

FINANCIAL INDUSTRY MONITORING SERVICE

March 2007

The pros and pitfalls of applying demographic analysis to the financial services industry

At a point of growing concern about whether a combination of cyclical and structural drivers can be expected to slow household debt growth and spur on saving activity, the field of demographic analysis is garnering renewed attention. It continues to be said that the business of household banking is shifting away from being driven by growth in debt products towards saving products due to aging trends. This theory essentially argues that one market's rise must be reflected in the other's fall in a nearly zero-sum manner just due to age trends.

This is as dangerous a proposition as it was throughout the 1990s, when we did a series of papers on the topic that correctly called the return of the consumer and housing markets by taking a position against the bestsellers on demographics.

An update is now warranted given renewed concerns over potential industry turning points. Demographic forecasts have been spectacularly wrong for two decades as consumers hung in, and saving remained weak, such that its usefulness as a predictive tool of analysis must be treated with great care. Where demographics can be useful, however, is in terms of rounding out the full set of market analysis tools after all else has been addressed, particularly at the micro-market level. An example is market segmentation through a fuller understanding of client diversity. Demographic analysis is useful — with many caveats, and not exclusively on its own - as one of the tools used to explain trends in business start-ups, demand for vacation properties, and inheritance activity. On its own, however, it is not terribly useful in terms of predicting financial returns, growth in either debt or saving products, or shifts in the composition of financial assets.

1. Challenging the demographers one-two punch

Demographic analysis is usually driven by the belief that only two variables are needed to forecast any market: age-based behavioural propensities such as how much debt, housing or equities people of varying ages wish to hold; and forecasts for the number of people within those individual cohorts that are often derived from simply extrapolating the present age structure of the population one year at a time. Multiply one variable by the other within cohorts and add it all up across the individual cohorts and, presto, a reliable market forecast is supposedly born that requires little if any awareness of any other potential drivers.

Using penetration rates and forecasts for the number of consumers in this manner is also one of the first business market forecasting techniques taught in marketing courses. Its extreme, yet popular, proponents argue that unlike most of economics, their work requires no grander assumption than the perfectly reasonable view that we all age one year at a time.

CHART 1

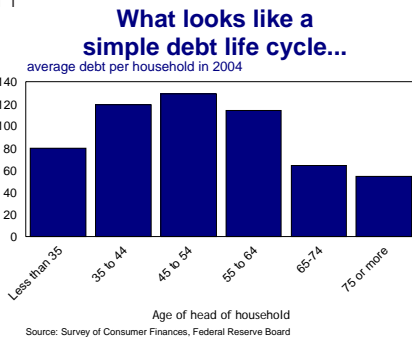


CHART 2

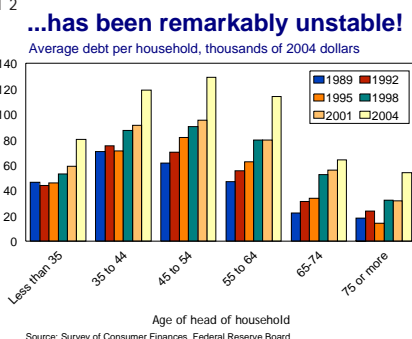
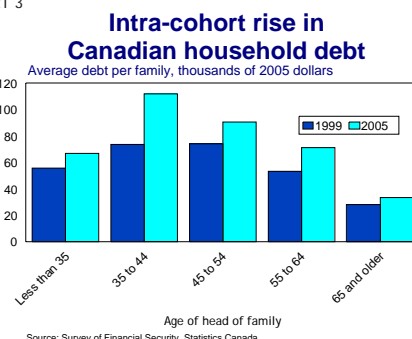


CHART 3



Derek Holt
Assistant Chief Economist
416-974-6192
derek.holt@rbc.com

1.a. Malleable age-based measures of behaviour

This is where the trouble begins. The bone of contention here is not with respect to the fact that we all have tendencies to change our behaviour throughout the course of our lives, including shifting through different phases of life in terms of how we manage our household finances. Of course we do. For example, chart 1 shows that indeed debt ramps up to the middle-aged periods of our lives, then ramps back down as we shift into wealth accumulation mode. It does so using data drawn from the triennial U.S. Federal Reserve's Survey of Consumer Finances.

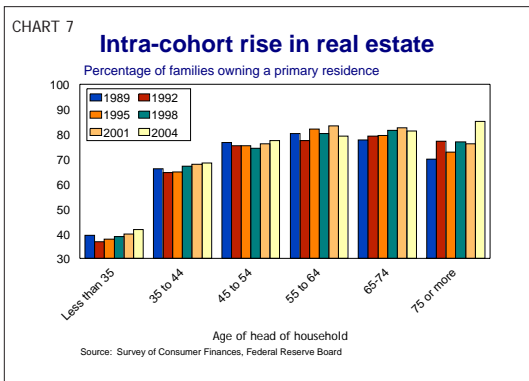
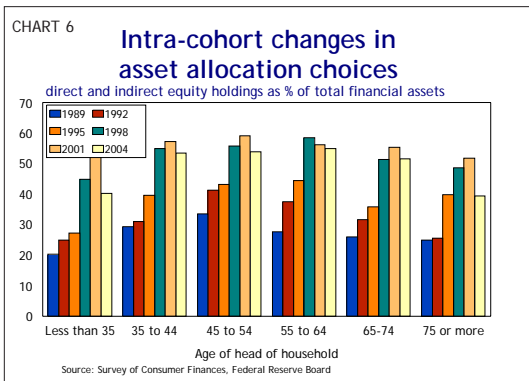
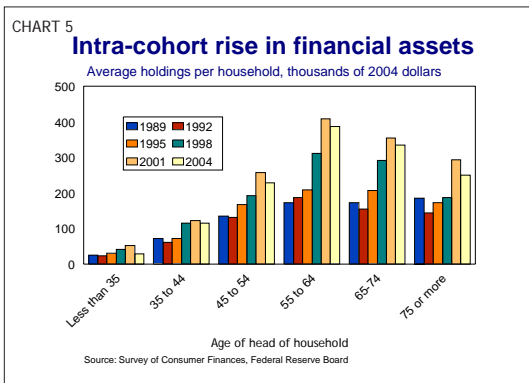
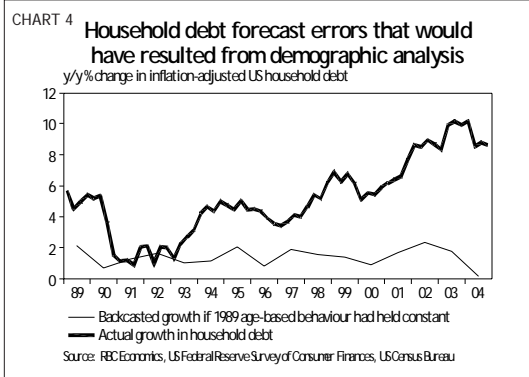
The trick being played here is to appeal to individual sensibilities at a single point in time - in this case, 2004. Few would refute such a pattern drawn from their own experiences. The problem, however, is that age-based behaviour is notoriously unstable over time and that's a key reason as to why demographers have been so wrong with their forecasts. It is also a reason why the leading, modern academic literature has moved beyond a single-generation life cycle approach and towards developing and testing overlapping intergenerational models.

Regardless of age, consumers are resilient and adaptable, and change sentiments and behaviours both frequently and rapidly. The second that one thinks their actions can't be influenced and are defined by immutable trends is when the work really begins. In essence, it is this malleable nature of consumer behaviour that is the essence of marketing.

To this effect, witness chart 2. We've plotted debt by age cohort not only for the most recent 2004 snapshot, but have also done so using results from each of the triennial surveys dating back to the late 1980s. Just look at the massive intra-cohort changes in debt holdings over time. For example, people in their late 40s or early 50s today hold twice the amount of debt in inflation-adjusted average individual terms as the exact same age cohort held in the 1980s. Today's forty year-olds also have higher incomes, and much higher net worth than yesterday's forty year-olds after controlling for inflation, so they've successfully managed debt in a period of record strength for credit quality. A similar argument can be made using Canadian data, although it is much more limited in scope and to just two fully comparable surveys (chart 3). Discussions on demographics have much in common in both countries due to virtually identical population age distributions.

Now, if a forecaster back in 1989 used the recommended method of taking 1989 age-based debt holdings and multiplying these debt levels by the number of people within each of these cohorts in each year over the past fifteen years to calculate a summed up debt market and yearly growth rates, then just look at the massive, sustained, and compounded annual forecast errors that would have resulted compared to what we now know to have occurred (chart 4). This analysis would have portrayed household debt markets as having been mature for the better part of the past two decades. Firms in banking or retailing that invested on the basis of this belief have likely disappointed their shareholders. Other examples of intra-cohort changes being more important than inter-cohort changes include:

- the rise in financial asset holdings (chart 5);
- asset allocation choices reflected in equity ownership (chart 6);
- home ownership rates (charts 7, 8);



■ income and wealth gains focused on older workers (charts 9, 10), mitigating concerns over low saving rates. It is the massive within-cohort surge in wealth for those aged over 60 that has driven much of the growth in private banking.

In all cases, the cumulative impact of intra-cohort changes is massive and speaks to the danger in simply shifting age groups through the various cohorts over time.

Real estate is worth elaborating upon in the context of the popular so-called empty nester hypothesis. Though there is a definite niche that is worth understanding, there is no evidence that this theory will ever become the feared market-wide phenomenon. Indeed, if people down-sized simply on the basis of the amount of space needed for a particular number of people, then why has the size of newly built homes pushed steadily upward over the years as average family size has plummeted (chart 11)? Long term growth in incomes and wealth are the likely explanations (chart 12), supported by evidence that identically defined older age cohorts have, over time, received most of the gains in family incomes and net worth. The emergence of policies addressing higher poverty rates among seniors over the post-war era has also dramatically raised their home ownership rates.

For many of these same reasons, other theories of macroeconomic and financial market changes brought upon by changing demographics are likely to flop. For example, hopes of a massive run-up in saving activity by boomers are simply running out of time as they push beyond the years of traditional peak-saving activity while other non-demographic factors influence their savings. Alarmism over a low percentage of paycheques being saved, however, still has to be tempered by a much higher wealth-adjusted personal saving rate; but even this measure is trendless over time despite what demographics might have predicted.

1.b. Population forecasts are fraught with uncertainty

The second problem is that population forecasting is much more difficult than simply extrapolating the current age profile of the population into the future. Indeed, demographers have a very poor track record on long-run population forecasts due to difficulty in predicting fertility, mortality and net immigration trends that are all driven by cyclical, structural, and policy factors.

For example, Canadian and U.S. demographers totally missed the baby boom with their post-war forecasts. Statistics Canada's early 1950s population forecast for Canada's population twenty years later was off by nearly 50% because neither the baby boom nor the surge in immigration over the 1950s were predicted. A forecast of 13.5 million people gave way to the reality of 22 million in less than two decades. The U.S. Census Bureau also missed the baby boom entirely, and then grossly overshot the trend at precisely the point at which births had peaked. Chart 13 demonstrates this point. In fact, the cumulative forecast errors for the 1958 and 1964 birth predictions amounted to over-predicting U.S. population by more than seventy million Americans in each case over only a two decade forecast interval, or one-third of the total actual population in 1970!

Should we have any more faith in population forecasts today, perhaps because of advancements in theory and statistical methods? One indication of a forecaster's confidence is to look at the range of possible outcomes provided. High and

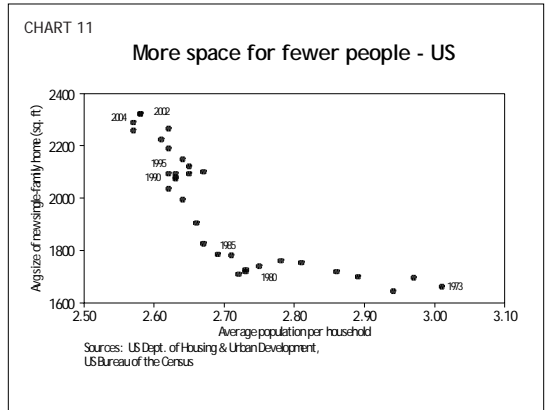
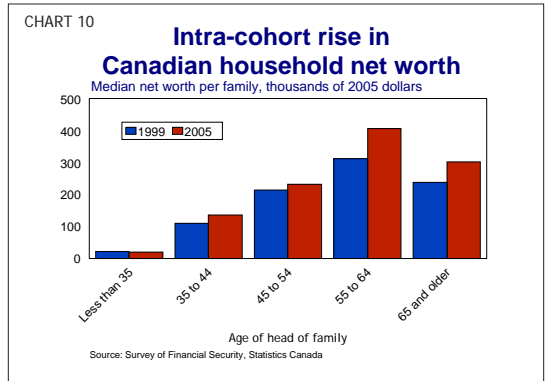
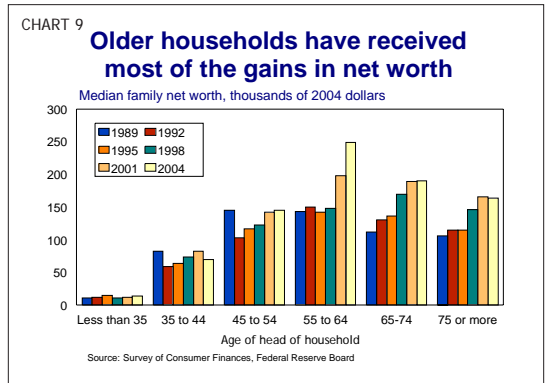
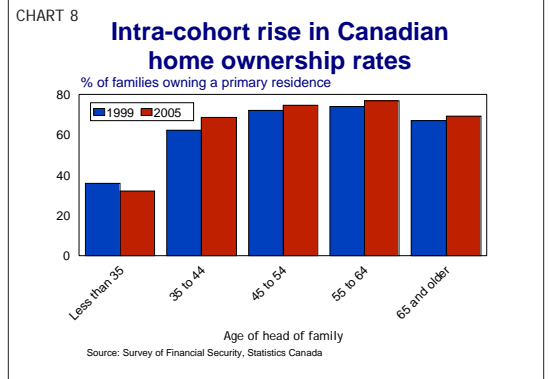
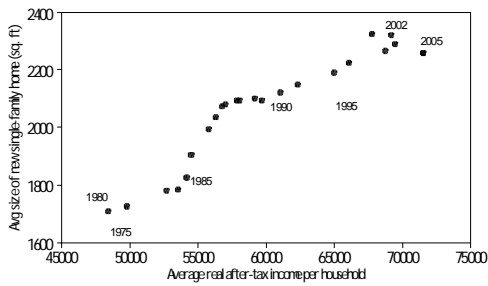


CHART 12

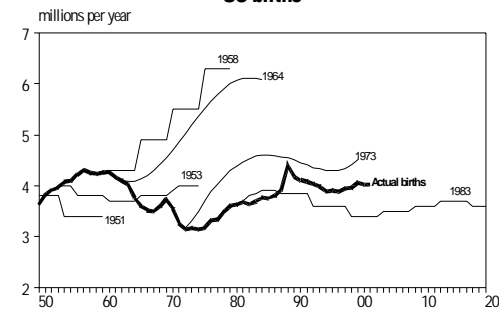
Income and house size - US



Sources: US Dept. of Housing & Urban Development, US Bureau of the Census, US Bureau of Economic Analysis

CHART 13

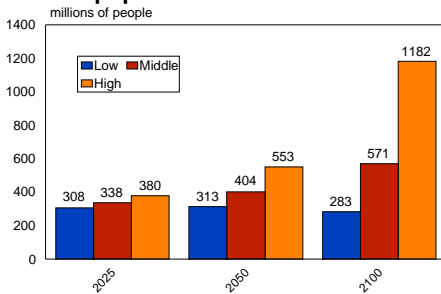
US births



Source: US Bureau of the Census
Replicated from Mankiw & Weil [1998]

CHART 14

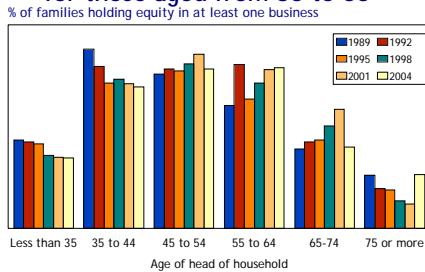
U.S. population forecast scenarios



Source: U.S. Census Bureau

CHART 15

Business ownership peaks for those aged from 35 to 65



Source: Survey of Consumer Finances, Federal Reserve Board

low estimates for population forecasts used to be provided by the U.S. Census Bureau (chart 14). By 2025, the gap in the high and low-scenarios could accommodate the present day populations of the UK, Germany, Italy, or France, or two-and-a-half times Canada's population. By 2050, Indonesia could be wedged between the high vs. low scenarios. By 2100, present day India's total population could be squeezed in between the high and low estimates. Small annual errors compounded each year blossom into huge numbers of people.

Population forecasts are fraught with uncertainty in predicting each of the components and this is no less likely to be the case in future particularly as countries like Canada struggle with how to define an appropriate immigration policy. For example, at the present rate of about a quarter-million per year, Canada would take on about 2.5 million new immigrants within a decade. At our recommended rate of 350-400,000 immigrants per year, this would add between one- and one-and-a-half million new Canadians beyond the present cruising speed - almost all of which at prime earning and spending ages.

2. Market questions where demographic analysis may be useful

There are clearly many other factors that are much higher up on the list of things to consider when drawing conclusions over the broad directions of the economy, financial markets, or product origination trends. Nevertheless, demographics can be a partially useful tool within niche markets. Three examples are now provided.

2. a. Business start-ups

There is fairly clear and stable evidence to support the argument that people are much more likely to start a business in their 40s and 50s and then exit (chart 15). This influence on business creation has peaked, with all boomers now in this age bracket. Small business markets may well spend the next decade in succession planning and consolidation mode, while start-up rates suffer. Indeed, this is already happening; whereas the 1990s was marked by rapid growth in new small businesses that suffered from very weak productivity levels, the current decade has been marked by a reversal of this trend as small business start-up rates have dried up while smaller businesses lead on productivity growth (chart 16).

2. b. Vacation properties

Another example relates to ownership of vacation properties. Chart 17 demonstrates that within-cohort changes in ownership rates for vacation property have been relatively small compared to large differences across age cohorts. Vacation property ownership rates rise sharply until people are in their fifties, then decline. This influence is peaking, again given that most boomers are already in this age cohort. What is interesting, however, is that whereas ownership rates of principal residences remain high among older people compared to younger ones, they sharply drop off for vacation property owners. This may portend a weakening influence upon vacation property prices next decade, unless demand is propped up by strong growth in incomes and wealth and innovative property financing.

2. c. Inheritance scenarios

A third example concerns future inheritance activity, albeit with several caveats. Present U.S. household net wealth amounts to about \$50 trillion, but is extremely

concentrated, with about \$35 trillion - or 70% - held by the wealthiest 10% of households, and little beyond the top 25% (chart 18). It is probable that after paper shuffling within families, a tight distribution of wealth will continue such that many firms may be competing for close relationships with few families.

Furthermore, timing is key. Wealth transfers that occur between now and the next couple of decades will be relatively minor as a small number of the boomers' parents bequeath small amounts that will be spread across a large cohort (chart 19). Most of the wealth transfer won't start until boomers start to bequeath assets beginning in the 2020s and lasting for about twenty years thereafter given current life expectancies that may continue to lengthen.

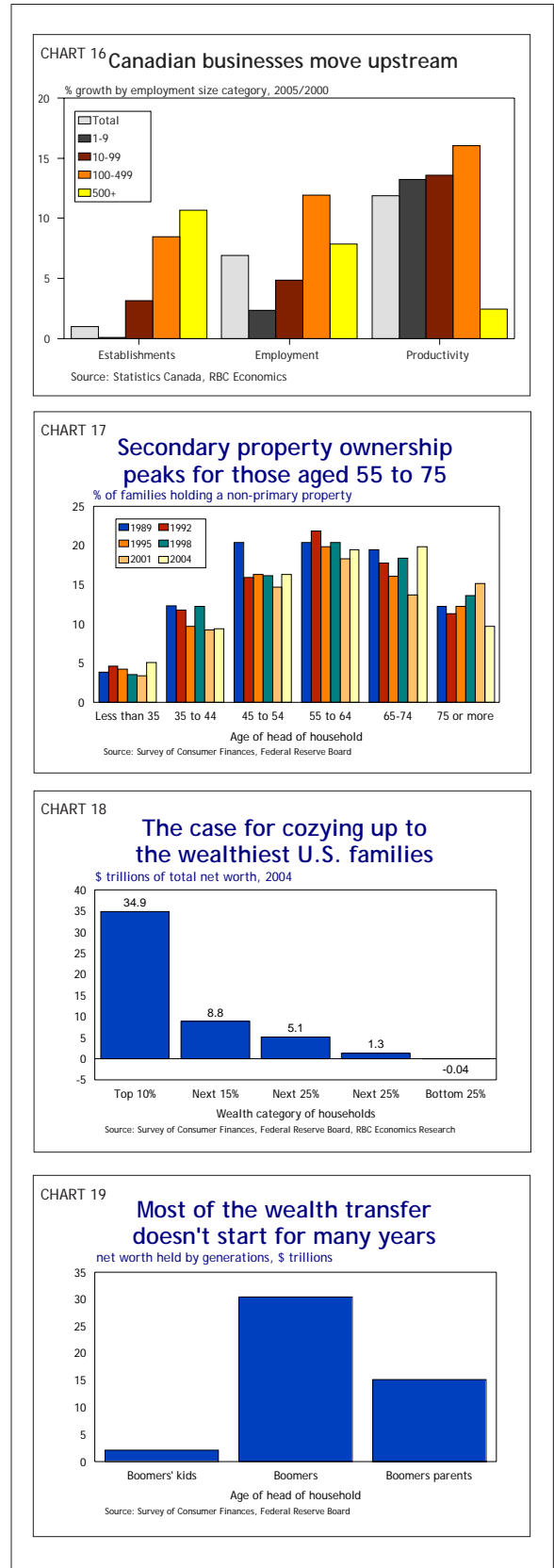
Lastly, there will be many companies, charities, and governments competing for a slice of the inheritance pie. Defining the market is key. Wealth managers also have every reason to fully understand potential innovation in debt products.

3. Conclusion

The problem with demographic analysis is that it often entails holding everything else in the world constant at a fixed point in time. This thereby rules out the ability of human behaviour to adapt to change, eliminates any role to be played by changing technology, ignores institutional changes such as trade liberalization and the associated rise of China, and treats everyone within the same age bracket as being virtual carbon copies of one another. It also usually assumes a closed-economy in which potentially counteracting forces of globalization are ignored.

While this paper is focused upon household finance markets with a planning audience in mind, we've consistently added caution to debates in other policy arenas as well. For example, government fiscal positions are widely variant across many industrialized economies despite being very similar on demographic drivers. Politics, public choice and technological change impacting health care spending are far more persuasive drivers of fiscal forecasts. Further, the unfunded position of U.S. Social Security is much less about today's demographic change than it is about unfunded promises made many years ago to a generation of workers, and very poor investment stewardship being exercised over the inflows.

The bottom line is that there are no easy short-cuts in devising strategies. One thing for sure is that age-based behaviour can change and is not something to be taken as given. If behaviour ever changed in a way that was complementary to demographic influences, then the effects could be very powerful but that's a very difficult prediction to make. Market segmentation, technology investments, wise workforce management, product and process innovation, and the adoption of global best practices will remain as hallmarks of planning successes and failures.



© Royal Bank of Canada. The material contained in this publication is the property of RBC Financial Group and may not be reproduced in any way, in whole or in part, without express authorization of the copyright holder in writing. The statements and statistics contained herein have been prepared by RBC Economics Research based on information from sources considered to be reliable. We make no representation or warranty, express or implied, as to its accuracy or completeness. This publication is for the information of investors and business persons and does not constitute an offer to sell or a solicitation to buy securities.

