Restructuring During Recessions: A Silver Lining in the Cloud?

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In the U.S. economy, workers change jobs, and firms create and eliminate jobs, in an almost constant flow. This process of restructuring occurs even more intensely during recessions. The economic costs of recessions are significant: many workers lose their jobs and not as much output is produced. The pain of recessions, though, can be accompanied by activity that helps prepare the economy for further expansion. During recessions, firms can eliminate low-productivity jobs, reorganize plants, and regroup their organization charts. In the words of economist Joseph Schumpeter, recessions can be times when "creative destruction" occurs. Consequently, what happens during recessions—and the response of policymakers to those events—can have implications for long-term economic growth.

In this article we will explore in some detail what happens to jobs and workers over the business cycle. The pace of restructuring seems

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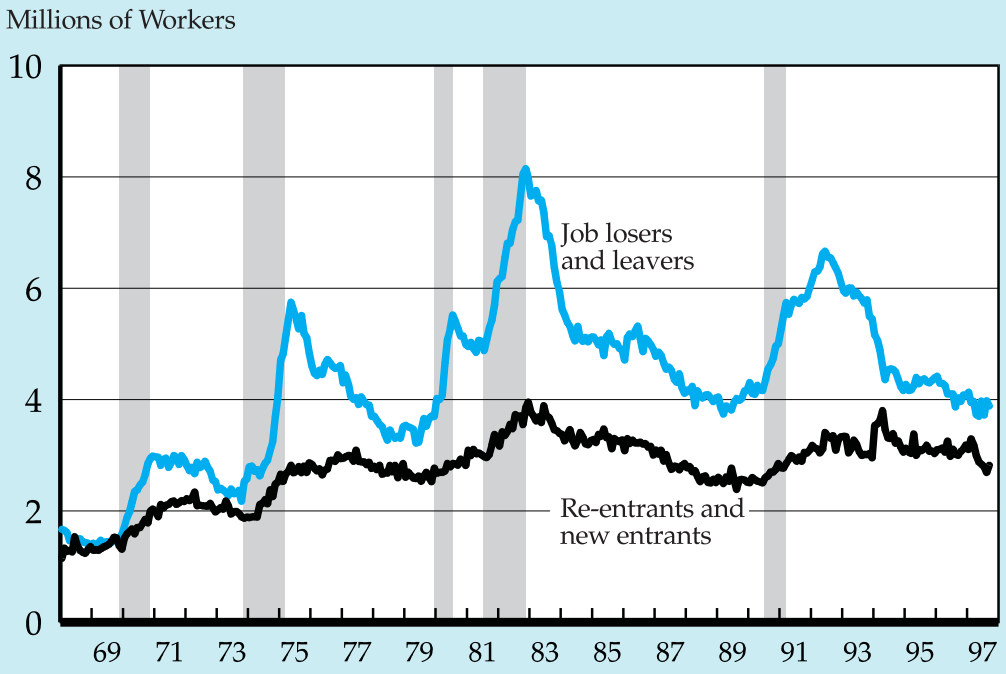
to be high in recessions for two reasons. First, adverse economic events may affect firms in different ways, leading to large movements of workers across firms and industries. Second, firms may find recessions an opportune time to restructure, since the cost of doing so is lower than it is during expansions: workers can be retrained and machines upgraded since more of their time is idle.

We'll also look at some of the questions restructuring raises for policymakers: Can policies designed to promote growth lead to too much restructuring? What about stabilization policies designed to boost the economy's production during recessions and throttle it back during expansions? Might these policies delay productivity-enhancing restructuring to the extent that long-term growth is adversely affected?

DATA ON RESTRUCTURING ACTIVITY

The U.S. economy is characterized by a large and continual movement of workers into and out of employment and unemployment. Over the course of a typical business cycle, unemployment rises during recessions and falls during expansions (Figure 1). The Bureau of Labor Statistics classifies unemployed workers in several ways. In the figure, we count job losers and leavers as those who lost or quit a job or who

FIGURE 1
Number of Unemployed
(January 1968 - September 1997)



Data source: Bureau of Labor Statistics

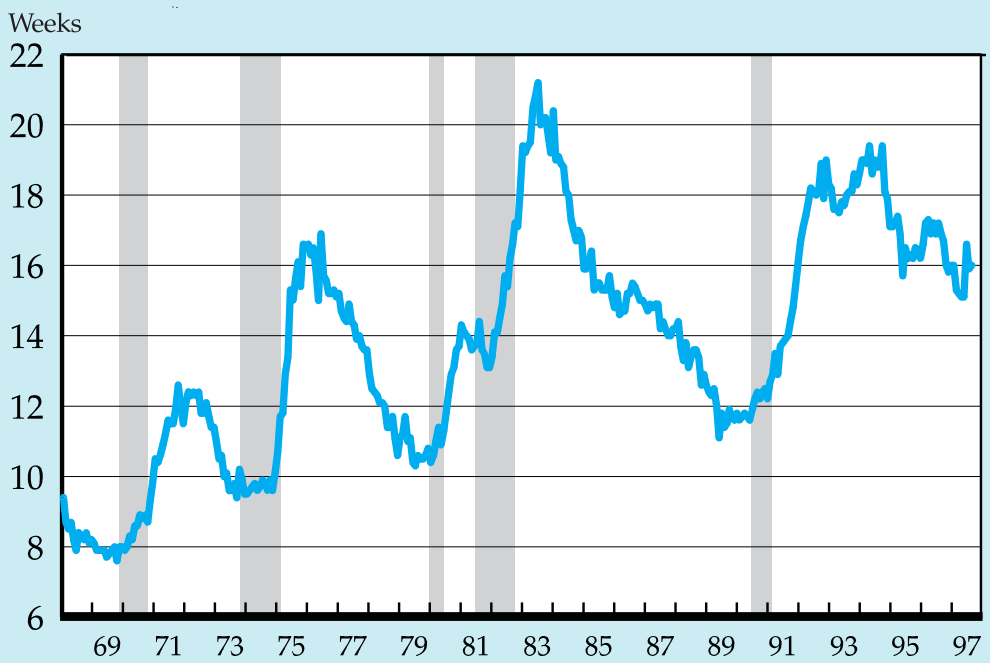
completed a temporary job. Alternatively, an unemployed worker may have just entered the labor force and begun looking for work (new entrants and re-entrants). Since the early 1970s, job losers have considerably outnumbered new entrants and re-entrants. On average, someone who becomes unemployed stays so for approximately three months, but this *duration* varies over the business cycle, rising during recessions and falling during expansions (Figure 2).

While these figures give us information about the numbers of workers who are unemployed, we would really like to know about the *flow* of workers into and out of unemployment. Further, if we want to characterize turnover in the labor market, we need to look at flows into and out of employment as well. This overall turnover is related to restructuring in the economy: if firms are continually restructuring to improve their profitability and if workers are improving their prospects by acquiring new skills, there will be large flows of workers into and out of employment and unemployment. These flows are associated with the creation of new jobs and the destruction of existing jobs. Job creation and destruction come about as existing firms expand or contract, as new firms are formed, and as existing firms die. This creation and destruction activity is driven by the actions of both firms and workers: a firm may

FIGURE 2

Average Duration of Unemployment

(January 1968 - September 1997)



Data source: Bureau of Labor Statistics

hire workers because of higher demand for its products or because some of its workers quit to search for new jobs or to leave the labor force.[1]

The average monthly flow of workers among the categories of employed, unemployed, and not in the labor force is quite large (Figure 3).[2] For example, according to data compiled by Olivier Blanchard and Peter Diamond, from 1968 to 1986 an average of 1.2 million workers per month moved from employment to unemployment, while 1.6 million workers moved from unemployment to employment. Similarly large flows occurred between the employed and those who are not in the labor force. The fact that more workers moved into employment than moved out means that the number of people working rose over time.

Data on gross flows are much more difficult to collect than data on unemployment and its duration. As a result, the data on gross job flows are currently available only up to 1986. The extent to which the patterns observed between 1968 and 1986 continued to hold after that period is an open question. The 1990s have been a time of high turnover as well: many firms have restructured and downsized. Overall, the evidence points to a labor market that is very dynamic: lots of turnover as workers shift between employment, unemployment, and not in the labor force.

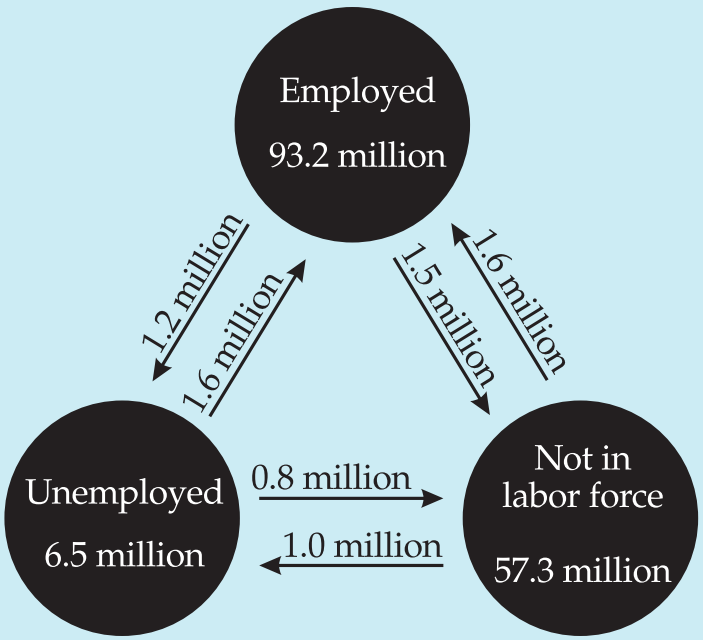
[1]We can distinguish between gross and net job creation and destruction. For example, whenever a worker is separated from a job, that job can be considered destroyed, and it contributes to the gross job-destruction count. What is often measured, though, is a net job creation and destruction count that compares numbers of jobs at two points in time. Thus, if a worker is separated from a job and the job is filled a short time later, there may be no measured change in net job creation and destruction even though gross job creation and destruction have changed. In the text, when we refer to job creation and destruction, we mean net job creation and net job destruction.

[2]The Bureau of Labor Statistics' survey counts individuals as "not in the labor force" if they did not work during the survey week and were not counted as unemployed. A worker is unemployed if he did not work during the survey week, was available for work, and searched for a job sometime during the previous four weeks.

FIGURE 3

Average Monthly Stocks and Flows

(January 1968 - May 1986)



From Blanchard and Diamond (1990)

Employment is procyclical: it rises during expansions and falls during recessions. The fall in employment during recessions can come about in two ways: the normal flow of workers moving from not employed (unemployed or not in the labor force) to employed decreases, and the flow of workers moving from employed to not employed increases. However, if we focus first on the flows between employed and *unemployed* (later, we'll talk about those not in the labor force), we find that, during recessions, the movement of workers from employed to unemployed rises, but the movement from unemployed to employed rises as well (Figure 4).

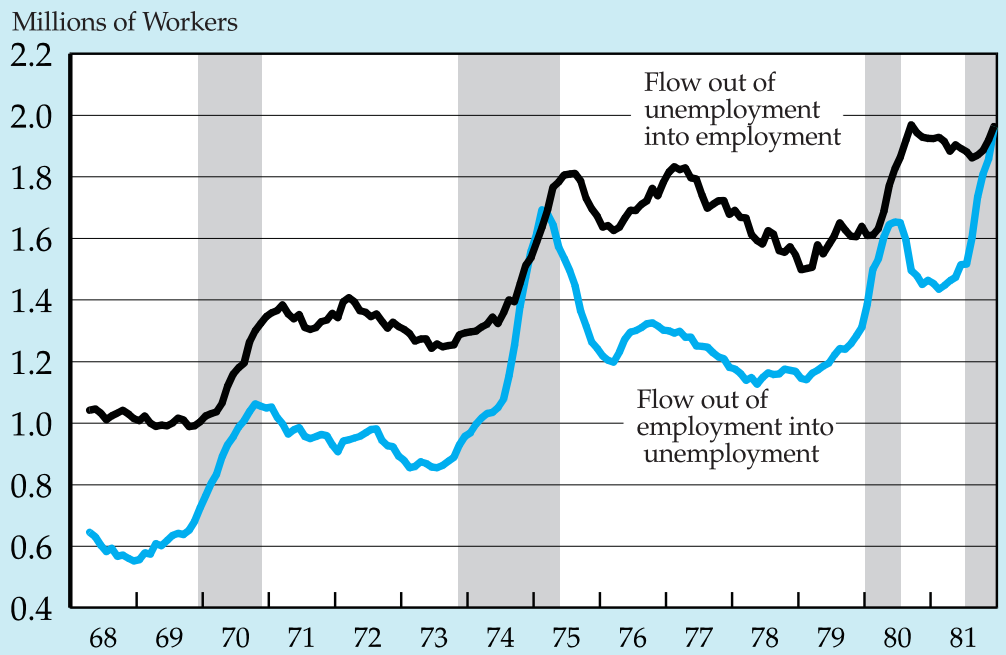
Why does this second movement occur? The increase in unemployment during recessions can benefit firms wishing to hire workers, since they now have a larger pool of applicants from which to choose. As the pool of unemployed workers increases, the cost to firms of searching for a good match between jobs and workers may fall because firms can more easily match workers' skills with available jobs. Consequently, the number of workers hired goes up. Even during recessions, the labor market remains quite active and not all firms are firing or laying off workers (Figure 4).

Furthermore, during recessions, some workers not in the labor force are enticed to re-enter and begin searching for jobs, perhaps because

FIGURE 4

Monthly Flows Between Employment and Unemployment

(January 1968 - December 1981)



Data source: Blanchard and Diamond, 1990.

second-income earners in households enter the labor market when primary-income earners lose their jobs (Figure 5). On balance, a good deal of job-searching activity by both workers and firms occurs during economic downturns.

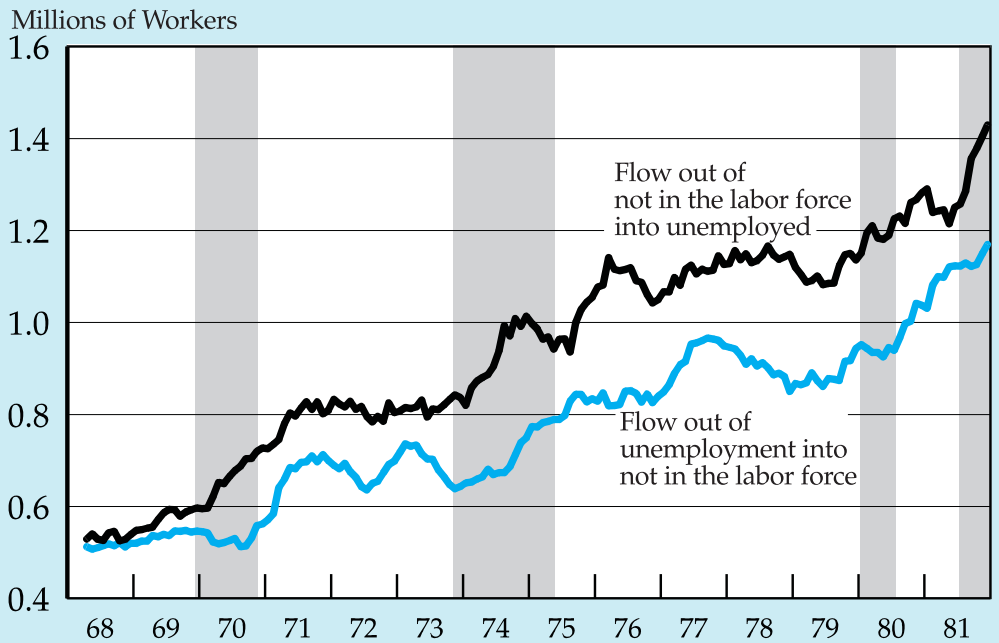
Job Flows in the Manufacturing Sector. Some detail on job flows in manufacturing can be obtained by looking at a data set compiled by economists Steven Davis, John Haltiwanger, and Scott Schuh. They collected plant-level data on job flows for the U.S. manufacturing sector using data from the U.S. Bureau of the Census. They defined *job creation* as employment gains summed over all plants that expand employment or start up over a selected interval, such as a quarter or a year, and *job destruction* as employment losses summed over all plants that reduce employment or shut down over a selected interval. The net employment gain, which measures the overall addition to or subtraction from manufacturing employment, is the difference between job creation and job destruction.[3] *Job reallocation* is defined as the sum

[3]The annual data in the book by Davis, Haltiwanger, and Schuh measure changes in the job count at plants from March of one year to March of the next. Thus, if a worker is laid off and then rehired at the same plant within the March-to-March period, he would not be counted in the job creation or destruction numbers.

FIGURE 5

Monthly Flows Between Unemployment and Not in the Labor Force

(January 1968 - December 1981)



Data source: Blanchard and Diamond, 1990.

of job creation and *job destruction* and represents the amount of job reshuffling across plants.

Like the overall economy, the manufacturing sector undergoes a large amount of job reallocation (see Table). In an average year, a little over 19 percent of manufacturing jobs are either created (9 percent) or destroyed (10 percent). The negative number for average net employment growth reflects the fact that manufacturing employment has been declining since the early 1970s as more workers have been hired to provide services and fewer have been hired to produce manufactured goods. In fact, the job creation rate peaked in 1984 when it hit a little over 13 percent. The job destruction rate hit a high of 16.5 percent in 1975, the same year in which the job creation rate plummeted to its lowest level, about 6 percent. On a year-to-year basis, job destruction is about 50 percent more volatile than job creation, that is, the destruction rate shows much wider yearly swings than the creation rate (Table).

If we associate job reallocation with firm or plant restructuring, the data suggest that the U.S. manufacturing sector experiences a great deal of ongoing restructuring as firms attempt to improve productivity and profitability and as workers search for better employment matches. One might suspect though that much of the job destruction and job creation activity represents temporary firing and hiring by firms in response to changing demand and may not correspond very closely to restructuring activity. Can the data help us sort this out?

Davis, Haltiwanger, and Schuh have also compiled statistics on the *permanence* of jobs created and destroyed. They found that 70 percent of jobs created in a given year are still filled one year later, and 54 percent remain filled two years later. Some 82 percent of jobs destroyed in a given year remain so one year later and nearly 74 percent two years later.[4] These numbers suggest that job destruction and creation are quite persistent in the manufacturing sector and most likely reflect some fundamental reorganizing activity at the plant level.

Job Flows and the Business Cycle. Now that

[4]An example may clarify how Davis, Haltiwanger, and Schuh measure persistence. Suppose a plant adds 100 jobs in 1997 and, as a result, has total employment of 1100. If employment at the plant falls to 1050 in 1998, 50 percent of the jobs created in 1997 are said to persist for one year. If plant employment in 1998 stays at 1100, or rises, 100 percent of the jobs created in 1997 are said to persist for one year.

TABLE

Annual Flows as a Percentage of Employment in Manufacturing

1972-1988

	Average	Volatility*	Minimum	Maximum
Job Creation	9.1	2.1	6.2	13.3
Job Destruction	10.3	3.1	6.1	16.5
Net Employment Growth	-1.1	4.8	-10.0	5.7
Job Reallocation	19.4	2.1	16.7	23.9

Source: Author's calculations based on the job flow data from Davis, Haltiwanger, and Schuh.

* Volatility is measured by standard deviation, which is the square root of the variance. Variance is the average sum of squared deviations from the mean.

we have some idea about the magnitude of the average flows in manufacturing jobs, we can look at how job flows vary over the business cycle. Job creation tends to fall in recessions and job destruction tends to rise, but the movement in job destruction is much greater (Figure 6). As confirmed by the numbers in the table, job destruction is much more volatile than job creation, a pattern suggested as well by the flows between employment and unemployment for the entire economy (see Figure 4).

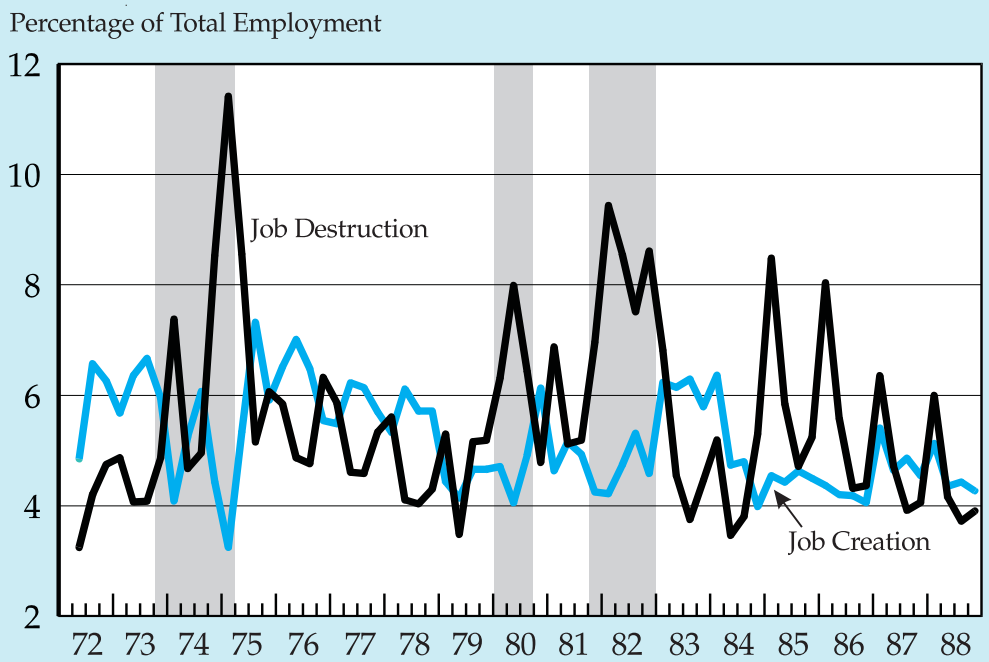
During economic downturns, firms tend to slow the rate at which new jobs are brought on line and increase the rate at which jobs are terminated. For example, from 1972 to 1988, for all manufacturing plants combined, the quarterly job creation rate during recessions is about 1 percentage point lower than during expansions, while the job destruction rate rises a little over 2 percentage points in recessions. Over the business cycle, the rates of job creation and destruction demonstrate an asymmetry: job destruction varies much more than job creation. This asymmetry holds up when plants are broken down by age, size, and average wages paid, but tends to be more pronounced for older, larger, higher-wage plants.

These observations indicate a significant difference in plants' responses to economic events. The high rates of job creation and destruction over the business cycle suggest that a lot of restructuring activity goes on in both recessions

FIGURE 6

Quarterly Job Creation and Destruction

Manufacturing Sector



Data source: Davis, Haltiwanger, and Schuh, 1996.

and expansions. Even during recessions, the job creation rate remains fairly high. Davis, Haltiwanger, and Schuh summarize some of the evidence related to business cycles by noting that "job flow dynamics in good times are dominated by the creation and destruction of jobs among relatively young and small plants. These younger and smaller plants are, like young workers, trying to determine whether and where they fit into the marketplace. During recessions, older and larger plants experience sharply higher job destruction rates, so their contribution to the process of job and worker reallocation rises. This time of intense job destruction by older and larger plants coincides with the rise in layoff unemployment, especially among prime-age workers."[5]

Recall that job reallocation is defined as the sum of job destruction and job creation and is a measure of the flow of jobs across plants. Another way of measuring job flow activity is excess job reallocation. This measures the amount of job creation and destruction that occurs beyond the amount required to account for the increase or decrease in total manufacturing employment.[6] For example, in 1984 manufacturing employment grew 5.7 percent. The growth in employment could have been accommodated by a job creation rate of 5.7 percent and a job destruction rate of zero, which would mean excess job reallocation was zero. But, in fact, job creation was over 13 percent in 1984 and job destruction was about 7.5 percent, so excess reallocation was a bit over 15 percent.[7] Thus, many more jobs were created and destroyed than the minimum amount required to account for the growth in employment. While excess job reallocation is generally higher during expansions, a significant amount occurs during recessions: on a quarterly basis, the average rate of excess job reallocation for all manufacturing plants is 9.2 percent in recessions and 10.2 percent in expansions. This compares to a quarterly average job reallocation rate for all manufacturing plants of about 12 percent in recessions and 10.6 percent in expansions. The bottom line is that a lot of job-flow activity occurs during both recessions and expansions.

THEORIES OF RESTRUCTURING

One common view of firms' behavior during recessions holds that recessions are caused by negative economic shocks that affect most firms at about the same time.[8] Furthermore, this view suggests that most firms respond to a bad economic shock in a similar fashion: they reduce production and employment, which results in an economywide recession. However, the observation that a lot of job reallocation occurs during recessions means this view can be refined to reflect the different ways that firms respond to shocks.

The facts about job and worker flows have led to several theories about business cycles and resource reallocation. Here, we discuss two of the more prominent theories.

The first view highlights the role of *allocative shocks* to the economy as a potential driving force in the overall business cycle.[9] When these shocks hit, resources must be reallocated across

[5]Davis, Haltiwanger, and Schuh, p.146.

[6]Excess job reallocation is measured as job reallocation (the sum of job creation and destruction) less the absolute value of the net change in employment.

[7]Specifically, job reallocation was 20.9 percent in 1984 — the sum of a job creation rate of 13.3 percent and a job destruction rate of 7.6 percent. So excess reallocation was 20.9 percent - 5.7 percent = 15.2 percent.

[8]An economic shock is an unexpected event, good or bad, that affects the operation of the economy.

[9]Allocative shocks are unexpected events that affect the closeness of the match between the economy's existing resources and its desired use of those resources. For example, a drought in the Midwest could lead to significant resource reallocation in the agricultural industry and its suppliers.

firms and industries, and a recession may result as part of the transition. Individual firms are also subjected to a type of allocative shock, ones that are unique to their enterprise. These *firm-specific shocks* also lead to a reallocation of resources. In the manufacturing sector, firm-specific shocks play a significant role in the overall movement of jobs and workers. A *sectoral shock*, one that affects a specific industry, is another type of allocative shock. For example, a strike in the coal industry affects coal suppliers and users as well as the firms and workers who supply products to the industry.

The second view pinpoints *aggregate shocks*, such as a fall in aggregate demand, as the primary driver of the business cycle. These shocks affect many industries and firms simultaneously. Firms then take advantage of these periods of low demand to reorganize their production because the cost of doing so in terms of forgone profits is less than it would be in expansions.

Both of these views stress the fact that firms are not all alike and that the economy has imperfections that lead to large flows among workers and jobs over the business cycle.

Allocative Shocks and the Business Cycle. A prime example of an allocative shock is a large, unexpected change in the price of oil. Since World War II, there has been a close relationship between oil-price shocks and recessions in the U.S. economy. In fact, James Hamilton has documented that an oil-price shock preceded all but one of the postwar U.S. recessions. Steve Davis, Prakash Loungani, and Ramamohan Mahidhara found that oil-price shocks were a major factor in postwar regional unemployment cycles in the United States. Oil-price shocks may cause major economic fluctuations by upsetting the closeness of the match between desired and actual amounts of labor and capital inputs used to produce goods and services, that is, the workers employed at a firm and the physical plant, machinery, and equipment used in production.

For example, consider the transportation industry and the oil-price shocks of the early 1970s. After the rise in oil prices, demand shifted toward more fuel-efficient means of transportation and away from the inefficient products then offered by the industry. This shift caused a great deal of upheaval in the U.S. automobile industry as consumers switched to small cars, which were not then widely offered by domestic producers.

In other words, the industry specialized in the production of a good for which demand had suddenly dropped. The automobile industry went through a long and wrenching process of redesigning cars, retooling plants, and retraining workers in an effort to meet the new demands of consumers. At the peak of the business cycle in 1973, just before the oil-price shocks helped drive the economy into recession, employment in the production of motor vehicles and equipment was 973,000 workers. By the next business cycle peak in 1980, employment in this sector had fallen to 852,000, and by the 1990 cyclical peak, employment had dropped even further to 826,000 workers. From 1973 through 1980, the average quarterly rate of job reallocation in automobile manufacturing was about 16 percent.

Similarly, many households and firms switched from oil to other products, such as coal and natural gas, to produce heat and other forms of energy. This led to disruption in the distribution pattern of energy resources and required investment in, and installation of, new capital equipment, such as furnaces and pipelines.

Other examples of allocative shocks include cutbacks in defense spending by the U.S. government; weather events, such as hurricanes; significant changes in industry regulation, such as allowing banks to branch into other states; and the invention of new technologies, such as personal computers. In each of these cases, the shock initially affects a narrow sector of the economy — an industry or a location, for ex-

ample. As a result, the shock alters the match between desired and actual labor and capital inputs used to produce goods and services.

The large flows of jobs and workers that occur over the business cycle suggest that the economy is continuously buffeted by allocative shocks. It is an open question how much these allocative shocks contribute to economywide recessions and expansions. Various studies come to different conclusions on the issue: some find that *allocative* shocks may account for as much as 40 to 60 percent of the variability of output and unemployment, while others find that *aggregate* shocks explain almost all of the variability.[10] Allocative shocks most likely play a significant role in the restructuring activity that occurs within firms and industries, but a consensus has not yet emerged on how important a role they play in causing recessions and expansions.

Aggregate Shocks and Restructuring Activity. Theories that attribute a prominent role to aggregate shocks as the driving force behind business cycles argue that recessions and expansions are caused by an event common to all participants in the economy. This argument implies that a single economic shock accounts for the similar movements in production and employment across different sectors of the economy over time. This view does not rule out allocative shocks as a significant factor in the restructuring that occurs in the economy, but says only that aggregate shocks play a much larger role in generating recessions and expansions. Aggregate shocks may interact with allocative shocks to produce complicated flows of workers and jobs across firms and industries.

If aggregate shocks cause recessions and expansions, how do we account for the intensity of restructuring activity during recessions?[11] Suppose a firm finds itself in an economywide recession caused by a falloff in aggregate demand. The firm can either use its capital and labor to produce output or reorganize its capital and labor in an effort to improve productivity. The firm has the option to forgo current production and instead expend resources to restructure, taking advantage of new management methods or new technologies that will eventually improve efficiency and profitability. In a recession, the profits forgone by the firm if it devotes more resources to restructuring and less to producing goods are low compared to what they would be in an expansion. In an expansion, demand for the firm's output is high, sales are brisk, and profitability is up. The firm has less incentive to reduce its production activity and devote resources to productivity-enhancing restructuring.

Another side of restructuring activity is that it may be advantageous to scrap old machinery, equipment, and plants. Outdated equipment is likely to be the least profitable for a firm and so becomes a larger drain on profitability in periods of economic downturn. Scrapping older equipment and shutting down outdated plants would entail a significant amount of job destruction.

What about job creation? The data show that the rate of job creation does not decline much during recessions, which suggests that some firms continue to add jobs and workers. These new jobs and workers are likely to be more productive for firms than jobs and workers associated with its older technology and equipment.

[10]There is a fairly large literature on the contribution of sectoral and aggregate shocks to the cyclical variability of economic aggregates. A few of the most recent studies are those by Russell Cooper and John Haltiwanger; Lael Brainard and David Cutler; and Olivier Blanchard and Peter Diamond (1989).

[11]The following discussion draws on research presented in the articles by Ricardo Caballero and Mohamad Hammour; Philippe Aghion and Gilles Saint-Paul; Robert Hall; Gilles Saint-Paul; Charles Bean; and Davis, Haltiwanger, and Schuh.

If it is more costly to add new workers and jobs at a faster rate — say, because of training and capital installation costs —firms will have an incentive to keep job creation somewhat smooth. If firms stopped adding new workers during recessions, it would be very costly for them to "catch up" during the next expansion. Thus, more of the downsizing activity may involve eliminating the most unproductive jobs and plants. In this view, job creation would be smoother than job destruction over the business cycle.

This theory has implications for economic growth and the cyclical behavior of productivity. Suppose firms find it less expensive to pay the costs of restructuring during recessions and then reap the benefits of a more efficient organization in the future. Higher productivity can translate to faster growth for the firm and, by extension, for the economy. These productivity-improving activities by firms may take the form of devoting resources to retraining their workers or to reorganizing the existing pattern of production to become more efficient. These types of activities are difficult to measure. If firms shift more workers to these hard-to-measure activities and away from directly producing output, measured output falls more than measured labor input, and, hence, measured productivity falls.[12] In this view, measured productivity is procyclical (increasing when economywide output rises), which is indeed what we see in the data for the U.S. economy.

Several criticisms can be levied against the view that firms restructure during recessions primarily because the cost of doing so is lower. Most of the investment measured by the government and used to compute gross domestic product, such as spending on capital goods, is procyclical. So why is some productivity-improving investment countercyclical (increasing when economywide output falls) rather than procyclical like other investment? Some of the restructuring activity that occurs during recessions may be in a form that is hard to pick up in standard measures such as those used to compute gross domestic product. Furthermore, productivity-improving investments with long-term benefits, such as retraining workers, are more likely to be countercyclical, since firms are more willing to wait until the next expansion to benefit from them. That is, the firm knows that the benefits from the investment will still be in place when the expansion starts and demand picks up.

Financing constraints may play a role here as well. Some firms have difficulty borrowing to finance new investment, particularly during economic downturns. For these firms, cash-intensive investment activities, which are easier to measure, are likely to be procyclical: the firm will be able to undertake them only when sales are brisk and cash inflows are high. On the other hand, productivity-improving investments that involve the redistribution of existing resources are less likely to be subject to these finance constraints, since they are not as cash-intensive. Thus, firms might find it advantageous to undertake these investments when output and cash flow are low.

Another criticism of the theory is that firms may have a greater incentive to introduce new technologies and innovations in booms, when demand and profits are high. When profits are high, firms can more quickly recover the costs of innovation. Furthermore, many firms innovating in a boom heightens the boom, which, in turn, promotes even more innovation. In addition, when output is high and firms are developing new technologies, other firms may learn about new innovations from observing their competitors. These observers can then introduce some of these innovations into their own production process. So, there are reasons to believe that a lot of procyclical restructuring activity may occur. This procyclical activity may

[12]Labor productivity can be measured as output divided by worker input.

be much more important than reorganization investment that is countercyclical.

Other Evidence on Restructuring Activity During Recessions. The data on job creation and destruction provide some evidence in favor of the view that a good deal of restructuring activity occurs during economic downturns. This restructuring can be driven by aggregate shocks, allocative shocks, or a combination of the two. No matter the source of the shocks, the restructuring-during-recessions theory implies that productivity may respond favorably to economic slumps. If firms undertake their productivity-enhancing activities during recessions rather than booms, overall productivity for the economy should rise in response to this investment.

Several studies have found that adverse shocks to the economy can lead to higher productivity or that there is a slight positive correlation between unemployment and productivity growth.[13] However, the statistical evidence in support of the theory is modest at best. Isolating the effects consistent only with the restructuring-during-recessions view is difficult. For example, the data may include the effect that, during recessions, some firms may be closer to bankruptcy and therefore forced to reorganize. Or perhaps recessions seem to lead to higher productivity because they affect low-skill workers more adversely than high-skill workers.

The evidence is not conclusive for the restructuring-during-recessions view, but it is not inconsistent with that view either. Most likely, some of the restructuring undertaken during recessions is voluntary, and some is an involuntary response to financial distress. Does the nature of the restructuring matter? If firms that are not financially distressed during recessions undertake voluntary restructuring, restructuring will be more widespread, and economic policies may change the incentives to invest in productivity-improving reorganization.

POLICY IMPLICATIONS

The large amount of job creation and destruction that occurs over the business cycle suggests that not all firms respond in the same way to economic shocks, whether allocative or aggregate. Much of this job reallocation seems to be associated with restructuring activity at these firms. What are the implications of these observations for economic policymakers?

Consider targeted industrial policies, such as those designed to promote growth in a specific sector of the economy. If a common set of identifiable circumstances or factors is holding back all firms in a sector, policies that offer regulatory and tax relief, government subsidies, or protection from foreign competition would be more likely to spur growth.

However, Davis, Haltiwanger, and Schuh argue that, for the data on manufacturing plants, job flows within sectors dominate job flows across sectors of the economy.[14] This holds true whether sectors are defined by industry, geographic region, plant size, or plant age, suggesting that firm-specific shocks play a major role in the job reallocation that occurs over time. If sectoral shocks were most important, flows across sectors would dominate for at least some sectoral breakdowns. But if, indeed, firm-specific shocks drive a large part of job reallocation and firm restructuring, targeted industrial policies will be of limited use because they are designed to modify factors common to all firms within a sector. Thus, designing an effective targeted industrial policy is likely to be very difficult.

[13]See the articles by Bean; Saint-Paul; and Caballero.

[14]That is, plants are first classified by sectors. Excess job reallocation is then broken down into a component caused by shifts in employment within a particular sector and a component caused by shifts in employment across different sectors.

Now, let's consider a different set of policies, such as minimum wages, job protection, and generous sick leave and unemployment benefits. These policies can hinder the reallocation of workers between firms and work activities by raising firms' costs of hiring and firing workers or by changing workers' incentives to search for employment opportunities. Such policies, in an effort to provide greater security for workers, could slow a firm's restructuring process because they hinder its flexibility to alter its work force. On the other hand, the total economic cost of such policies is unknown. Unrestricted competition in the labor market may not generate an efficient amount of restructuring because of factors such as imperfect information and inefficient wage-setting arrangements.

Generous worker benefits are more common in Europe than in the United States and may be a contributor to the persistently high unemployment rates in Europe. Firms will be more reluctant to create permanent jobs when the cost of doing so is higher. An extreme case is Spain: there, a permanent employee who is fired may receive generous compensation equal to 45 days' pay times the number of years the worker was with the company. Spanish firms have responded by creating few permanent positions and, instead, offer temporary contracts that carry less job protection. About 30 percent of Spanish workers are covered by these temporary contracts. Almost 50 percent of workers under 24 years of age are unemployed. In addition, generous worker benefits in Spain have led to a sharp distinction between "insiders," who have jobs, and "outsiders," who do not, and has led to low aggregate job creation.

A prominent hypothesis is that the United States has created many more jobs than Europe over the last 30 years because U.S. labor markets are more flexible. However, the story is more complicated than that. Job reallocation rates in the largest European countries (Germany, France, Italy, and the United Kingdom) are not that different from those in the United States, so, by that measure, European labor markets are nearly as flexible as U.S. labor markets.[15] A major reason the United States has created more jobs since the 1960s is that the supply of labor went up more in the United States than it did in Europe, largely because of women entering the U.S. labor force in great numbers. These additional workers were then successfully absorbed into the workforce as evidenced by the relative decline in the U.S. unemployment rate. Looking at data across countries does not reveal a significant relationship between job reallocation and unemployment rates. However, more of the unemployed in countries with low rates of job reallocation do seem to have long spells of unemployment.

The restructuring of jobs over the business cycle also has implications for government stabilization policies. Stabilization policies are actions that attempt to use monetary and fiscal policy to smooth out recessions and expansions, keeping economic growth on an even keel. Our overview on the theory and evidence of restructuring over the business cycle raises several questions. Do stabilization policies delay economic restructuring and possibly alter the long-term prospects for economic growth? If stabilization policies delay restructuring, do they merely put off a more severe day of reckoning? Is the pace of economic restructuring efficient, or are there policies that can improve efficiency?

Economists are just beginning to address these questions, so definite answers are not yet available. But recent research points to some possibilities.[16] Suppose an expansionary policy aims to boost economic growth either to help the economy out of a recession or to boost the

[15]See the article by Dale Mortensen and Christopher Pissarides.

[16]See the 1994 article by Caballero and Hammour and the one by Alwyn Young.

economy's long-run growth prospects. The policy might take the form of incentives, such as an investment tax credit, that encourage firms to undertake investment in new technologies. Another policy, such as lowering the corporate income tax, may provide production incentives that encourage firms to produce more output. On the surface, these policies seem to be the same, but they differ in an important way. *Creation incentives* (those that encourage investment in new technologies) have a direct impact on a firm's decision to invest and lead to more intense hiring in the labor market as firms put new capital in place. Increased hiring activity can then help buttress wages. *Production incentives* (such as a cut in the corporate income tax) affect investment decisions as well, but they also encourage firms to keep older production technologies in place longer: the cost associated with using an older technology rather than scrapping it in favor of a new, more productive technology is effectively lowered.

Creation incentives have an ambiguous effect on unemployment: their effect depends on the degree to which destruction of old technologies and jobs offsets the positive impact that investment in new technologies has on employment. Production subsidies lower unemployment but lead to greater use of old equipment. Both policies can potentially increase employment and production in the economy, but could they be taken to excess? If creation incentives are too strong, the economy may undertake too much restructuring at too fast a pace and too high a cost. If production incentives are too strong, we can imagine a case where the adoption of new technologies is slowed by a reluctance to retire old machinery and equipment, which ultimately may have negative consequences for economic growth.

The empirical evidence on this issue is slight, especially concerning stabilization policies. A study by Alwyn Young looks at the long-run growth experiences of Singapore and Hong Kong and identifies a potential cost of excessive restructuring. In the post-World War II period, these economies have grown at about the same rate, but they have invested at very different rates. The Singapore government put policies in place that boosted investment as a share of GDP from about 10 percent in 1960 to more than 40 percent in 1984. Over the same period, investment relative to GDP hovered around 20 percent for Hong Kong, which had a much less activist government.

Despite the much more massive investment, Singapore did not grow any faster, on average, than Hong Kong over the postwar period. In fact, Young shows that all of Singapore's per capita real GDP growth came about through the accumulation of more capital and not through increased technological progress. Hong Kong had significant technological progress over the same period and so was able to achieve the same amount of growth with much less investment. The people of Hong Kong appear to be better off. Hong Kong's ratio of consumption to GDP hovered around 70 percent over the period 1970 to 1992, while real GDP grew an average of about 6.3 percent per year. In Singapore, the ratio of consumption to GDP has fallen from 73 percent in 1970 to 53 percent in 1992, while real GDP growth averaged about 6.9 percent. So, at least as of 1992, the people of Singapore were not seeing the benefits of rapid growth in terms of consumption when compared with the people of Hong Kong.[17]

Young concludes that the Singapore government's policies to encourage investment in new technologies and production were too strong and have led to a too rapid pace of restructuring, thereby adversely affecting productivity. He hypothesizes that the pace of restruc-

[17] Although Singapore has a high rate of saving, it has a low return on capital. Young's analysis implies that Singapore's real return on capital had fallen to about 10 percent by the late 1980s. In contrast, the real return on capital in Hong Kong remained above 20 percent over 1960-86.

turing is so fast that workers do not have enough time to learn to work effectively with new technologies and new capital in an industry. Before workers learn to use existing resources, those resources are shifted to a new industry or the existing technology is replaced by a next-generation technology. Thus, Singapore may have encouraged too much investment.

CONCLUSION

The U.S. economy is characterized by large flows of workers into and out of unemployment and by the shifting of jobs between firms. These flows suggest that firms are continuously restructuring their production activities and that this restructuring is particularly intense during recessions. The intensity of restructuring observed during recessions may be due to allocative shocks that affect different firms and industries in different ways, leading to a large flow of workers between jobs and firms. This job flow activity could be severe enough to show up as an economywide recession. Although there are no firm estimates, some research suggests that as much as 40 to 60 percent of the variability of output might be due to allocative shocks. Alternatively, it may be that aggregate demand shocks are the primary causes of recessions and that firms take the opportunity provided by recessions to reorganize production because the cost, in terms of forgone profits, is lower in recessions.

The large amount of restructuring that occurs during recessions carries policy implications. Designing effective targeted industrial policies to help specific sectors may be difficult, since the evidence suggests that most restructuring occurs in response to firm-specific shocks. Policies that hinder the restructuring process are likely to have an adverse effect on employment and economic growth in the long run. On the other hand, policymakers must guard against promoting too much restructuring at too fast a pace and too high a cost, which can adversely affect productivity.

REFERENCES

Abowd, John, and Arnold Zellner. "Estimating Gross Labor Force Flows," *Journal of Economic and Business Statistics*, 3 (1985), pp. 254-83.

Aghion, Philippe, and Gilles Saint-Paul. "On the Virtue of Bad Times: An Analysis of theInteractions Between Economic Fluctuations and Productivity Growth," Discussion Paper No. 578, CEPR (1991).

Bean, Charles. "Endogenous Growth and the Procyclical Behavior of Productivity," *European Economic Review*, 34 (1990), pp. 355-63.

Blanchard, Olivier, and Peter Diamond. "The Cyclical Behavior of Gross Flows of U.S. Workers," *Brookings Papers on Economic Activity*, 2 (1990), pp. 85-155.

REFERENCES
(continued)

Blanchard, Olivier, and Peter Diamond. "The Beveridge Curve," *Brookings Papers on Economic Activity,* 1 (1989), pp. 1-60.

Brainard, S. Lael, and David Cutler. "Sectoral Shifts and Cyclical Unemployment," *Quarterly Journal of Economics,* 108 (1993), pp. 219-43.

Caballero, Ricardo. "Demand, Unemployment, and Growth: Comment," *European Economic Review,* 37 (1993), pp. 855-59.

Caballero, Ricardo, and Mohamad Hammour. "The Cleansing Effect of Recessions," *American Economic Review,* 84 (1994), pp. 1350-68.

Caballero, Ricardo, and Mohamad Hammour. "On the Timing and Efficiency of Creative Destruction," NBER Working Paper 4768 (1994).

Cooper, Russell, and John Haltiwanger. "Inventories and the Propagation of Sectoral Shocks," *American Economic Review,* 80 (1990), pp. 170-90.

Davis, Steven, John Haltiwanger, and Scott Schuh. *Job Creation and Destruction.* Cambridge: MIT Press, 1996.

Davis, Steven, Prakash Loungani, and Ramamohan Mahidhara. "Regional Unemployment Cycles," manuscript (1994).

Hall, Robert. "Labor Demand, Labor Supply, and Employment Volatility," *NBER Macroeconomics Annual* (1991), pp. 17-47.

Hamilton, James D. "Oil and the Macroeconomy Since World War II," *Journal of Political Economy,* 91 (1983), pp. 228-48.

Mortensen, Dale and Christopher Pissarides. "Job Reallocation, Employment Fluctuations, and Unemployment Differences," manuscript (1997).

Saint-Paul, Gilles. "Productivity Growth and the Structure of the Business Cycle," *European Economic Review,* 37 (1993), pp. 861-87.

Young, Alwyn. "A Tale of Two Cities: Factor Accumulation and Technical Change in Hong Kong and Singapore," *NBER Macroeconomics Annual* (1992), pp. 13-54.