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Job Creation and Destruction: The Dominance of Manufacturing

ESTIMATES OF GROSS JOB CREATION and destruction (gross flows) give a deeper perspective on the ebb and flow of labor markets in a market economy than do the headline-grabbing announcements of net employment growth. Gross flow data give insight into the uniformity of employment growth across different parts of the economy. The path of total employment may be the total of many industries with similar growth experiences or of many industries with extremely diverse experiences; overall employment growth may be the result of lots of job creation canceling lots of job destruction or only a little of each.

In addition, the mix between job creation and destruction can and does vary dramatically over the business and seasonal cycles in the economy. Considerable attention has been devoted recently to the behavior of gross flows in the labor market (Blanchard and Diamond, 1990; Davis and Haltiwanger, 1990, 1992; Ritter, 1993), and stylized facts from these descriptive analyses have begun to generate theoretical research (Mortensen and Pissarides, 1993). Little attention, however, has been devoted to the question of whether these facts characterize all parts of the economy or only particular segments. This paper addresses that question using the method for measuring gross flows developed in Ritter (1993). It examines gross job creation

and job destruction in three broad sectors: goods production, trade, and service production excluding trade.

The main conclusion is that job creation and destruction behave much differently in the goods-producing sector than in the rest of the economy. Manufacturing and other goods-producing industries, which make up only a quarter of private nonfarm payrolls, contribute disproportionately to changes in overall job creation and destruction, particularly during recessions. Given systematic differences between goods- and service-producing sectors, it is misleading to draw sweeping conclusions (that is, "stylized facts") about the economy from aggregate gross flows (Blanchard and Diamond, 1990; Ritter, 1993) or from manufacturing gross flows (Davis and Haltiwanger, 1990, 1992). Anderson and Meyer (1994), studying labor turnover, also concluded that manufacturing was "atypical in a large number of dimensions."

In addition, the dynamics of job creation and destruction in manufacturing appear to have changed during the most recent recession. Combined with the declining share of goods production in overall employment, this suggests that the dynamics of job creation and destruction for the economy as a whole may be substantially different in the future.

CONSTRUCTING GROSS FLOW DATA

The raw data used to construct gross job creation and destruction are monthly employment levels in several hundred industries in the private nonfarm sector of the economy. The payroll or establishment survey, on which the employment data are based, currently covers more than 370,000 establishments, including all firms with more than 250 employees and a subset of smaller firms. These data are benchmarked annually using yet more comprehensive information. The survey excludes agricultural workers, unpaid family workers, domestic workers in private homes, and self-employed persons. To focus on job creation and destruction driven primarily by market forces, the data used for this paper also exclude government workers, though the survey includes them.¹

The details of constructing job creation and destruction series (and caveats about them) are described in Ritter (1993), but the main idea is as follows. First, the breadth of coverage is defined by the set of industries for which continuous employment data are available since 1972. The 1972 start date was chosen because, for a large fraction of industries outside manufacturing, disaggregated employment data are not available for earlier years. Thus, the data cover a comprehensive cross-section of the nonfarm business sector. In January 1972, employment was 58.1 million for all private nonfarm payrolls, with 97.6 percent in the industries used in the job creation and destruction calculations. By March 1994, total employment was 93.4 million for all private nonfarm payrolls with 95.3 percent included in the present calculations. Second, a set of nonoverlapping industries is created using the finest level of detail available. These are three- and four-digit industries as well as the parts of two- and three-digit industries that are not more finely classified into three- and four-digit industries. The exact set of industries varies over time as the Bureau of Labor Statistics (BLS) refines the industrial classification scheme.

Third, for a month t when there is no change in the industrial classification (most months), gross job creation is defined as the sum of

employment changes in industries in which employment is increasing:

$$JC_t = \sum_{i=1}^N \delta_{it}^{(+)} \Delta E_{it},$$

where $\delta_{it}^{(+)}$ is 1 if employment is increasing in industry i and 0 otherwise; E_{it} is employment in industry i ; and N is the number of industries in the sector under consideration. Job destruction is defined as the sum of absolute values of employment changes in industries in which employment is decreasing:

$$JD_t = \sum_{i=1}^N (1 - \delta_{it}^{(+)}) |\Delta E_{it}| = JC_t - \sum_{i=1}^N \Delta E_{it}.$$

Job creation and destruction *rates* used below divide creation and destruction levels by total employment in the sector's N industries:

$$JCR_t = \frac{JC_t}{\sum_{i=1}^N E_{it}}$$

$$JDR_t = \frac{JD_t}{\sum_{i=1}^N E_{it}}.$$

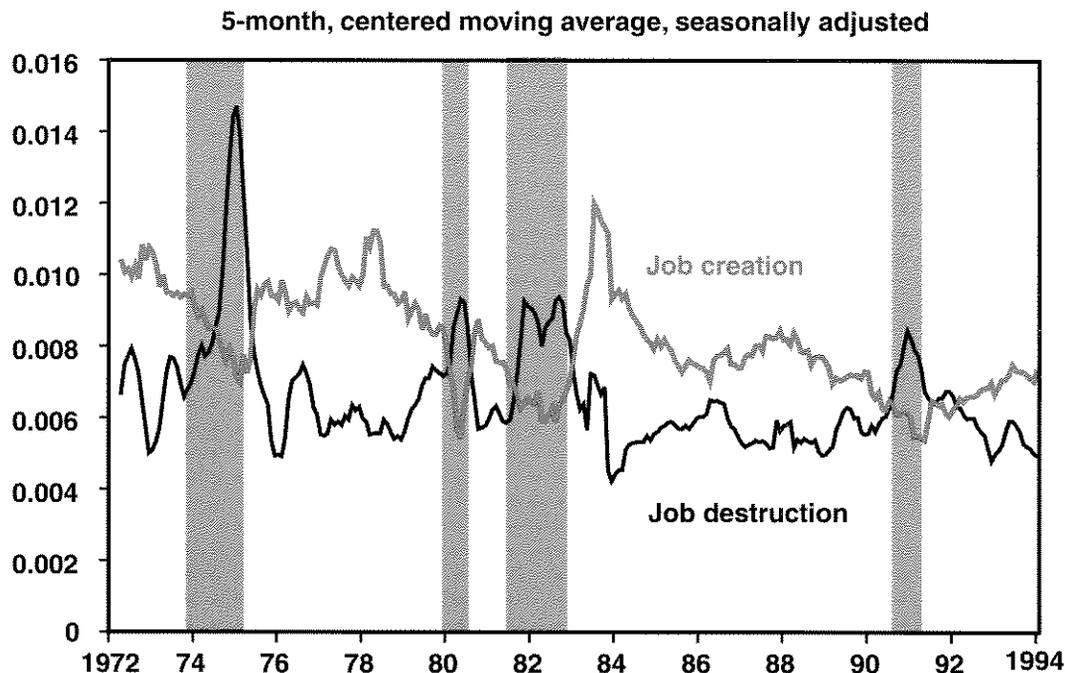
In several different years, the standard industrial classification (SIC) used by BLS to allocate employment among industries is revised. In general, the revision results in a finer breakdown of industries already included, but sometimes it adds coverage of entirely new industries. As previously mentioned, the job creation and destruction series are constructed so that the breadth of industrial coverage does not change from the first period to the last. A finer breakdown within a larger industry is exploited, however, by using an adjustment at the "birth" of a new (three- or four-digit) industry that accounts for the fact that the start of data on the industry does not indicate job creation, but reclassification. Since new three- and four-digit industries are generally created to subdivide growing industries, this procedure tends to limit the extent to which job creation and destruction net out within industries.²

This paper presents data on three sectors: (1) goods production, which includes manufacturing, construction and mining; (2) wholesale and

¹ Including government workers in subsequent calculations does not significantly change aggregate patterns of job creation and destruction.

² The exact procedure followed in months when a finer breakdown of an industry appears in the data is described in the appendix to Ritter (1993).

Figure 1
**Job Creation and Destruction Rates for All Private
 Nonfarm Industries**



retail trade; and (3) service production except trade. The third category includes services, transportation, utilities, communications, finance, insurance and real estate. Trade is usually counted as a service-producing industry, but is initially treated here as a separate category because its close tie to goods production (through purveyance of goods) could make its gross flow dynamics more similar to manufacturing than to services.

One problem with using industry data to measure gross flows is that the unit of measurement (an industry) is quite large. Substantial netting of job creation and destruction could take place within each industry. This point is discussed extensively in Ritter (1993), but the problem is magnified by the present attempt to disaggregate the gross flows. Although 573 industries are used in constructing gross flow measures for the private nonfarm economy, 338 are in goods production, but only 97 are in trade and 138 are in other service production. As a result, the average

sizes of industries in 1993 were 69,239 workers in goods production, 264,679 in trade and 278,034 in service production.

GROSS FLOWS BY SECTOR

Job creation and destruction rates for the entire nonfarm sector are shown in Figure 1. The figure illustrates two features of gross flow data which have been noted in previous work: (1) There is always a great deal of both creation and destruction; at their lowest points the five-month moving averages of monthly creation and destruction rates were still 0.5 percent and 0.4 percent of private nonfarm employment per month. Because of intraindustry netting, these figures understate the extent of ongoing job creation and destruction.³ (2) Net employment change during recessions is dominated by rises in job destruction, rather than falls in job creation. As noted in Ritter (1993), these features are shared by gross flow data produced from the Current Population Survey,

³ Ritter (1993) compared job creation and destruction rates in manufacturing constructed from establishment-level data with those constructed from industry employment data. The former were more than three times higher on average.

Figure 2
Job Creation and Destruction Rates in Goods Production

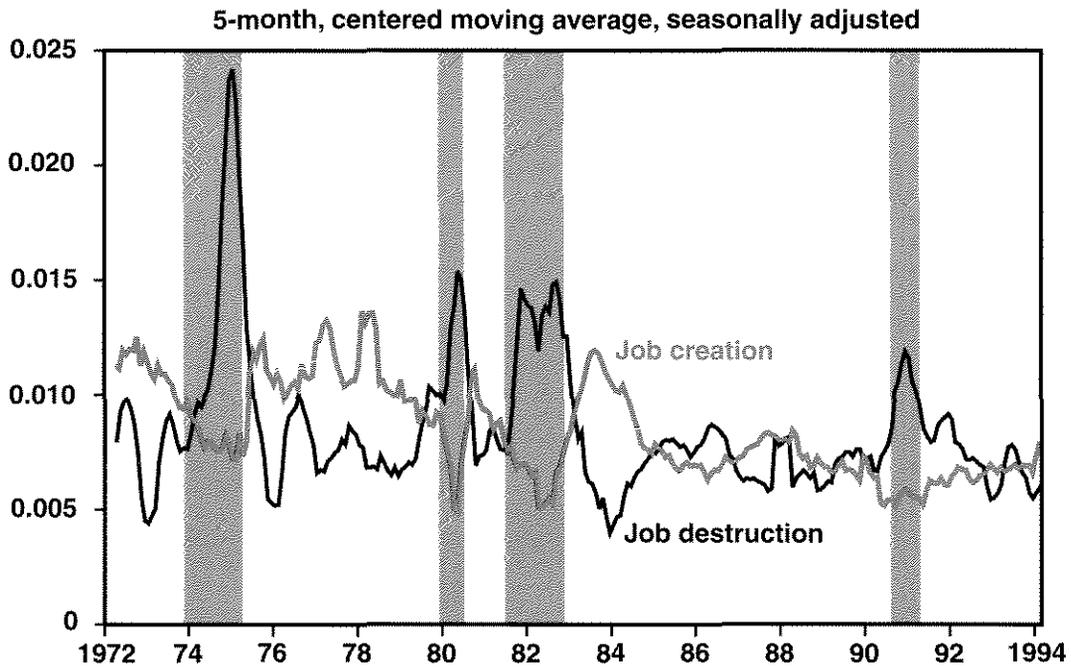


Figure 3
Job Creation and Destruction Rates in Trade

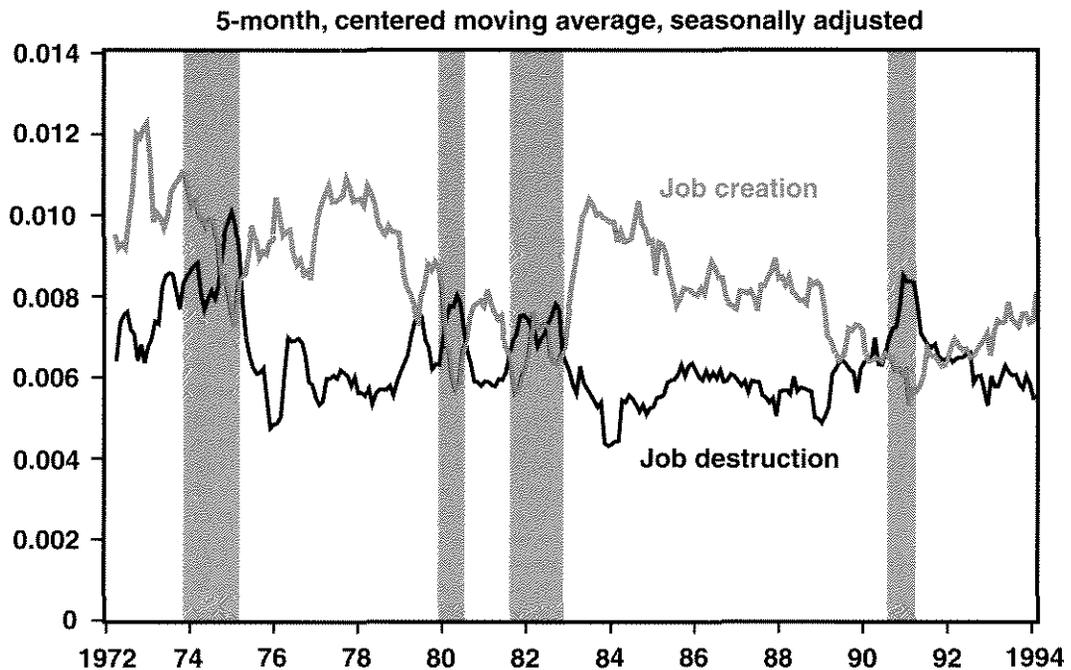
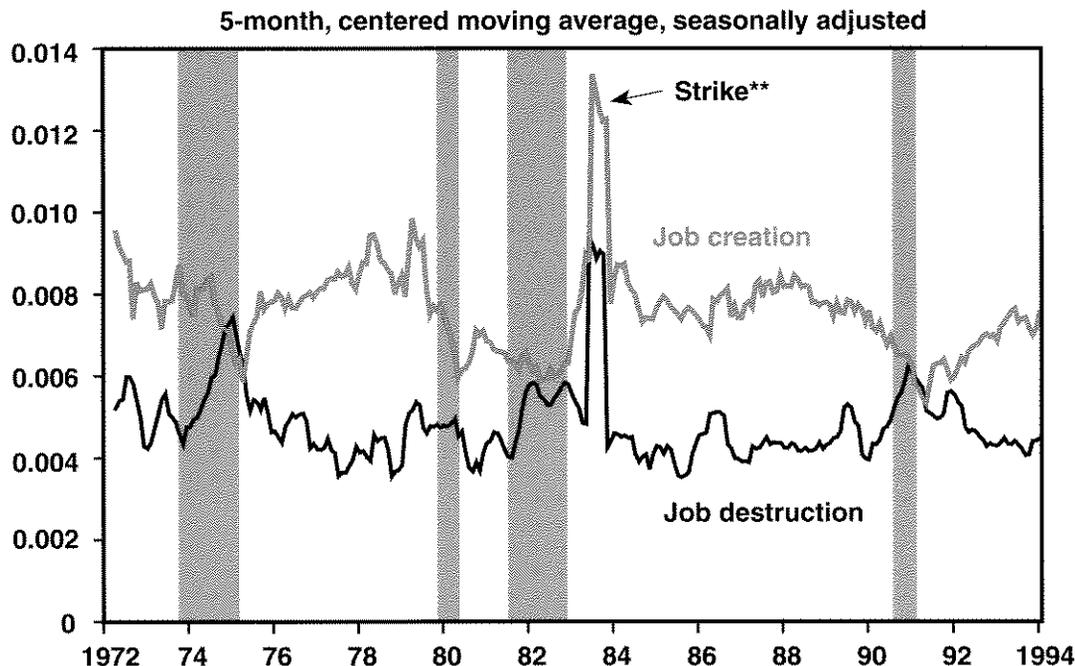


Figure 4
Job Creation and Destruction Rates in Service Production*



* Excluding trade

** Spikes in creation and destruction during 1983 are caused by a large strike in the telephone communications industry. See footnote 4.

which tracks individuals, and by gross flow data produced by Davis and Haltiwanger (1990, 1992) from the Census of Manufactures, which tracks employment at single establishments.

Figures 2, 3 and 4 show job creation and destruction rates for the goods-producing, trade and service-producing sectors.⁴ Three points about these charts stand out. First, the gap between creation and destruction for the trade and service-producing sectors during the 1980s indicates the well-known fact that these sectors produced substantial net employment gains during the decade. In fact, in the service-producing sector, job creation exceeded job destruction during all but a few months since 1972. Trade experienced more frequent employment declines, but even during recessions these drops were not

particularly large or prolonged. By contrast, following the recovery from the 1982 recession, job creation and destruction were closely balanced in the goods-producing sector until the onset of the 1990 recession.

Second, goods production shows a sharp asymmetry between creation and destruction during recessions; destruction is considerably more volatile. Neither trade nor service production shows evidence of this asymmetry, however.

Finally, despite trade's close link with goods production, gross flows in the trade sector do not exhibit patterns that closely resemble those in goods production.

Job creation and destruction rates for different sectors are compared directly in Figure 5, which

⁴ The large spikes in destruction and creation during 1983 in Figure 4 reflect the beginning and end, respectively, of a large strike in the telephone communications industry (SIC 4813). A comparison of BLS data on new work stoppages (which starts in 1981) and the job destruction series shown in Figure 1 reveals that a few small spikes in job destruction

during the 1980s correspond to relatively large strikes, but the telephone communications strike is the only one that has a noticeable impact on the series.

isolates a striking fact: Both creation and destruction rates are far more volatile in goods-producing industries than in trade or other service-producing industries. Goods production thus contributes disproportionately to fluctuation in aggregate gross flows, particularly job destruction.

Figure 5 does not tell the whole story about the relative importance of gross flows in goods production because this sector made up 25 percent of private nonfarm employment in 1993 (down from 39 percent in 1972). Figure 6 displays the contributions of goods-producing and service-producing (now including trade) industries to total job creation and destruction levels.

Figure 6 appears to show that goods production contributes a disproportionate share of overall job creation and destruction levels. This is probably misleading, however. The manufacturing sector is more finely divided, so there is probably less intraindustry netting of job creation and destruction in the goods-producing sector than in the service-producing sector. This would impart a substantial upward bias to the relative contribution of goods production to the *level* of overall job creation and destruction.

The relative contributions of goods- and service-producing industries to cyclical *changes* in overall job creation and destruction are shown more reliably in Figure 6. Goods production has typically accounted for more of the cyclical movements than the industries that make up the other 75 percent of employment. This is particularly evident in the lower panel of Figure 6, which shows much more dramatic cyclical swings in total job destruction than in service production alone.

Two pieces of evidence suggest that intraindustry netting does not substantially bias the contribution of goods-producing industries to *changes* in job creation and destruction. First, if four-digit industries are ignored in constructing the job creation and destruction series (thus increasing the average size of industries used in the calculation and the extent of intraindustry netting), both series shift down, but the amplitude of fluctuations is not significantly changed.⁵ Second, in manufacturing, if job creation and destruction series created from industry employ-

ment data are compared to those created from establishment data by Davis and Haltiwanger, the size of fluctuations is again very similar, though the levels of the series differ dramatically (see Ritter, 1993).

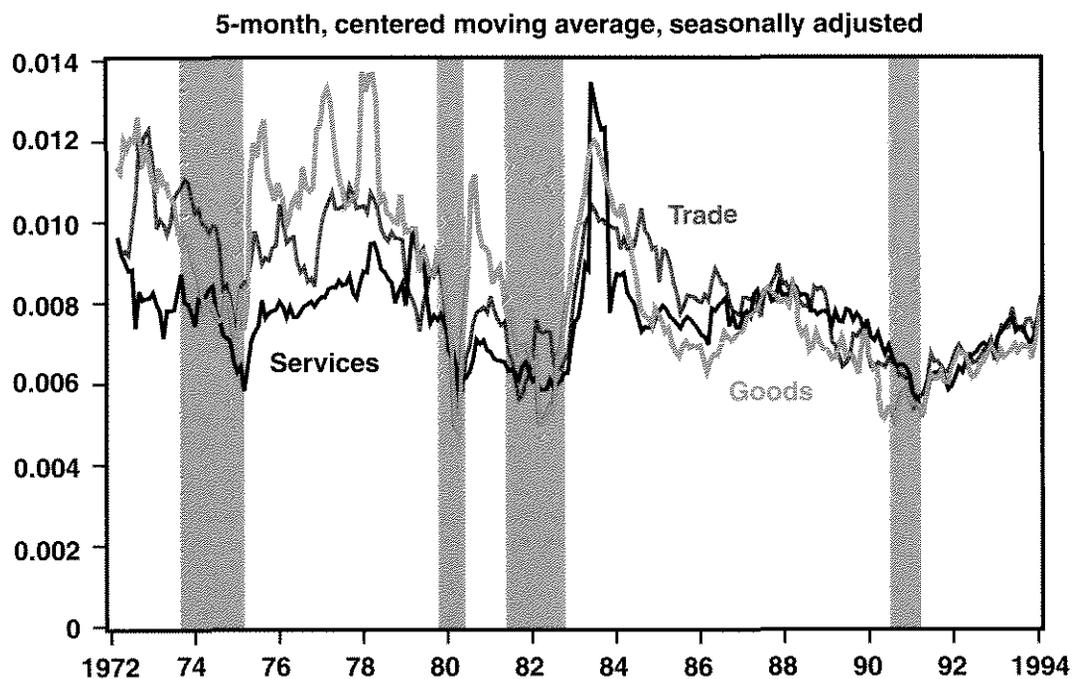
THE CHANGING ROLE OF MANUFACTURING

Figure 2 reveals that gross flows in the goods-producing sector were less volatile during the 1990 recession than during previous recessions. This warrants closer attention to manufacturing, which makes up more than three-quarters of goods-producing employment. Figure 7 shows that the phenomenon is even more pronounced in manufacturing. When the gross flow data for manufacturing are extended back to 1947 (which, unfortunately, cannot be done reliably for non-manufacturing industries), all previous recessions show much more dramatic swings in job creation and destruction than 1990. If manufacturing is split into durables and nondurables, both show patterns very similar to Figure 7. Gross flows for mining and construction (the remainder of the goods-producing sector) did not seem to follow the same pattern as manufacturing during the 1990 recession. The very low levels of job creation and destruction during the 1990 recession are, therefore, clearly due to developments in the manufacturing sector.

As measured by drops in either industrial production or manufacturing employment, the 1990 recession was mild. Manufacturing employment, however, declined almost continuously from the beginning of 1989 until late 1993. It appears that, rather than the usual sharp cyclical response, manufacturing firms have experienced a longer-term contraction over these five years. Though it is clear that something different happened during the 1990 recession, it is impossible to know whether the old pattern of sharp increases in job destruction will reassert itself in future downturns. If the fluctuations of gross flows in manufacturing remain subdued during future recessions, the movement of overall gross flows will be significantly damped. The declining share of employment found in manufacturing reinforces this effect by lowering the weight attached to the most volatile sector.

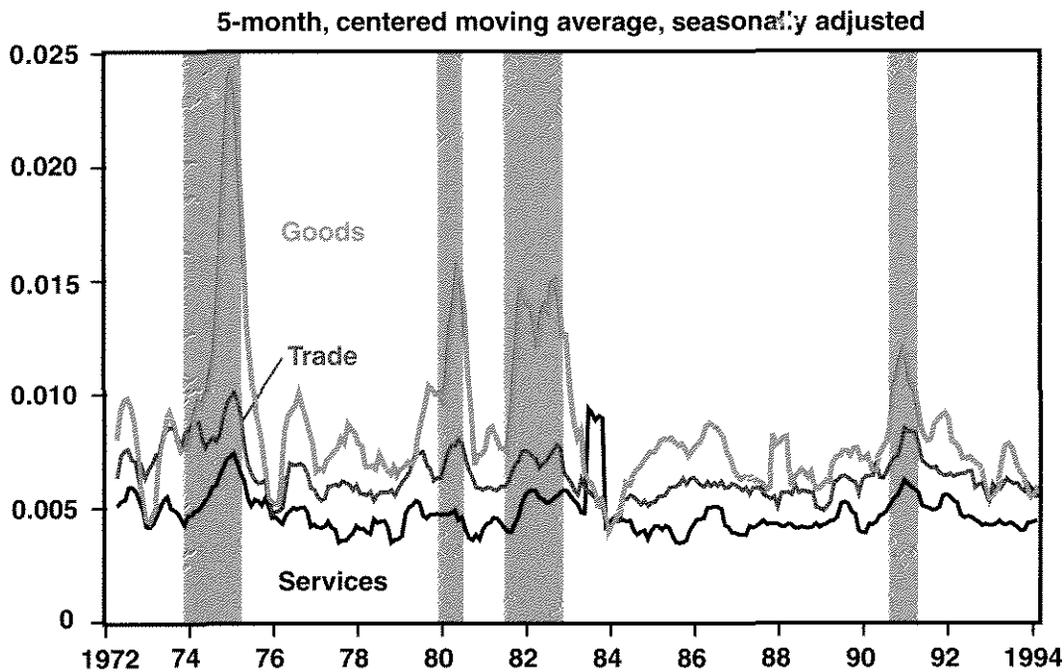
⁵ Regressing job creation constructed without four-digit industries on job creation constructed with four-digit industries (or vice versa) produces a coefficient very close to 1.0 and an R^2 greater than 0.99. The same is true of the job destruction series.

Figure 5a
Job Creation Rates in Goods Production, Trade and Service Production*



* Excluding trade

Figure 5b
Job Destruction Rates in Goods Production, Trade and Service Production*



* Excluding trade

Figure 6a
Job Creation in Goods Production and Service Production

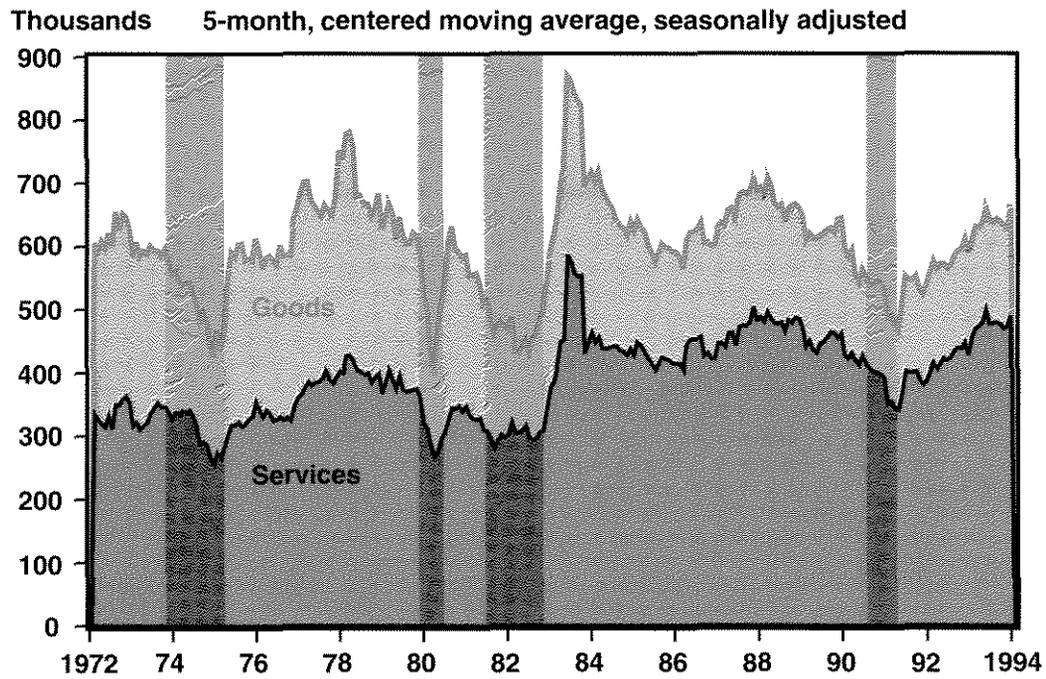


Figure 6b
Job Destruction in Goods Production and Service Production

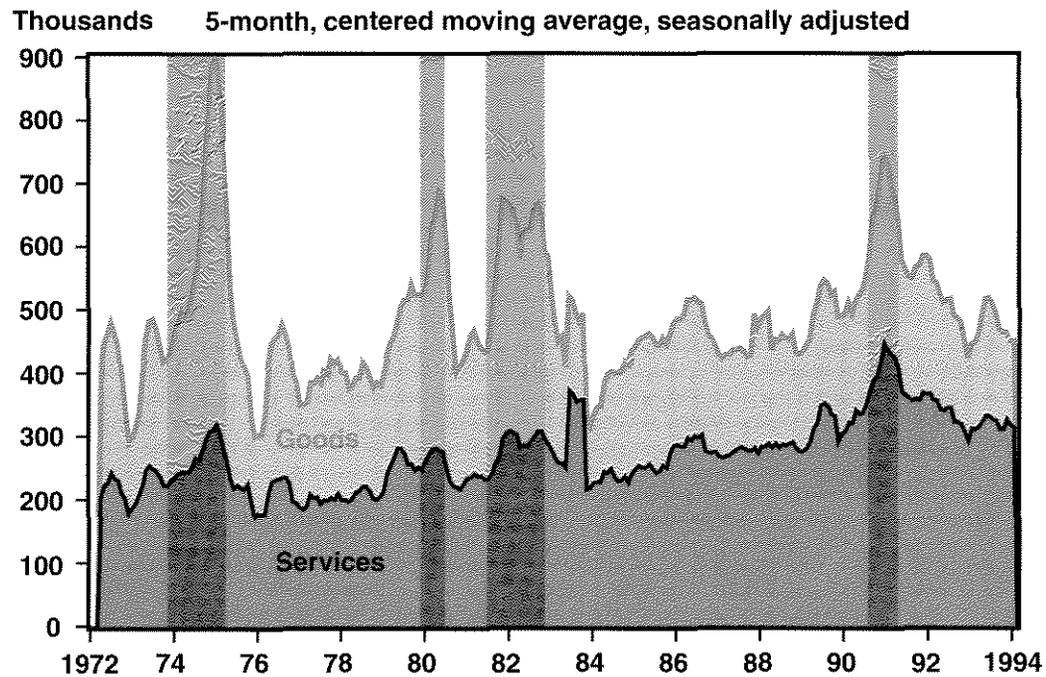
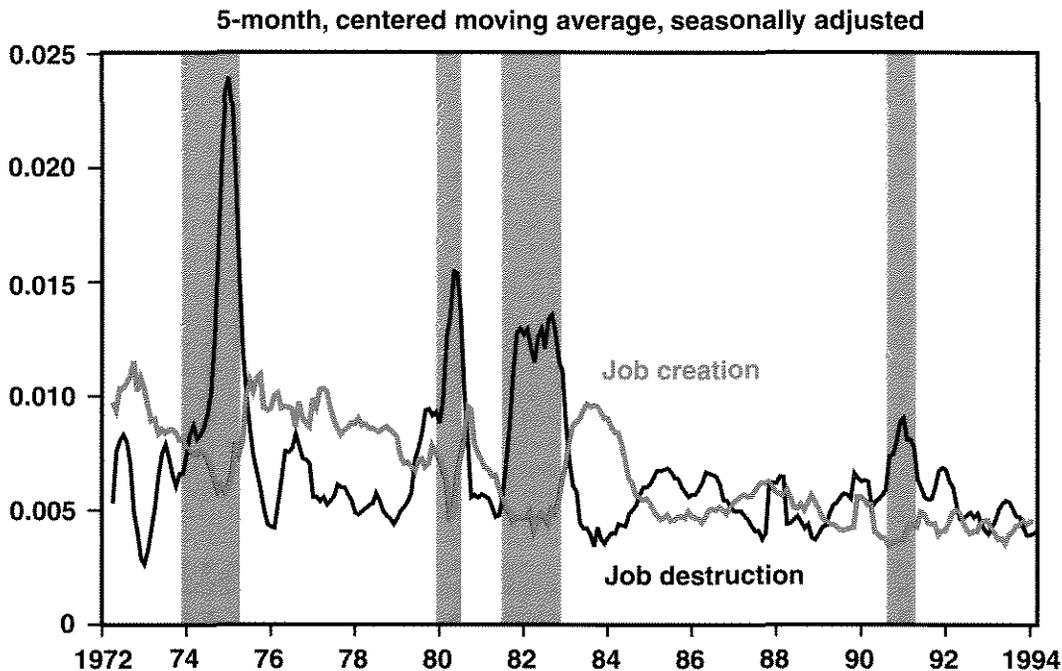


Figure 7
Job Creation and Destruction Rates in Manufacturing



CONCLUSIONS

Job creation and destruction behave much differently in the goods-producing sector than in the rest of the economy. Job creation and destruction have historically been much more volatile in manufacturing and other goods-producing industries, so that they have contributed disproportionately to fluctuations in overall job creation and destruction. Further, there does not appear to be a cyclical asymmetry between creation and destruction outside of manufacturing. The stylized fact, cited by several authors (Blanchard and Diamond, 1990; Davis and Haltiwanger, 1990, 1992; Ritter, 1993), that job destruction tends to dominate employment changes during recessions thus appears to be generated by manufacturing industries. In addition, job creation and destruction in manufacturing were noticeably damped during the most recent recession. Combined with the fact that goods production makes up a declining share of employment, this suggests

that the dynamics of job creation and destruction may be substantially different in the future.

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