

## Mitchell's Musings 4-22-13: Does the CPI Have an Unchained Malady?

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Most people know or would recognize the song “*Unchained Melody*.” It became a hit in the mid-1950s and was recorded by various singers at that time and later.<sup>1</sup> However, most people who have heard the song don’t know the origins of its title since the word “unchained” does not appear in the lyrics. The song’s obscure origin is that it appeared in the 1955 movie “*Unchained*,” a difficult-to-obtain film about an actual California low-security prison. The prison operation was based on the idea that good treatment of prisoners would straighten them out.<sup>2</sup> Curiously, the song was not the film’s title theme and was incidental to the plot.<sup>3</sup> And, of course, the film’s message of prisoner redemption stands in sharp contrast to California’s later tough-on-crime, three-strikes-and-you’re-out policy.

For most people, the origin of the *Unchained Melody* is no more obscure than is that of the “*chained-CPI*,” an alternative price index recently embraced by President Obama in his latest budget message as a way of cutting future Social Security and other federal payments. Social Security benefits are adjusted by the Consumer Price Index (CPI), which is commonly described as an ongoing pricing of a typical “basket” of consumption goods. In fact, while that description was once reasonably accurate, the CPI’s methodology is more complicated today than that simple basket story suggests.



Economists in graduate school learn about “the index number problem” regarding substitution. The idea is that consumers don’t actually buy a fixed basket of goods but, over time, adapt to changes in *relative* prices by substituting against those products that rise in price particularly fast. The ability to make such substitutions partly offsets the price increase so that a fixed basket’s cost is said to exaggerate a typical consumer’s actual change in the cost of living. Thus,

<sup>1</sup> One of the first hit versions can be heard at <https://www.youtube.com/watch?v=KNj11dnFI68>. The song was revived in the mid-1960s [<https://www.youtube.com/watch?v=6ssySMc9B-Y>] and particularly again in the 1990s when the mid-1960s version was used in a popular movie.

<sup>2</sup> An excerpt of the 1955 movie can be seen at <http://www.youtube.com/watch?v=CxKMYzhc9IA>. There are apparently some versions available on DVD now (which may be bootlegged). The film had a second-tier cast with the lead played by football star Elroy “Crazylegs” Hirsch. Those who have seen old Perry Mason TV shows from the 1950s will also recognize the actress who played Mason’s devoted secretary in the film.

<sup>3</sup> The scene in which the song appears can be seen at <http://www.youtube.com/watch?v=JckrStimeDQ>.

if the basket version of the CPI rises by, say, 10% it seems to imply that the typical consumer's income would need to rise by 10% to offset the impact fully. But maybe only, say, an 8% increase in income would be needed to offset the measured 10% CPI increase thanks to the ability of consumers to make substitutions.

In fact, the U.S. Bureau of Labor Statistics (BLS) has published a version of the CPI that purports to account for the substitution effect and is known as C-CPI-U or "chained-CPI." As an empirical matter, it seems generally to rise more slowly than "regular" CPI. Thus, adopting the chained-CPI would reduce the cost of Social Security payments, assuming it produced a lower measure of inflation over long periods than the regular index. The President included the chained-CPI in his latest budget as an offering to Republicans in Congress in the context of ongoing negotiations. The proposal was immediately criticized by Democrats as a *de facto* Social Security cut.

It is easy to see the political case for making a reduction in Social Security via a technical adjustment which is based on the economic rationale that the chained-CPI is a more accurate measure of inflation. Changing the formula used to index Social Security to inflation reduces the dollars paid out by the program without explicitly doing so. In that sense, *if* the President ever gets his budgetary "Grand Bargain" accord with House and Senate Republicans, the chained-CPI might be more palatable to Democrats than an overt cut in Social Security. On the other hand, the descriptor "chained" was probably not the best word for the alternative price index from a public relations perspective; who wants to be chained? And the concept readily subject to parody: <https://www.facebook.com/photo.php?v=10151641531311522>.

We'll look more closely at the substitution idea in a moment. But note that if you really push economists, they would have to admit that except in very unusual circumstances, you can't really measure the "utility" (happiness) or the change in "utility" of a diverse group of people. You can talk about an average consumer but no one is quite average. If you are a teetotaler and the price of beer goes up, it doesn't matter to you at all. If you are an alcoholic, it matters a lot. And most people are somewhere in the middle across a spectrum.

Without weighting each person's happiness – how would you do that? – you can't say precisely what has happened to group welfare when relative prices shift. The very concept of group welfare is fuzzy. And, of course, all Social Security recipients – including those who have yet to become recipients – are a very large and diverse group. So the notion that a refinement in the CPI formula is making the index more accurate is questionable. It may look scientific to change the price index, but at best you are seeking to make a refinement of a problematic concept.

Critics of this particular refinement note that doing it “right” would require a study of consumer habits of the elderly and the chained-CPI is not based on such age-specific habits. But even if there were an elderly CPI, refining it down to the chained-CPI notion is a quest for a Holy Grail that doesn’t exist.

However, let’s ignore the non-existence problem and play the game. It should be the case that if all prices rise at exactly the same rate (so no relative price changes), an index that corrects for the substitution effect should move exactly the same as an index without such a correction. In such a case, the “basket” CPI needs no correction since consumers would not be making substitutions. So, specifically, if in period A and in a later period C, relative prices are exactly the same (although all prices have risen from A to C), we need no correction.

Now let’s assume there is an interim period B between A and C in which there was a relative shift in prices. (Some prices rose faster than others from A to B). And let’s assume that from B to C, the relative price shift is undone so that the goods with rapidly-rising prices in the A to B period were the goods with slowly-rising prices in the B to C period. If you had an index which supposedly corrected for substitution from A to B and from B to C, it should come out exactly the same over the entire A-to-C period as would an index that had no such correction. If regular CPI is analogous to the index that doesn’t correct for substitution, and if chained-CPI is analogous to an index that does correct for inflation, from A to C, both should show the same rate of inflation.

Let’s take a concrete example. Suppose there are just two goods: apples and oranges. Let’s assume that in period A, both sell for \$1 each. And let’s assume that with that array of relative prices (1-to-1), a “typical” consumer buys 50 apples and 50 oranges at a total cost of \$100. In period B, the price of an apple goes up to \$1.50 and the price of an orange goes up to \$1.10. With a fixed basket of consumption, the 50-50 consumption pattern would cost \$130 dollars (\$75 for apples; \$55 for oranges). So we would have to raise the consumer’s income by 30% to allow the basket to be purchased unchanged.

But at this point, the economist says “ahah!” You have neglected the substitution effect between A and B! The consumer could buy more oranges and fewer apples and thus offset some of the relative price effect. For example, if the consumer changed the basket in B to, say, 40 apples and 60 oranges (which would cost a total of \$128), we could compensate for inflation by raising income by only 28%.<sup>4</sup>

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<sup>4</sup> Imagine that we give the consumer varying amounts of income experimentally in period B and determine that with \$128 dollars, 40 apples, and 60 oranges, the consumer says he/she is just as happy in period B as he/she was in A.

Suppose now in period C, the apple price and the orange price have both risen to \$1.80. *Relative* prices are again 1-to-1 (one apple exchanges for one orange) just as they were in period A. So compared to period A, there should be no substitution effect and if fully compensated for inflation, the consumer would buy 50 apples and 50 oranges at a cost of \$180. Put another way, the typical consumer would need an 80% increase in income relative to period A to be equally well off in period C as in A.

Again, if we take the regular CPI to be analogous to the fixed basket story and chained-CPI to the substitution-correcting price index, regular CPI and chained-CPI should give the same inflation measure from A to C. Regular CPI would rise faster than chained-CPI from A to B but the two would reverse in relative pace from B to C. So what does BLS say about comparing the two over different periods? Here is an excerpt from a question-and-answer page on the BLS website:<sup>5</sup> [C-CPI-U is the chained-CPI; CPI-U is the regular CPI.]

*Is it possible for the C-CPI-U to increase faster than the CPI-U?*

*At lower levels, and for short periods of time, it is possible for the C-CPI-U to increase faster than the CPI-U. That said, the evidence suggests that the C-CPI-U over time will trend slightly lower than the CPI-U.*

It may well be that, as an empirical matter, BLS' chained-CPI has risen more slowly than regular CPI over the period in which the agency began to compute its chained-CPI. But to say that chained-CPI will *always* rise more slowly over very long periods is immediately suspect. More than the substitution effect must be involved in differentiating the two indexes if that projection by BLS is definitely true. Or there must be an over-correction for substitution in chained-CPI.

You cannot say with certainty that over decades and decades, relative prices in some sense won't realign compared to some base period as they do in our A-to-C example. If chained-CPI rose more slowly than regular CPI from A to B *and again from B to C*, something is wrong with the chained-CPI measurement since regular CPI is correct from A to C. Chained-CPI cannot rise more slowly than regular CPI over both sub-periods and yet come out the same as regular CPI over the entire period.

Perhaps it would have been more accurate for the BLS webpage to say simply that in trying to deal with substitution, it came up with chained-CPI. In the past experimental comparison period, chained-CPI rose more slowly than regular CPI. BLS could then say that chained CPI

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<sup>5</sup> Source: [http://www.bls.gov/cpi/cpisupqa.htm#Question\\_6](http://www.bls.gov/cpi/cpisupqa.htm#Question_6).

probably will rise more slowly than regular CPI over long periods in the future but that exactly why is not clear. Both indexes are in fact more complicated than the simple basket-versus-substitution story suggests, it could say, and therefore it is not evident which is “better” for indexing Social Security.

Of course, over very long periods, more than substitution comes into play. Tastes could change, new products could be invented, and folks might become happier or sadder for reasons unrelated to prices. But all of that is simply the reason why we can’t really go on a pretend quest to measure changes in happiness precisely. Are people today happier or unhappier than they were, say, 30 years ago? Who knows? What does that question even mean in some ultimate sense?

Note that there are folks on Social Security today who started on Social Security 30 years ago. It’s probably the case that a 95 year old Social Security recipient might well be less happy for health reasons than she was at age 95. (It is very likely to be a *she* at age 95.) Do we really want to have a Social Security reduction, therefore, that chips away year-by-year at her income due to lower measurement of inflation? If we were going to cut Social Security benefits, couldn’t a case be made for taking more away from younger recipients than from older ones? Absent some complicated additional correction, however, chained-CPI works in the opposite direction.

There are many other considerations in a switch to chained-CPI for Social Security indexing. BLS makes corrections in the CPI’s various components (whether those components go into chained-CPI or regular CPI) for product “quality.” Consumer products such as computers, cell phones, etc., may improve in quality over time but valuing that improvement and factoring it into the CPI is a complicated matter; reasonable alternative methodologies could produce alternative results.<sup>6</sup> To be clear, there is no implication here that BLS is somehow cheating. It is just that there is a range of options. It’s likely that the range of reasonable quality-adjustment options could produce alternative price measures that in either direction (more or less measured inflation) would be larger than the projected gap between regular CPI and chained-CPI.

In the end, what we have in a switch to chained-CPI for Social Security is a political decision, not a scientific one. But once we make the switch – if we do - it will be in effect for decades and will touch the welfare of many people. As the lyrics to *Unchained Melody* suggest, “time goes by so slowly, and time can do so much...”

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<sup>6</sup> Not everything improves in quality as anyone old enough to remember what a tomato once tasted like can attest.