

HOW MILLENNIALS ARE SLOWING U.S. POPULATION GROWTH AND ENHANCING SUSTAINABILITY

An NPG Forum Paper
by Edwin S. Rubenstein

They are stressed out. Afraid to take risks. The cheapest generation of Americans, say some, preferring to rent rather than buy, share rather than own, and yet complete spendthrifts when it comes to procuring the latest and greatest cell phones, i-pads, and other digital technologies. They marry later, have less income, and fewer children, than prior generations did at similar stages of life. And, in late 2015, millennials passed Baby-Boomers as the most populous generation of Americans.

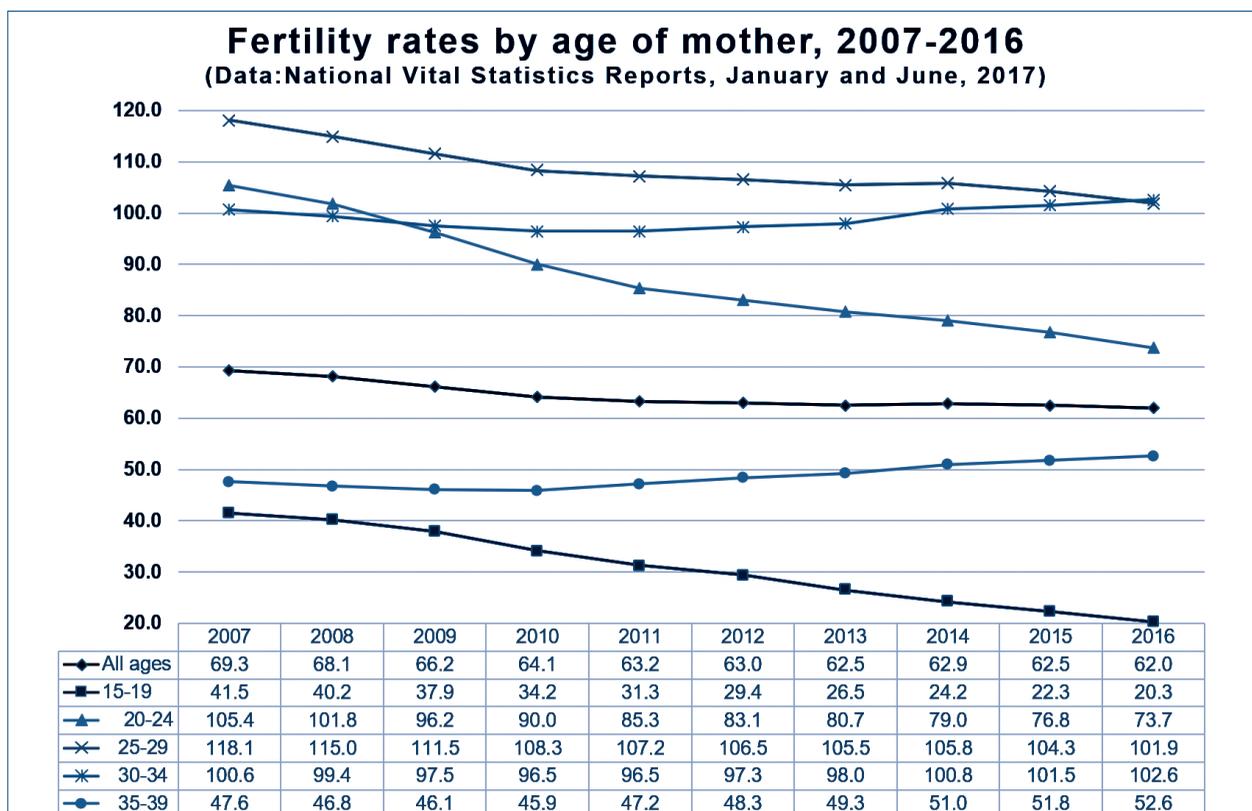
Born between 1980 and 2000, millennials are the youngest Americans in the labor force. Their attitudes towards marriage, procreation, and materialism cannot be attributed to their youth. Nor is it a fad they will outgrow. While the Great Recession is responsible for some of their worldview, it seems that long lasting economic and demographic trends – wage stagnation, urban gentrification, high gas prices, the sharing economy, on-line consumption, and an unprecedented student loan crisis – has fundamentally changed the game for millennials.

The largest generation of Americans may never have as many children, or spend as lavishly as its parents. Most mainstream economists find this prospect daunting, as it portends lower GDP growth. For us, however, negative growth in both population and consumption is nothing less than a perfect storm. Should it continue, NPG’s goal of a sustainable U.S. economy, in which the utilization of scarce resources equals the ability of our eco-system to replenish those resources, will be attainable.

Let us count the ways this can occur.

FALLING BIRTH RATES

The United States is in the middle of what some call a “baby bust”. According to the Centers for Disease Control and Prevention, the number of babies born in this country fell by 338,000 – or 8.7% between 2007 (the year prior to the Great Recession) and 2016. Over that period the national fertility rate (births per 1,000 women of childbearing age, 15 to 44) fell from 69.3 to an



historic low, 62.0, in 2016. At the peak of the post World War II Baby Boom, in 1960, the rate was 118.0.

As seen in the graphic above, the fertility rate decline is driven entirely by millennial mothers in their teens and twenties.

Mothers ages 15 to 19 saw the largest decline: their birth rate fell more than 50%, from 41.6 per 1,000 in 2007 to 20.3 per 1,000 in 2016. Increased availability and effectiveness of sex education and contraceptives for males and females undoubtedly play a large role in reducing this age group’s birth rate.

Mothers ages 20-24 and 25-29 also saw significant declines, down 30% and 12%, respectively. **Birth rates for all age groups of women under 30 fell to record lows in 2016.**

Fertility rates for women in their 30s and 40s increased, but not enough to offset the lower rates of their millennial counterparts. As a result, the national fertility rate (all ages) fell 11% between 2007 and 2016.

Some demographers are freaked out by the falling birth rate, an occupational hazard for people who spend their professional lives scrutinizing population statistics. Economists, however, have made peace with the notion that a shrinking population is not necessarily a bad thing. While GDP may slow, a better measure of the country’s economic health – GDP per capita – can benefit. This is especially relevant in a world where robots, AI, and other technologies threaten the jobs of many Americans.

Ecologists have long perceived both procreation and economic growth as threats to the environment, exacerbating global warming and straining resources such as clean water and food. They enshrined this idea in a simple formula to illustrate impact of human activity on the environment:

$$I = P \times A \times T$$

In the so-called “IPAT” equation, **I** (the Impact of human activity) is the product of three factors: **P** (total Population), **A** (Affluence, as measured by GDP per capita), and **T** (the Technology used to produce the goods and services measured in GDP).

In the particular case of climate change, the following variation of the IPAT equation has been suggested:

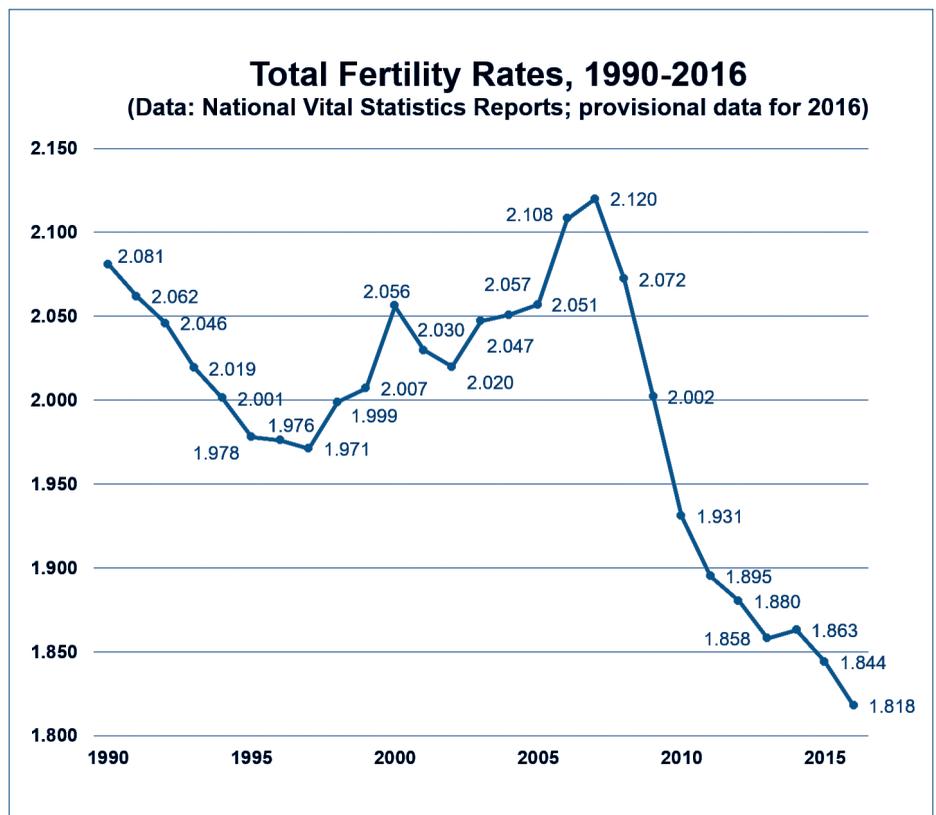
$$CO_2 \text{ emissions} = P \times (GDP/population) \times (energy/GDP)$$

The CO₂ equation tells us that while population is important, it is by no means the only factor driving climate

change. Affluence, as measured by GDP per capita, also matters. The wealthier we become, the more “stuff” we buy – and that stuff (whether cars, houses, vacations, etc.) is produced by burning fossil fuels that emit CO₂ into the atmosphere. Other things equal, a rapidly-growing economy will generate more CO₂ and other greenhouse gases than a shrinking economy.

Over the past four decades A and T have either stumbled or are in long-term decline. A, as measured by GDP per capita, fell sharply during the Great Recession and has not yet regained its pre-recession growth rates, while T, as measured by energy usage per dollar of GDP, is in long-term decline due to advances in energy-saving technology as well as the shift from a manufacturing-based to a service-based economy.

Population growth – P – has been the unrelenting driver of environmental degradation for most of this period. There is, however, good news on this front. Since 2007 the Total Fertility Rate (TFR) has slipped below the 2.1 children per mother threshold regarded as the “replacement level”:



TFR measures the theoretical number of children a typical mother would have over her reproductive lifetime based on the age-specific birth rates in a given year. The most recent TFR reading – 1.818 in 2016 – is 1% below the rate in 2015, and the lowest since 1984.

Yes, fewer children means fewer workers contributing to Social Security and Medicare programs 40 years hence,

when their parents retire. On the other hand, a smaller family enables parents to invest more in each child's education, increasing their productivity and making up for the fact that there are fewer of them. There is no evidence that the negatives associated with a smaller population are serious compared to the benefits. Just look at China, Germany, and Japan – countries where vibrant economies have co-existed with below replacement fertility rates for decades.

Despite the decline, our TFR is still well above those in Russia, China, Germany, and Japan – albeit below the disastrously high levels recorded in India and Mexico:

Total fertility rates, 2000 and 2016 (ranked on 2016 TFR)			
	2000	2016	% change
India	3.11	2.45	-21.2%
Mexico	2.67	2.25	-15.7%
U.K.	1.63	1.89	16.0%
United States	2.06	1.82	-9.2%
Australia	1.79	1.77	-1.1%
Russia	1.25	1.61	28.8%
China	1.70	1.60	-5.9%
Germany	1.38	1.44	4.3%
Italy	1.29	1.43	10.9%
Japan	1.29	1.41	9.3%

Data: CIA, *The World Factbook*, 2000 and 2016.

We have been here before. Economic distress in the early 1930s (Great Depression) and late 1970s (the Great Inflation) coincided with sharp declines in birth rates for twenty-somethings.¹ In each case, older mothers more than compensated for declines among their younger cohorts, avoiding a generational decline in births.

Is it different this time? Research suggests it is. Activities long considered rites of passage for young adults are increasingly delayed, or abandoned altogether, by millennials.

- A 2016 study of Census data from Pew Research found nearly one-third of young adults (ages 18-34) live with their parents, slightly more than the proportion that live with a spouse or partner. Not since record keeping began in 1880 has living at home for this age group outpaced living with a spouse. “They’re concentrating more on school, careers and work and less focused on forming new families, spouses or partners and children,” Richard Fry, lead author of the Pew report, said of millennials. Although student debt is often blamed, it may not be the dominant factor: the trend is stronger for those without a college education.^{2,3}

- When it comes to marriage, millennials say “I don’t” more than any previous generation. Research by the Urban Institute finds that if current trends continue, 30.7% of millennial women will remain single by age 40, approximately twice the share of their Gen-X counterparts. The data show similar trends for males. Marriage rates fell drastically during the Great Recession, but they had been declining for years prior to that event. At this point even a return to pre-recession levels will not prevent marriage rates among millennial women from falling below those of Gen-Xers by age 40.⁴ Ironically, the aversion of millennial females to marriage may reflect their economic strength *vis a vis* males: “Sharp declines in the earning power of non-college males combined with the economic self-sufficiency of women — rising educational attainment, falling gender gap and greater female control over fertility choices — have reduced the economic value of marriage for women.”⁵
- A cross-generational study conducted at Wharton School of Business found more than half (58%) of millennial female undergraduates do not plan to have children. That is nearly three-times the 22% of Gen-X female undergraduates who did not want children when surveyed in 1992. Results were similar for male students. (The researchers compared surveys of the Wharton graduating class of 1992 and 2012.) While Gen-X women felt “motherhood fulfilled their need to help others” millennial females believe they can serve the greater need by succeeding at work. For millennial men “doing good” is increasingly connected to creating greater balance between work and family. Not surprisingly, they are less likely to think of themselves as the sole breadwinner. Even millennials who do want children say they do not see a clear path toward it.^{6,7}
- Immigrants are the wild card. They account for 15% of U.S. millennials, up from 6% of the prior generation.⁸ Although birth rates for foreign-born millennials are generally above those of native-born, a recent study by the Center for Immigration Studies finds that the gap is narrowing.⁹ From 2008 to 2015: birth rates for foreign-born women ages 15 to 19 fell 50.6% versus a 43% drop for native-born in that age cohort; birth rates for immigrant women 20 to 24 fell 40.5% versus a 28.5% decline for native-born. The Total Fertility Rate – a measure of the number of children a woman can be expected to have in her lifetime based on current patterns – fell 21.5% for immigrant women and 15.4% for native-born

women over that period. The implication is clear: When it comes to family size, immigrant millennials have embraced the “smaller is better” ethos of the larger, native-born millennial community. That is good news to those of us who believe a smaller population is in the national interest.

Maybe, just maybe, the eye-popping fertility rate declines we’ve seen in recent years will not be reversed. Maybe, just maybe, immigration will fall to levels consistent with zero or negative population growth. What then?

There is an app for that. OK, its not an app on your cell phone. It’s a rather complex calculation that demographers do to project future population growth rates if current trends persist for the long haul – say, a generation or two.

The Census Bureau explains the concept:

“**The intrinsic rate of natural increase (IRNI)** measures the rate of change of population size that would eventually result from the continuance of the age-specific birth and mortality rates of a given year over time, assuming no migration. A rate that is less than zero (negative) signifies a population decline, while a rate greater than zero (positive) denotes population growth.”¹⁰

IRNI is often referred to as the “Malthus parameter” in recognition of the Parson’s fear that human populations, if not controlled, will increase at a steady exponential rate and that, thanks to the compounding, the number of people

added to the population will increase every year. As we all know, he expected population growth to outpace the growth in natural resources, especially food.

Birth rates and death rates were much higher in 1798, when Malthus wrote *Essay on the Principle of Population*. Women got married earlier than they do today, and had more children. Many mothers and their new-born children died at childbirth, but still the population increased. The intrinsic rate of natural increase – births minus deaths – was positive.

So it may come as a surprise to many that in the U.S., IRNI has been negative for decades, and plummeted after the Great Recession:

The most recent calculation is for 2014. IRNI that year was negative 3.7, implying that if birth and death rates for the various age groups were to stay at 2014 levels, and immigration ceases, U.S. population will eventually decline by 3.7 persons per 1,000 population – or by a steady -0.37% per annum.

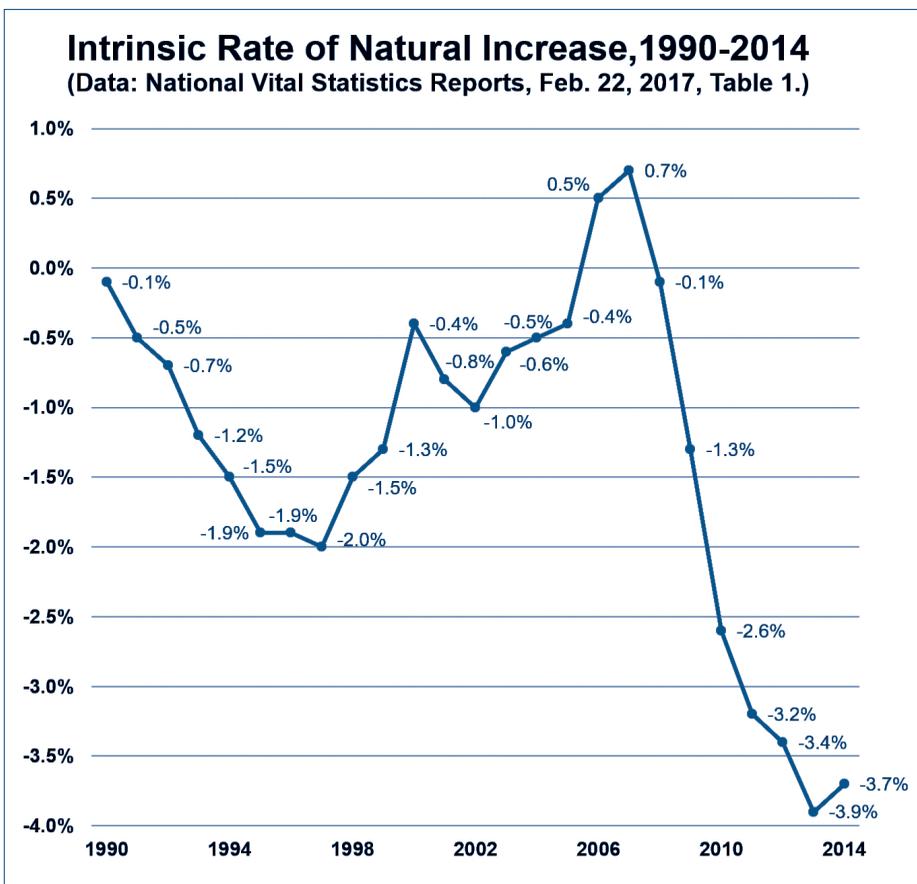
This may not sound like a big deal but even a small negative rate, when compounded over a long stretch of years, can lower population dramatically. Over a 25-year period, for example, population declines by 8.9%; after 50 years there would be 17% fewer Americans, and in 100 years, 31% fewer.

Except for 2006 and 2007, IRNI was negative throughout the 1990 to 2014 period. Population did not fall because of immigration, which added a million per year during much of this time – even more when you consider their U.S.-born children.

Millennials have already demonstrated that a lower “P” – U.S. population growth – may be in our future. They also show signs of changing the traditional role of “A” - increased affluence – on the consumption of goods and services. Since World War II new families, new houses, and new cars have powered the economy and propelled recoveries. Millennials may have lost interest in each.

THE AMERICAN DREAM? HOLD THE PICKET FENCE

This is America. You are expected to buy a home with a 30-year mortgage when you are young, build up equity in your working years, cash out with a nice nest egg at retirement, and then downsize to the condo in Boca – with plenty left over for travel, the grand kids, and the good life. That’s the theory. And for most of the post-World War II period in our economic history, that was the reality.



Enter the new normal: Millennials may be the first generation in the modern era that is overwhelmingly blocked from attaining the classic American dream of home ownership. Since the housing boom of the mid 2000s homeownership among the young has fallen off a cliff:

The homeownership rate among young people is a record low.

Bad news? Not necessarily. Certainly not if you are concerned with energy efficiency and the environment. Households living in single family houses use about twice

of the Great Recession, both of which are evident in the graphic above.

The recession is where everything started going wrong for millennials. In September 2008 the so-called sub-prime mortgage market collapsed, bringing the entire credit market to a screeching halt. What had been suspected by a few was painfully obvious: mortgage lending standards had been way too loose for way too long. The lofty ownership rates of the early 2000s were unsustainable. Lending standards got much tighter: banks required a higher down payment and income for mortgage approval.

As millennials lost their jobs, many prepared for a better job by enrolling in college. After all, this strategy had worked for their Baby Boomer parents in earlier recessions. From the beginning of 2007 to 2016 student debt more than doubled. At \$1.31 trillion, student loan debt is larger than either credit card or car loan debt, and is second only to home mortgages.¹² This probably understates the true burden, since students and their families often take on credit card debt and home equity loans to finance college.

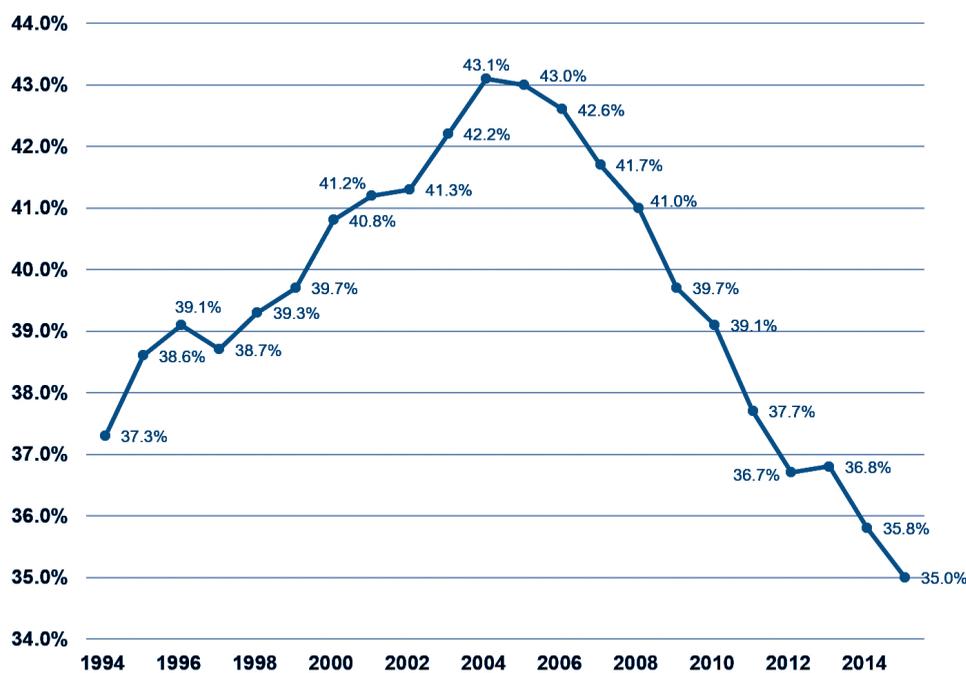
Unfortunately, while unemployed millennials were upgrading their college credentials, U.S. employers were re-evaluating their need for college-educated employees. Many saw an overqualified – and underutilized – workforce, and cut employment and wages accordingly. The result: Millennials earn 20% less than Baby Boomers did at the same stage in life, despite being better educated.¹³

Education still boosts incomes, but the median college educated millennial of today earns only slightly more than a Baby Boomer without a degree earned in 1989.

As the new job market reality sinks in, college enrollments have declined. Too late for those millennials who took out loans but dropped out before graduating. They face the “worst of both worlds” – substantial amounts of debt without a degree that could help them secure a better job.¹⁴

The Millennial malaise threatens the wellbeing of Baby Boomers also, especially those who are retired or on the cusp of retirement. Payroll taxes from millennials help finance the Social Security and Medicare benefits that most Boomers rely on. Those same Boomers need younger generations to buy their homes and to invest in financial securities to bolster their savings.

Homeownership rate for people under thirty-five, 1994 to 2015 (Data: Census Bureau)



as much energy per household as those living in apartment houses.¹¹ A number of factors, including their smaller living space, shared interior walls, and fewer windows, explain the energy advantage for apartments.

But for most of us, the decision to buy a home is about affluence, not effluence. Economic downturns are usually a great time to buy real estate, and the Great Recession is no exception. According to the Federal Reserve U.S. homeowners held \$12.7 trillion in home equity at the end of 2016. That is the highest since the end of 2006, before the housing bubble burst, and more than double the \$6 trillion reached when home prices were at their crisis-era lows. By eschewing real estate, millennials missed out on the wealth creation that bolstered the net worth of previous generations.

There are two big reasons why young people let this opportunity slip by: student debt and the lingering impact

On a more practical level, Baby Boomers need their millennial children still living at home to move out in order to downsize. A study by the New York Federal Reserve finds that student loans exert a “...**large, negative, and highly significant**” impact on this outcome: In particular, “...**a \$10,000 increase in average student debt per graduate....reduces the rate at which youth living with parents move out...by 14.8%.**”¹⁵

Downward mobility for millennials could easily trigger a vicious cycle that drags down Baby Boomers and the entire economy. A looming crisis in the short run, a smaller, more sustainable, economy in the long.

THE LOVE AFFAIR BETWEEN YOUNG AMERICANS AND CARS IS OVER

“I don’t believe that young buyers don’t care about owning a car...We just don’t think anybody truly understands them yet.” – John McFarland, GM’s manager of global strategic marketing

“We’re trying to get the emotional connection correct.” – Doug O’Reilly, a publicist for Subaru.

Both statements are from a lengthy piece co-authored by Derek Thompson and Jordan Weissmann in the *Atlantic* magazine called “*The Cheapest Generation: Why Millennials aren’t buying cars or houses, and what this means for the economy.*” (September, 2012.)

Both statements reflect the “conventional wisdom” among automakers at that time: that the demand for cars among Millennials is just waiting to be unlocked; that as the economy comes back, young people will buy cars at the same rate their parents and grandparents did; that a finer-tuned marketing campaign focused on millennial values would coax them into the dealerships.

But five years later, those notions seem woefully out of date. Not only are millennials not buying cars the way they once did, they are increasingly avoiding driving altogether.

Young people are not getting their driver’s licenses so much anymore. In fact, no one is, but the declines are most pronounced among people below age 45. According to a study by the University of Michigan Transportation Institute 16.4% fewer 20-to-24 year-olds had licenses in 2014 than in 1983, while 10.3% fewer 30-to-34 year-olds had them. Above 50 it’s a different

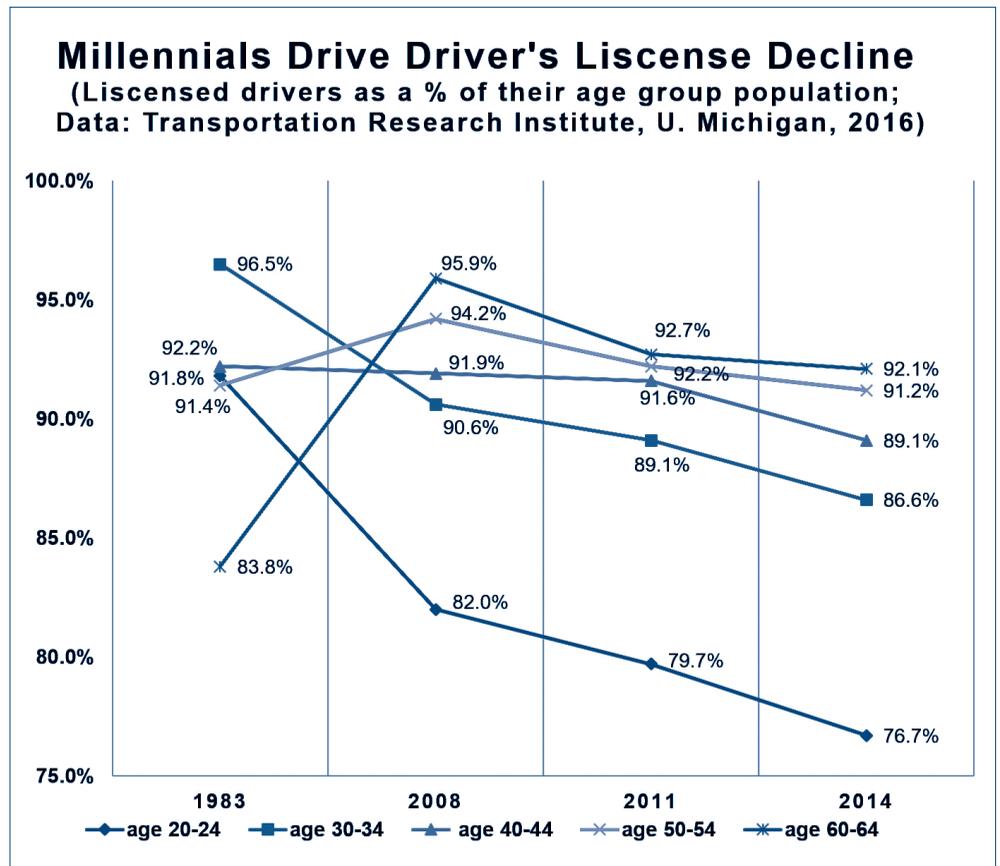
story, with either more modest declines – 0.2% among 50-to-54 year-olds, or notable increases, 10% among people aged 60 to 64.

Ironically, the largest decline (not shown in the graphic) was among 16-year-olds, the iconic age when American youth get their first license. In 2014 just 24.5% of 16-year-olds had driver’s licenses, a 47% fall from 1983, when 46.2% did.

From a distance, the automobile industry is booming: a record 17.5 million new vehicles were sold in 2016, and Americans are driving more than ever. But the decades-long decline in driver’s license reciprocity among young people portends big trouble ahead. Automakers finally get it: they no longer expect better marketing or a booming economy will bring young American back to the showrooms.

They are preparing for “peak car ownership,” when the number of single-owner car sales start to plummet. Instead of marketing cars to millennials, they are designing “shared mobility solutions” for car services favored by millennials. GM, for example, is designing a self-driving electric car (the Chevy Bolt) specifically as a ride-sharing vehicle for Lyft.¹⁶ Uber is busy testing self-driving software in its partnership with Volvo.¹⁷ The list goes on and on.

To paraphrase one auto executive, instead of trying to sell 1,000 BMWs, the company is trying to share one BMW a thousand times.¹⁸



The marriage of auto technology to social networking is a no brainer. Millennials live in a sharing economy. Much of it is virtual: Facebook (sharing experiences, thoughts, and friends), Spotify and Pandora (music), Hulu (films and TV shows.) But the rise of transportation network companies – Uber, Lyft, and other carsharing services – allows people to share vehicles without owning them. In its first six years the Uber app was downloaded by over 8.5 million people in over 60 countries. Nearly 50% of these users are millennials.¹⁹

For consumers, car sharing benefits are enormous: Vehicle expenses are the second-largest expense for most Americans, yet most vehicles are parked over 90% of the time. Not having to own a car could save Americans \$1 trillion per year, according to one estimate.²⁰ Yet less than one-third of young adult non-drivers cite the costs of car ownership as a reason.²¹

Whatever the reason, the car sharing instincts of millennials are, potentially, good news for the environment. A shared use vehicle survey conducted by researchers at UC Berkeley found that every car made widely available for sharing took more than 10 cars off the streets.²² MIT's Computer Science and Artificial Intelligence Laboratory claims that ridesharing – if applied properly – could cut traffic in cities by as much as 75%. Among their conclusions: A mere 3,000 app-hailed, four-seater vehicles could do the same work as New York City's 14,000 taxi fleet.²³

Reality check #1: These “savings” are theoretical, based on mathematical algorithms developed by researchers in transportation labs. Uber and its competitors are businesses, not black boxes. Their drivers are hungry for business. In San Francisco alone an estimated 45,000 Uber and Lyft drivers operate in a city that authorized a mere 2,020 legal taxi medallions. San Francisco's Municipal Transportation Agency has attacked the California state commission tasked with regulating car-sharing companies for “...a rulemaking process” [that] “clearly has had a significant environmental impact,” including increasing carbon emissions due to more Uber and Lyft cars on the road.²⁴

Not the first time that politics has ruined a good idea.

Reality check #2: The car-sharing market is concentrated mainly in densely populated urban areas. While millennials may indeed account for half of that market, only a small fraction of the nation's millennials have the need – or the means - to use car sharing services on a regular basis. Uber et al. are overwhelmingly the province of urban, upper income elites.

By contrast, cell phones are accessible to young adults in all socio-economic strata. More importantly, they are the preferred means of connecting with peers: “You no longer need to feel connected to your friends with a car when you have this technology that's so ubiquitous, it transcends time

and space,” notes Sheryl Connelly, head of global consumer trends at Ford.²⁵

Us boomers, no matter how well plugged in, cannot appreciate how social networks have changed the day-to-day lives of millennials. Millennial blogger Jessica Nick provides eye opening details:²⁶

“Millennials are constantly connected with friends and what is going on in the world. It is becoming less common to see a millennial do things alone such as going to bars, grocery shopping, or even going to the gym. It is not that a millennial cannot do these things alone; they simply strive and do better in a group.”

“...A millennial's desire to go to the movie theater, rent a Blockbuster, or watch regular TV is decreasing each day. Ultimately, millennials have shown more interest in sharing these tech experiences and are beginning to live more virtually than ever before.”

“...Businesses are adapting to sell to our market, and we are showing interest in those that are sharing their profits to become better companies and make the world better. This responsibility millennials have, and businesses have as a result of millennials, stems from the millennial's desire to share.”

The takeaway: if millennials save the environment, it will be because of how they relate to each other, not how they relate to the Ubers and Lyfts of the world.

SUMMARY

Millennials came of age during the worst economic crisis since the Great Depression. Many saw their parents lose their jobs, their homes, and their dignity – and vowed they would not repeat those mistakes. As a result, life-cycle milestones so prized by their Baby Boomer parents – the first driver's license, marriage, children, home-ownership – are postponed, or abandoned altogether, by millennials.

There have been other such generational retrenchments in U.S. economic history. Eventually the old ways come back. Is this time different? No one knows. But this is certain: the social networks available to millennials make it far easier for them to do without tangible goods. Whether cars or housing, the price of shared online services are less than private ownership. Information sharing can lead to greater trust. Millennial values are likely to evolve in ways that make a return to the old ways less likely.

While Millennials are still young (the oldest are in their late thirties), they seem determined to break away from the spendthrift, materialistic ways of their Baby Boomer parents. The long-term benefits of this transformation will be enormous: a lower U.S. population, a lower per capita carbon footprint, the proliferation of renewable energy sources.

There are risks. As GDP slows, politicians may panic. They will seek to grow the economy via immigration, or

protect dirty, albeit politically powerful, energy sources like coal. Eventually political power will shift to Millennials. Their values will predominate in Washington. But “eventually” can be a long time. Our efforts and energy must be focused on this goal now.

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