

# Discussion of “The Lost Ones: The Opportunities and Outcomes of Non-College Educated Americans Born in the 1960’s”\*

Greg Kaplan

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Borella, De Nardi and Yang (2019) tackle an important question. They consider two cohorts of white, non-college educated Americans: (i) those born between 1936 and 1945 (referred to as the 1940’s cohort); and (ii) those born between 1956 and 1965 (referred to as the 1960’s cohort). They consider three differences in the opportunities afforded to these cohorts: (i) potential wages; (ii) life expectancy; and (iii) out-of-pocket medical expenses. And they ask how these three differences in opportunities affected three differences in outcomes across the two cohorts: (i) labor supply; (ii) savings; and (iii) welfare.

The authors reach a provocative conclusion. They write:

“Our results indicate that the group of white, non-college educated people born in the 1960s cohort, which comprises about 60% of the population of the same age, experienced large negative changes in wages, large increases in medical expenses, and large decreases in life expectancy and would have been much better off if they had faced the corresponding lifetime opportunities of the 1940’s birth cohort.” (page 4)

If correct, this finding is extremely worrying. In fact, it is so concerning that it is worth repeating. Despite all the technological advances in health care, communication, and transportation; despite the progress that has been made on gender equality; despite the massive increase in international trade; despite iPhones and the Internet; despite the fact that real GDP per capita has grown by more than a factor of 2.5 in the 50 years from 1965 to 2015. Despite all these perceived improvements in life, *more than half of the US population would have been better off had they been born 20 years earlier.*

In the following section I will offer some casual observations of changes in the US economy over this time period that might make one skeptical that the 1940’s cohort was really better off than the 1960’s cohort. In order to shed light on the authors’ pessimistic conclusions, I will then explain why the authors’ assumptions about each of the three changing opportunities that they take as inputs into their analysis - potential wages, life expectancy, medical expenses - might be considered pessimistic lower bounds. With regards potential wages, I will highlight the importance of choosing an appropriate price index to deflate nominal wage changes. With regards life expectancy, I will highlight the importance of assumptions regarding the

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\*In preparing this discussion I have drawn heavily on other people’s work, in particular Furth (2017). I make no claims as to the originality of the ideas put forth here.

calibration of the Value of a Statistical Life (VSL). With regards medical expenses, I will suggest that the benefits of higher medical expenditures need to be offset against these higher costs. I will end the discussion by offering some more methodological thoughts, about how to identify the most important features of the model around which to perform sensitivity analysis.

## Were the 1940's Cohort Really Better Off ?

Smith, Son and Schapiro (2015) offer a first hint that maybe life is not so terrible compared with two decades ago. They report responses to a question in the General Social Survey that asks a representative sample of Americans whether they think that their own standard of living is better or worse compared with their parents' standard of living at the same age. In 2014, 60% of respondents said that their own living standards were better than their parents and only 15% said that their living standards were worse. Moreover, this pattern of responses has been relatively stable over the last 20 years. In 2004 and 1994, 70% and 65% of respondents, respectively, believed their living standards were better than their parents, and 12% and 13% said they were worse.

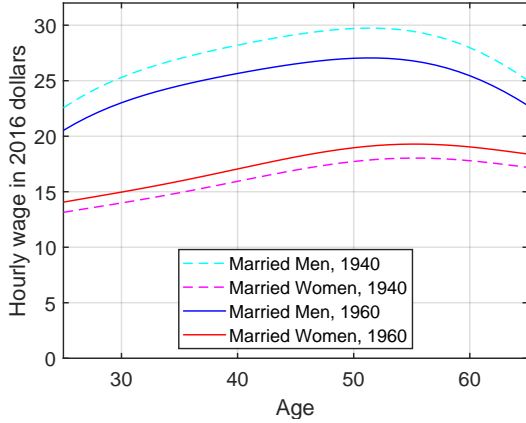
Of course, stated beliefs about quality of life should be taken with a grain of salt. But a number of tangible measures of quality of life also suggest that things might not be so bad. Meyer and Sullivan (2011) examine various dimensions of the material well-being of poor and middle-class households and show improvement among many dimensions. For example, for households in the bottom quartile of the income distribution, they report increases in the number of rooms (adjusted for household size), average house size, and the fraction of households with air conditioning, dishwashers, washing machines and dryers, between 1981 and 2009. It's not just about housing either - they also show that car ownership, on both the extensive and intensive margin, also increased substantially for this group of households.

Patterns of expenditures on non-durables also suggest growth in real incomes among this population. Furth (2017) makes the important observation that Engel's Law can be used to inform us about changes in real income. Engel's Law - of which Houthaker (1957) remarks "of all the empirical regularities observed in economic data, Engel's Law is probably the best established" - states that as real incomes rise, the proportion of income spent on food declines. And indeed, Furth (2017) shows that between 1979 and 2014, the percentage of disposable personal income spent on food declined from over 13% to under 10%. Moreover, the proportion of total household food expenditures spent on food away from home, which is well known to be a luxury good, increased from just under 32% to over 43%. Both of these observations are inconsistent with generational real wage stagnation.

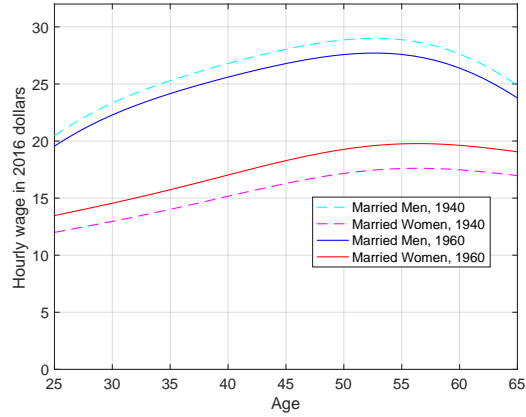
So what explains the authors' finding that the majority of the US population in the 1960's cohort would have been better off had they been born twenty years earlier? This finding about welfare can be decomposed into approximately orthogonal components arising from each of the three changes in lifetime opportunities. The largest factor, accounting for roughly half of the decline in welfare, is the decline in potential wages. The decline in life expectancy and the increase in medical expenses account for the other half of the decline in welfare in roughly equal parts. In the following sections, I highlight some caveats regarding each of these sources.

## Measuring Changes in Real Wages

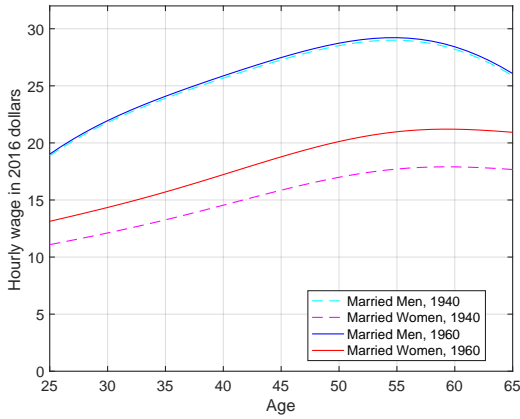
Figure 1a reproduces the authors' assumed life-cycle profiles for mean potential hourly wages for married men and women in each of the two cohorts. The main driver of the wage component of the decline in



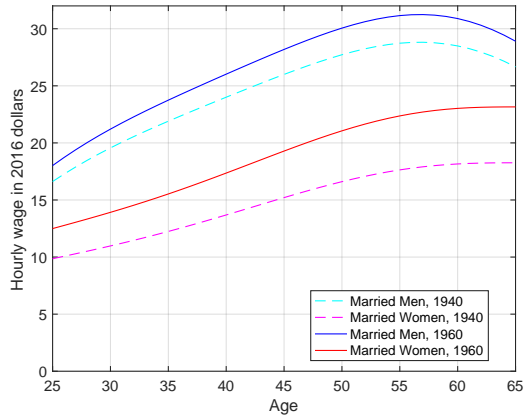
(a) Mean potential wages, deflated with CPI-U (as in paper)



(b) Mean potential wages, deflated with CPI-U-RS



(c) Mean potential wages, deflated with PCE



(d) Mean potential wages, deflated with PCE-BA

Figure 1: Mean potential wages with alternative price indexes

welfare is the fact that, at all ages, mean potential wages for men in the 1960's cohort (solid dark blue line) is about 9% lower than for men in the 1940's cohort (dashed light blue line). When this lower potential wage profile is fed through the structural model, it generates lower welfare for the later cohort. The authors construct real wages (which they report in 2016 dollars) by adjusting nominal wages for inflation using the Consumer Price Index for All Urban Consumers (CPI-U). I will argue that adjusting for inflation using CPI-U provides only a very low bound on implied real wage growth, and that using other price indexes that adjust for some of the biases in CPI-U paint a very different picture of mean real wage growth across these cohorts.

Over the last half-century, the Bureau of Labor Statistics (BLS) has made numerous changes to the way that it calculates the Consumer Price Index, most of which took place prior to 2000. Although these changes are intended to improve accuracy, the historical CPI-U series is not retroactively adjusted to reflect these improvements and hence the CPI-U is not consistent over time. Accordingly, the BLS makes available the Consumer Price Index Research Series Using Current Methods (CPI-U-RS), which adjusts CPI-U from 1978 onward to incorporate most of the recent improvements into the entire series. From 2000 onwards,

the CPI-U and CPI-U-RS series are almost identical, but between 1978 and 2000 the differ substantially. In particular, inflation according to the CPI-U is on average 0.4% p.a. higher than inflation according to the CPI-U-RS. Figure 1b shows that using the CPI-U-RS rather than CPI-U to construct lifecycle profiles for mean potential wages reduces the decline for married men across cohorts by about one-half.

There are also a number of well-known biases in the CPI-U-RS series (see Furth (2017) for an excellent summary). The CPI-U-RS is constructed by first estimating 8,018 separate item-area indexes and then aggregating these using a Laspeyre's price index. First, an upward small-sample bias arises because geometric averages are used to compute price indexes for about 2/3 of the item-areas. This bias has been estimated by the BLS to be about 0.15 percentage points per year. Second, a substitution bias arises because the Laspeyre's index used to aggregate across item-areas does not account for households substituting towards lower priced goods. This bias has been estimated by the BLS to be about 0.10 percentage points per year. Both of these biases can be mitigated by using a chain-weighted index, such as the C-CPI-U or the Personal Consumption Expenditure deflator (PCE). Furth (2017) also notes a third bias specific to the CPI that is due to the fact that the BLS uses the Consumer Expenditure Survey to construct item weights. Since households have better recall for large and repeated purchases, the weights on housing and utilities, which happen to be high inflation items, are biased upwards. Furth (2017) estimates this bias to be about 0.07 - 0.1 percentage points for year.

These biases in the CPI-U-RS can mostly be avoided by using the PCE deflator. The Bureau of Economic Analysis (BEA) uses a Fisher index to construct the PCE, which mitigates the small-sample and substitution biases, and computes weights using business sales data which suffers less from the weighting bias. Over the 50 years from 1967 to 2017, the period covered by the authors' data, inflation as measured by the PCE is on average 0.3%p.a. lower than inflation as measured by the CPI-U-RS. Moreover, the PCE covers a different basket of goods than the CPI-U-RS. If the PCE were re-weighted to reflect the same bundle of goods as the CPI, it would yield even lower inflation over this period. Figure 1c shows that using the PCE yields mean potential wage profiles that are actually slightly higher for the 1960's cohort than for the 1940's cohort.

But it is likely that even the PCE still overstates inflation because there a number of biases that are common to both the PCE and CPI. These include: (i) outlet-substitution bias, which reflects the fact that consumers can save money by shopping around and purchasing high quantities from lower-price sellers; (ii) new-product bias, which reflects the fact that the introduction of new products is essentially a price reduction from infinity to a finite price; (iii) quality-adjustment bias, which reflects the fact that both the BEA and BLS can only partially adjust for the effects of products being replace by higher quality versions; and (iv) consumer-valuation bias, which reflects the fact that when preferences change over time, households substitute toward preferred goods. Furth (2017) provides an overview of attempts to quantify the size of each of these biases, and concludes that a conservative lower bound on the upward bias is around 0.4% p.a. (0.1% p.a. of outlet-substitution bias and 0.3% p.a. of new-product bias and quality-adjustment bias). He labels the resulting price index as a Bias-Adjusted Personal Consumption Expenditure deflator (PCE-BA). The PCE-BA generates very similar inflation to the preferred measure of Meyer and Sullivan (2011), which is to subtract 0.8% p.a. from CPI-U-RS to account for these biases.

Figure 1d shows the effects of deflating nominal wages with the PCE-BA on the authors' potential wage profiles for married men and women. Two features stand out. First, rather than showing a large decline in potential wages for men across cohort, the data now shows a substantial increase for both men and women. Second, the implied potential wage profiles are much steeper with respect to age, than the original versions, suggesting that much of the flatness of the authors' wage age-profiles is due to the choice of price index.

Overall this suggests that about half of the decline in welfare across cohorts is directly due to the choice of price index for deflating wages. The authors' chosen price index (CPI-U) implies substantially higher inflation, and hence lower real wage growth, than more appropriate price indexes, such as the PCE.

## Interpreting Changes in Life Expectancy

To understand how changes in life expectancy drive the differences in welfare across the two cohorts, it is useful to recap the way that the authors model mortality. In the authors' model, dying is exogenous. The probability of dying depends on which of two health states an individual is in, so the death shock might be considered a "hit-by-a-bus shock, with a little bit of warning". There is nothing that an individual can do about mortality risk, since not even health-care affects the probability of being hit by the death shock.

Since the value attached to death is additively separable from the value of consumption and leisure while alive, the welfare effect of an increase in the probability of dying is effectively pinned down by the calibrated value of the parameter ( $b$ ) that governs the value of death. The authors choose this parameter to match a target Value of Statistical Life (VSL) of \$5 million. By choosing different values for this target, the authors' model could have delivered almost any desired implied welfare effect of the assumed change in life expectancy.

Empirical estimates of VSL come with a very large degree of uncertainty. The authors cite two studies that report values for VSL from \$1 million to \$9 million, but the reality is that we know very little about this number, particularly for the sub-population of low-educated whites that is the focus of the paper. Even small variations within this range yield large (almost one-to-one) differences in the welfare effects of changes in life expectancy. For example, increasing (decreasing) the target VSL by 40% leads to an increase (decrease) in the welfare costs of approximately 40% (see footnote 21).

UP TO HERE. Main reason this is an upper bound on welfare cost: effectively assumes that all the increase in mortality is of the hit-by-a-bus variety. Exogenous shock that one can do nothing about. But the increases we have seen do not fit this mould.... Moreover, as Currie and Schwindt show, focusing on middle-aged white males misses the point - the increase in mortality among this group is barely visible when placed alongside the massive declines in mortality that have been experienced by other groups over this same period, most notably non-whites.

## Modeling Changes in Medical Expenses

Medical expenses necessarily bad: ....

It seems prudent to at least allow for some of the possible benefits that these increased expenditures have yielded.

## Optimization and Sensitivity

## Final Thoughts