The Impact of Economic Variability on Single Mothers' Work and Welfare Decisions: Development and Estimation of a New Measure of Labor Market Conditions

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December 2007

Abstract

Recent studies examining the impact of social policy and the economy on single mothers' work and welfare decisions throughout the 1990s focus disproportionately on one measure of economic conditions: the state unemployment rate. Among the most important drawbacks of the unemployment rate is its neglect of within-state variation in labor market conditions. In this paper, I develop and test a new indicator of states' economic environments, *economic variability*, which measures deviations in county unemployment rates from the statewide unemployment rate. Findings yield several insights about the nature of labor market heterogeneity. Economic variability declined during the past several decades, suggesting that labor market conditions in U.S. counties became increasingly homogenous. Moreover, overall declines in variability were driven by substantial drops in the most economically diverse states. Regression results indicate that economic variability is related to several employment and welfare outcomes, and is able to explain 17 percent of single mothers' employment growth between 1985 and 2004.

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I. Introduction

Implementation of the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) in 1996 dramatically altered the focus of states' welfare offices from providing cash assistance to helping low-skilled individuals enter the labor force. Empirical studies evaluating single mothers' transition off welfare have stressed the role of supply-side factors, such as human capital development, as well as the flurry of social policy reforms implemented throughout the 1990s. This literature treats policy reforms as extremely nuanced and multidimensional explanations of the observed work and welfare changes, and it is common to include detailed measures of welfare reform, the Earned Income Tax Credit (EITC), and child care subsidies in such models.[2]

Economic conditions are also expected to influence work and welfare decisions, through the availability of jobs and the generosity of wages. However, recent studies devote little attention to exploring demand-side factors. Moreover, what we do know about the impact of macro-economic conditions comes from the literature's nearly exclusive focus on a single variable: the state unemployment rate. Exceptions to the use of the unemployment rate are rare, but they include aggregate employment growth rates (Schoeni & Blank, 2000), median wages (Wallace & Blank, 1999), average earnings in various industries (Hoynes, 2000), new hires and new hires' earnings (Herbst & Stevens, 2007), and gross job flows (Bartik & Eberts, 1999).

Studies matching individual-level survey data with the unemployment rate or an employment-based alternative suffer from a number of deficiencies. Among the most important drawbacks is the lack of sub-state-level geographic identifiers in the major datasets,

[2] For thorough reviews of the literature, see Blank (2002) and Grogger and Karoly (2005). See Herbst (2007), McKernan and Ratcliffe (2006), and Fang and Keane (2004) for examples of research that estimates a large number of social policy reforms.

including the Current Population Survey (CPS) and the Survey of Income and Program Participation (SIPP). Confidentiality concerns usually prevent researchers from linking sample members to a geographic area smaller than the state. Such an omission overlooks the large within-state variation in states' labor market conditions, and forces researchers to average the impact of the economy over the entire state. Aside from being conceptually unsatisfying, state-based measures likely produce misleading estimates of the impact of local economic conditions. These shortcomings mean that previous studies have defined imprecisely states' labor markets, and it is no surprise that results from this body of work are inconclusive about the effect of the economy on single mothers' work and welfare decisions.

In this paper, I exploit the heretofore untapped variation within states' economies by developing and testing a new measure of local labor market conditions. Specifically, I construct a measure of *economic variability*, defined as the average deviation in county-level unemployment rates from the annual, state-level unemployment rate. Increases in the absolute value of this measure indicate a greater spread in county-level unemployment rates around the mean for the state, and thus a more volatile climate in which to find work. This measure not only makes better use of sub-state-level economic information than previous studies, but it also investigates a new dimension of labor market dynamics. Given the exploratory nature of this paper, I provide several descriptive statistics for economic variability, assess the degree of overlap between this measure and the unemployment rate, and compare in a multivariate context the impact of both measures on a large number of work and welfare outcomes. In doing so, I calculate for each state-year the measure of economic variability and merge this information with CPS samples of single mothers between 1985 and 2004.

The remainder of this paper proceeds as follows. Section II briefly summaries recent empirical studies using state- and sub-state-level economic indicators, and provides a conceptual framework highlighting the importance of economic variability. Section III develops the measure of economic variability (hereafter referred to as EV), provides a descriptive portrait of this measure, and compares time series trends with the unemployment rate (hereafter referred to as UR). Section IV discusses the data and estimating equations, Section V presents the multivariate results, and concluding remarks are made in Section VI.

II. The Impact of Labor Market Conditions: Theory and Evidence

Standard economic models suggest that the decision to work is a utility maximization problem in which individuals choose quantities of leisure and levels of government assistance (e.g., welfare, food stamps, and Medicaid) subject to budget and time constraints. Arguments in the budget constraint include the expected wage offer, income from means-tested programs, and other sources of non-wage income. Under reasonable conditions, utility can be formalized as a linear function of leisure time, all sources of income, and stigma associated with participation in means-tested programs. The probability that a single mother works is the probability that expected utility while working exceeds the expected utility of not working. A testable implication of this model is that local labor markets influence the relative utility from working in two ways. First, mothers operating in high employment growth areas experience fewer structural constraints on finding jobs, thereby increasing the likelihood of employment. Second, conditional on finding a job, increased wage offers make work relatively more attractive than welfare, also increasing the likelihood of employment.

For purposes of this study, the literature on the effects of economic conditions is usefully divided between studies examining state-level measures and studies examining

county-levels measures. In terms of the former type, early research comes from welfare caseload studies and relies heavily on the unemployment rate (Bartik & Eberts, 1999; Blank, 2001; CEA, 1997; 1999; Figlio & Ziliak, 1999; Levine & Whitmore, 1998; Moffitt, 1999; Schiller, 1999; Wallace & Blank, 1999; Ziliak, Figlio, Davis & Connelly, 2000). Results from these studies indicate that a one percentage point increase in the unemployment rate increases aggregate welfare caseloads by five to seven percent. A smaller number of caseload studies experiment with employment-based economic indicators, such as gross job flows (Bartik & Eberts, 1999), minimum wages (CEA, 1999), median and 20th percentile wages (Wallace & Blank, 1999), and wage premiums (Bartik & Eberts, 1999). There is weaker consensus about the influence of these factors.

These caseload studies were then altered to incorporate individual-level survey data on single mothers' work and welfare decisions. Most of this research pools time-series of cross-sectional samples from the CPS or SIPP to model the impact of demographic characteristics, social policy reforms, and economic conditions on the binary employment and welfare participation outcomes (Fang & Keane, 2004; Grogger, 2003; 2004a; Herbst, 2007; Looney, 2005; Meyer & Rosenbaum, 2001; Noonan, Smith, & Corcoran, 2005; O'Neil & Hill, 2001; Schoeni & Blank, 2000). However, as in the caseload literature, most studies use the state unemployment rate as the sole measure of states' economic environments. Nevertheless, findings from this research suggest that a one percentage point increase in the unemployment rate decreases employment by 0.5 to 2.0 percentage points and increases welfare use by one percentage point.[3]

The literature examining county-level economic conditions is substantially smaller,

[3] These point estimates imply that the unemployment rate accounts for approximately 25 percent of single mothers' employment growth and 20 percent of the decline in welfare use throughout the 1990s.

but once again relies heavily on the unemployment rate. Several studies analyze the impact of county-level unemployment rates on welfare exits (Blank, 1989; Fitzgerald, 1995; Harris, 1993), while others investigate returns to welfare (Harris, 1996; Pavetti, 1993; Mueser, Stevens, & Troske, 2007) None of these studies find large or statistically significant effects of local labor market conditions. Two noteworthy exceptions are Hoynes (2000) and Herbst and Stevens (2007). The former uses California administrative data between 1987 and 1992 to analyze several county-level labor market variables on exits from and reentry to welfare. Hoynes' results suggest that a 10 percent increase in UI-covered employment or a 3.5 percent increase in employment-to-population ratios is associated with a 7 to 15 percent increase in the likelihood of exiting welfare. The study by Herbst and Stevens (2007) uses Maryland administrative data between 1996 and 2005 to estimate the impact of new hires and new hires' earnings on the full set of work-welfare combinations. Their findings suggest that increases in both variables increase the likelihood that single mothers choose alternatives that include work.

Extending Previous Research to Account for Economic Variability

The studies surveyed above suffer from seemingly irreconcilable drawbacks: studies based on state-level economic measures fail to exploit within-state variation, while the typical study using county-level measures fails to take advantage of cross-state variation. By capturing heterogeneity within states' labor market conditions in a way that can be applied uniformly to all states, the measure of EV reconciles these drawbacks. Furthermore, unlike state-level indicators of labor market conditions, which average the effect of the economy over the entire state, EV measures the magnitude of economic imbalance across areas within a state and averages that imbalance across those areas. Finally, EV is important on conceptual

grounds because, as will be shown, the degree of variability in local labor market conditions is not indicative of overall, state-level conditions.

An important theoretical justification for EV is that, unlike the UR or other employment-based alternatives, it does not assume potential workers derive expectations about finding a job from statewide information. Rather, it assumes that demand conditions and employment shocks are assessed within small geographic sphere, and that information about local economies is more useful for generating employment expectations. This is a plausible assumption, especially in large states, where it is unlikely that job seekers have access to all labor markets no matter how many jobs are available in some areas. The measure of EV, therefore, reflects variation in the degree of uncertainty about finding a job, which in turn influences individual decisions to seek employment or cash assistance. In the context of the standard economic model, an increase in economic variability signals to potential workers a structural constraint on finding a job, thereby increasing the utility of remaining unemployed and seeking cash assistance.

The measure of EV also finds strong theoretical grounding in the extensive literature on the spatial mismatch hypothesis (SMH). First proposed by Kain (1968) and then updated and formally tested by Wilson (1987) and others (Jencks & Mayer, 1989; Holzer, Stoll, & Ihlanfeldt, 2000), the SMH posits a structural explanation for low employment and high welfare participation rates among inner-city residents.[4] Specifically, these outcomes are due to the coupling of restrictions on residential choice with the out-flow of low-skilled jobs to adjacent suburbs. As a result, a spatial imbalance develops between the supply of low-skilled labor and the demand for that labor. Critical to the measure of EV are the dual channels

[4] The SMH is the subject of substantial empirical research. For thorough reviews of the literature, see Holzer (1991) and Kain (1994). Also, see the review by Ihlanfeldt and Sjoquist (1998) for a review as SMH relates to welfare recipients and welfare reform.

through which the combination of residential segregation and suburbanized employment influences work and welfare decisions: (1) information gaps that make suburban job searches difficult to conduct from central city residences and (2) increased monetary and psychic costs associated with commuting to suburban job locations. This discussion implies a twofold relationship between the SMH and the measure of EV. First, states with large geographic discrepancies between the location of job seekers and employers are more likely to have greater variability in local labor market conditions. Second, when information gaps and transportation costs increase because workers and employers are spatially mismatched, economic variability necessarily implies that low-skilled individuals face prohibitively high fixed work costs. Both conditions are predicted to decrease the probability of employment and increase the probability of welfare receipt.

III. Economic Variability: Construction and Description

To create this measure, I first collected county-level UR data for each state and year over the period 1985-2004. I then calculated two permutations of EV, defined formally in the following manner:

[1] $$\mathrm{EV}_{w,\,st} = \frac{\sum(|\,CUR_{st} - SUR_{st}\,|\,w_{st})}{\sum w_{st}}$$

[2] $$\mathrm{EV}_{st} = \frac{\sum |\,CUR_{st} - SUR_{st}\,|}{n_{st}}$$

where *w* indicates a weighted version of EV calculated for each state, *s*, at time *t*. The CUR denotes a given county-level unemployment rate, SUR denotes the state unemployment rate, and *n* denotes the number of counties in *s*. The difference between each CUR and SUR in [1] is weighted by *w*, the size of a county's labor force. Both measures represent the absolute value of the average county-level deviation in unemployment rates from the overall, state-

level unemployment rate, with [1] weighting these deviations by the number of individuals in each county's labor force.[5] Weights are applied to adjust for the differential size of labor markets both within and across states. Higher values for EV indicate a greater spread of county-level unemployment rates around the state unemployment rate, and therefore increasingly heterogeneous labor market conditions.

To explore the nature of the EV and UR variables over time, I report a number of descriptive statistics, beginning with Table 1. The average UR over the period 1985-2004 is 5.8, while the average weighted and unweighted EV measures are approximately 1.8. The EV variables are interpreted to mean that county unemployment rates vary, on average, nearly two percentage points around the state unemployment rate. Given that the employment and welfare regressions will be estimated with state fixed effects and year dummies, it is instructive to determine how much variation in these variables remains after removing sources of unobserved heterogeneity. I report the standard deviation of weighted residuals from a regression of each economic variable on state and year dummies, as well as the R^2 from a regression of each variable on state and year dummies. The R^2 ranges from 0.71 to 0.85, suggesting that between 15 percent and 29 percent of the total variation in these economic variables remains after removing unobserved state and year effects. Somewhat more residual variation remains in the weighted EV measure (relative to the unweighted measure), and so I focus on this variable in the regression analysis. The last column in Table 1 presents the parameter estimate on a linear time trend for each economic measure. These coefficients

[5] A few points about the EV measures are worth making. First, there is a high correlation (r=0.94) between the weighted and unweighted EV measures. Second, the District of Columbia always has a zero value for both EVs, simply because it does not contain any geographic subdivisions with which to calculate mean deviations. In some analyses, the District of Columbia is included, and it is omitted from others. This change will always be specified. In no case, however, does the District's inclusion or omission alter the results. I experimented with more traditional variance measures, in which the difference between each CUR and SUR would be squared. However, I ultimately decided against this approach because it would have significantly complicated the interpretation. Indeed, one of the nice properties associated with the absolute value approach is that it expresses mean deviations in the original units of the unemployment rate, so that both measures can be compared directly and easily. I also experimented with mean deviations based on metropolitan area unemployment rates. However, not all states have an adequate number of urban areas to create variation in such an EV measure. Furthermore, a metropolitan-based EV measure would still neglect a large fraction of local economies, especially in rural states.

imply that EV and UR are decreasing over time, a trend that will be apparent in the figures discussed next.

Figure 1 shows national time series trends of the EV and UR variables. Movements in EV track closely those of the UR, especially during the early part of the observation period, but it is clear that the degree of co-variation declines over time. After reaching a peak in 1992, EV began a persistent decline that became pronounced after 1996, when economic conditions strengthened substantially. It is also interesting to observe that average EV decreases throughout the study period, suggesting that county labor market conditions moved toward greater homogeneity between 1985 and 2004. An interesting question is whether time series movements in EV are similar in states with weak and strong overall economies. Figure 2 addresses this issue by plotting the EV trends for states at the bottom and top quartiles of the UR. These results are striking. Movements in EV for states at the top quartile of the UR (weak conditions) show pronounced time trends, whereas EV for the bottom quartile states (strong conditions) remains relatively steady. Perhaps surprisingly, the EV trends for the weak states are inversely related to the UR: average EV reaches a low point during recessionary periods and rises initially during periods of growth. This observation implies that recessions in already weak states impact some counties more than others, and recoveries lessen the variability in local economic conditions, although it takes several years to do so.

Which states contain the most variability in local labor market conditions, and do these states have high overall unemployment rates? The final piece of descriptive evidence, presented in Table 2, addresses these questions. This table ranks the top five (weakest) and bottom five (strongest) states in terms of the EV and UR variables for 1985, 1995, and 2004. A number of patterns emerge. First, although there is some overlap between the level of EV

and overall economic conditions within states, it is far from perfect. The EV-UR overlap increases somewhat over time among the weakest states and declines among strongest states. In addition, there is substantial variation in the mix of states that comprise the top and bottom five: Arizona and California are the only states in the EV top five every year, while Delaware is the only state in the EV bottom five every year. Table 2 also suggests that the overall EV declines discussed previously are largely due to declines among states with the most variable labor market conditions: the top state in 1985 (Arizona) had an EV of 6.3, compared to 3.2 for the top state (Alaska) in 2004.

IV. Data and Estimation Strategy

To explore the impact of EV and UR on a number of employment, income, and welfare use outcomes, I draw upon individual-level data on single mothers from the annual demographic supplement to the CPS. The CPS is a nationally representative survey of approximately 60,000 households, providing detailed data on labor market behavior, income, and demographic characteristics for individuals ages 15 and over. March CPS surveys for the years 1986 to 2005 are used, yielding information on employment and income for the years 1985 to 2004. Included in the sample are single women (widowed, divorced, separated, and never married) ages 18 to 64, who have at least one child ages 18 and under.[6] After applying a number of standard exclusions on the sample composition, the final analysis sample consists of 120,183 single mothers with at least one child ages 0 to 18.[7]

Once the state-level measures of EV and UR were merged with the CPS micro-data, I estimated the following generic regression model:

$$[3] \qquad y_{ist} = \alpha + E_{st}\beta + \mathbf{P}_{ist}'\theta + \mathbf{X}_{ist}'\phi + \mu_s + \nu_t + (\text{trend}) + \varepsilon_{ist}$$

[6] Single mothers from census-defined families comprise the unit of analysis. I include not only independent female-headed families (primary families), but also female heads of related sub-families and (unrelated) secondary families.

[7] Exclusions to the sample include women in the armed services and women with negative earnings, negative non-labor income, positive earnings but zero hours of work, or positive hours of work but zero earnings.

for $i = 1, \ldots, N_{is}$; $s = 1, \ldots, S$; $t = 1, \ldots, N$, where $\varepsilon \sim$ i.i.d. $N(0,1)$. The dependent variable, y_{ist}, is one of nine outcomes explored in this study: any work in the previous year (binary); worked and did not receive welfare (binary); worked full-time (35+ hours), full-year (48+ weeks) (binary); weeks of work (continuous); hours of work (continuous); the log of earnings (continuous), the log of total income (continuous); received welfare in the previous year (binary); and received food stamps in the previous year (binary). Probit regression is used to estimate all models with binary dependent variables, tobit regression is used estimate the weeks and hours of work models, and OLS regression is used to estimate the earnings and income models. The primary variable of interest, E_{st}, is either the EV or UR, although I also estimate models that include both measures simultaneously. The $\mathbf{P}_{ist}$ represents a vector of social policy reforms, and $\mathbf{X}_{ist}$ is a vector of demographic and human capital variables, such as age, race, marital status, educational attainment, number and ages of children, metropolitan status, and non-wage income.[8] The parameters μ_s and ν_t denote state and year fixed effects, while (trend) indicates a linear time trend.[9] State fixed effects control for unobserved time-invariant differences across states, and year fixed effects control for time-varying factors that influence economic conditions in all states. The time trend accounts for unobserved factors that are trending linearly over time for all states. The coefficient of interest, β, measures the average change in a given outcome associated with a one percentage point increase in EV or UR.[10] Standard errors allow for arbitrary heteroskedasticity by using robust standard errors. All regressions are weighted by the March CPS Supplemental Person weight.

[8] The social policy variables include the following: EITC maximum benefit, CCDF spending per child ages 0-12, maximum welfare benefit, amount of disregarded earnings, dummy variable for job search program, dummy variable diversion program, dummy variable for work requirement, dummy variable for welfare sanction, dummy variables for three types of time limits, and dummy variable for Medicaid coverage.

[9] In specification checks, I estimate models that include state-specific time trends.

[10] Marginal effects associated with EV and UR are reported in all tables. For the tobit models, the marginal effects are those based on the expected value of the dependent variable conditional on being uncensored, or $E(Y \mid X, Y > 0)$.

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V. Multivariate Results

Effects of EV and UR on Employment, Income, and Cash Assistance Outcomes

Table 3 presents main results from estimating [3], which examines the effects of the EV and UR variables on nine employment, income, and welfare outcomes. Three separate models are estimated for each outcome: one that includes only the EV measure, another that includes only the UR measure, and a model that incorporates both. Based on the descriptive results, I limit the analysis to the weighted EV measure. Generally speaking, EV is statistically significantly associated with a variety of outcomes.[11] The magnitude of the EV effect rivals, and in some cases exceeds, the estimated effect for UR. Furthermore, as shown in the final column of Table 3, the EV effect often persists after controlling simultaneously for the overall UR. I describe a few key results below.

Looking first at the dichotomous employment decision, I find that a one percentage point increase in the variability of states' local economic conditions (EV) is associated with a 1.2 percentage point decrease in the probability of employment (from a base of 74.4 percent). A similar increase in the overall unemployment rate (UR) is associated with a decrease in the employment probability of 0.9 percentage points. When both economic measures are included together, however, it appears that the UR effect dominates: the coefficient on EV decreases by more than half, while the UR coefficient remains basically unchanged. Standard errors associated with the estimates indicate that both variables are as precisely estimated together as in the individual models.

I also examine the impact of EV and UR on four infra-marginal work outcomes: work and no welfare; full-time, full-year work; and weeks and hours of work. The EV variable

[11] Nearly all social policy, demographic, and human capital variables are statistically significant at conventional levels, and all coefficients are signed in accordance with economic theory. Full results are available upon request.

continues to be strongly and negatively related to these outcomes. Specifically, the estimated effect translates into a 1.8 percentage point decrease in the likelihood of working and not receiving welfare and working full-time, full-year. Moreover, results from the tobit models suggest that a one percentage point increase in economic variability (EV) is associated with a reduction of less than a full week of work per year and less than a full hour of work per week. Although these effects are economically small, the magnitude of the EV coefficient exceeds that of the UR coefficient across every infra-marginal outcome. Furthermore, many of the significant EV effects persist after controlling for the overall UR, although in most cases the magnitude of the EV declines somewhat.

The final set of results presented in Table 3 relates to participation in cash assistance programs. Although the EV coefficient in the welfare participation model is positive, as predicted by the conceptual model, the standard error is almost as large as the estimate. The UR coefficient, however, is positive and statistically significant, indicating that a one percentage point increase in the UR raises welfare participation by 0.4 percentage points. Both economic measures are strongly related to food stamp receipt. In fact, increases of one percentage point in EV and UR are expected to increase the fraction of single mothers receiving food stamps by over one percentage point. When these measures are controlled for simultaneously in the welfare and food stamps models, it appears that the impact of UR dominates the EV effect. Parameter estimates for UR remain largely unchanged, while those associated with EV decline substantially.

The results in Table 3 average the effect of EV and UR across all single mothers. However, a number of studies find that economic conditions have heterogeneous effects on work and welfare outcomes depending on the observable characteristics of women

(Fitzgerald, 1995; Herbst & Stevens, 2007; Hoynes, 2000; Noonan, Smith, & Corcoran, 2005). To explore this possibility with the EV measure, I estimate models separately for non-white and white mothers. These results are presented in Table 4. Consistent with previous studies, these results suggest that non-white mothers are more sensitive to labor market conditions. For seven of the nine outcomes, the EV coefficient for non-whites is larger than the corresponding coefficient for whites. This is the case for all nine outcomes in the models using the UR. Differential responses to within-state economic variability are particularly large for food stamp participation. A one percentage point increase in EV raises participation by 2.1 percentage points among non-white mothers, but only 0.09 percentage points among white mothers. Interestingly, both groups of women continue to be unresponsive to changes in EV with respect to welfare receipt.

To test the robustness of the main results, I re-estimate the "any work" model after making a number specification changes. Results from this exercise for the EV variable are presented in Table 5. Generally speaking, the EV effect is robust to a number specification changes and across a number of sub-groups. Based on the trends displayed in Figure 2, which show that EV is more sensitive to recessions and recoveries in already weak state economies, I first investigate the differential impact of EV across quartiles of the state UR. This is accomplished by interacting the EV measure with dummy variables indicating the four quartiles of the state UR and then regressing the work outcome on these interactions. Marginal effects presented at the top of Table 4 imply that the negative impact of EV on employment is concentrated in relatively weak state economies. In others words, increased variation in local labor market conditions does not appear to reduce employment when overall

state economies are strong; rather, increased variation appears to exacerbate the employment situation in states that already have weak labor demand conditions.

The next set of results test whether the EV effects are driven by the situation in Arizona and the District of Columbia, two jurisdictions consistently at the high and low end of the EV measure. After omitting these jurisdictions from the analysis, the coefficient on EV remains statistically significant and even increases slightly in magnitude. The main results do not appear to be driven by the use of CPS weights or the weighted EV measure, but there is evidence (at least for this outcome) that including state-specific time trends causes EV to become statistically insignificant. When the time trends are included in models for other outcomes, the EV coefficient remains statistically significant. Finally, I estimate the EV effect on a number of key sub-samples of single mothers: low-skilled mothers, those with young children, and never married mothers. In each case, the coefficient on EV remains precisely estimated, and its magnitude is largely unchanged from the baseline model.

The Contribution of EV and UR to Explaining Employment and Welfare Changes

To assess the explanatory power of EV and UR, I use the coefficients reported in Table 3 to decompose the contribution of both factors to the observed employment and welfare changes among single mothers over the period 1985-2004 and 1992-2000.[12] As shown in Table 6, employment rates increased 9.9 (1992-2000: 14.4) percentage points at the any work margin; 15.9 (1992-2000: 19.1) percentage points at the work, no welfare margin; and 7.6 (1992-2000: 6.9) percentage points at the full-time, full-year margin. Welfare participation rates decreased 23.2 (1992-2000: 20.7) percentage points over the study period.

[12] The decomposition is calculated by subtracting the change in EV (and UR) between 1985 and 2004, multiplying the difference by the appropriate regression coefficient, and dividing this quantity by the percentage change in a given employment/welfare outcome. For example, the EV decomposition for the any work outcome is as follows: ((2.50 - 1.11) * (-0.0119)) / 0.099 = 0.167.

Estimates from the main employment model suggest that EV explains 16.7 percent of the observed employment growth between 1985 and 2004. This amount is somewhat greater than the 15.2 percent explained by UR. Turning to the other work outcomes, however, I find that EV explains a substantially greater fraction of the observed growth: 15.3 percent compared to 10.5 percent for work, no welfare and 33.1 percent compared to 22.3 percent for full-time, full-year work. Interestingly, neither economic measure provides much explanatory power in terms of welfare participation. Finally, when the decomposition is conducted for models that jointly estimate EV and UR, the combined explanatory power exceeds that of the individual measures. Such a finding underscores the importance of using multiple measures of economic activity, and that no single measure fully captures the complexities of states' labor market conditions.

The bottom panel of Table 5 conducts the decomposition based on employment and welfare changes between 1992 and 2000, a period of considerable economic growth. Findings from this exercise suggest that EV continues to play a strong role in explaining the observed work and welfare changes. In particular, EV explains about 27 percent of the 7 percentage point increase in work activity at the full-time, full-year margin. The UR performs substantially better in the 1992-2000 decompositions, and is able to explain a larger fraction of the work and welfare changes than EV. This is most likely due to the steeper and more persist decline in unemployment rates over this period.

VI. Conclusion

This paper began with the observation that recent studies examining single mothers' work and welfare changes throughout the 1990s focus disproportionately on measuring social policy reforms while neglecting more nuanced measures of states' economic conditions. In

particular, studies rely almost exclusively on a single measure, the unemployment rate, despite its drawbacks. Perhaps the most important weakness associated with the unemployment rate is that it fails to advantage of within-state variation in labor market conditions. The goal of this paper, therefore, is to develop and test a new indicator of states' economic environments—*economic variability*, which measures the degree of heterogeneity in local labor market conditions. The EV measure is fairly easy to calculate, straightforward to interpret, and is one of the few measures that simultaneously exploits information about local economic conditions and is usable with survey datasets that do not provide sub-state geographic identifiers.

Findings in this paper yield several insights about the nature economic variability. Find, I find variation in EV that rivals the UR, and a nontrivial fraction of this variation cannot be explained by state and year fixed effects. Second, time series movements in EV track the UR, but this relationship declines over time. This is due to a steady decline in EV over the past several decades, suggesting that economic conditions in U.S. counties became increasingly homogenous. Third, the structure of EV does not remain fixed over time, with different states comprising the most (least) heterogeneous labor market conditions in a given year. Examining EV's structure also reveals that overall declines in this measure have been driven disproportionately by declines in the most economically heterogeneous states. Fourth, the status of the overall economy is related to EV: volatility in already weak economies is more sensitive to recessions and recoveries than previously strong economies. Finally, regression results indicate that EV is strongly associated with several employment, income, and welfare participation outcomes and is able to explain nearly 17 percent of the observed employment growth between 1985 and 2004, an amount that exceeds the UR.

These findings warrant a few comments. It is interesting to note that models controlling simultaneously for EV and UR show insignificant EV effects for cash assistance outcomes, but do show significant effects for employment outcomes. In other words, after accounting for the overall economic environment, single mothers' welfare participation decisions are not further influenced by the degree of variability in labor market conditions. However, mothers' work decisions are influenced by variability. That EV continues to be strongly related to work decisions is reasonable in the context of the spatial mismatch hypothesis. States with large discrepancies between the location job seekers and employers are likely to have substantial variation in labor market conditions, even though overall economic conditions might be favorable. This scenario implies that statewide economic shocks dampen the employment low-skilled individuals in a way that is mutually exclusive from local shocks, which in this case includes the out-flow of employment from central cities to adjacent suburbs.

Results in this paper also underscore the importance of measuring multiple dimensions of states' economic environment, a point of growing importance in the empirical literature (Fitzgerald & Ribar, 2004). This paper highlights the conceptual and statistical dangers associated with relying on one economic measure, namely the unemployment rate. The unemployment rate accounts for the availability of jobs, ignoring other such dimensions as the attractiveness of jobs or the potential returns to working. Furthermore, my empirical results consistently show that the impact of the UR weakens when the EV is included in the models. This suggests that the unemployment rate, considered in isolation, is at the very least an inadequate indicator of the economic environment in which single mothers operate. At worst, previous estimates of the effect of the economy are biased upward if the unemployment rate is

correlated with unobserved dimensions of states' economies. My findings speak directly to this upward bias, at least where influence of EV is concerned.

This paper lays the groundwork for a number of interesting extensions. For example, it is important to know why U.S. counties became more economically homogenous during the past several decades. A related issue concerns the differential impact of changes in overall economic conditions across more and less heterogeneous states. Another promising avenue for future investigation is whether other economic indicators display similar time series movements and associations with work/welfare outcomes as the unemployment rate. Measures of EV could be calculated for employment and earnings in key industries, job flows, and employment-to-population ratios, among others. The Census Bureau's recent launch of the Quarterly Workforce Indicators (QWI) database enables researchers to generate these indicators at the county-level for most states, making such an analysis more feasible.

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TABLE 1:
Summary Statistics for the Measure of Economic Volatility (EV) and Unemployment Rate (UR)

Variable	Mean	SD	Residual SD	R^2	Trend
Unemployment Rate	5.78	1.50	1.22	0.71	-0.0953
Economic Volatility (weighted)	1.78	0.94	0.51	0.81	-0.0613
Economic Volatility (unweighted)	1.80	0.83	0.43	0.85	-0.0605

Notes: All means and standard deviations are weighted by the CPS March Supplemental Person weight. Residual SD is the weighted standard of the residuals calculated from a regression of each economic measure on state fixed effects and year dummies (no constant). The R^2 is from a regression of each economic measure on state fixed effects, year dummies, and a constant. Trend denotes the parameter estimate associated with a linear time trend in a regression of each economic measure on the time trend and a constant.

TABLE 2:
States with the Highest and Lowest Values for the Measure of Economic Volatility (EV) and Unemployment Rate (UR)

	1985		1995		2004	
State Rank	**EV**	**UR**	**EV**	**UR**	**EV**	**UR**
Top Five States:						
1	AZ (6.3)	WV (13.0)	AZ (6.9)	WV (7.9)	AK (3.2)	AK (7.4)
2	NM (4.1)	LA (11.5)	CA (3.7)	CA (7.8)	AZ (2.6)	OR (7.3)
3	CA (3.8)	MS (10.3)	NM (3.2)	AK (7.3)	CA (1.878)	MI (7.0)
4	TN (3.8)	MI (9.9)	WV (3.0)	RI (7.0)	MS (1.872)	SC (6.8)
5	WV (3.7)	AK (9.7)	HI (3.0)	LA (6.9)	SC (1.84)	WA/MS (6.3)
Bottom Five States:						
46	NH (0.708)	KS (5.0)	IA (0.81)	UT (3.6)	FL (0.46)	WY/NH/NE (3.9)
47	MA (0.706)	CT/RI (4.9)	NH (0.60)	IA (3.5)	VT (0.45)	SD (3.8)
48	RI (0.51)	VT (4.8)	CT (0.53)	ND (3.3)	DE (0.40)	VT/VA (3.7)
59	CT (0.40)	MD (4.6)	NE (0.46)	SD (2.9)	NV (0.38)	ND (3.5)
50	DE (0.35)	NH/MA (3.9)	DE (0.24)	NE (2.6)	HI (0.24)	HI (3.3)
National Average:	2.50	7.27	2.01	5.67	1.11	5.56

Notes: The number in parentheses is the measure of economic volatility or the unemployment rate. The District of Columbia is omitted from this analysis because it does not consist of multiple jurisdictions and hence does not vary with respect to economic volatility. Only the weighted measure of economic volatility is reported in this table. The measure of economic volatility is constructed to reflect the absolute value of the mean deviation in each state's unemployment rate, calculated using county-level unemployment data and weighted by the size of each county's labor force.

TABLE 3:
The Impact of EV and UR on Work and Welfare Decisions, All Mothers

Outcome Variable	Obs.	Mean	Model Includes the Following Economic Measure(s)		
			EV Only	UR Only	EV and UR
Any Work	120,183	0.744	-0.0119	--	-0.0050
			(0.0035)***		(0.0038)
			--	-0.0088	-0.0079
				(0.0016)***	(0.0018)***
Work, No Welfare	120,183	0.647	-0.0175	--	-0.0110
			(0.0042)***		(0.0046)**
			--	-0.0098	-0.0077
				(0.0019)***	(0.0021)***
Full-time, Full-year Work	90,024	0.606	-0.0181	--	-0.0124
			(0.0050)***		(0.0054)**
			--	-0.0099	-0.0076
				(0.0024)***	(0.0026)***
Weeks of Work	120,183	32.63	-0.4699	--	-0.1595
			(0.1291)***		(0.1402)
			--	-0.4166	-0.3864
				(0.0627)***	(0.0681)***
Hours of Work	120,183	28.01	-0.5239	--	-0.2238
			(0.1103)***		(0.1198)*
			--	-0.4153	-0.3728
				(0.0535)***	(0.0582)***
ln(earnings)	90,024	18,281	-0.0178	--	-0.0042
			(0.0107)*		(0.0114)
			--	-0.0189	-0.0181
				(0.0053***	(0.0056)***
ln(total income)	115,673	20,488	-0.0249	--	-0.0092
			(0.0080)***		(0.0088)
			--	-0.0206	-0.0188
				(0.0036)***	(0.0039)***
Welfare Receipt	120,183	0.238	0.0026	--	-0.0014
			(0.0021)		(0.0024)
			--	0.0040	0.0043
				(0.0009)***	(0.0010)***
Food Stamp Receipt	120,183	0.332	0.0126	--	0.0026
			(0.0041)***		(0.0045)
			--	0.0123	0.0118
				(0.0019)***	(0.0020)***

Source: Author's calculation from the 1986-2005 March CPS

Notes: Marginal effects are presented, along with robust standard errors (in parentheses). All estimates are weighted using the March CPS Supplemental Person weight. *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively. All models include controls for age; age-squared; whether the youngest child is ages 3-5, ages 6-8, ages 9-12, and ages 13-17; number of children ages 0-5; educational attainment; marital status; non-white; metropolitan residence; and non-wage income; a full set of social policy controls (EITC maximum benefit, CCDF spending, maximum welfare benefit, amount of disregarded earnings, dummy variable for job search program, dummy variable diversion program, dummy variable for work requirement, dummy variable for welfare sanction, dummy variables for three types of time limits, and dummy variable for Medicaid coverage); state fixed effects; year dummies, and a time trend. The following outcomes are estimated by a probit regression: any work; work, no welfare; full-time, full-year work; welfare receipt; and food stamp receipt. The following outcomes are estimated by a tobit regression: weeks of work and hours of work. The following outcomes are estimated by an OLS regression: ln(earnings) and ln(total income).

TABLE 4:
The Impact of EV and UR on Work and Welfare Decisions, By Mother's Race

Outcome Variable	Model 1a: Non-white	Model 1B: White	Model 2a: Non-white	Model 2B: White
	Model Includes the Following Economic Measure:			
	EV	EV	UR	UR
Any Work	-0.0177	-0.009	-0.0147	-0.0050
	(0.0071)**	(0.0039)**	(0.0031)***	(0.0019)***
Work, No Welfare	-0.0226	-0.0159	-0.0117	-0.0078
	(0.0084)***	(0.0047)***	(0.0036)***	(0.0022)***
Full-time, Full year Work	-0.0190	-0.0193	-0.0138	-0.0083
	(0.0100)*	(0.0058)***	(0.0045)***	(0.0028)***
Weeks of Work	-0.8123	-0.2847	-0.6683	-0.2319
	(0.2324)***	(0.1562)*	(0.1055)***	(0.0785)***
Hours of Work	-0.7543	-0.4261	-0.5976	-0.2815
	(0.2016)***	(0.1324)***	(0.0915)***	(0.0665)***
ln(earnings)	-0.0254	-0.0158	-0.0262	-0.0159
	(0.0224)	(0.0120)	(0.0098)***	(0.0062)**
ln(total income)	-0.0229	-0.0273	-0.0279	-0.0154
	(0.0143)	(0.0097)***	(0.0060)***	(0.0045)***
Welfare Receipt	0.0068	0.0013	0.0056	0.0028
	(0.0047)	(0.0022)	(0.0020)***	(0.0010)***
Food Stamp Receipt	0.0211	0.0088	0.0121	0.0115
	(0.0083)**	(0.0044)*	(0.0036)***	(0.0021)***

Source: Author's calculation from the 1986-2005 March CPS

Notes: Marginal effects are presented, along with robust standard errors (in parentheses). All estimates are weighted using the March CPS Supplemental Person weight. *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively. All models include controls for age; age-squared; whether the youngest child is ages 3-5, ages 6-8, ages 9-12, and ages 13-17; number of children ages 0-5; educational attainment; marital status; non-white; metropolitan residence; and non-wage income; a full set of social policy controls (EITC maximum benefit, CCDF spending, maximum welfare benefit, amount of disregarded earnings, dummy variable for job search program, dummy variable diversion program, dummy variable for work requirement, dummy variable for welfare sanction, dummy variables for three types of time limits, and dummy variable for Medicaid coverage); state fixed effects; year dummies, and a time trend. The following outcomes are estimated by a probit regression: any work; work, no welfare; full-time, full-year work; welfare receipt; and food stamp receipt. The following outcomes are estimated by a tobit regression: weeks of work and hours of work. The following outcomes are estimated by an OLS regression: ln(earnings) and ln(total income).

TABLE 5:
Sensitivity of EV Coefficient to Alternative Specifications of the "Any Work" Model

Specification	Marginal Effect	SE
Baseline Marginal Effect	-0.0119	(0.0035)***
Effect of EV Across Quartiles of the State UR:		
EV × (UR < 26th)	-0.0097	(0.0063)
EV × (UR 26th – 50th)	-0.0029	(0.0048)
EV × (UR 51st – 75th)	-0.0142	(0.0044)***
EV × (UR > 75th)	-0.0115	(0.0047)**
Exclude District of Columbia	-0.0116	(0.0035)***
Exclude Arizona	-0.0142	(0.0040)***
Exclude District of Columbia and Arizona	-0.0139	(0.0040)***
Exclude social policy variables	-0.0108	(0.0034)***
Include state-specific trends	-0.0049	(0.0042)
Unweighted data	-0.0072	(0.0030)**
Unweighted measure of EV	-0.0113	(0.0046)**
Mothers with a high school degree or less	-0.0143	(0.0051)***
Mothers with children ages 0-5	-0.0124	(0.0062)**
Never married mothers	-0.0128	(0.0065)**

Source: Author's calculation from the 1986-2005 March CPS

Notes: Marginal effects are presented, along with robust standard errors (in parentheses). The dependent variable in all analyses is the dichotomous employment status in the previous year. All models are estimated with probit regression. . *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively.

TABLE 6:
Changes to Employment and Welfare Participation Attributable to Economic Variability and the Unemployment Rate: 1985-2004 and 1992-2000

	Any Work	Work, No Welfare	Full-time, Full-year Work	Welfare Participation
Percentage Change:				
1985-2004	9.9	15.9	7.6	-23.2
1992-2000	14.4	19.1	6.9	-20.7
Percent of 1985-2004 Employment/Welfare Changes Attributable to:				
Economic Variability	16.7	15.3	33.1	1.6
Unemployment Rate	15.2	10.5	22.3	2.9
Economic Variability and Unemployment Rate	20.7	17.9	39.8	2.3
Percent of 1992-2000 Employment/Welfare Changes Attributable to:				
Economic Variability	8.4	9.3	26.8	1.3
Unemployment Rate	21.1	17.7	49.6	6.7
Economic Variability and Unemployment Rate	22.5	19.8	56.4	6.5

FIGURE 1:
National Time Series of Economic Volatility and the Unemployment Rate, 1985-2004

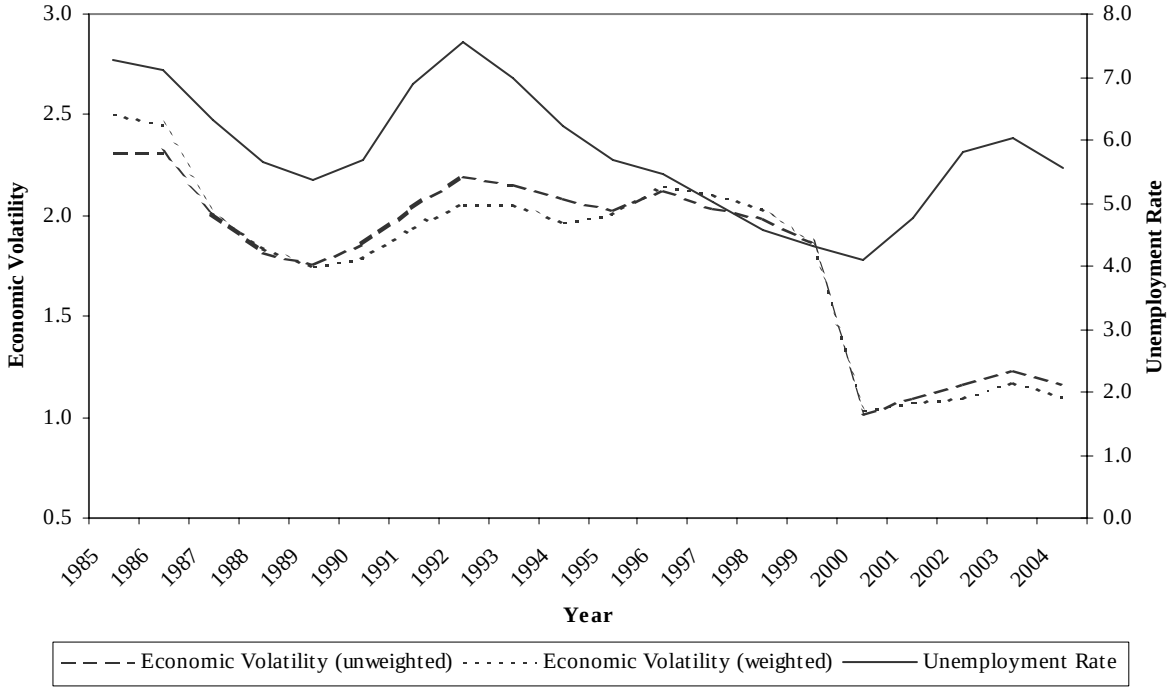

FIGURE 2:
National Time Series of Economic Volatility Across the Top and Bottom Quartiles of the State Unemployment Rate, 1985-2004