FEDERAL RESERVE BANK OF ATLANTA

Economic Review

Number 4, 2009

Changes in the Aggregate Labor Force Participation Rate

Julie L. Hotchkiss

FEDERAL RESERVE BANK OF ATLANTA
Economic Review
Volume 94, Number 4, 2009

Changes in the Aggregate Labor Force Participation Rate

Julie L. Hotchkiss*

Human capital is a vital component in the production process, so the size of the labor force can profoundly affect the potential for economic growth. In the United States, the overall labor force participation rate (LFPR)—the percent of the population supplying labor to the market—began to grow in the mid-1960s, mainly because of the rise in women's LFPR. But since 1997 the aggregate LFPR has been generally declining. Many researchers have linked this decline to demographic factors, chiefly the drop in labor force participation among young people and working-age women.

This article presents a simple methodology for decomposing changes in the aggregate LFPR over time into demographic group changes in both labor force participation behavior and population shares. The decomposition reveals that a decline in the population shares of working-age men and women was actually the driving force behind the recent drop in the aggregate LFPR, outweighing the effect of the declining participation rates of women and youth.

This simple method demonstrates how little information is needed to evaluate the historical evolution of the aggregate LFPR and to make projections of its future path that are a close match to estimates from more complex structural forecasting models.

JEL classification: J11, J21, E24
Key words: labor force participation, decomposition, forecasting

ISSN 0732-1813

*The author is a research economist and policy adviser in the Atlanta Fed's research department.

Changes in the Aggregate Labor Force Participation Rate

Julie L. Hotchkiss
The author is a research economist and policy adviser in the Atlanta Fed's research department. *She is grateful to Alexander Ellis of the U.S. Census Bureau, who was extremely helpful in obtaining historical population projections, and Bruce Fallick, who shared his model's forecasts of labor force participation rates. She also benefited greatly from discussions with John Robertson and e-mail correspondence with Karen Smith and David Brauer. She thanks Elaine Clokey, Kathryn Rees, and Amanda Kay Seals for additional assistance.*

The share of the population willing to supply their labor to the market can have a profound impact on the potential growth of the economy. Human capital is an important component of the production process, and an ever-growing supply of labor feeds an ever-growing level of production without putting too much pressure on costs and, thus, on prices of final products. The labor force participation rate (LFPR) measures the percent of the population willing to supply their labor. In the mid-1960s, the LFPR began to grow significantly, driven largely by the rise in the LFPR among women (see figure 1). But in 1997 the aggregate LFPR began a decline that has continued (with fits and starts) through 2008.

Many researchers have tried to identify the source of the relatively recent decline in the aggregate LFPR in the United States. Some have linked the decline to cyclical factors, yet the decline started before and continued past the 2001 economic downturn, suggesting an additional structural component to the change (see Aaronson et al. 2006). Among different demographic groups, the most significant declines in labor force participation have been observed among the young and among working-age women (see Cohany and Sok 2007; Lerman 2007; Mosisa and Hipple 2006; Hotchkiss 2006; Bradbury and Katz 2005; and Kirkland 2002).

These efforts to explain changes in the aggregate LFPR by focusing on behavioral changes among certain demographic groups often neglect the simple algebraic contribution that population changes can make to the determination of the aggregate LFPR. This article illustrates how changes in the aggregate LFPR can be decomposed into changes in the labor force participation behavior of different demographic groups and changes in each group's population share. This exercise demonstrates that the decline in the population share of working-age men and women actually dominated the change in participation rates of women and youth that has received so much recent attention. In addition, this article demonstrates how this decomposition, population projections, and simplistic assumptions about labor force participation can be used to construct a reduced-form, back-of-the-envelope time path of future changes in the aggregate LFPR that matches fairly closely estimates from structural forecasting models.

The decomposition

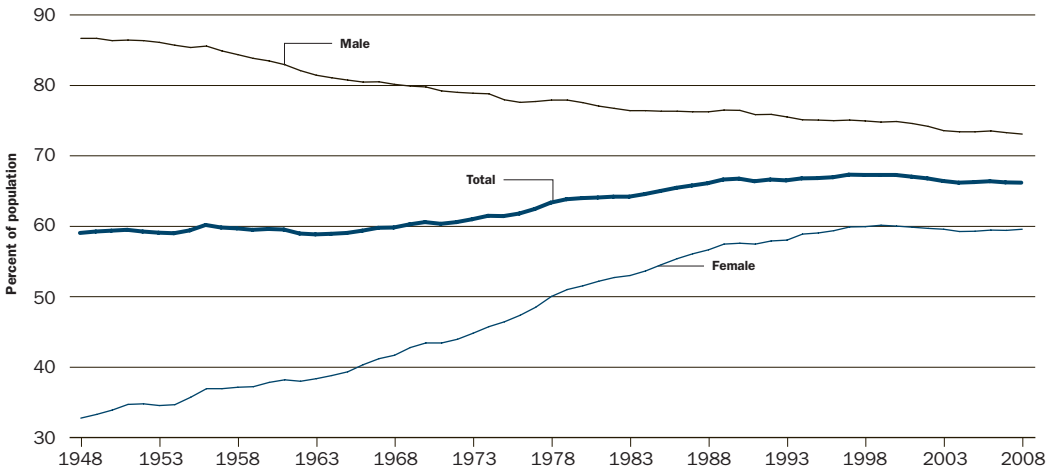
The aggregate LFPR can be expressed as a population-weighted average of the LFPR for different demographic groups:

$$(1)\quad LFPR_t = \Sigma_i p_t^i LFPR_t^i,$$

where $LFPR_t$ is the aggregate labor force participation rate at time t, $LFPR_t^i$ is the labor force participation rate of demographic group i, and p_t^i is the population share of demographic group i. The change in the labor force participation rate from $t-1$ to t is given by

$$(2)\quad LFPR_t - LFPR_{t-1} = \Sigma_i \{[LFPR_t^i - LFPR_{t-1}^i]\, p_t^i + [p_t^i - p_{t-1}^i]\, LFPR_{t-1}^i\}.$$

Figure 1
Labor force participation rate (LFPR), 1948–2008



Source: BLS

In equation 2 the change in the aggregate *LFPR* is represented by the change in each demographic group's participation rate (weighted by the group's current-period population share) and the change in population shares (weighted by the group's previous-period LFPR).

Other researchers have presented similar decompositions of the aggregate LFPR. Juhn and Potter (2006) decompose changes in the aggregate LFPR as described in equation 2 but fix the population weights to their 1979 levels; they conclude that changes in population weights accounted for very little of the change in the aggregate LFPR between 1969 and 2004. The decomposition results in this article, however, show that, except for the 1970–80 period, population changes have not only contributed significantly to changes in the aggregate LFPR but have even dominated most of the time since 1950.

Aaronson et al. (2006) and Fallick and Pingle (2007) decompose deviations of the aggregate LFPR from its mean over time as a function of deviations of population shares and demographic group participation rates from their respective historical averages. Their decompositions identify how each group's evolution in participation rates and population shares contributes to the evolution of the aggregate LFPR. Fallick and Pingle point out that the evolution in population shares accounts for most of the evolution in the aggregate LFPR.

The focus of these earlier analyses was on how to better understand the evolution of labor force participation rates within different demographic groups. The goal of this article is simplicity: to demonstrate how little information is needed along with the algebraic relationship in equation 2 to understand the driving force behind the historical evolution of the aggregate LFPR and to predict the future path of the aggregate LFPR.

Changes in the aggregate LFPR from 1950 to 2008

The table presents the contributions of four different demographic groups' changes in both labor force participation behavior and population shares to five-year changes in the aggregate LFPR. The last two rows of the table show the percent of the change in the aggregate LFPR attributable to absolute value changes in both behavior (the sum of absolute value changes in LFPRs across groups) and population shares. While results are shown for four groups—16-to-24-year-olds, women between 25 and 54 years, men between 25 and 54 years, and everyone 55 years and older—the exercise can be expanded to many more demographic groups and be repeated at any frequency desired.

Contributions of changes in labor force behavior and population share to five-year changes in the aggregate LFPR

	1950–55	1955–60	1960–65	1965–70	1970–75	1975–80	1980–85	1985–90	1990–95	1995–2000	2000–2005	2005–2008
Five-year change in aggregate LFPR	**0.02**	**0.10**	**–0.54**	**1.54**	**0.93**	**2.43**	**1.05**	**1.77**	**0.05**	**0.49**	**–1.04**	**–0.07**
Change in LFP of 16–24 year olds	–0.60	0.05	–0.12	0.87	1.10	0.75	0.06	–0.18	–0.16	–0.08	–0.81	–0.32
Change in population share of 16–24 year olds	–1.48	0.90	1.47	0.95	0.67	–0.46	–1.88	–1.18	–0.93	–0.12	0.07	–0.12
Change in LFP of women 25–54 years old	0.91	0.91	0.63	1.30	1.30	2.29	1.55	1.25	0.47	0.32	–0.42	0.16
Change in population share of women 25–54 years old	0.10	–0.40	–0.72	–0.47	–0.29	0.04	0.77	0.89	0.54	–0.21	–0.82	–0.51
Change in LFP of men 25–54 years old	0.25	–0.11	–0.08	–0.22	–0.34	–0.05	–0.08	–0.14	–0.51	0.00	–0.30	0.00
Change in population share of men 25–54 years old	0.22	–1.20	–1.63	–0.83	–0.28	0.25	1.23	1.54	0.69	–0.31	–0.71	–0.47
Change in LFP of 55+ year olds	–0.23	–0.31	–0.40	–0.14	–1.13	–0.52	–0.69	–0.05	–0.03	0.65	1.38	0.67
Change in population share of 55+ year olds	0.84	0.27	0.31	0.08	–0.10	0.13	0.08	–0.36	–0.03	0.24	0.56	0.52
Percent of total contribution of (absolute value) changes in LFP	**43.00**	**33.29**	**22.98**	**51.94**	**74.26**	**80.37**	**37.43**	**29.02**	**34.62**	**54.36**	**57.32**	**41.56**
Percent of total contribution of (absolute value) changes in population share	**57.00**	**66.71**	**77.02**	**48.06**	**25.74**	**19.63**	**62.57**	**70.98**	**65.38**	**45.64**	**42.68**	**58.44**

Source: Author's calculations using labor force data and labor force participation rates from the BLS

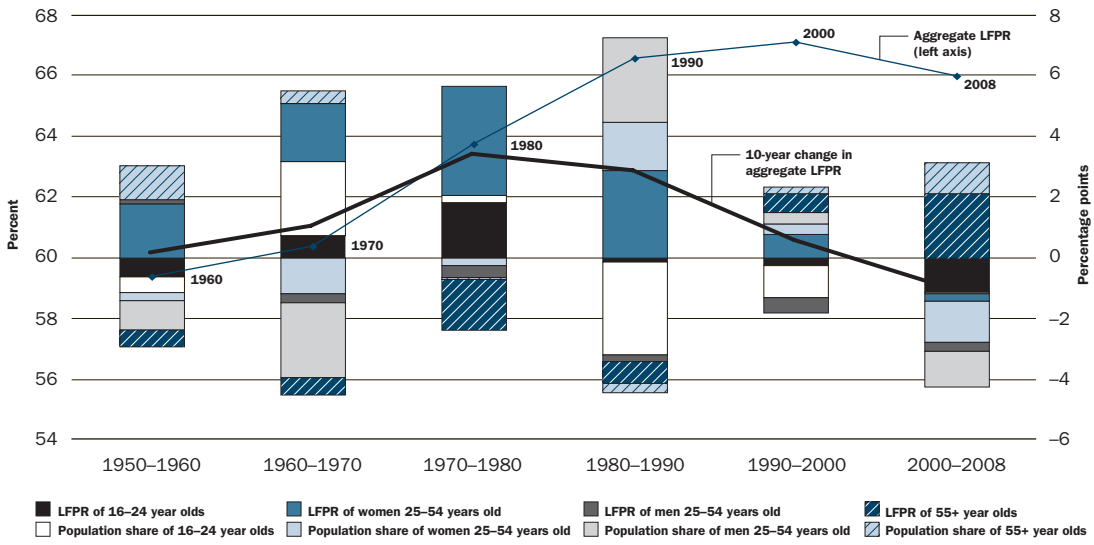
Except during the 1970–80 period, when women's labor force behavior was changing dramatically, changes in population shares contributed significantly to changes in the aggregate LFPR. Between 2000 and 2005, the decline in population shares of men and women between 25 and 54 years of age overwhelms the downward contribution imposed by behavioral changes of 16-to-24-year-olds and working-age women. The largest factor offsetting those declines was an increase in labor supply behavior among people 55 and older.

The relative contributions of behavior and population changes to changes in the aggregate LFPR can be visualized more easily in figure 2, which decomposes the ten-year change (as opposed to the five-year change in the table) in the aggregate LFPR into population share changes and LFPR changes across the same demographic groups already described.

The figure illustrates the dramatic contribution that rising labor force participation among working-age women made to the rise in the aggregate LFPR between 1950 and 1990. While working-age women's labor force participation continued to rise between 1990 and 2000, it did so by a much smaller amount than in previous decades. Counteracting the slowdown in the growth of women's labor force participation was the change in trend of labor force participation among those 55 and older. The contribution of changing population shares is also evident. The decline in the population share of 16-to-24-year-olds between 1980 and 1990 (the first period of "aging" for baby boomers) was a large contributor to the slowdown in the rise in the aggregate LFPR.

Figure 2 also clearly shows the contribution of the declining labor force participation of youth and working-age women to the decline in the aggregate LFPR between 2000 and 2008. The noted dramatic rise in labor force participation among the elderly (see Gendell 2008) is also evident. Most notably, however, figure 2 shows that the decline in the population shares of working-age men and women contributed more to the decline in the aggregate LFPR than the change in behavior

Figure 2
Contributions of changes in labor force behavior and population share to ten-year changes in the aggregate LFPR



Source: Author's calculations using labor force data and labor force participation rates from the BLS

of the young and women combined. Without the benefit of this study's relative comparison and consideration of changing population shares, other researchers have claimed that the change in behavior among the young and women alone offset the rising labor force participation among the elderly. This decomposition makes it apparent that without the declining population shares of working-age men and women, the rise in the labor force participation of the elderly would have dominated the labor force participation declines among the young and women.

Projecting changes in population shares

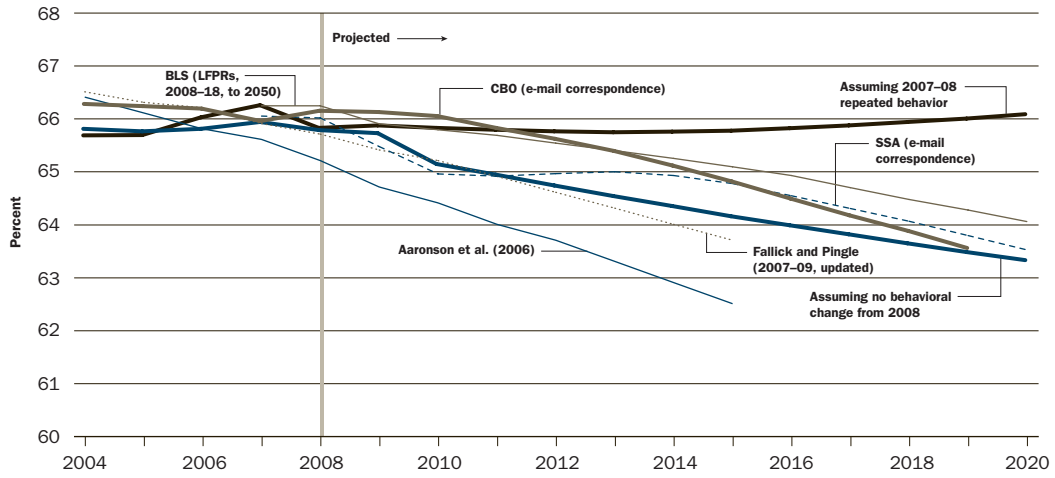
This simple accounting for changes in population shares follows a path similar to that projected by structural behavioral models of long-term labor force participation trends. The structural models will necessarily be more accurate in pinpointing aggregate levels of labor force participation in the short term, but population changes appear to be a driving force in these models when making longer-term predictions.

Figure 3 plots LFPR projections from various sources, along with the projection derived from equation 2 that accounts for U.S. Census Bureau population projections and two simple behavioral assumptions: no behavioral change from 2008 and repeated 2007–08 behavioral change. The assumption of no behavioral change is more consistent with the projections from the structural models. The implication from comparing the aggregate LFPR projection derived by taking into account only changes in population shares (assuming behavior in 2008 remains unchanged) and projections derived from much more sophisticated modeling efforts is that these structural projections are clearly driven by changes in population projections rather than by estimated changes in behavior.

Conclusion

This article has shown that, in spite of the attention the changing behavior of youth and working-age women has received in trying to explain the decline in the aggregate LFPR since 2000, changing population shares accounted for an even greater portion of that decline.

Figure 3
Projected total LFPRs



Source: Aaronson et al. (2006); Fallick and Pingle (2007); CBO (2009) and e-mail correspondence with David Brauer; SSA (2009) and e-mail correspondence with Karen Smith; U.S. Census Bureau (2008); BLS (2009)

Going forward, simply accounting for changes in population shares (and assuming no behavioral change) yields a projection of the aggregate LFPR that is consistent with structural models produced from a variety of sources. The implication of identifying most of the anticipated declines in aggregate LFPR as being rooted simply in changes in population shares is that there are predictable underlying changes that may constrain economic growth, at least through 2020 (see Aaronson et al. 2006).

Of course, these projections of continuing declines in labor force participation assume that the U.S. Census Bureau and others have correctly predicted population growth. For example, an increase in immigration would not only increase the population share of certain age groups but, if immigrants are positively selected, may also increase the labor force participation rates of those groups (Mosisa 2006). In addition, participation rates may vary across immigrants depending on country of origin (see Schoeni 1998 and MacPherson and Stewart 1989). Furthermore, changes in labor productivity will be important in determining how any level of labor force participation translates into economic growth. Indeed, many are convinced that immigration, gains in productivity, and normal price fluctuations in the labor market will resolve any labor shortage issues that might be expected to arise from declining labor force participation (for example, see Freeman 2006 and Grossman 2005).

References

Aaronson, Stephanie, Bruce Fallick, Andrew Figura, Jonathan Pingle, and William Wascher. 2006. The recent decline in the labor force participation rate and its implications for potential labor supply. *Brookings Papers on Economic Activity* no. 1:69–134.

Bradbury, Katharine, and Jane Katz. 2005. Women's rise: A work in progress. Federal Reserve Bank of Boston *Regional Review* 14, no. 3:58–67.

Cohany, Sharon R., and Emy Sok. 2007. Trends in labor force participation of married mothers of infants. *Monthly Labor Review* 130, no. 2:9–27.

Congressional Budget Office (CBO). 2009. The budget and economic outlook: Fiscal years 2009 to 2019. January. www.cbo.gov/doc.cfm?index=9957 (December 14, 2009).

Fallick, Bruce, and Jonathan Pingle. 2007. A cohort-based model of labor force participation. Federal Reserve Board, Finance and Economics Discussion Series #2007-09, April.

Freeman, Richard B. 2006. Is a great labor shortage coming? Replacement demand in the global economy. NBER Working Paper #12541, September.

Gendell, Murray. 2008. Older workers: Increasing their labor force participation and hours of work. *Monthly Labor Review* 131, no. 1:41–54.

Grossman, Robert J. 2005. The truth about the coming labor shortage. *HRMagazine* 50, no. 3:46–53.

Hotchkiss, Julie L. 2006. Changes in behavioral and characteristic determination of female labor force participation, 1975–2005. Federal Reserve Bank of Atlanta *Economic Review* 91, no. 2:1–20.

Juhn, Chinhui, and Simon Potter. 2006. Changes in labor force participation in the United States. *Journal of Economic Perspectives* 20, no. 3:27–46.

Kirkland, Katie. 2002. Declining teen labor force participation. U.S. Department of Labor, Bureau of Labor Statistics, *Issues in Labor Statistics*, Summary 02-06 (September).

Lerman, Robert I. 2007. Career-focused education and training for youth. In *Reshaping the American workforce in a changing economy*, edited by Harry J. Holzer and Demetra Smith Nightingale. Washington, D.C.: Urban Institute Press.

MacPherson, David A., and James B. Stewart. 1989. The labor force participation and earnings profiles of married female immigrants. *Quarterly Review of Economics and Business* 29, no. 3:57–72.

Mosisa, Abraham T. 2006. Foreign-born workforce, 2004: A visual essay. *Monthly Labor Review* 129, no. 7:48–55.

Mosisa, Abraham, and Steven Hipple. 2006. Trends in labor force participation in the United States. *Monthly Labor Review* 129, no. 10:35–57.

Schoeni, Robert F. 1998. Labor market assimilation of immigrant women. *Industrial and Labor Relations Review* 51, no. 3:483–504.

Social Security Administration (SSA). 2009. *The 2009 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds*. May 12. www.ssa.gov/OACT/TR/2009/index.html (December 14, 2009).

U.S. Census Bureau. 2008. 2008 national population projections. www.census.gov/population/www/projections/2008projections.html (December 14, 2009).

U.S. Department of Labor. Bureau of Labor Statistics (BLS). 2009. Labor force (demographic) data. www.bls.gov/emp/ep_data_labor_force.htm (December 11, 2009).