, and a breakdown of financial assets by asset type, such as equity, bonds, mutual funds, and deposits. Debt is also shown. There are also breakdowns showing the average assets held by age band and by marital status (single/married). However, the summaries do not present the information in the form required for this research, so certain assumptions were made in order to convert the data to the desired form. An overview of the approach used follows. See the dissertations of Chitnis (2011) and Horsted (2011) for additional detail.

The average wealth by age band was divided into household type, using factors developed based on the information in Meh (2009). These assets were further subdivided by asset purpose using the information in Meh (ibid). This categorization of the data formed the basis for wealth projection to the year in which the individual would attain age 65.

Since all of the baby boomers in this study are assumed to continue to work beyond 2005, it was necessary to project future contributions and service to RPP and RPSPs, as well as to project forward accumulated retirement assets in 2005. RPP and RPSPs are aggregated as retirement assets. The income for households is affected by whether there are one or two earners and whether the main earner is male or female.

It was assumed that the only additional savings would be with respect to retirement assets; however, the value of accumulated wealth is considered to grow due to asset appreciation and inflation. The net wealth data by household type, expressed in current dollars, was projected forward to attainment of age 65. Chitnis (2011) used a real growth rate of wealth of 3.73% per annum and used the actual returns on real estate from CIA (2007) through 2010 and thereafter the real return growth assumptions from OCA (2010). The results of such projections suggest asset values that are substantial. For this paper, a more

conservative projection of assets was used. The growth rates of wealth and of real estate values used by Chitnis (2011) were reduced by 2 per cent per annum.

The income from SFS, pension plans, and other earmarked retirement assets, is compared to projected expenses, by household type. Any shortfall is converted to the single premium for a life annuity. To purchase the annuity, assets are liquidated in priority order; first, financial assets, and if those assets are insufficient to meet the income shortfall, then by sale of a home.

3.0 PROJECTED SHORTFALL BY HOUSEHOLD TYPE

The projected income from SFS, pension plans, and earmarked retirement assets, less projected expenditures produced the shortfalls, which are summarized in the following four tables for male-headed dual-income mixed-sex couples, male-headed single-income mixed-sex couples, single males, and single females. For results for other household structures and for a detailed description of the methodology, see Horsted (2011).

Table 2: Male-headed Dual-income Mixed-sex Couple Age 65 in Year Shown

Annual Amount	2016	2021	2026
Expenses	62,148	69,428	77,788
CPP	15,678	18,495	22,073
OAS	13,991	15,630	17,512
Retirement Assets	24,351	25,793	28,324
Shortfall (annuity required)	8,128	9,510	9,879
Shortfall (purchase price of required annuity)	167,758	199,769	211,159

Table 3: Male-headed Single-income Mixed-sex Couple Age 65 in Year Shown

Annual Amount	2016	2021	2026
Expenses	62,148	69,428	77,788
CPP	8,921	10,524	12,560
OAS	13,991	15,630	17,512
Retirement Assets	18,112	19,172	21,104
Shortfall (annuity required)	21,124	24,102	26,612
Shortfall (purchase price of required annuity)	436,005	506,307	568,797

Table 4: Single Male Age 65 in Year Shown

Annual Amount	2016	2021	2026
Expenses	34,201	38,207	42,808
CPP	8,921	10,524	12,560
OAS	6,995	7,815	8,756
Retirement Assets	8,523	9,653	11,169
Shortfall (annuity required)	9,761	10,215	10,324
Shortfall (purchase price of required annuity)	201,475	214,589	220,655

Table 5: Single Female Age 65 in Year Shown

Annual Amount	2016	2021	2026
Expenses	28,059	31,345	35,120
CPP	6,757	7,971	9,513
OAS	6,995	7,815	8,756
Retirement Assets	5,203	6,060	7,256
Shortfall (annuity required)	9,103	9,499	9,594
Shortfall (purchase price of required annuity)	209,007	220,945	226,039

The order in which other assets are deemed to be liquidated in order to eliminate the shortfall required to pay the purchase price of the required annuity was to sell business equity, followed by financial assets (in the order deposits, stocks, mutual funds, other), and finally to sell real estate. The following table shows that most households would be required to sell real estate in order to meet the income shortfall, but are projected to have sufficient assets in aggregate. However, households of single males reaching age 65 in 2016 and 2026, and couples with a single earner who is a female reaching age 65 in 2026, are projected to have insufficient assets to meet income requirements, as shown by the asterisks.

Table 6: Requirement to Sell Real Estate to Meet Shortfall at Age 65

Household Composition	2016	2021	2026
Male-head Dual Income Couple	No	No	Yes
Male-head Single Income Couple	Yes	Yes	Yes
Male Single	Yes*****	Yes	Yes*****
Female Single	Yes	Yes	Yes
Female-head Dual Income Couple	Yes	Yes	Yes
Female-head Single Income Couple	Yes	Yes	Yes*****

4.0 ASSET DRAWDOWN

By using population projections (Statistics Canada, 2010a) and information derived from the 2006 census data available on the Statistics Canada website, an estimate was made of the number of family units in each of 2016, 2021 and 2026, classified in accordance with the household composition shown in Table 6. It was assumed that any sales of business equity would not have an impact on asset prices, either because it was a small number of shares in large publicly traded companies or because it would be ownership interests in private companies. The following table shows the total amount of assets, other than retirement, business equity and real estate, available for sale by those projected to turn age 65 in 2016, 2021 and 2026. It is interesting to note the decline in asset values for baby boomers born later. This group's assets may be lower on average than baby boomers born earlier because the earlier boomers had the first opportunity to acquire the better paying jobs and because the earlier baby boomers may have had more assets invested during the equity boom in the 1990s. These results and the results presented in Table 6 tend to support Robert L. Brown's (verbal but apparently not written) assertions that, on average early boomers are better off than later boomers.

Table 7: Financial Asset Values for Those Attaining Age 65 in the Year Shown Excluding Retirement, Business Equity and Real Estate

Year	Asset Value ($ billions)
2016	28.5
2021	38.5
2026	18.9

The question this paper seeks to answer is will asset sales of the magnitude shown in Table 7 impact asset prices? Table 8 shows statistics with respect to trading value on Canada's main stock exchange, the TSX. As can be seen the amount of assets to be sold, as shown in Table 7, is small in comparison to trading values shown in Table 8. Moreover, the

values shown in Table 7 are in current dollars, i.e., include inflation to the year shown, whereas the figures in Table 8 in 2011 dollars and are likely to increase in subsequent years because of inflation.

Table 8: TSX Trading Values

Description	Value ($billions)
Value traded on Dec. 13, 2011	6.1
Value traded in Nov. 2011	112.7
Value traded in 2010	1,263.8
Average daily volume 2011 YTD	6.0
Average daily volume 2010	5.5

A similar approach was used to estimate the value of real estate to be sold, if all those projected to turn age 65 in the 2016, 2021 and 2026 were to sell their house in that year. The results of the calculation are shown in Table 9.

Table 9: Real Estate Asset Values for Those Attaining Age 65 in the Year

Year	Asset Value ($ billions)
2016	74.9
2021	96.9
2026	127.9

For the first eleven months of 2011, the value of residential real estate sales across Canada is estimated to be approximately $150 billion. The value of real estate shown in Table 9 is unlikely to have an impact on prices, especially when house price inflation that may occur in the future is taken into consideration. However, real estate is less liquid than most other financial assets and also involves a significant single purchase. If there is strong demand to sell homes by baby boomers there is potential for prices to be somewhat depressed in thin markets.

Writing with respect to the United States, Liu and Spiegel (2011) find a strong relationship between the age distribution of the population and stock market performance.

They argue that as the members of the baby boom generation reach retirement age, they are likely to shift from buying stocks to selling their equity holdings to finance retirement. Their statistical models suggest that this shift could be a factor holding down equity valuations over the next two decades. Chitnis (2011) used Canadian historical data and calculated the ratios described by Liu and Spiegel (2011). Canadian data did not show a relationship between the age distribution of the population and stock market performance.

5.0 LIMITATIONS AND AREAS FOR FURTHER RESEARCH

This research concerns a future period and involves many assumptions in order to make the projections. It is unlikely that all assumptions made will be realised. In this subsection, some of the major methodological approaches used and their impact on the results are discussed.

First, the projections are based on historical information. The assumption is made that there will not be any substantive changes in past behaviour or in the relationships among variables. For example, it is assumed that there will be no change in consumption patterns over time, no change in the relative weight of the basket of expenditures, and no change in personal taxes relative to total expenditures. It is also assumed that couples would have the same level of expenditure regardless of whether they had been a single earner couple or a dual earner couple prior to retirement. Over the projection period, it is quite likely that the weights of items in the basket will change. Furthermore, if as is projected by this research, some households have shortages of income, it is possible that their expenditure patterns will change.

Similarly, it is assumed that individuals will continue to have the same preferences for the type of asset holdings as they have had historically; but these preferences may also change. On the one hand, people may consider the risk/return payoff on equities to be too risky for those at advancing ages and may reduce equity investments. On the other hand,

those facing potential income shortfalls may be more willing to take equity risk in the hope of achieving sufficiently high returns to close the income gap. Furthermore, if Canadians were to change substantially their preference for living in a home that they have purchased, to living in rental accommodation, the selling price of homes might be depressed.

Second, the amount of assets to be liquidated to meet the income shortfall is calculated as the purchase price of a life annuity. It is unlikely that many Canadians will choose to liquidate the majority of their assets to purchase annuities because people are generally averse to purchasing an annuity. They are more likely to liquidate some of their assets to meet immediate income shortfalls, resulting in a gradual drawdown of assets.

Accordingly, this methodological approach is likely to overstate the severity of any asset drawdown in the short term. This will mean that the severity of any insufficient savings will be deferred to a time beyond the study period. Also the problem of any insufficiency of savings will manifest itself as an elderly poverty problem rather than as a problem of asset devaluation.

This study finds that there is unlikely to be any significant impact on asset values due to the Canadian baby boomers' retirement and asset liquidation, except possibly with respect to real estate values in certain thinly traded markets. Although the methodology of asset liquidation to purchase annuities likely overstates the amount and timing of asset drawdown, it does not affect the conclusions of this study regarding the impact of asset drawdown on asset price.

Third, the study uses households as the key unit of analysis and shows average asset values and wealth by household of various compositions. The average asset holding and average wealth is one, rather crude, measure of the underlying distributions. Undoubtedly there will be those with fewer assets than the average that will have insufficient assets and there will be those with more assets than average that will have sufficient assets and for

whom there may be no shortfall in any circumstance. In situations where it is indicated that the average asset holding must be annuitized, in full or in part, the study likely over-estimates the amount of asset sales. This is because the study assumes that all households will sell the amount of assets required to meet the shortfall, whereas those with less assets than the average required amount will only be able to sell the assets held. In respect of this paper's objective to determine what impact, if any, asset drawdown may have on asset prices, the use of averages will overstate the impact.

5.1 AREAS FOR FUTURE RESEARCH

The findings of this paper could be enhanced through research in the following areas. First, it would be useful to have more information regarding households. For example, it would be useful to have asset holdings by household composition. It would also be useful to have expenditure information by household composition. It would also be useful to have information regarding age differences in two-member households. In this study it was assumed that both household members would be the same age.

Second, it would be useful to have more information regarding spending patterns for those ages 65 and over. For example, it is quite possible that spending patterns change as people age 65 and over age, as their financial circumstances change, as their health status changes, and with the death of one member of the household. It would also be useful to understand substitution effects on the basket of goods purchased by the elderly as their uncertainty regarding the adequacy of income and assets increases. MacDonald et al. (2010), in a study of expenditures on basic needs by the elderly in five Canadian urban centres, find variation in the threshold of expenditures by urban centre. It is quite possible that the threshold would vary further for rural areas. It would be useful for such research to be performed. It would also be useful to understand the behaviour of elderly Canadians with

respect to moving to areas of lower expenditure requirements (in the face of potentially inadequate income).

Third, although this research indicates that there need be little concern that asset liquidation will result in price declines in Canada, the research does indicate that there should be concern regarding inadequate saving for retirement by some Canadians. It is likely that the adequacy will be much more significant at a later period than the study period. Research that provided additional information regarding inadequacy and its severity would be useful, particularly if it informed saving and investment decisions.

6.0 CONCLUSIONS

This research has developed a model to project the average and aggregate asset holdings of those attaining age 65 in the period 2016 to 2026, by family composition. After projecting the expenses, income from SFS, pension plans and retirement assets, by family composition, it determines the average income shortfall. The paper uses the assumption that individuals faced with shortfalls will liquidate sufficient assets to a purchase an annuity to cover the shortfall. In practice, it is unlikely individuals will purchase annuities. They are more likely to drawdown assets as required. However, since one objective of this research is to determine whether the liquidation of assets may have an impact to depress prices, this methodology is likely to overstate any such depressive impact on prices.

The research shows that there are some family compositions for which projected average asset holdings may be insufficient to meet expenses. This is consistent with research such as CIA(2007); however, the use of averages masks the severity of the problem for those who have assets below the average. There is potential that the shortfall in assets may become a serious matter in the years beyond the study period.

The reasons for this concern are as follows. Individuals are more likely to drawdown assets to meet their current requirements rather than to plan for their lifetime, e.g., by purchasing an annuity. This study assumes mortality improvements; however, over even longer periods than this study examines, greater mortality improvements are possible. This will increase the likelihood that there will be a surviving member of a family unit that may outlive the assets. The projected wealth figures have been based on averages. The distribution of wealth is different from the average, so there will be those with fewer assets than the average that will have insufficient assets.

In order to purchase the annuity in respect of the income shortfall, the assets are assumed to be liquidated in priority order; first, by sale of financial assets, last, by sale of a home. As shown, the aggregate value of asset sales required is not significant compared to the value of current sales of similar assets. Given price inflation that is likely to occur, it seems unlikely that asset sales by baby boomers during the study period 2016 to 2026 will have an impact to depress asset prices. The one exception may be with respect to real estate prices in thin markets, where demand by potential sellers might depress prices.

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