Commentary

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Macroeconomists ranging from policymakers to business and economic forecasters use the concept of potential output in specific economic constructs. In some applications, economists look at the "output gap"—the difference between an estimate of potential output and the measure of actual real output—as a forecasting tool for inflation to gauge whether deviations of real output from potential should lead to increases or decreases in future inflation. Monetary policymakers use potential output in this way in applications of the Taylor rule framework. Separately, economic forecasters use the estimate of potential output as a comprehensive measure of the underlying trend in real output growth for the economy. In the latter usage, calculating an estimate for potential output typically starts with estimates of the primary factors of production—capital and labor inputs.

The motivation for the paper "Trends in the Aggregate Labor Force" (Matheny, 2009) is the search for a more accurate and comprehensive measure of the labor input for potential output estimates. The goal is commendable, and there are few reasons to fault the author for committing resources toward producing an improved estimate for the labor input. Matheny uses a more detailed set of labor data series from which to calculate an estimate of the available labor force and ultimately to create an estimate of the labor input measure. Even in a preliminary form, the paper provides a concise survey of a work in progress as it outlines a number of additional issues that remain unsettled. Among the main findings is an influential role of factors that could influence the labor force participation of women 55 and older as inferred from an estimated regression model. This participation rate has increased over time and is currently higher than has been observed historically. The bottom line from the research is that estimates of potential output that do not take into account behavioral responses that reflect increasing labor force participation rates of the older population will *under*estimate the growth in the labor force and thereby underestimate the growth rate for potential output.

In this discussion, I focus my comments on these central findings of the research. First, my discussion outlines the contribution of the paper with respect to the calculation of the demographic component of the labor force. Next, the comments focus on the main explanatory variable in the aggregate labor force participation rate regression—the population proportion of women 65 and older weighted by life expectancy of women at age 65 (the behavioral variable *WT65F_LEF65* in the paper). Next, the discussion investigates whether other, additional factors may explain the strong observed correlation between the dependent variable (a change in the aggregate labor force participation rate) and the *WT65F_LEF65* variable. More narrowly, I ask whether there are underlying variables that may explain the increased labor force participation of women 65 and older in addition to the rising life expectancy of women.

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Further, the discussion investigates whether the implied elasticity of labor force participation with respect to the *WT65F_LEF65* variable in the regression is consistent with feasible changes in the labor force participation rate of women 65 and older. The findings suggest that there remain numerous interesting research questions that these observations raise for labor economists in particular. Finally, I make some suggestions for broadening the appeal of the work.

CALCULATION OF THE LABOR INPUT

The bottom-line finding of the paper is that a revised labor input measure contributes an increase of nearly 0.5 percentage points to the estimation of potential output growth. The measure sounds small, but that kind of calculation is significant, especially if it is an accurate forecast. Clearly, the labor input for the estimation of potential output is only one of several inputs important for that calculation. Rather than highlighting the limitation of focusing on only one factor input, this discussion adopts the view, as stated in the paper, that refining the labor input measure for a potential output estimate is "low-hanging fruit."

The treatment of labor force growth is central to the paper, and it clarifies the distinction between the components of labor force growth that reflect only shifting population demographics and those that reflect labor force participation rates of the demographic subcategories (gender and age categories). The population demographics can be predicted reliably from population data. In contrast, the labor force participation rates may vary as a result of changes in economic situation, life expectancy, and so on and therefore may deviate from a trend labor force participation rate. The paper makes a notable contribution to the measurement of the labor input estimate from the calculation of additional gender/age brackets and the incorporation of the related labor force participation rates. Specifically, the paper increases the number of age brackets from 7 to 15, thereby increasing the detail of the population characteristics and likely affording a more comprehensive labor force estimate. Further, the paper uses the narrower population measure—civilian noninstitutional population—rather than resident population data—to generate more precise estimates of labor force. Using available population demographic data (civilian noninstitutional population), the author calculates a chain index of the age-and-gender population detail at the quarterly frequency.

The labor force series uses the participation rates from the previous period ($t-1$) as weights for the population demographics for each age and gender category in the current period and thereby emphasizes the impact of demographic factors. The series, listed as *LFCADJL*, measures the quarter-to-quarter growth as entirely due to demographic factors. The previous description understates the amount of meticulous data analysis required to formulate an improved labor force growth estimate.

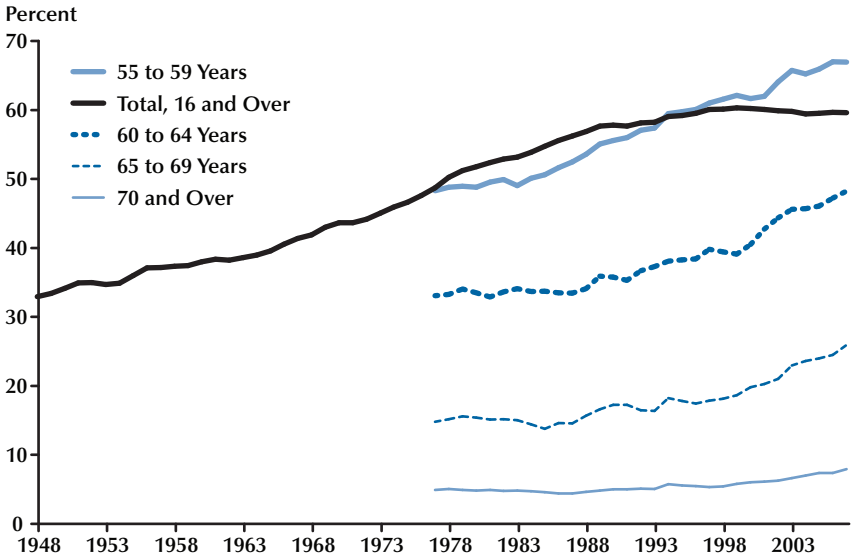
The influence of population growth in a given demographic component on the labor force relies on the proportion of that demographic group in the labor force (noting the dating differences of the aggregate and age-gender bracket). Clearly, if a demographic group—like those 75 and older—grows rapidly, but the share of that demographic group in the labor force is low, then the influence of that population growth on the labor force is small. As noted previously, this labor force measure highlights the demographic components of population and its effects on the labor force if labor force participation rates were not changing.

The accounting aspect of the investigation, that is, the addition of demographic subcategories in the labor input measure, provides only the groundwork for the economic analysis of the behavioral element of the labor force input. Still, the general work on the comprehensive dataset offered opportunities to investigate the labor force participation rates of various age and gender brackets.

Figure 1 illustrates the specific isolation of the labor force participation rate for women 55 and older and its subcategories (55-59, 60-64, 65-69, and 70 and older). The observation of rising labor force participation rates of women 65 and older compels further investigation, and the empirical work investigates whether including a

Figure 1

Female Labor Force Participation by Age



measure of the life expectancy of women at age 65 multiplied by the population proportion of women 65 and older adds explanatory power to a regression to forecast the behavioral element (labor force participation rates) of the aggregate labor input. The research provides an interesting initial inquiry into a regression-based empirical model to explain (and then predict) the aggregate labor force participation rate.

THE REGRESSION

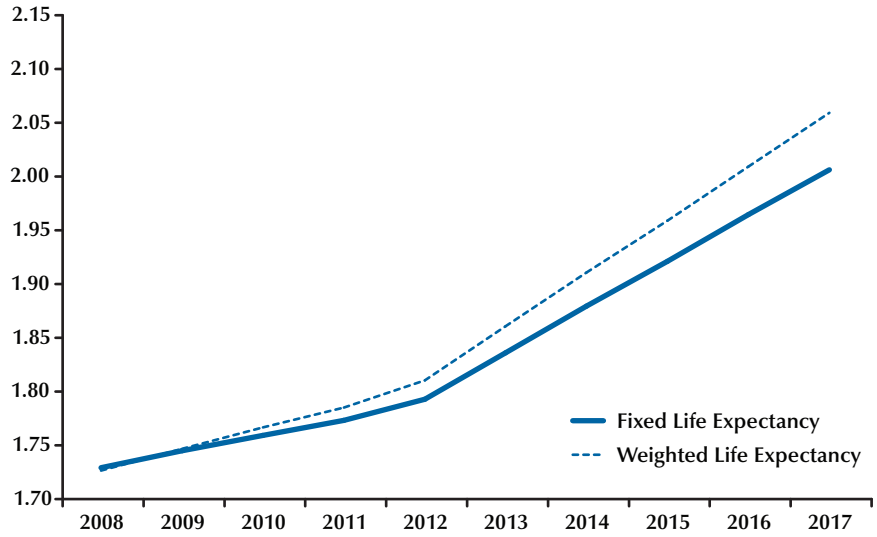
The regression analysis in the paper uses a set of explanatory variables intended to account for the behavioral changes in the aggregate labor force participation rate. The paper outlines and describes the regression in detail; my discussion here focuses on one key explanatory variable—life expectancy of women at age 65 times the share of women age 65 and older in the adult population. This variable is especially important for the forecast period 2011-17 and largely explains the increase in labor force participation in the new estimate for the labor input.

The finding raises a number of questions; the main one is whether a regression model that is meant to explain the behavioral variations in aggregate labor force participation rates attributes too much influence to this particular variable. It would be helpful to have an explicit accounting for the quantitative increase in the labor force generated by increases in *WT65F_LEF65*. First, the explanatory series should have a positive effect on the participation rates of women 65 and older. Second, the increase in the participation rate of women 65 and older times the population of women 65 and older should generate an increase in the labor force of women 65 and older of a similar magnitude to the one generated by the aggregate labor force participation rate regression.[1] Conversely, the author can work in the opposite direction by taking the increase in the labor force implied by the aggregate labor force participation rate regression coefficient and investigate the required increase in the labor force participation

[1] A related question is whether the rise in life expectancy for women at age 65 has significant explanatory power for the participation rate of women 65 and older.

Figure 2

Comparison of Weighted versus Unweighted Population Proportion of Women 65 and Older



SOURCE: Population projections from www.bls.gov/emp/emplab1.htm.

rate for women 65 and older that would be necessary to generate the labor force observation.

Second, the variable itself is composed of two increasing components—the population proportion of women 65 and older and the life expectancy of women at age 65. Figure 2 shows the estimated series for 2008-17 along with a series in which the life expectancy after age 65 is held fixed at 19.7 years (the expectancy in 2008). Clearly, the dominant component of the series is the population proportion of women 65 and older, which reflects the demographic influence of the large baby boom generation. If the life expectancy component of the measure were important to the regression results, then a regression using only the population proportion of women 65 and older should not have much explanatory power. If, on the other hand, the regression results are similar, then the result suggests that behavioral variations in the aggregate labor force participation rate respond to demographic movements. Such an explanation would be unsatisfying.

The author could also try a few other techniques to assess the feasibility of the result. The data on the population of women 65 and older could be used to carry the demographic analysis out to the forecast year 2017, given standard assumptions for the mortality rate, and so on. Then, the analysis can focus on examining a set of possible labor force participation rates for women 65 and older and how different labor force participation rates affect the aggregate labor force. For example, a particular labor force participation rate for this specific entry could be chosen to determine what that participation rate suggests for the aggregate labor force calculations. The accounting of the population demographics is noncontroversial; the examination of the labor force implications of various labor force participation rates for this demographic can be thought of as a conditional forecasting exercise. The analysis would allow an inference for (i) whether the explanatory power of the life expectancy of women at age 65 reflects only the contribution of women 65 and older to the labor force or (ii) whether the measure reflects further influences as a proxy. Other factors may be correlated with the specific regressor variable; that result, if found,

would allow further refinement of the initial finding. Additional research would then aim at uncovering the additional factors with the goal of identifying (or at least clarifying) other underlying sources for the increase in the labor force participation rate.

The regression model is meant to explain the behavioral aspects of labor force participation, although the current findings also introduce some intriguing questions that, the author admits, remain unsettled. Some of these questions are addressed in the paper. For example, the author investigates whether aggregate wealth calculations explain the increased labor force participation; initial results suggest that a measure of wealth was not associated with the increase in labor force participation. The result may be only preliminary, however, because it uses an aggregate measure of per capita wealth. In accord with the previous suggestions, an analysis of disaggregate wealth measures that relate to specific demographic groups—for example, the population 65 and older—may have explanatory power for the labor force participation of that subcategory.

Increased life expectancy of women at age 65 may explain the higher-than-anticipated labor force participation of women 65 and older; it makes intuitive sense. Separately, there may be important cost-of-living elements that drive a higher labor force participation rate for those 65 and older. Recent empirical work by Broda and Romalis (2008) suggests that economic analysis can be more precise with respect to the "wage gap" with more precise price deflators that relate more closely to the prices and to the expenditure patterns of the relevant income groups in the comparison. Perhaps a similar approach can be used for the population 65 and older. The consumer basket for a person 65 or older could be notably different from the standard basket of goods used in the calculation of the consumer price index. One might expect a larger component of spending on prescription drugs and for health services for those 65 and older; then, there might be a faster rate of inflation for that cohort than for the general public. A rising cost of living for those facing fixed incomes might lead to a higher-than-expected rate of labor force participation. In this case, longer work lives may also be related to the increased life expectancy of those 65 and older.

These comments and criticisms aim to refine and dissect a notable result. The basic finding of the regression highlights a major flaw in the use of fixed or trend participation rates in the calculation of "potential" labor force. That contribution remains even though several other factors remain to be investigated as potential sources for a forecast of increased labor force participation in the aggregate labor input measure. Specifically, the empirical work captures some of the observed changes in the labor force decisions of older individuals and the effect of those changes on the labor force projections for the future. The point is especially important given the demographic impact of the baby boom generation on the labor force as that generation approaches retirement age. If the baby boomers stay in the labor force longer than anticipated, there will be important labor market effects, and this paper emphasizes that point.

IDEAS FOR ILLUSTRATING THE IMPORTANCE OF THE LABOR INPUT REVISION

The paper provides ample evidence to suggest that the labor force participation rate increase among those aged 65 and older may increase the potential labor force above the pessimistic forecasts offered by the demographic data alone. Yet, the labor input is only one component of the calculation of potential output. In addition, some influential treatments of estimating potential output have instead focused on the calculation of the effect of computers on economic growth (Jorgensen, 2005). The paper can use the impending baby boomer event to motivate the relevance of the labor input in the calculation of a real-time potential output estimate. The estimate of potential output that incorporates revised labor force participation rates (new behavioral labor force estimates) displays a deviation from the previous potential gross domestic product estimate that is

larger than at any earlier period in the estimation sample.

Revisions to potential gross domestic product measures have been the subject of numerous empirical investigations (Orphanides, 2001); the paper could incorporate some of these findings to illustrate where prior estimates of potential output failed to account for certain factors. It is likely that the current labor force participation rates are undergoing an adjustment that, in retrospect, will seem more apparent.

It may be worthwhile, though not necessarily for this research agenda, to determine whether there are precedents for the labor force participation rate underestimate. Perhaps the increase in female labor force participation through the 1970s and 1980s was relatively unexpected. More recently, the influence of immigration may have affected estimates of the labor input. The paper can highlight further its relevance if it can isolate historical episodes in which more accurate labor input measures for a potential output estimate were empirically important.

CONCLUSION

The paper offers an interesting contribution to the calculation of the labor input for a potential output estimate by increasing the disaggregation of the demographic components of the labor force input. Further, the paper provides initial results for a model of the behavioral element of the labor force input, essentially, a model of the aggregate labor force participation rate. The data-based enhancements for the labor input measure are noncontroversial and should offer a roadmap for other estimates of potential output growth. The model-based predictions regarding the aggregate labor force participation rates are intended to stimulate discussion rather than be taken as ultimate findings. The discussion highlights a number of avenues to pursue to refine our understanding of the estimated regression model and to assess its robustness.

The overall implication of the regression analysis suggests that the pessimistic forecasts of labor force growth in the United States may be too low, and that suggestion contributes to an interesting debate about labor force dynamics in the medium term. The paper raises a number of interesting research topics from the aggregate labor data. Perhaps other interesting research could use the aggregate research results as motivation for modeling the behavioral decisions for labor force participation on the level of the disaggregate population demographics. Although these ideas are not part of the author's research agenda, labor economists could offer findings that then help isolate additional sources of the increased labor force participation rate.

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