

THE ECONOMICS OF LABOR

Edited by
George J. Borjas

CRITICAL CONCEPTS IN
ECONOMICS



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Critical Concepts in Economics

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Volume II

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Part 3

MARKET EQUILIBRIUM

REGIONAL EVOLUTIONS

Olivier Jean Blanchard and Lawrence F. Katz

Source: *Brookings Papers on Economic Activity* 1 (1992): 1-61.

In 1987, the unemployment rate in Massachusetts averaged 3.2 percent, three percentage points below the national rate. Only four years later, in 1991, it stood at 9.0 percent, more than two points above the national rate. For firms taking investment decisions and for unemployed workers thinking about relocating, the obvious question is whether and when things will return to normal in Massachusetts. This is the issue that we take up in our paper.

However, instead of looking only at Massachusetts, we examine the general features of regional booms and slumps, studying the behavior of U.S. states over the last 40 years. We attempt to answer four questions. When a typical U.S. state over the postwar period has been affected by an adverse shock to employment, how has it adjusted? Did wages decline relative to the rest of the nation? Were other jobs created to replace those jobs destroyed by the shock? Or did workers move out of the state?

Our interest in these questions extends beyond regional economics. Blocs of countries, notably those in the European Community, are increasingly eliminating barriers to the mobility of goods and factors and moving toward adopting a common currency. Once these institutional changes are in place, economic interactions among these countries will more closely resemble those of U.S. states. This paper offers at least a glimpse of the nature and the strength of the macroeconomic adjustment mechanisms upon which these countries increasingly will rely.

We start by drawing a general picture of state evolutions over the last 40 years. The most striking feature is the range of employment growth rates across states. Over the last 40 years, some states have consistently grown at 2 percent above the national average, while some states have barely grown, with rates 2 percent below the national average. Rather than leading to fluctuations around trends, employment shocks typically have permanent effects. A state that experiences an acceleration or a slowdown in growth can expect to return to the same growth rate, but on a permanently different path of employment. The picture is very different when one looks at unemployment rates. Relative unemployment rates have exhibited no trend; moreover, shocks to relative unemployment rates have lasted for only one-half decade or so. Thus unemployment

patterns present an image of vacillating state fortunes as states move from above to below the national unemployment rate, and vice versa. Finally, the last 40 years have been characterized by a steady convergence of relative wages, a fact documented recently by Robert Barro and Xavier Sala-i-Martin (using personal income per capita rather than wages).¹ As for unemployment, the effects of shocks to relative wages appear to be transitory, disappearing within a decade or so.

We next develop a simple model that can account for these facts. We think of states as producing different bundles of goods, all sold on the national market. We assume that production takes place under constant returns and that there is infinite long-run mobility of both workers and firms. Under these two assumptions, our model implies that differences in the amenities offered by states to either workers or firms lead to permanent differences in growth rates. However, while employment growth rates differ, labor and product mobility lead to a stable structure of unemployment and wage differentials. Thus the model can explain the observed trends. Moreover, the model can help us think about the shocks and mechanisms underlying regional slumps and booms. As states produce different bundles of goods, they experience different shocks to labor demand and thus experience state-specific fluctuations. Shocks to labor demand first lead to movements in relative wages and unemployment. These in turn trigger adjustments through both labor and firm mobility, until unemployment and wages have returned to normal. By then, however, employment is permanently affected; to what extent depends on the relative speed at which workers and firms adjust to changes in wages and unemployment. In the rest of the paper, we use this model as a guide to interpreting the joint movements in relative employment, unemployment, wages, and prices.²

Our third section clears some empirical underbrush. First, we examine the issue of how much of the movement in state employment is common to states and how much is state-specific. The answer is simple. Aggregate fluctuations account for most of the year-to-year movement in state employment, but their importance declines steadily over longer horizons. We then address the practical issue of how one should define and construct state relative variables. After considering alternatives, we define all variables as logarithmic deviations from the national average.

We then look at joint movements in employment, unemployment, and participation. We find very similar results across states. A negative shock to employment leads initially to an increase in unemployment and a small decline in participation. Over time, the effect on employment increases, but the effect on unemployment and participation disappears after approximately five to seven years. Put another way, a state typically returns to normal after an adverse shock not because employment picks up, but because workers leave the state. These results raise an obvious set of questions: does employment fail to pick up because wages have not declined enough or because lower wages are not enough to boost employment?

We take up that question in the next section, where we examine joint fluctuations in employment, unemployment, wages, and prices. We find that in response to an adverse shock in employment, nominal wages decline strongly before returning to normal after approximately 10 years. This decline triggers some recovery

in employment, but the response of job creation to wage declines is not sufficient to fully offset the initial shock. Using prices as well as wages, we characterize the response of consumption wages to employment shocks. We find that consumption wages decline little in response to such shocks because housing prices, in particular, respond strongly to employment shocks. Thus migration in response to shocks appears to result more from changes in unemployment than from changes in relative consumption wages.

Throughout our paper, we identify innovations in employment with shocks to labor demand. Because we consistently find that positive shocks to employment increase wages and reduce unemployment, we are comfortable with this identification assumption. At the end of the paper, we follow an alternative and more conventional approach. We examine the effects of two observable and plausibly exogenous demand shocks: defense contracts, and predicted growth rates of employment, using the state industry shares and the national growth rates for each industry. We characterize their effects on employment and unemployment. The picture that emerges is consistent with our earlier findings: the effects on unemployment of employment changes predicted by changes in defense spending and by our industry mix instrument are quite similar to those we estimated for overall innovations in employment.

In the conclusion, we summarize the mechanisms underlying typical regional slumps and booms. Having done so, we return to the case of Massachusetts. We then take up three larger issues. First, we ask whether the adjustment process that we have characterized is efficient. In response to shocks, should workers or jobs move? Our empirical work, which is largely descriptive, cannot answer the question, but the results provide a few hints. We indicate how sharper conclusions could result from further micro-empirical work on the nature of the labor migration and on the ways in which shocks affect the process of job creation and destruction. We then draw the implications of our findings for an understanding of differences in regional growth, because we think—and our model formalizes—that the dynamic mechanisms at work are largely the same. Finally, we discuss the implications and limits of our analysis for European countries as they move to form a common currency area.

Background

We begin by laying out basic facts about regional evolutions of employment, unemployment, and wages in the postwar period.

Trends and fluctuations in relative employment

Over the last forty years, U.S. states have experienced large and sustained differences in employment growth rates. This experience is illustrated in figure 1, which plots average nonfarm employment growth from 1950 to 1970 against average nonfarm employment growth from 1970 to 1990. (A few states have a later starting date. The appendix gives exact definitions, sources and coverage for the series used in this paper.) The line is a regression line and has a slope of

Annual employment growth, 1970–90(percent)

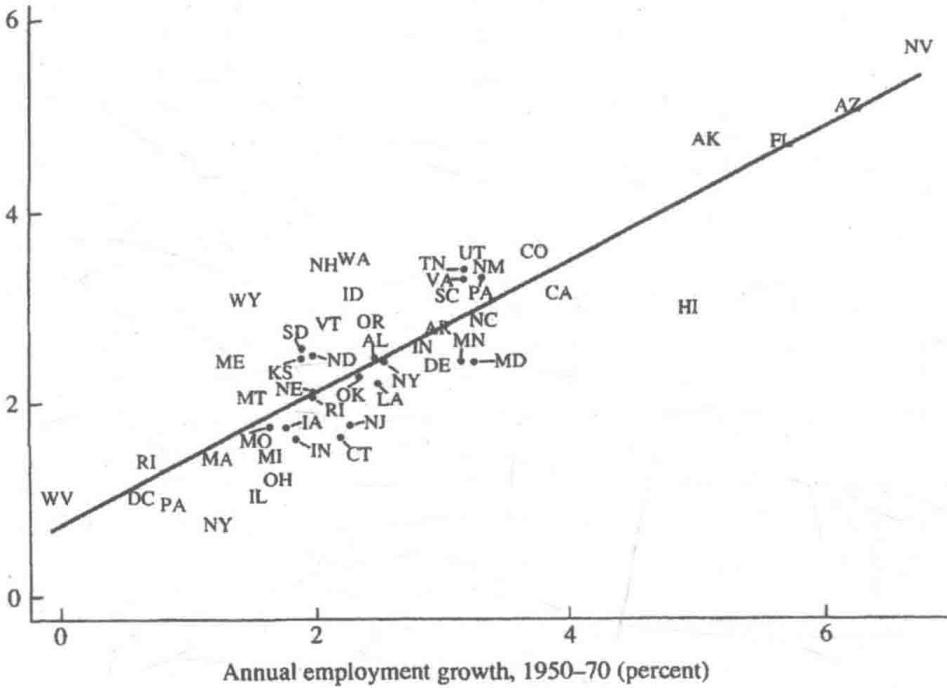


Figure 1 Persistence of Employment Growth Rates across U.S. States, 1950–90

Source: Authors' calculations using data from *Employment and Earnings*. See the appendix for more information. Annual employment growth is measured by the average annual change in log employment over the specified time span.

0.70 and an R^2 of 0.75. Arizona, Florida, and Nevada have consistently grown at 2 percent above the national average. Even leaving these states out, the R^2 is still equal to 0.60. Massachusetts, New York, Pennsylvania, Rhode Island, and West Virginia have consistently grown at rates much below the national average. The variation in growth rates is substantially greater among large U.S. states than among European countries.³

It is true that, over much longer periods, trends in state relative employment growth have changed. The Northeast grew before relatively declining, the South stagnated before growing, and so on. However, over the postwar period, those trends have been surprisingly stable.⁴ Thus figure 1 puts such stories as the turnaround of the South after the introduction of civil rights in the 1960s and the “Massachusetts miracle” of the early 1980s in the proper perspective.

Figure 2 gives a sense of regional trends as well as fluctuations by showing the evolution of employment for a number of states. It plots employment for New England, the Mid-Atlantic states, the Rust Belt, the Sun Belt, the farm states, and the oil states since 1947, measured relative to U.S. aggregate employment. The Massachusetts miracle of the 1980s is little more than a blip on a downward trend.

The experience of New York is similarly depressing. Ohio and Illinois also display steady relative employment losses, with losses accelerating in the late 1970s. Michigan's substantial postwar relative employment decline is concentrated in two sharp adverse shocks that affected the auto industry in 1956–58 and 1979–82. In contrast to those states, the Sun Belt states have grown consistently since 1947; note the size of the scale of the vertical axis. Two sets of states—not surprisingly, the farm and the oil states—exhibit a different behavior. The farm states do not exhibit a trend, but rather large fluctuations, culminating in the farm crisis of the 1980s.⁵ The oil states exhibit a boom in the 1970s, followed by a bust in the 1980s.

Having displayed our findings graphically, we turn to a formal characterization of the stochastic behavior of relative employment movements. We define n_{it} as the logarithm of employment in state i in year t minus the logarithm of U.S. employment in year t . Because most states clearly have a trend in relative employment, and we do not find the hypothesis of deterministic trends appealing, our assumption is that their process contains a unit root. We nevertheless test for evidence against a unit root by running for each state

$$\Delta n_{it} = \alpha_{1i} + \alpha_{2i}(L) \Delta n_{i,t-1} + \alpha_{3i} n_{i,t-1} + \alpha_{4i} T + \eta_{it}, \quad (1)$$

where T is time and η_{it} is a disturbance term.

We allow for four lags in $\alpha_{2i}(L)$.⁶ The period of estimation is 1952–90. The evidence from augmented Dickey-Fuller tests, which look at the t statistic on α_{3i} , the coefficient associated with the lagged level, is mixed. In all states, the coefficient on the lagged level is negative. But in only three states—Massachusetts, South Dakota, and Wyoming—is it significant at the 5 percent level. Thus, given our prior, we impose from here on the hypothesis of a unit root in relative employment.⁷

We then estimate the univariate process for employment by running from 1952 to 1990:

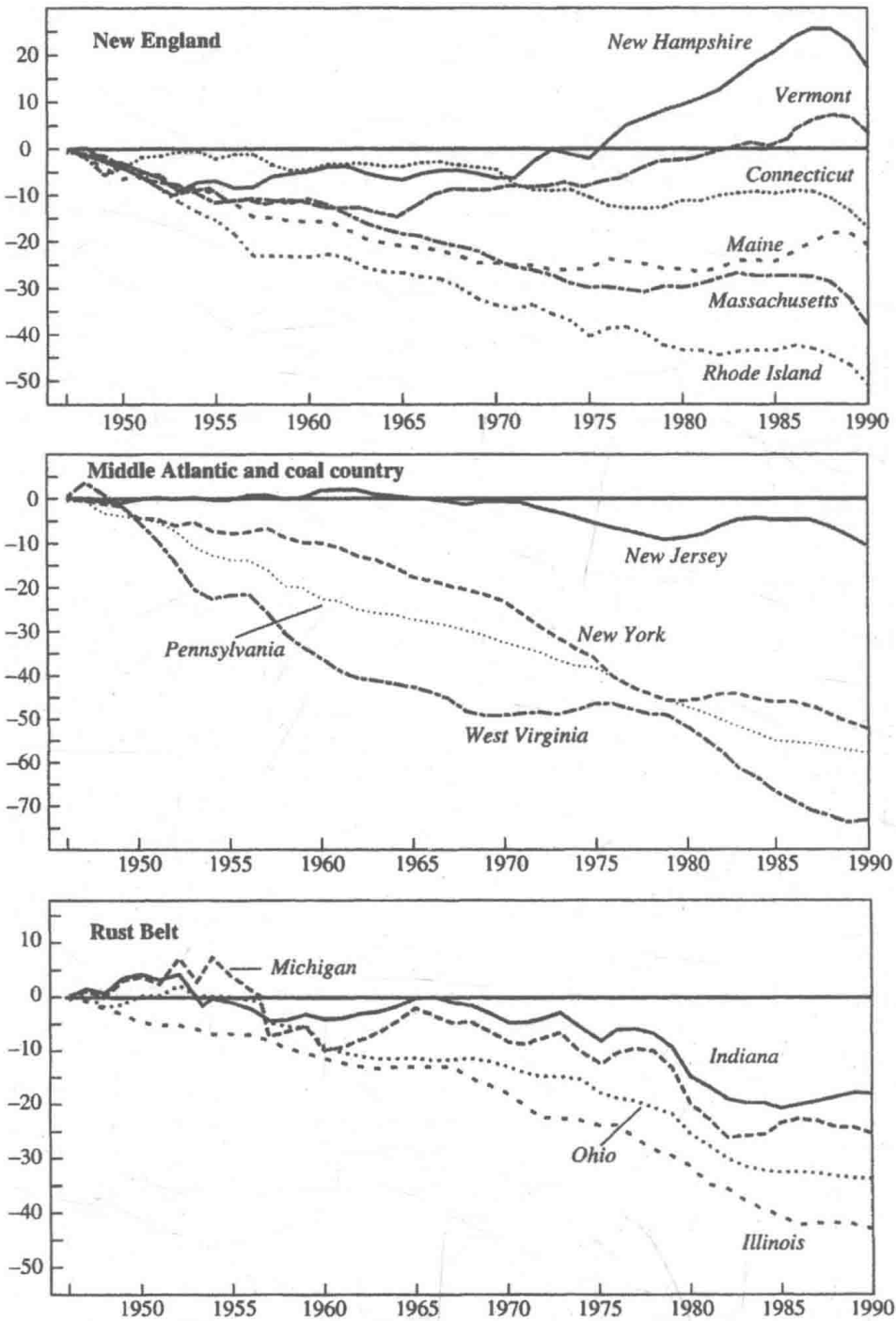
$$\Delta n_{it} = \alpha_{1i} + \alpha_{2i}(L) \Delta n_{i,t-1} + \eta_{it} \quad (2)$$

We allow for four lags in $\alpha_{2i}(L)$. From these estimated coefficients, we derive the associated impulse response, which gives the response of the level of relative employment to an innovation in η implied by equation 2. Regression coefficients and impulse responses are given in table 1.

The results in table 1 are obtained by pooling all states together, allowing for state effects. Throughout the paper, we take advantage of the cross section and time series dimensions of our data by estimating equations not only state-by-state but also for pooled sets of states. When pooling, we either pool all 50 states and the District of Columbia together as in table 1, or pool them by Census division.⁸ There are nine such divisions; they are relatively homogeneous and thus provide a natural way to pool states.⁹ Because of their different patterns, we also often look separately at farm states and oil and mineral states. We define farm states as those states in which earnings from agriculture accounted for more than 4 percent

LABOR MARKET EQUILIBRIUM

Percent



REGIONAL EVOLUTIONS

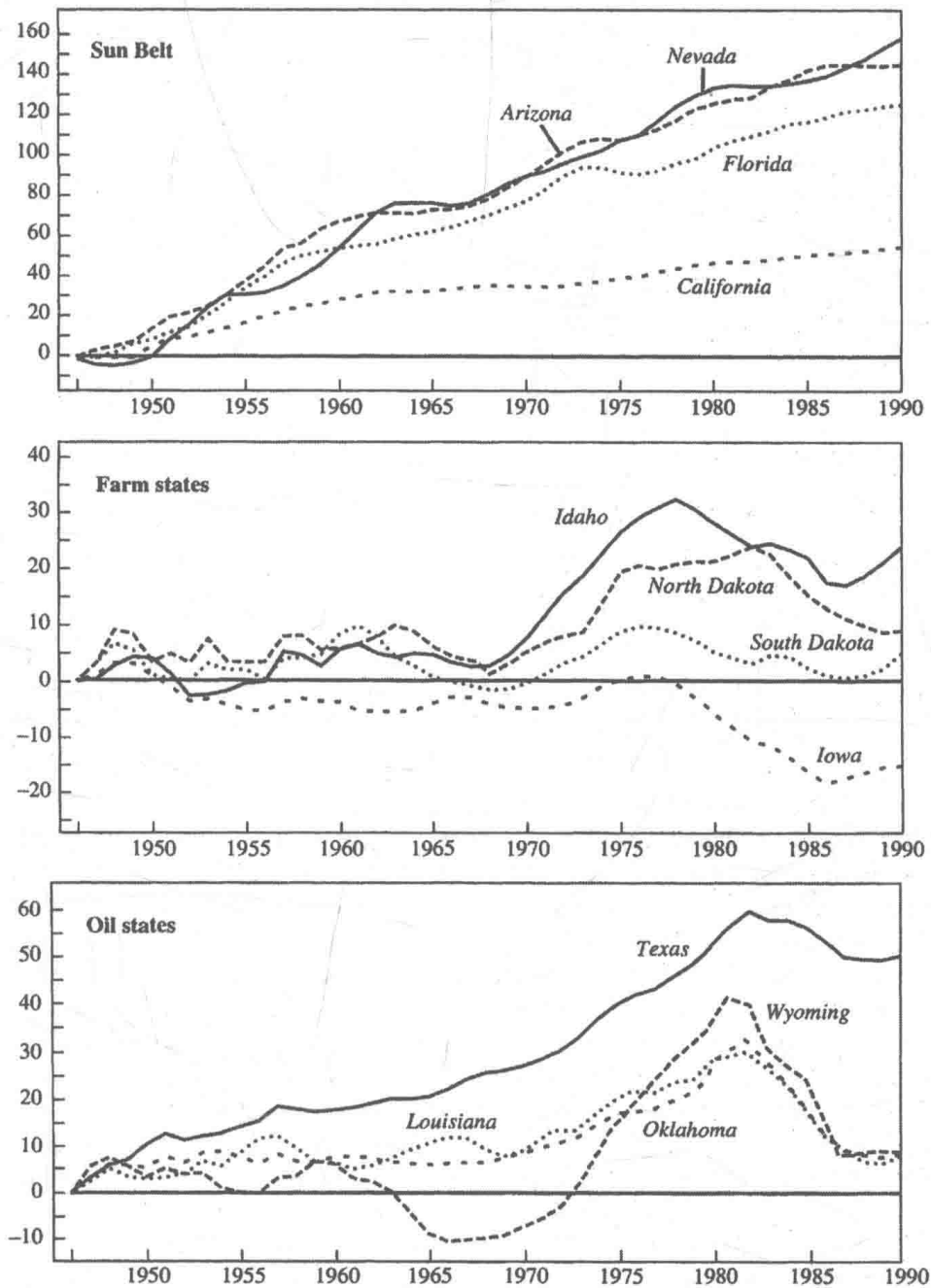


Figure 2 Cumulative Employment Growth, U.S. States Relative to the National Average, 1947-90

Source: Authors' calculations using data from *Employment and Earnings*. Cumulative employment growth is measured as the cumulative change in log employment. See the appendix for more information.