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Supporting material:



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**The Rising Strength of Management, High Unemployment and Slow Growth:
Revisiting Okun's Law**

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Why is economic growth so slow and why are we having jobless recoveries? I address these questions here by revisiting Okun's Law, focusing not just on its cyclical component but also upon its implied estimates of trend growth. Some observers argue that the rising strength of management (falling strength of labor) since the 1980s has led to a more volatile labor market and therefore to the decay of Okun's Law. Using cross-state data since 1964 I examine whether Okun's Law has changed in response to the decline of unionism. I find that the cyclical component of Okun's Law does not need revision and that the trend growth component has declined moderately.

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Forthcoming in Robert Pollin and Jeannette Wicks-Lim eds., *Capitalism on Trial*, Edward Elgar Press. Revised version of a paper prepared for the conference, "Capitalism on Trial," in honor of Thomas Weisskopf, University of Massachusetts, Amherst, September 30, 2011.

11.1 INTRODUCTION

In early 2009, just after President Obama was sworn into office and a few months after the financial crisis had erupted, it was evident that the economy was in a full-blown recession. However, the “real-time” GDP data then available indicated that US GDP was falling at only 3.8 percent per year, one of the most moderate rates of any postwar recession. In the same period, employment was falling by nearly 700,000 jobs per month, or over 6 percent on an annual basis.¹ As a result, the unemployment rate rose from 4.6 percent in late 2008 to 10.2 percent in June of 2009. A change of such magnitude had not occurred in over 25 years.

The dramatic increase in unemployment in 2009 took many policymakers by surprise, as it represented a sharp departure from the amount forecast by a relationship known as Okun’s Law. Formulated by then Council of Economic Advisers Chair Arthur Okun in 1962, Okun’s Law decomposes the historical relationship between unemployment and GDP into a cyclical component and a trend component. The cyclical component represents the estimated responsiveness of the labor market to cyclical (de-trended) changes in GDP. The trend component represents an estimate of what the trend GDP growth rate would be if the unemployment rate was stationary. Of these two components, it is the cyclical relationship that most analysts refer to when speaking of Okun’s Law.²

Based on historical experience in both recessions and recoveries, Okun’s Law posits that a cyclical decline of 1 percent of GDP is associated with an increase of 0.5 percentage points of unemployment one year later.³ But instead of increasing by 2 percentage points in 2009 in response to the 3.8 percent decline in GDP, the unemployment rate increased by about 6 percentage points. This breakdown of the relationship led many observers to declare that Okun’s Law had disintegrated.⁴ As it turned out, data revisions in the intervening time have indicated that the economic downturn was much more severe—GDP declined 8.9 percent not 3.8 percent—than the early data suggested. After the revised data were crunched, it appeared that the Okun’s Law relationship might stand intact.

¹ By comparison, employment fell about 3.1 percent in the early 1980s recession, less than 2 percent in the early 1990s, and about 2 percent in the 2001 recession.

² Knotek (2007) provides a recent exposition of Okun’s Law, including both static and dynamic versions, and a literature review. For insightful international comparisons on Okun’s Law in the Great Recession, see International Monetary Fund (2010).

³ In Okun’s original formulation, the increase in the unemployment rate was one-third of the decrease in percent decline in GDP. The 0.5 relationship is based on the ten recessions in the period from 1947–2004. See Romer (2006, table 4.3).

⁴ Another important part of Okun’s Law refers to hours per employee. The trend of involuntary part-time employment has exhibited two upward breaks, one in 2001–2002 and a much larger one in the current recession. I suggest below that this part of Okun’s Law may also need revision.

Some observers nonetheless believe that Okun's Law needs revision, pointing to the weak response of the labor market in the economic recovery. According to the econometric estimates of Gordon (2011a), the responsiveness of unemployment to a change in GDP has risen substantially since the mid-1980s.⁵ Gordon (2011a; b) suggests that Okun's Law has changed because employers have much greater power and they treat workers now as more disposable than they were before the 1980s. Hence the jobless recoveries since the 1990s, the large increase in unemployment in 2008–2009, and the jobless recovery that began in 2010.

Whether or not Gordon is correct about Okun's Law is of major importance. Five years after the onset of the Great Recession, the weak character of the economic recovery and the even weaker recovery of the labor market continue to raise the question: Why is economic growth so slow and why are we having jobless recoveries? I address this question here by revisiting Okun's Law, focusing not just on the cyclical relationship that is emphasized by Gordon and most economists, but also upon its implied estimates of trend growth.

My main argument concerns the effects of the falling strength of labor since the 1980s upon economic growth and stability in the US. I show that Okun's Law has changed in response to these institutional changes. But unlike Gordon, the part of Okun's Law that my findings revise involves not its cyclical component, but rather the part that has received less attention: trends in growth rates.

It is well known that economic growth since the early 1980s has been slower than in the previous postwar period. Although the number of jobs grew rapidly during the technology boom of the late 1990s, the growth of employment since 2001 has been especially slow. By early 2012, even with the recovery from the Great Recession, employment was essentially at the same level as in 2001. The labor market had already experienced more than a lost decade.

While this slower employment growth is a well-known fact, it is often attributed to globalization and an upsurge in productivity growth, rather than to slower economic growth and the decline of unions. I examine here the implications of the declining power of labor, which I shall also refer to as the rising strength of management. I suggest that the decline of unionism was a major part of a shift to a low-road path of development for the US economy, one in which profitability is enhanced by cutting labor costs rather than by investments in innovation and productivity growth that would be shared with labor. Since the 1980s, large segments of US employers moved away from a mutual-gains relationship with their employees and toward a shorter-run perspective that emphasized cost-cutting at the expense of long-term investments.⁶ These developments reduced the growth-rate of the economy as a whole.

My results suggest, somewhat surprisingly, that the cyclical component of Okun's Law has not been changed substantially by the weakening of labor. Unions in the US do protect

⁵ Gordon (2011a) arrives at this finding using a Kalman filter to detrend changes in GDP, rather than the Hedrock–Prescott filter that is more commonly used by macroeconomists.

⁶ Some sectors of the U.S. economy, notably information and computer technology, have done very well, but they have become the exception rather than the rule.

workers from arbitrary dismissals and they sometimes slow down plant closures, either through collective bargaining agreements or through political pressure. In some cases, unions do bargain over employment levels, as in the cases of airplane crew sizes, nurse–staff ratios or teacher–student ratios. US unions can also, through concession bargaining, be an instrument of nominal downward wage flexibility, and thereby save some of their members' jobs.⁷

But most union contracts contain a management rights clause that gives management the right to set the size of the workforce and to adjust it as needed when business conditions warrant. With a management rights clause, the employer's decisions regarding the size of the workforce adjustment does not require any further justification. Gordon and many other observers thus overstate the extent to which strong unions ever had substantial power in the US to prevent layoffs when the economy turns south.

In addition to reducing the size of their workforce, employers can in principle adjust to downturns in economic activity by cutting their workers' hours. Indeed, as Bernanke (1986) showed, hours reductions that were shared by all employees were quantitatively as important as layoffs in reducing labor input during the Great Depression. Since that time, however, unions have pressed for layoffs rather than hours reductions as the preferred adjustment method. Using layoffs protects senior workers from hours reductions and places more of the adjustment costs on junior workers, who were the first to be laid off. Layoffs in unionized companies are allocated according to rules set forth in the contract, usually involving inverse seniority.⁸

Houseman and Abraham (1994) showed that labor market adjustment in recessions occurs more through layoffs in the US and more through hours reductions in other countries, such as Germany and Japan. As is well-known, strong European unions have obtained employment protections for workers on indefinite contracts. These protections make layoffs very costly to employers and have led European employers to greater use of hours reductions as the labor adjustment mechanism in recessions.⁹

Has the US pattern that emphasizes layoffs over hours reductions begun to change? Gordon (2011a, fig. 6) does show that labor hours adjusted much more to GDP changes in the later period than they did in the earlier, while the responsiveness of employment to GDP changes shows only a small increase from the early period to the later one. On the other hand, US

⁷ Downward nominal wage rigidity in the private sector was the rule in the Great Recession. Ironically, it is the union sector that exhibits more wage flexibility in a downturn.

⁸ On seniority rules regarding layoffs and promotions in the unionized context, see Abraham and Medoff (1984). Mills (1985) showed that seniority rules were just as prevalent in the non-union context. This finding was reversed by Abraham and Farber (1988).

⁹ Appelbaum (2011) argues that institutional weaknesses in the US labor market have inclined employers to adjust to recessions through layoffs rather than hours reductions, as in Belgium, Canada, Germany, and a number of other European countries that utilize work-sharing policies. This leaves open the question of whether the use of layoffs in the US has increased over time.

employers have been very slow to utilize work-sharing subsidies that are available in over 20 states (Reich, 2012).

My focus on the rising strength of management since the 1980s and its consequences contrasts strongly with Thomas Weisskopf's analysis of the rising strength of labor and its consequences for the period up to 1979. This contrast does not represent a critique of Weisskopf's study. Rather, it demonstrates how much the dynamics of capitalism have changed in the intervening time.

In Section 11.2 of the chapter I discuss Weisskopf's approach in order to highlight these contrasts. Section 11.3 examines some of the changes since 1980 that have led over time to a low-road business model in the US, one in which managers see workers as a cost to control rather than a partner in growth. Section 11.4 recognizes that the decline of unionism is correlated with the decline of manufacturing in the US, as well as with institutional changes in the National Labor Relations Act and the policies of the National Labor Relations Board, and asks how these two phenomena might be distinguished. Section 11.5 discusses how changes in economic fluctuations and growth of US capitalism can be examined conceptually through the lens of Okun's Law. Section 11.6 provides my empirical identification strategy of the causal changes and Section 11.7 discusses the empirical results. I provide some concluding comments in Section 11.8.

11.2 WEISSKOPF'S 1979 ANALYSIS

In his classic 1979 article, "Marxian crisis theory and the rate of profit in the postwar U.S. economy," Thomas Weisskopf analysed the changing economic relationships of the postwar period that gave rise to the long crisis of the 1970s. The postwar period was one of high growth rates, and a shared prosperity among all income quintiles. The postwar system broke down, however, in the 1970s. Weisskopf determined that the growth of business costs—primarily wages but also raw materials prices—had squeezed profits, thereby reducing investment and setting off a period of stagflation (Weisskopf, 1979). The growth of these costs resulted in part from unusually rapid economic growth, especially during the Vietnam War, which increased the demand for labor, raw materials, and other inputs faster than supplies of each could be mobilized. As a result, unemployment rates fell to levels that had not been seen since the Second World War, productivity growth slowed and wage pressures squeezed profits. In other words, the findings supported a "Rising Strength of Labor" thesis.

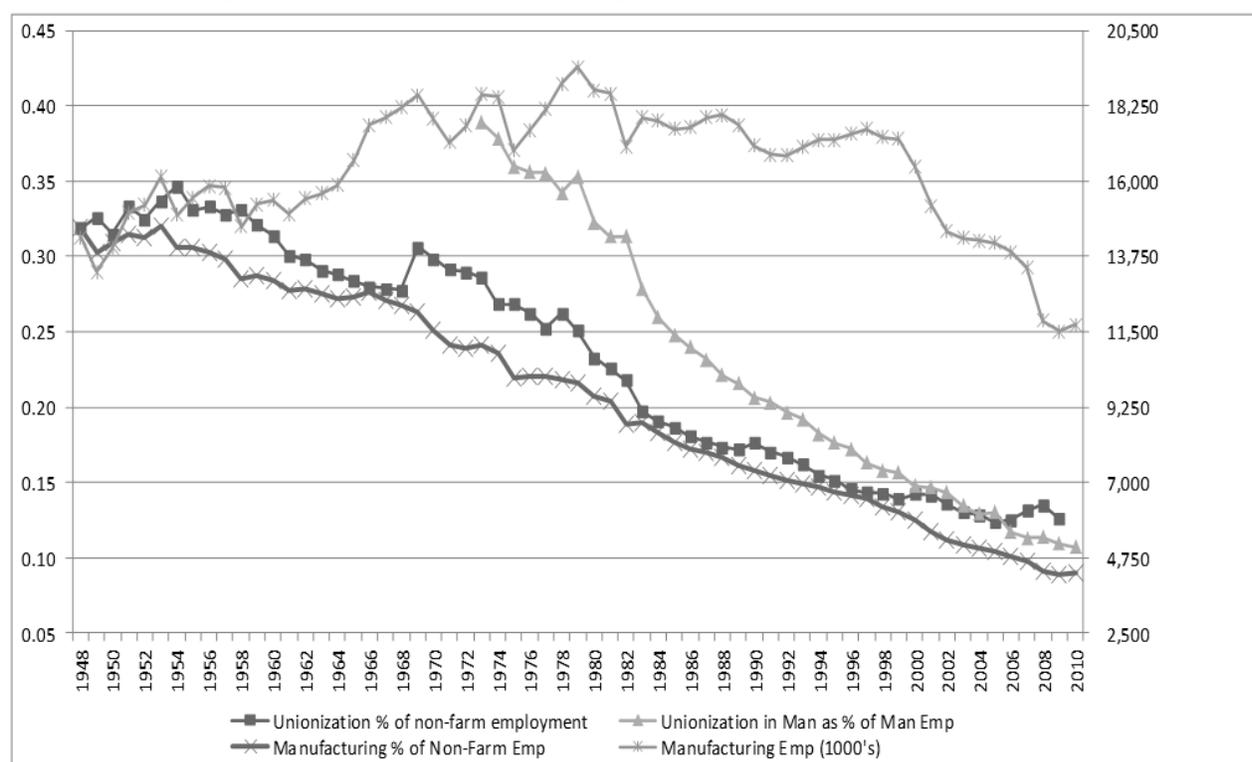
Weisskopf's article made many important contributions to the economic crisis literature. As usual, he provided an extremely detailed and very instructive discussion of each of the data series that he used, the proper price indices needed to measure real quantities, and how to handle such issues as changing relative prices of consumer and capital goods.

But most important, by elucidating the panoply of forces that determine the rate of profit, Weisskopf elegantly brought together into a single framework the variety of conditions that could lead to a sustained economic downturn. That framework encompassed the conditions in

which aggregate demand crises, such as the Great Depression of the 1930s, would erupt, as well as the conditions under which profits could be squeezed on the costs side, especially in the labor and raw material markets. Weisskopf thus provided a means to resolve the then-ongoing debate among the Keynesians, the stagnationists, and the underconsumptionists who emphasized aggregate demand problems, and the profit-squeeze perspectives of those, such as Glyn and Sutcliffe and Boddy and Crotty, who paid more attention to the depletion of the reserve army of the unemployed and the consequent growth in wages and in labor's share of national income.¹⁰

Was Weisskopf correct to speak of a rising strength of labor in the 1960s and 1970s? The idea that labor once had economic strength, to say nothing of the idea that its strength was increasing in the US into the 1970s, seems remarkable in retrospect. Indeed, private sector union membership peaked at an estimated 21 million members in absolute numbers in 1979, the year Weisskopf's article appeared. On the other hand, union density—the proportion of the workforce represented by unions—peaked much earlier, in 1953; then declined slowly but steadily through the 1970s, before declining further at an accelerated rate, beginning, but not ending, in the 1980s (see Figure 11.1).

Figure 11.1 Manufacturing employment (level and share) and union membership in nonfarm employment and in manufacturing

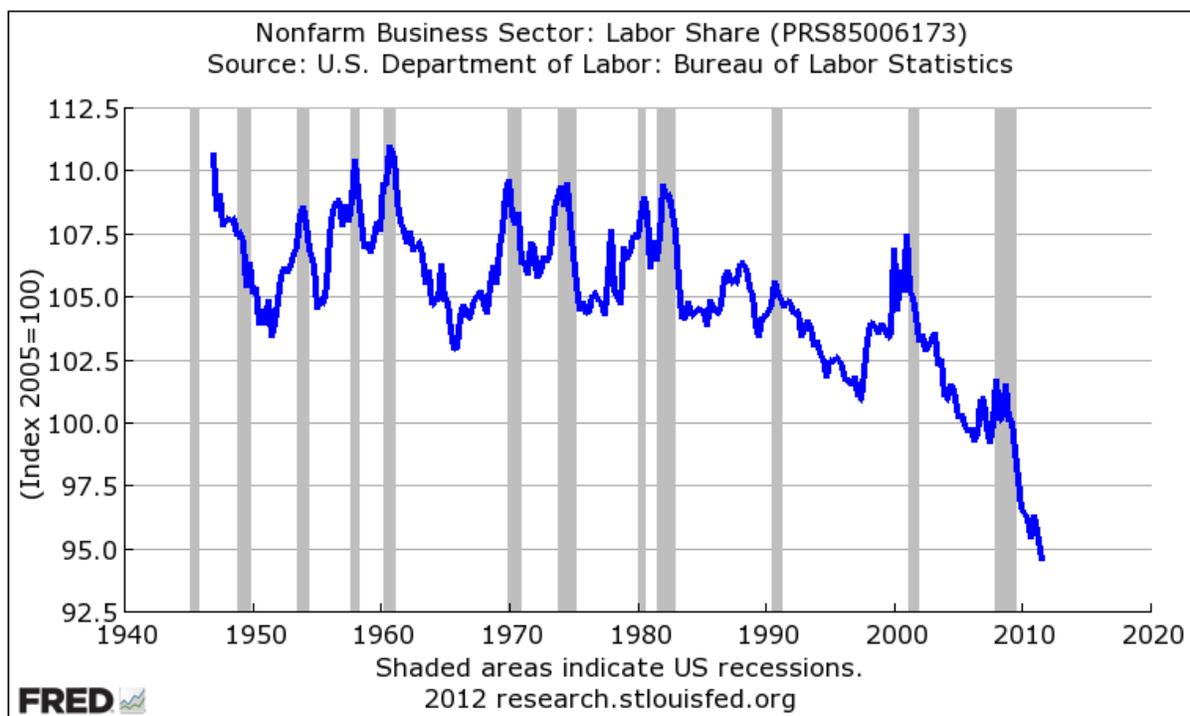


¹⁰ Weisskopf's model did not distinguish clearly enough between the strength of labor, understood in institutional terms such as union density, and its proxy, the share of labor in national income. But much in Weisskopf's analysis is unchanged if we just redefine his RSL acronym as denoting the Rising Share of Labor.

Weisskopf was nonetheless correct to refer to a rising strength of labor because in the period from the early 1960s to the early 1970s falling unemployment rates and rapid economic growth made it more difficult for employers to find workers just when they needed them most. Market conditions thus provided unions with more bargaining leverage. Union strikes became more common, putting more pressure on employers to offer more favorable contract terms, including in many cases generous cost-of-living allowances (Rosenberg, 2010).

This rising strength of labor then translated into a rising share of labor in national income. As Figure 11.2 shows, labor's share of national income contains a strong cyclical component, falling in the first half of an expansion and rising in the second half. Thus, the proportion of national income received by labor rose between the mid 1960s and the business-cycle peak of 1973, recovered after the 1974–5 recession and then increased again in the latter 1970s.

Figure 11.2 Labor's share of national income, 1947q1 to 2011q3



Notes: [move from figure itself]

Source: [move from figure itself]

Yet Weisskopf could not foresee in 1979 that labor's strength had peaked and was about to enter a long period of decline. The subsequent changes in labor's share of national income provide one indicator of its weaker power. As Figure 11.2 shows, labor's share has been falling

since the mid-1980s, interrupted only temporarily in the second half of the 1990s expansion, and then plummeting in the 2000s.¹¹

11.3 THE RISING STRENGTH OF MANAGEMENT

The timing of the decline in labor's share coincides with two key changes in labor–management relations that emerged in the early 1980s, each of which had implications for both growth rates and how labor markets absorbed economic fluctuations.¹² First, in response to the stagflation crises of the 1970s, which as Weisskopf showed were related directly to the rising strength of labor, employers mounted a prolonged, multi-pronged, and very successful anti-union offensive. As a result, labor's success in NLRB elections plummeted in the early 1980s and never recovered (Farber and Western, 2002).

Second, in response partly to growing international competition and to challenges from aggressive shareholders, and without the countervailing power of unions, managers became much more oriented toward and rewarded by the short-term buttressing of company share prices.¹³ To do this they invested less in research and development and less in their own workforce. This change represented a systemic shift toward managers. Instead of cooperating with workers or their representatives for mutual long-term productivity gains, the emphasis became generating short-term increases in profits that would boost shares at the expense of long-term growth. This shift in the corporate business model meant that employers placed a lower value on long-term employment relations, shifting away from defined-benefit pensions and other benefits that tied employers and employees together and toward the use of shorter-term employees.

Changes since the 1970s in how the stock market responds to layoffs indicate how much the corporate business model has shifted. As Hallock et al. (2011) show, the stock market does not valorize the firm-specific skills of long-term employees and increasingly reacts to layoff announcements as evidence of positive managerial decision-making. In other words, layoff announcements have become interpreted as a sign of increased cost-efficiency rather than one of financial stress. And when layoffs are expected to increase share prices, managers with short-

¹¹ This decline cannot be accounted for by trends in capital-output ratios. After applying a Hedrick–Prescott filter, Heintz (this volume) also finds a declining labor share over this period, compared to a rising share in the earlier period. He therefore characterizes labor's share as relatively constant over the longer run (40 years), while I instead emphasize the different trends in the two periods. The institutional analysis of the Social Structure of Accumulation perspective, which Weisskopf was building upon, also emphasizes the contrasts between the two periods. See McDonough et al. (2010).

¹² The discussion in this section presents a very brief summary of a large literature. For details, see the relevant chapters in Reich (2009) and in McDonough et al. (2010).

¹³ The challenge for corporate control that aggressive shareholders brought to less aggressive managers was resolved in favor of managers in the mid-1980s by various state laws making takeovers more difficult and by the 1985 Delaware case, *Moran vs Household* (Cremers and Ferrell, 2011). But by then, the structure of managerial compensation had become aligned with shareholder value.

term horizons are likely to overshoot the frequency and size of layoff announcements, even if they destroy long-term assets embodied in their employees, and thereby lower the company's share prices in the longer-run (Love and Nohria, 2005).

Hallock et al. (2011, fig. 7) present annual data on the relationship between large layoff announcements and share prices. In the 1970s, share prices of large companies reacted strongly and negatively to layoff announcements. This pattern began to reverse in the 1980s. By the 1990s layoff announcements were nearly as likely to generate positive effects on share prices as to generate negative ones (see also Uchitelle, 2006). According to Hallock (1998): "Firms that announce layoffs in the previous year pay their chief executive officers more and give them larger percentage raises than firms that do not have at least one layoff announcement in the previous year."

As Hallock et al. (2011) show with annual data, the relationship between layoffs and share prices is highly cyclical. In particular, layoffs still have negative effects on share prices during recessions even as they have positive effects during expansions. However, the magnitude of these cyclical variations has not changed in recent years compared to the 1970s, indicating that the stock market may not have affected the cyclical patterns of layoffs. Interestingly, in addition to the cyclical variations, the annual data display a long-term trend from 1970 through 2007 toward higher share prices after layoff announcements. Put together with the greater proportion of managerial compensation that is share-price related, the result is that employers now are more rewarded by layoffs than they were in the 1970s.

Trends in job tenure indicate how attachments between firms and their workers have evolved. Farber (2010) provides the most thorough study of trends in job tenure; his data cover the period from 1973 to 2008. Farber finds a substantial and steady reduction over this period in the proportion of male private-sector workers who hold a job with the same employer for more than 10 years, confirming the familiar narrative that lifetime jobs are much less common than before.¹⁴ This pattern occurred among men in all age groups and especially for men over 40. Mean tenure fell from 13.5 years to 11.4 years for men aged 50, and from 18 years to 14 years for men aged 60. Changes in employer pensions that reinforced the attachments of workers and firms show similar patterns. Between just 1992 and 2004, the proportion of men aged 48 to 52 with defined benefit retirement plans—which unlike 401k and other defined contributions plans provide benefits based upon length of service with the firm—fell from 41 percent to 24 percent.

Farber also finds that the proportion of workers in short-term jobs—those who remain with the same employer for less than 1 year—increased in the same time period. The proportion of workers in new jobs rose in all age groups, and especially among workers aged 30–39.¹⁵ By

¹⁴ The trends for women were stable, in large part because increases in the long-term attachment of women to the labor force and to their jobs have offset occupational declines in job duration.

¹⁵ Farber uses less than 1 year as his cutoff because information on the distribution of job tenure by months is not available for many of the years in his dataset.

2008 these short-term jobs accounted for one-fifth of total private sector employment.¹⁶ Equally important, by 2008 half of all new jobs ended within the first year, implying that about a quarter of all new jobs end within 6 months.

Some of the decline in long-term jobs reflects the decline of industries, such as manufacturing, that had above-average job tenure levels. Similarly, some of the increase in short-term jobs reflects the rise of industries, such as retail and accommodation and food services, that long had lower levels of job tenure. As Farber reports, however, the shift to shorter job tenure is also visible *within* industries.

In summary, the increased propensity to use layoffs to increase share prices and the declining value placed upon long-term employment relations each suggest that the labor market has become more flexible. What remains open is whether this greater flexibility has affected the volatility of employment with the business cycle and the trend rate of economic growth.

11.4 THE DECLINE OF LABOR OR THE DECLINE OF MANUFACTURING?

As Hallock et al. (2011) make clear, a large proportion of layoffs in the US have taken place in manufacturing. Some observers suggest that the decline of manufacturing is the product of globalization, especially illustrated by growing competition in recent decades from low-wage producers in China and Mexico. But as Figure 11.1 shows, manufacturing employment has been declining steadily as a share of total employment since the early 1950s, well before the emergence of international competition from Europe, Latin America, or Asia. It seems more likely that manufacturing employment has declined because of greater productivity growth in manufacturing than in services and because of growth in the demand for services.

On the other hand, the level of manufacturing employment (also shown in Figure 11.1) did increase in the 1960s and 1970s. It then fluctuated in the 1980s and 1990s with the value of the dollar against other currencies and with the growth of the US current account deficit (McKinnon, 2004). According to McKinnon, the steep decline of manufacturing in the 2000s reflects the large increase in the fiscal deficit, which increased interest rates and increased the value of the dollar, thereby increasing the manufacturing trade deficit. For this reason, the decline of manufacturing in other major economies, such as Germany and Japan, has been much less steep than in the US.

Manufacturing jobs are important for economic growth and innovation because they pay much above the economy-wide average and because about 70 percent of research and development takes place in manufacturing. The decline of manufacturing consequently holds implications of its own for long-term economic growth. Manufacturing is also more cyclically sensitive than other sectors of the economy. Therefore, the decline of manufacturing can also affect how much employment responds to fluctuations in GDP.

¹⁶ As Farber notes, over this period job duration in the public sector increased, especially but not solely among women.

The decline of manufacturing also has implications for the decline of unionism. Figure 11.1 shows that union density in manufacturing has always been higher than in the economy as a whole. Nonetheless, union density in manufacturing has been declining more rapidly than in the economy as a whole. The decline of manufacturing employment may also hold major implications for labor's share of national income, Weisskopf's measure of labor's strength.

Consider the trend in the level of manufacturing employment displayed in Figure 11.1. Manufacturing employment grew in the 1960s and 1970s, the period when labor's share of national income (shown in Figure 11.2) was also rising. And the rapid decline in manufacturing employment since the 2000 recession coincides with the rapid decline in labor's share in the same time period.

In summary, it is important to distinguish the effects of manufacturing decline from the effects of union decline. I therefore take manufacturing decline into account in the empirical tests that I discuss below.

11.5 REVISITING OKUN'S LAW

In the preceding section I reviewed major changes in the US labor market that began in the 1980s: weaker unions, shorter managerial time horizons, a greater propensity to lay workers off, declining employer commitments to employees, and the decline of manufacturing. These changes can be summarized as generating increases in the flexibility of US labor markets.

Has this increase in flexibility since the 1980s changed how the labor market reacts to economic growth and fluctuations? An increase in labor market flexibility could lead to more volatility in employment, as occurred in Spain and other countries that increased their use of temporary contracts (Bentolila et al., 2010). The 1984 to 2006 period of moderation in business cycles, sometimes referred to as the Great Moderation, suggests the opposite occurred in the US, while the large increase in unemployment during the Great Recession of 2007–2009 supports the hypothesis of increased volatility.

An increase in flexibility, if it reduces employer investments in worker productivity, can reduce longer-term economic growth. The European experience with more flexible labor markets suggests just such an outcome, as does the slower rate of growth of the US economy since the 1980s.

Okun's Law, which summarizes both short-run cyclical patterns and longer-run trend growth rates, is well-suited to address the effects of increased labor market flexibility upon short-run fluctuations and longer-run growth. Okun's Law in effect decomposes changes in the unemployment rate into cyclical and trend economic growth rate components:

$$\Delta UE_t = a + b \left(\frac{\Delta GDP_t}{GDP_t} \right) + \varepsilon_t \quad (1)$$

where ΔUE_t equals the change in the unemployment rate and $\frac{\Delta GDP_t}{GDP_t}$ equals the growth rate of GDP. The cyclical (short-run) component of Okun's Law is the estimated b .

To obtain the estimated trend of GDP growth consistent with no change in unemployment, set $\Delta UE_t = 0$. This condition implies:

$$\left(\frac{\Delta GDP_t}{GDP_t}\right)^* = -\frac{a}{b} \quad (2)$$

The trend growth rate (the rate of economic growth consistent with no change in unemployment) thus equals the intercept divided by the absolute value of the cyclical coefficient.

6. Identification strategy and data

First stage

My first-stage strategy consists of estimating Okun's Law coefficients across the fifty U.S. states over the period 1964-2010. For each state i , I regress the annual change in the state unemployment rate (ΔUE) against the percentage change in real state GDP:

$$\Delta UE_{it} = a_i + b \left(\frac{\Delta GDP_{it}}{GDP_{it}} \right) + \varepsilon_{it}$$

I then examine whether the coefficients changed in the 1980s and whether they changed more in states that had greater declines in unionization.¹⁷ I do so first by estimating Okun's Law for two different periods and separately for states that had greater or smaller than median declines in unionization over the period.

To estimate these regressions I require only real state GDP, state unemployment rates for each year and unionization rates for each year and state.¹⁸ State GDP data are from the NIPA regional tables, available in real terms for later years and in nominal terms for earlier years. To obtain real state GDP for earlier years I extrapolated backwards using state-level trends in state GDP price deflators for later years. State unemployment rates are from BLS for later years and

¹⁷ The operating assumption here is that union membership rates measure labor's strength. But labor's strength is also affected by many other factors. These include the state of the labor market, the degree of solidarity among workers in different unions and those who are not unionized or unemployed, the financial resources available to management and to labor. These considerations are beyond the scope of the present paper.

¹⁸ Since hours per employee are not available at the state level, I cannot test whether hours adjustments have become more responsive to GDP change.

from the *Employment and Training Report of the President 1976* for earlier years.¹⁹ Unionization data are from union-stats.com.²⁰

It is instructive also to examine directly whether the decline in unionization had a *causal* impact on the changes in the Okun coefficients. A challenge for this exercise is that states differ in their cyclical responses and trend growth rates. For instance, a state producing natural resources such as Texas has somewhat different cyclical responses from the country as a whole - and this may have little to do with unionization as such. To eliminate such confounding factors across states, I focus on comparing *changes* in unionization with *changes* in the cyclical and trend responses. In so doing, I also examine whether the decline in unionization is related to the decline in the share of employment in manufacturing over this period. Thus, in a second-stage I regress the estimated state-level changes in the coefficients upon percentage changes and levels in state-level unionization and manufacturing employment shares.

Second stage

For the second-stage of identification, for each state (i), I regress for 1986-2010 the annual change in the state unemployment rate (UE) against the percentage change in real state GDP:

$$\Delta UE_{it} = a_i + b \left(\frac{\Delta GDP_{it}}{GDP_{it}} \right) + \varepsilon_{it}$$

Define $trend_{post,i} = -\frac{a}{b}$ equals the trend growth rate, and $cycle_{post,i} = b$ equals the cyclical response of unemployment to state GDP change.

For each state (i), I then regress for 1964-85 the change in the state unemployment rate (UE) against the percentage change in real state GDP:

¹⁹ Monthly state unemployment rates can be somewhat unreliable because they are calculated from small CPS samples and are sometimes adjusted by models and other data that come from the GDP side. I use only annual rates, which are much less affected by such shortcomings.

²⁰ I start with 1964 because state-level unionization data are available beginning in that year. See the Data Appendix for further details. In order to avoid weighting states by their population, which can exacerbate spatial heterogeneity, I omit four states that are clearly outliers. I measure union decline as the *percentage* change in the union proportion of the workforce (union density). Using the *point* change in union density would lead to misclassification of states with strong and weak unions, since states with initially low union density approach a zero lower bound while those with high union density do not. As Table A3 suggests, the states with lower percentage changes in union density are primarily the states with higher initial and final union density.

$$\Delta UE_{it} = c_i + d \left(\frac{\Delta GDP_{it}}{GDP_{it}} \right) + \varepsilon_{it}$$

Define $\mathbf{trend}_{pre,i} = -\frac{c}{d}$ equals the trend growth rate, and $\mathbf{cycle}_{pre,i} = d$ equals the cyclical response of unemployment to state GDP change.

Then, for each state (i), I calculate the differences in coefficients between the later (post) and the earlier (pre) periods:

$$\Delta \mathbf{trend}_i = \mathbf{trend}_{post,i} - \mathbf{trend}_{pre,i}$$

$$\Delta \mathbf{cycle}_i = \mathbf{cycle}_{post,i} - \mathbf{cycle}_{pre,i}$$

and merge those into a state-level dataset that contains the change and later-period levels of two independent variables:

$\Delta \mathbf{union}_i$

= percent change in unionization rate between pre and post periods in state i

$\Delta \mathbf{manuf}_i$

= percent change in manufacturing employment share (pre and post) in state i

$\mathbf{union}_{post,i}$ = unionization rate in later period for state i

$\mathbf{manuf}_{post,i}$ = manufacturing employment share in later period for state i

I then estimate six regressions:

$$\Delta \mathbf{trend}_i = \alpha + \beta_1 \cdot \Delta \mathbf{union}_i + \beta_3 \cdot \Delta \mathbf{manuf}_i + \varepsilon_i$$

$$\Delta \mathbf{trend}_i = \alpha + \beta_2 \cdot \mathbf{union}_{post,i} + \beta_4 \cdot \mathbf{manuf}_{post,i} + \varepsilon_i$$

$$\Delta \mathbf{trend}_i = \alpha + \beta_1 \cdot \Delta \mathbf{union}_i + \beta_2 \cdot \mathbf{union}_{post,i} + \beta_3 \cdot \Delta \mathbf{manuf}_i + \beta_4 \cdot \mathbf{manuf}_{post,i} + \varepsilon_i$$

$$\Delta \mathbf{cycle}_i = \alpha + \beta_1 \cdot \Delta \mathbf{union}_i + \beta_3 \cdot \Delta \mathbf{manuf}_i + \varepsilon_i$$

$$\Delta \mathbf{cycle}_i = \alpha + \beta_2 \cdot \mathbf{union}_{post,i} + \beta_4 \cdot \mathbf{manuf}_{post,i} + \varepsilon_i$$

$$\Delta \mathbf{cycle}_i = \alpha + \beta_1 \cdot \Delta \mathbf{union}_i + \beta_2 \cdot \mathbf{union}_{post,i} + \beta_3 \cdot \Delta \mathbf{manuf}_i + \beta_4 \cdot \mathbf{manuf}_{post,i} + \varepsilon_i$$

11.7 RESULTS

The first-stage results are presented in Tables 11.1 and 11.2. I begin with results for all the states in the sample over the entire period. I then consider whether these results vary by time period and by the extent of union decline. Then I discuss the results when I vary both the time period and the extent of union decline.

Table 11.1 Okun's Law, 1964 to 2010

	1964 to 2010		1964 to 1985		1986 to 2010	
Change in UE rate						
	(1)	(2)	(3)	(4)	(5)	(6)
GDP % change (cycle)	-0.220	-0.237	-0.239	-0.261	-0.197	-0.219
se	(0.006)	(0.006)	(0.009)	(0.009)	(0.009)	(0.009)
Constant	0.798	0.767	0.905	1.051	0.640	0.557
se	(0.028)	(0.130)	(0.045)	(0.220)	(0.034)	(0.160)
Trend growth	3.480	3.460	3.780	3.750	3.250	3.200
se	(0.078)	(0.075)	(0.130)	(0.120)	(0.120)	(0.110)
N	2162	2162	1012	1012	1150	1150
R ²	0.371	0.401	0.421	0.459	0.301	0.355
State fixed effects	n	y	n	y	n	y

Notes: All coefficients are significant at the 1 percent level. Excludes outlier states: Alaska, North Dakota, Louisiana, and Wyoming. Regressions performed in R with lm function. Standard errors are clustered at the state level. The standard errors for the trend growth estimates were determined with a bootstrap: for each regression group, sample N=46 observations with replacement from the group data, calculate the trend estimate for the sample, repeat 500 times, determine the empirical distribution of the 500 trend growth estimates for each group.

Table 11.2 *Okun's Law, by time period and extent of union decline*

	1964 to 2010		1964 to 1985		1986 to 2010	
	Union decline group		Union decline group		Union decline group	
	Small	Large	Small	Large	Small	Large
Δ UE rate	(1)	(2)	(3)	(4)	(5)	(6)
% Δ GDP (cycle)	-0.226	-0.246	-0.253	-0.268	-0.206	-0.229
se	(0.009)	(0.009)	(0.013)	(0.014)	(0.014)	(0.012)
Constant	0.820	0.733	1.090	1.038	0.599	0.508
se	(0.192)	(0.189)	(0.316)	(0.318)	(0.235)	(0.218)
Trend growth	3.577	3.349	3.906	3.635	3.264	3.145
se	(0.011)	(0.01)	(0.037)	0.034	(0.028)	(0.014)
N	1058	1058	483	483	575	575
R ²	0.374	0.408	0.437	0.438	0.290	0.371
State fixed effects	y	y	y	y	y	y

Notes: All the cycle and trend coefficients are significant at the one percent level. Excludes outlier states: Alaska, North Dakota, Louisiana, and Wyoming. Regressions performed in R with lm function. The standard errors for the trend estimates were determined with a bootstrap: for each regression group, sample N=46 observations with replacement from the group data, calculate the trend estimate for the sample, repeat 500 times, determine the empirical distribution of the 500 trend growth estimates for each group.

Table 11.1 presents the estimates over the entire period 1964–2010, without state fixed-effects in column 1 and with state fixed-effects in column 2. In this table and in Table 11.2, the more revealing results are those that include state fixed-effects. My discussion therefore focuses only on those results. Standard errors are clustered at the state level in all the tables.

In Table 11.1, column 2, the estimated cyclical coefficient, which is labeled as GDP percent change, equals -0.237 and the estimated trend growth rate is 3.46 percent.²¹ Both are significant at the 1 percent level.

In Table 11.1, columns 3 to 6 divide the entire time period into two parts, 1964 to 1985 and 1986 to 2010.²² In columns 4 and 6, which provide the specifications that include state fixed-effects, the cyclical coefficients and the trend growth rates remain significant at the 1 percent level in both time periods, but they vary substantially between the two periods. The change in the cyclical coefficient, from -0.261 to -0.219 (a decline of 16.1 percent), indicates that a given decline in GDP has a *smaller* effect on unemployment in the later period than in the earlier period. This result suggests that any increased labor market flexibility in the later period, when unions were weaker, is *not* associated with an increase in labor market volatility, contrary to the suggestions of Gordon and others.

What about the difference in growth rates in the two periods? In Table 11.1, columns 4 and 6 show a decline in the estimated trend growth rate, from 3.75 percent in the earlier period to 3.20 percent in the later period. The increase in labor market flexibility in the later period, when unions were weaker, is thus associated with a somewhat reduced economic growth trend, consistent with the arguments made earlier in this chapter.

I turn next to examining the possible effects of the decline of union density. Table 11.2 presents Okun's Law estimates, but now disaggregated into two sets of states. One set consists of states in which the percentage decline in union density was less than the median (columns 1, 3, and 5), and the other consists of states in which union density declined by more than the median amount (columns 2, 4, and 6).²³

Consider first the differences between the two sets of states over the entire period of 1964–85. These results are shown in columns 1 and 2 of Table 11.2. The cyclical coefficient in column 2 is slightly higher than in column 1, suggesting again that greater union decline did not have much effect on the volatility of employment.

The trend growth rates in these two columns show a different pattern. Over the period 1964–2010 trend growth was 3.58 percent in the states with the less rapid decline in unionism and 3.35 percent in the states with the more rapid union decline. States in which labor decline was muted grew moderately faster than those in which labor decline was greater. This result, which is consistent with the finding in Table 11.1, suggests that greater increases in management strength versus labor are associated with lower economic growth.

²¹ In equations that include state fixed-effects, the estimated trend growth is calculated using the average of the 46 state trend estimates.

²² I use 1985 as the break year for comparability with Gordon (2011b), who identifies a change in Okun's Law then.

²³ The median decline in union density from 1964 to 2010 equals 16 percentage points, or about half the level in 1964.

I turn next to Okun's Law estimates that compare both the earlier and later periods and the states with lesser or greater amounts of union decline. These results are also presented in Table 11.2. Columns 3 and 4 show the results for both sets of states in the earlier period and columns 5 and 6 exhibit the results for both sets of states for the later period.

The cyclical coefficient in column 4 of Table 11.2 is about 10 percent larger than that in column 3. States with weaker unions had somewhat more cyclical volatility in the 1964 to 1985 period. The same pattern applies in the later period, as shown in columns 5 and 6.

But the more interesting comparisons involve changes over time within each set of states. Consider first the changes in the states with less union decline, as shown in columns 3 and 5. The cyclical coefficient falls by about 20 percent between the two time periods, indicating that cyclical volatility fell within this group of states. Roughly the same pattern obtains for states with more union decline, as shown by comparing columns 4 and 6. Within each group of states, labor markets are somewhat *less* volatile in the later period relative to the earlier one, again contrary to the arguments of Gordon and others.

A different pattern appears for the estimated trend growth rates in Table 11.2. As the results in columns 3 and 4 in Table 11.2 indicate, the estimated trend growth rate in the earlier period is 3.91 in the states with less union decline and 3.64 in the states with more union decline. In the early period, more union decline is associated with lower trend growth.

In the later period, the estimated trend growth is 3.26 in the states with less union decline and 3.15 in the states with more union decline. Thus, in the later period, the estimated trend growth rate is higher in the states with less union decline than in those with more union decline. Comparisons across the two groups of states within each period indicate a higher growth rate where union decline is smaller. Within each set of states, on the other hand, the trend growth rate changes in a similar manner over time. Both sets of states experience a growth rate decline, of similar relative size, from the earlier to the later period.

Summarizing to this point, the results in Tables 11.1 and 11.2 suggest that the cyclical coefficients are relatively unchanged when comparing states with less union decline than those with more union decline. Labor markets have become less volatile over time, however, across both groups of states. Trend economic growth has similarly fallen for both groups of states over time.

The main differences between the two groups of states are that the states with less union decline have a modestly lower level of volatility and a modestly higher trend growth rate, across both time periods. As already mentioned, however, these results may be confounded by heterogeneity across states. The second-stage changes-on-changes regression provides one test of whether this is the case.

I turn next to the results of the second-stage regression. This regression investigates whether the declines in unionism and in manufacturing at the state level can account for the change in the trend and cycle coefficients for each state. To recall, I focus here on changes-on-

changes regressions in order to identify the causal effect of de-unionization on trend growth, and to take into account how heterogeneity across states could confound the comparison of trend growth rates to the change in unionization.

These results are displayed in Table 11.3. As columns 1 and 4 indicate, a greater decline in unionism does not significantly affect the trend growth rate, nor does it significantly change the cyclical volatility of unemployment. A greater decline in manufacturing, moreover, is also not associated with a significant change in the trend growth rate, nor with a significant change in cyclical volatility.

Table 11.3 Effects of unionization and manufacturing on changes in trend and cycle

N = 46	Change in trend			Change in cycle		
	(1)	(2)	(3)	(4)	(5)	(6)
% Δ union _{net} se	-0.253 (1.646)		-2.203 (1.852)	0.038 (0.104)		0.021 (0.123)
% Δ manuf _{net} se	-0.056 (1.399)		0.184 (1.415)	-0.112 (0.088)		-0.105 (0.094)
union _{mean post} se		4.519 (3.646)	6.971* (4.218)		0.223 (0.241)	0.101 (0.279)
manuf _{mean post} se		-4.533 (4.616)	-6.217 (4.917)		0.015 (0.305)	-0.002 (0.325)
Intercept se	-0.790 (1.487)	-0.592 (0.872)	-1.824 (1.652)	0.004 (0.094)	0.021 (0.058)	-0.015 (0.109)
R ²	0.001	0.001	0.001	0.001	0.001	0.001

Notes: * indicates significant at ten percent level. Excludes outlier states: Alaska, North Dakota, Louisiana, and Wyoming. Regressions performed in R with lm function. See Table A2 in the online data appendix (www.irle.berkeley.edu/workingpapers) for details of independent variables.

As a check on these results, columns 2 and 5 in Table 11.3 ask whether the state-based levels of unionism and manufacturing in the later period are related to changes in the trend and cycle coefficients. None of the coefficients in these regressions is significant. Finally, the change and level variables are both included in the regressions reported in columns 3 and 6. The results in column 3 indicate that a higher level of union density is significantly related to a higher estimated growth trend rate. This result supports the findings from the first stage.

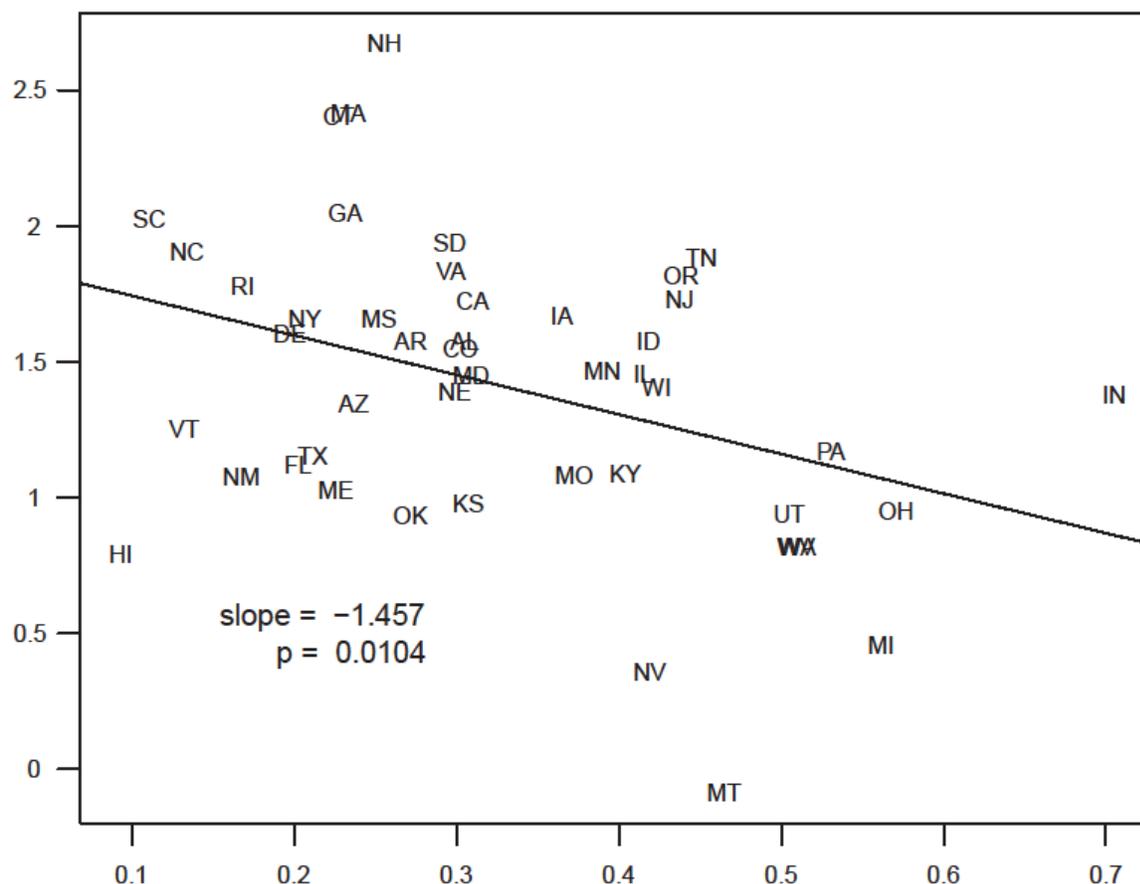
Column 6 indicates again that both the decline of unionism and the level of unionism are not significantly related significantly to changes in the cyclical volatility of unemployment. A greater decline of manufacturing, moreover, is not significantly related to increased cyclical labor market volatility. This result is surprising, since manufacturing is highly cyclical.

With respect to the question of increased labor market volatility, the second-stage results, which are better designed to identify causation rather than correlation, support the findings from the first stage: declining union density does not seem related to increased cyclical responses of unemployment to changes in GDP. Indeed, as Table 11.1 showed, the cyclical response of unemployment is somewhat weaker in the more recent period.

With respect to the question of changes in trend growth, the second-stage results provide only weak evidence supporting the effects of de-unionization on reducing growth that were found in the first stage.

While the second-stage regressions provide one approach to correcting for state-level heterogeneity, they are not a panacea. Indeed, in previous research on minimum wage effects using similar specifications (Allegretto, Dube and Reich 2011), my co-authors and I found that specifications with state and time fixed effects suffered from omitted variables bias precisely because of spatial heterogeneity. As a final test, I therefore examine the relationship between productivity growth and union decline across states, but using change over the entire time period 1969-2010. These results are presented in Figure 11.3 They indicate that productivity growth did decline more in states with greater union decline. This evidence thus supports the view that labor's declining strength had negative effects on long-term economic growth.

Figure 11.3 *Productivity growth versus union decline, 1969 – 2010*



Notes: Excludes outlier states: Alaska, North Dakota, Louisiana and Wyoming. Average annual percent change in productivity versus average annual percentage point *decrease* in union share. Data for each state for 1969-1971 are averaged to provide initial productivity and union share values. Data for each state for 2008-2010 are averaged to provide final productivity and union share values. The values in this figure are the difference between the final and initial values divided by 40, i.e., the number of years from the beginning of the period to the end (1970 to 2009 due to the three year averages used for the final and initial values). State productivity is measured as the ratio of real gross domestic product (RGDP) and the total number of employees.

Sources: Total state/year employment: State Annual Personal Income, SA27; Wage and salary employment by industry, Bureau of Economic Analysis, U.S. Department of Commerce: bea.gov/regional/spi/. For methodology information, see: bea.gov/regional/pdf/spi2010.pdf. For RGDP and union data sources and details, see online appendix at www.irlle.berkeley.edu/workingpapers.

11.8 CONCLUSION

As Weisskopf (1979) demonstrated, the postwar period until the mid-1970s was characterized by a rising strength of labor. During this period of rapid economic growth, shared prosperity raised living standards among all sections of the US income distribution. Strong trend growth did not eliminate periodic business cycles. As Arthur Okun's original formulation showed, changes in GDP were accompanied by predictable changes in unemployment rates. This postwar system collapsed in the 1970s, to be followed by a new one that, among other changes, substituted a rising strength of management for the previous rising strength of labor.

My investigation of Okun's Law finds that the cyclical patterns of the early period persist in the more recent period, but the trend growth patterns are very different. Trend growth has been slower from 1985 to 2010. It is slower growth, rather than changes in labor market adjustments during recessions, that is responsible for the jobless recoveries from the recessions that have taken place since the 1980s.

What can explain the slower growth? My Okun's Law estimates on the whole suggest that the decline of unions has led to lower economic growth, but that evidence is not entirely conclusive. The longer-term evidence in Figure 11.3 does buttress support for this argument. De-unionization, on the other hand, has clearly not made the labor market more responsive to cyclical changes in GDP, as some have argued it would. In other words, unions have not played any significant role in preventing employers from responding to business cycles, at least with regard to employment.

In sum, the cyclical component of Okun's Law does not need revision, but the trend growth component has declined substantially. *Future* research should focus attention on exactly why the overall growth of the US economy has slowed over the last 3 decades, to explain, and thus find policies to change, the relatively recent phenomenon of "jobless recoveries."

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