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Black Female Earnings and Income Volatility

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Abstract I provide new evidence on earnings and income volatility among Black women in the United States over the past four decades by using matched data from the March Current Population Survey. I use a measure of total volatility that encompasses both permanent and transitory instability, and that admits labor-force transitions. My results show that, for Black women, earnings volatility fell over the entire period and income volatility rose after the mid 1980s. I also find that changes over time in labor force transitions into and out of work along with an increasing share of Black women continuously employed coincide with shifts in volatility levels and trends. Among Black women, differences in volatility levels emerge across education groups and marital status, though the trends typically remain consistent both across and within racial groups.

Keywords Volatility · Labor force non-participation

America's labor market fundamentals have undergone significant structural change over the past 40 years (Autor et al. 2008). Within this time frame, the early 1970s marks the realization of legal victories protecting women and minorities from labor market discrimination (Griggs v. Duke Power Co. 1971; Betsey 1994), which ultimately support an increase in labor force participation among women and Black Americans. The increased labor force participation of women coincides with a decline in their aggregate earnings volatility (Ziliak et al. Forthcoming - hereafter referred to as ZHB), likely related to women transitioning into and maintaining stable employment. Still, in spite of their unique history and experience in the labor force (Conrad 2001), little is known about the earnings and income volatility

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experienced by Black women. In a departure from most volatility studies, the focus of this paper is on earnings and income volatility among Black women. I find average earnings and income volatility levels among Black women higher than those among White women and the overall population.

A combination of short-term and longer term factors may drive these differences in volatility levels, including differential exposure to economic risk from temporary job loss or cross-race differences in the economic consequences of skill biased technological change (Gottschalk and Moffitt 2009). People who can effectively borrow against economic volatility may feel little, if any, effects. However, when credit markets function imperfectly, individuals and families cannot adequately consumption smooth over permanent income (Loury 1981; Mazumder 2005). Without full insurance for volatility from unanticipated events, Black women exposed to higher earnings or income instability may experience a wide range of consequences affecting current needs and future investments. For example, volatility may compromise the ability of individuals to invest in themselves, their children's education (Becker and Tomes 1979; Blundell et al. 2008; Keys 2008; Hardy 2011), and their own personal relationships (Chaney and Marsh 2009). Efforts to insure against downward economic volatility within the family can negatively impact wealth accumulation for relatives providing insurance and absorbing financial risks (Chitegji and Hamilton 2002). Thus, it is apparent volatility exposure could have serious consequences.

By documenting income and earnings volatility, it is possible to compare how trends in the volatility of non-labor income sources, including public assistance, respond relative to earnings volatility over time. By definition, income volatility focuses on the instability of labor market earnings, non-labor income, and government transfers. Yet, within the definition of income and among low to moderate income women, where U.S. social policies are targeted, earnings are typically the largest component. Using the March Current Population Survey (CPS) from 1973 to 2009 and leaning heavily on ZHB, the large sub-group sample sizes compared to the widely used Panel Study of Income Dynamics (PSID) allow for new evidence on earnings and income volatility among Black women. While labor force participation is increasing since the 1970s for all women, Blacks have lower employment levels relative to Whites over most of the sample period. I find declining earnings volatility of 10% for Black women and 16% among White women, coinciding with the rate of increase in female labor force participation by race. Black women exit the labor force at a slightly higher rate than White women over this time period, and the exclusion of labor force transitions results in lower volatility levels as well as volatility trends that are more closely aligned for women across race in the 1990s and 2000s. Between 1973 and 2009, income volatility falls, but within this series a rise is observed after the 1980s. This could be caused by a combination of market volatility for investment income and policy changes to means-tested government transfer programs.

Data

I use data from the 1973–2009 waves (1972–2008 calendar years) of the March Annual Social and Economic Study of the CPS. The unit of observation is an

individual between the ages of 16 and 60. Given the rotating design of the CPS, a respondent is in sample for 4 months, out 8 months, and in another 4 months, making it possible to match approximately one-half of the sample from one March interview to the next.

There was a major survey redesign both in the mid 1980s and mid 1990s so it is not possible to match across the 1985–1986 waves and the 1995–1996 waves. In addition, the line number, which is intended to uniquely identify a person in the household, was not recorded for the 1976–1978 survey years, and in 1977 there were changes in the format of matching variables. This yields an interrupted time series across 36 years with gaps in *calendar* years 1974–1975, 1975–1976, 1984–1985, and 1994–1995. See ZHB for a more detailed description of the match process and data generating procedure.

Employment trends of black women

In Figs. 1 and 2, I plot employment trends for women continuously working (1,1), entering the labor force (0,1), exiting the labor force (1,0), and never working (0,0). The left columns of Figs. 1 and 2 show employment trends by race, and the right columns disaggregate employment by race and education. In 1973, approximately 50% of Black and White females work continuously. From this point forward, the labor force participation of White females rises consistently until the early 1990s, where it plateaus around 70%. Meanwhile, between 45 and 50% of Black females are continuously employed through the middle of the 1980s. At this point, more Black women enter the labor force and their participation converges towards that of White women. In the late 1990s, 65% of Black women work continuously. This level, like that of White females, falls in the 2000s to 60% for Blacks and 65% for Whites. The employment growth rate among White females, 36%, outpaces that of Black females, 16%. This slower employment growth rate among Black women coincides with a slower decline in earnings volatility over the past four decades. Between one-fourth and one-third of Black females do not work, and 12 to 20% of Black women transition into and out of the labor force.

The right side panel of Fig. 1 depicts employment trends among Black and White women with less than high school education. Large differences in employment trends within race by educational attainment are apparent. For Black women, the proportion continuously working (1,1) begins at approximately 40% and falls to 30% by the end of the sample period, while the share never working increases over the same period. Employment trends for White women with less than high school education follow the same trend, though the upward trend in never working (0,0) and downward trend in continuously working (1,1) women occurs later in the sample, around the late 1990's. Transitions into (0,1) and out of work (0,1) are roughly similar across the four panels. This suggests differences in employment transitions are unable to fully explain differences in volatility across education groups. In Fig. 2, the right side panels depict employment trends among women with more than high school education. As expected, women with higher labor market skills display higher rates of continuous (1,1) employment across race, between 70 and 80%, and below 20% are out of work both periods (0,0). The employment trends

Fig. 1 Mean employment rate by entry and exit status

across Figs. 1 and 2 show similar employment trends across Black and White females, and that skills are associated with higher levels of continuous employment. Considering these volatility trends and then comparing differences in educational attainment by race, Table 1 shows almost one-third of Black females and 18% of white females lack a high school diploma. A 10% gap in favor of White females also emerges for post-high school educational attainment. Thus, it appears cross-race differences in educational attainment drive at least some of the observed difference in employment between Black and White females.

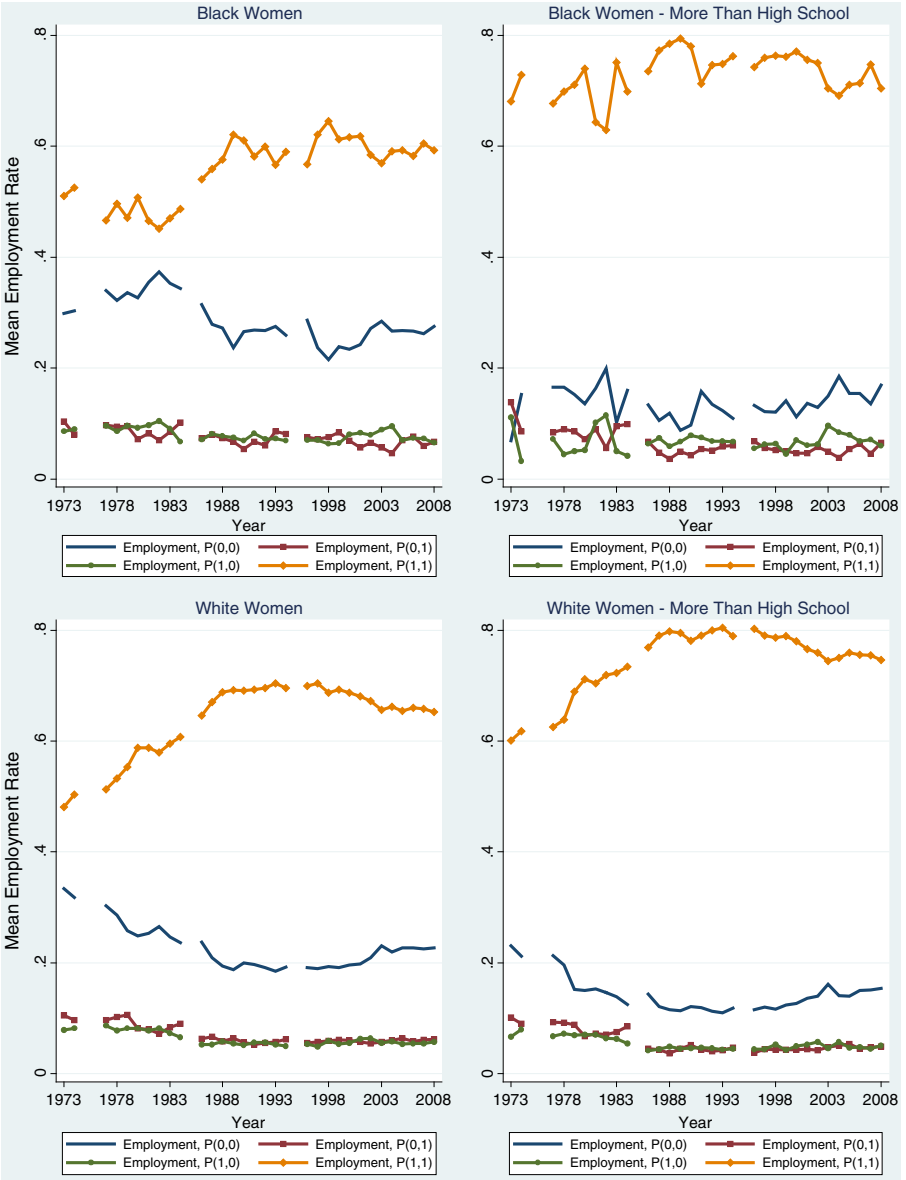

Fig. 2 Mean employment rate by entry and exit status

Trends in earnings and income volatility among black women

From ZHB, earnings and income volatility are measured as the standard deviation of the arc percent change.

$$volatility = \sqrt{Var\left\{100^{*}\frac{y_{it} - y_{it-1}}{\overline{y}_{l}}\right\}},$$

Table 1 Summary statistics by 2nd year adjusted for inflation (2008 Dollars)

Variables	Mean - all	Mean - black females	Mean - white females
Earnings and income			
Individual earnings ($)	27,481.12	15,173.37	17,869.86
% Change in individual earnings	5.44	1.78	6.01
Individual wage-salary ($)	25,590.48	14,858.80	17,146.82
% Change individual wage-salary	5.12	1.81	5.70
Individual income ($)	29,693.91	17,555.98	20,051.23
% Change in individual income	6.19	3.61	6.73
Demographics			
Age	37.58	36.68	37.98
% Female	53.54	-	-
No. of persons in family	3.29	3.37	3.26
% less than high school	20.52	30.71	18.24
% high school	35.78	34.99	37.95
% more than high school	43.69	34.30	43.81
% white	86.15	-	-
% black	9.51	-	-
% other	4.34	-	-
% married	62.86	35.99	66.41

where y_{it} is earnings (income) for person i in time t, and $\bar{y}_l = \frac{y_{it}+y_{it-1}}{2}$, which is the person-specific time mean across the matched pair of years (Dynan, et al. 2008). The key advantage of this measure over the variance of log earnings used in most of the prior literature is that it is defined even if earnings are zero in one of the 2 years, and that it is symmetric and bounded below by −200% and above by +200%.[1] With a rising share of the population out of the labor force two years in a row after the mid 1990s among women, my definition retains these individuals and sets their volatility to zero. This definition captures volatility from short-term events, such as temporary unemployment spells, along with permanent shifts or structural change in the economy (Gottschalk and Moffitt 1994; Keys 2008; Dynan et al. 2008; ZHB).

Figure 3 depicts trends in year-to-year individual earnings and income volatility for Black and White females. The top left panel, earnings volatility of workers in all states of employment follows a steady downward trend for women between 1973 and the mid-1980s, falling 10% among Black women, at which time the trend levels off. Across race, the trends follow the same pattern, though volatility levels are higher for Black females from the mid-1980s onward. By 1986, most of the decline

[1] The symmetry property is violated if earnings are negative 1 year, say due to a business loss, and positive the next. In this analysis, I do not allow for negative earnings. There are a small number of negative observations, between zero and six, in any given year. In ZHB, the arithmetic mean in the denominator is modified so that $\bar{y}_l = \frac{abs(y_{it})+abs(y_{it-1})}{2}$, where $abs(.)$ refers to the absolute value. Their measure permits negative earnings and retains the symmetry property of −200% and +200%.

in earnings volatility is realized for Black and White women. White women experience a larger 16% overall decline in earnings volatility over the period.[2]

In the top right panel of Fig. 3, before-tax income volatility trends for Black and White women follow the same upward trajectory from the middle of the 1980s onward. While volatility of income falls for both Black and White women between the early 1970s and 1980s, a steady rise follows between 1986 and 2008. The year-to-year variability among Black women lies within the range of White women's volatility throughout the approximately 25 year period from the middle 1980s until 2008. This rise in income volatility could be tied to social safety net policy change or stock market volatility, which should affect different skill groups.

In the bottom left panel of Fig. 3, earnings volatility among women with continuous employment is lower across race while maintaining the same downward trend. Upon excluding individuals transitioning into and out of the labor force, earnings volatility levels are lower for Black females than White females through the middle 1980s and the gap between the two groups' trends is diminished. Instead of observing increasing income volatility (bottom right panel) across race from 1986 onward, volatility now increases 5% (from 11%) for Black women and falls by 1% among White women (from a 3% increase after 1986). Taken together, it suggests that the inclusion of transitions from labor force entries and exits affects the Black-White difference in volatility.

Heterogeneity in volatility

For a more detailed set of trends among Black women, I describe volatility by marital status and educational attainment. In the top panel of Fig. 4, separation occurs in the level of earnings volatility between Black females by marital status. The series for married Black females exhibits particularly high volatility between years, due to small sample sizes. In most years, single Black females have higher earnings volatility levels relative to their married counterparts and exhibit a 9% decline in volatility over the series compared to an overall 14% decline among married Black females. In the bottom panel of Fig. 4, volatility levels of married Whites and Blacks are lower than their single counterparts within race, but the gap is small. Single Black and White females experience an overall decline in earnings volatility of 6 and 9%, while married Black and White females experience a larger decline of 22 and 14%, respectively. For Blacks, this occurs between the early 1970s and the mid 1980s.

Figure 5 displays the volatility of earnings (top panel) and income (bottom panel) by education for Black females. Earnings volatility among the least skilled is highly variable between years, falls through the early 1980s, and is generally higher than that of workers with more than high school education. After 2000, year-to-year volatility among high school educated Black women spikes for the remainder of the sample period. Compared to heterogeneity by education within the overall population (ZHB), differences in volatility levels are less distinct among Black women. In 2008 there are 16 standard deviation points separating earnings volatility of all women with less than

[2] In results not shown, Black female volatility exhibits statistically significant pro-cyclical behavior when a time trend is not included in time-series regressions.

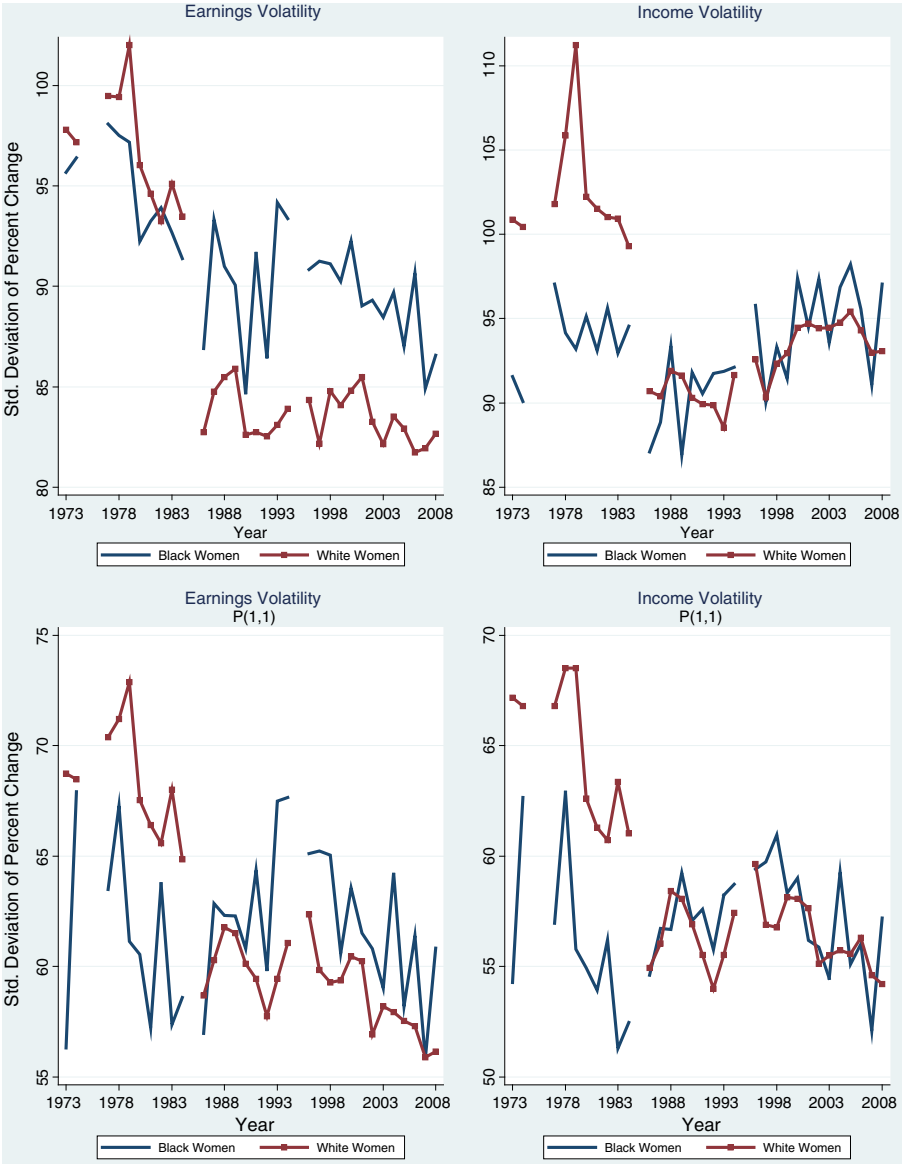

Fig. 3 Individual female volatility by race

high school education to those with a high school diploma, compared to less than a point among Black females. Similar to the population as a whole, earnings volatility is generally falling for Black women, though earnings volatility for higher skilled Black women increases between 1974 and 2008.

Volatility trends for individual income (Fig. 5, bottom panel) suggest similar trends with differences in levels emerging by education. Volatility of income is on the rise across education and follows the same trend since the late 1970s, with higher skill groups experiencing lower overall volatility levels. The rise in volatility occurs fastest among women with more than high school education, at 24%, between 1974

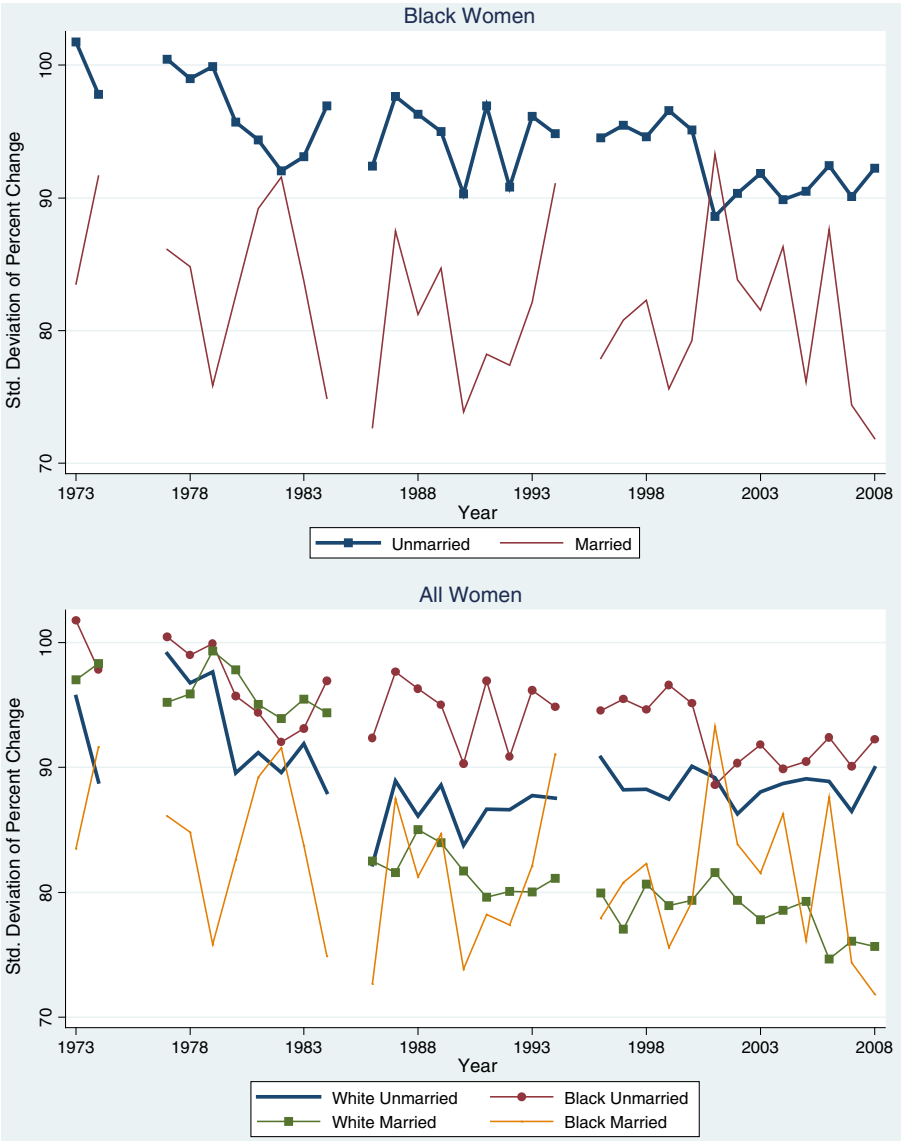

Fig. 4 Individual earnings volatility by status in families and race

and 2008. Similar to earnings volatility among more than high school educated Black women, income volatility trends among the higher skilled are sensitive to choosing 1973 versus 1974 as an initial point.

Conclusion

Among Black women, earnings volatility falls, especially throughout the 1970s and the 2000s. Meanwhile, income volatility of Black women rises from the early to

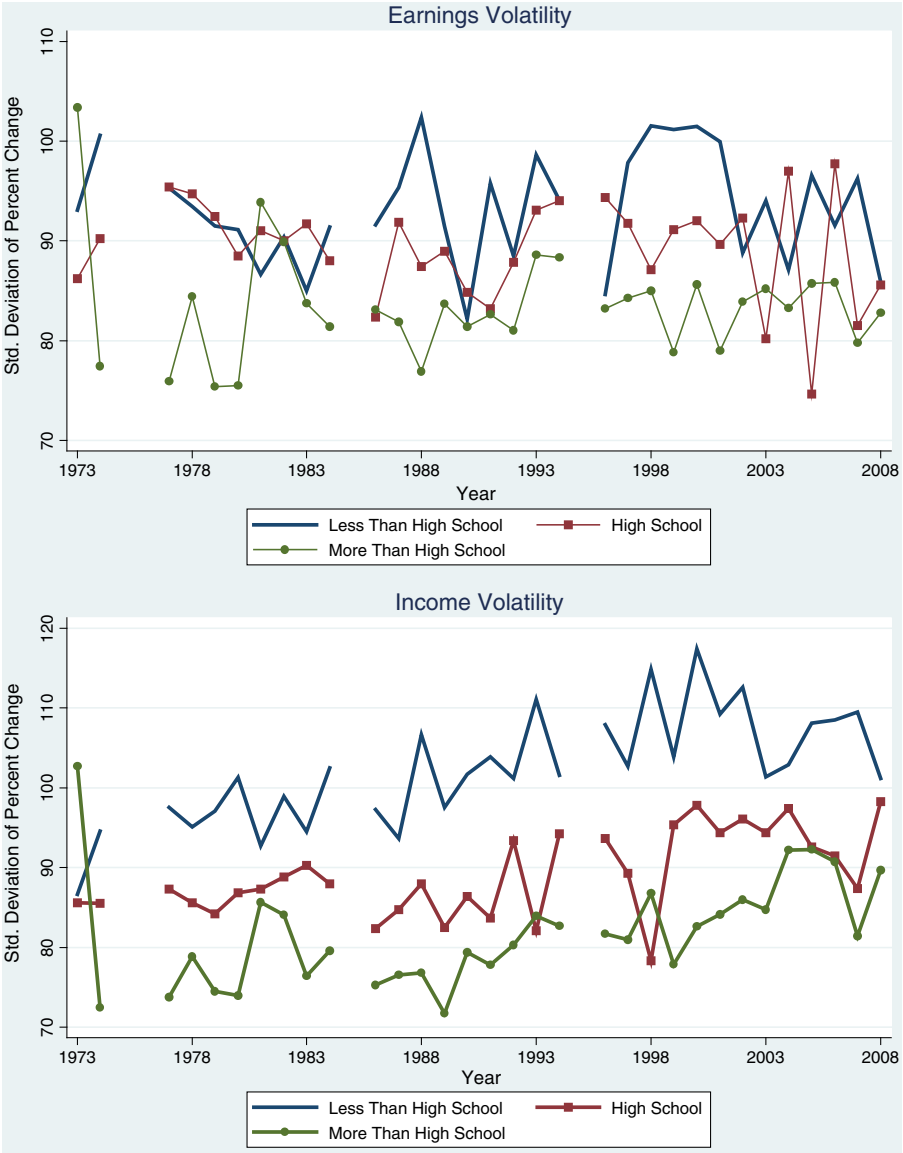

Fig. 5 Individual black female volatility by education

middle 1980s. These volatility trends coincide with rising labor force participation of Black women, and these co-occurring trends are observed in studies pooling all women (ZHB). There is heterogeneity in volatility levels based on education and marital status, but for earnings these differences are smaller among Black women than they are in the overall population and among men. Black women and those with less education generally exhibit higher levels of income and earnings volatility, while the trends follow similar paths across race and education. In the case of earnings, racial gaps in volatility fall when the trend analysis is restricted to continuously employed women, and employment trends among highly educated

women depict higher and similar levels of continuous employment across race. Given these results, it seems that differences between Black and White female volatility may be explained in part by differences in the labor market for high versus lower skilled workers and the disproportionate share of Black women without post-high school education.

To reconcile the rising income volatility and falling earnings volatility of Black females, it is worth considering the role of market volatility along with significant changes to the design and implementation of means-tested programs throughout the 1980s and 1990s (Blank 2002; Hotz and Scholz 2003; Ziliak 2009). The increasing volatility of income among Black women could be troubling if families cannot or do not smooth consumption in the event of shocks to income (Hardy 2011). Since Black women are more likely to be single, primary earners within their households, there is less reliance on a second earner to insure against economic risk. Accordingly, future research focused on understanding the welfare implications of volatility can examine the causes and consequences of income volatility for Black families, including those headed by Black women and those dependent on government transfer programs.

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