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EMPLOYMENT DYNAMICS OF THE LARGEST INDUSTRIAL FIRMS IN TURKEY (1980 -2006)

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YASEMİN ÖZERKEK

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DANIŞMAN: PROF. DR. FATMA DOĞRUEL

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Marmara Üniversitesi
Sosyal Bilimler Enstitüsü Müdürlüğü

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ÖZET

İş akışlarının analizi, son yıllarda işgücü piyasasında dikkati çeken konulardan biridir. İktisatçılar, istihdam dinamiklerini incelemek amacıyla yaygın olarak firma bazında veri kullanmaktadırlar. 1980'lerin başında dışa açık bir kalkınma modeli benimseyen Türkiye ekonomisi, istihdam dinamiklerinin incelenmesi bakımından ilgi çekmektedir. Bu çalışmada, 1980–2006 döneminde Türkiye'nin en büyük sanayi firmalarının iş akış dinamikleri incelenmektedir. İş akışları analizi; en büyük imalat sanayii firmalarının iş akışlarının farklı dönemlerde ve kriz/durgunluk yıllarında nasıl tepki verdiğini, en büyük özel imalat sanayii firmalarının istihdam dinamikleri açısından Türkiye'nin tüm özel imalat sanayii firmalarından sektörel bazda nasıl farklılaştığını ve özel imalat sanayii firmalarının firma büyüklük grupları açısından istihdam dinamiklerinin söz konusu dönemde nasıl değiştiğini ortaya koymaktadır.

Analiz sonuçlarına göre, en büyük özel sanayi firmaları konjonktür dalgaları boyunca aynı anda hem iş yaratmakta hem iş yıkımını gerçekleştirmektedirler. Durgunluk/kriz (canlanma) yıllarında iş yaratma oranı azalmakta (artmakta), iş yıkımı oranı artmaktadır (azalmaktadır). Söz konusu firmalar istihdam davranışları açısından heterojen bir yapıya sahiptirler ve yaratılan ve yıkıma uğrayan işler uzun vadeli olmaktadır. En büyük kamu sanayi firmaları ise durgunluk yıllarından etkilenmedikleri ve daha homojen bir yapıya sahip oldukları için özel firmalardan farklılık göstermektedir. Öte yandan, özel imalat sanayii firmaları ve en büyük özel imalat sanayii firmaları ekonomideki olumsuzluklar karşısında sektörel bazda farklı istihdam dinamikleri sergilemektedirler. Türkiye'de, özel imalat sanayiindeki büyük firmaların, orta ölçekli ve küçük firmalara kıyasla iş yaratma ve yıkımı oranları daha yüksektir. Firma büyüklüğü arttıkça net istihdam artışı yükselmektedir. Durgunluk/krizlerin firma büyüklüğü üzerindeki etkilerinin farklılığı da göze çarpmaktadır.

GENERAL KNOWLEDGE

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ABSTRACT

The analysis of gross job flows in the labor market has attracted much attention in recent years. Economists began to make wide use of firm/establishment level data in order to elucidate the dynamics of aggregate employment. Turkish economy, which adopted a more outward-oriented economic development strategy in the beginning of 1980s, attracts attention to examine its job flow dynamics. To this end, this thesis analyzes the gross job flow dynamics of the largest industrial firms in Turkey in the period 1980-2006. The job flow statistics evinces how employment dynamics of the largest manufacturing firms react in different periods and crisis/recessionary years; whether the largest private manufacturing firms differ from all-private manufacturing firms in terms of job flow dynamics at sectoral level; and how the firm size categories vary in their employment dynamics in the Turkish private manufacturing industry.

The findings show that there exist both job creation and job destruction in all phases of the business cycle for the largest private industrial firms. Recessions/crises (booms) are typically times of high (low) job destruction and low (high) job creation. These firms are heterogeneous in employment behavior and their job reallocation process is long-term in nature. The largest public firms exhibit different employment dynamics from the largest private firms in that the recessionary years are not reflected in their job flow statistics and they are a more homogenous group of firms. Furthermore, at the sectoral level, private manufacturing firms and the largest private manufacturing firms show distinct behavior in the face of economy wide disturbances. Large firms in the Turkish private manufacturing sector have a greater potential to create and destroy jobs than medium-size and small firms. As the firm size grows, net employment growth increases. The diverse effects of recessions/crises on firm size groups are also striking.

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List of Abbreviations

CU	Customs Union
EU	European Union
GDP	Gross Domestic Product
IMF	International Monetary Fund
ISIC	International Standard Industrial Classification
ISO	Istanbul Chamber of Industry
JCR	Job Creation Rate
JDR	Job Destruction Rate
LDF	Longitudinal Data File
LPMF	Largest Private Manufacturing Firm
NET	Net Employment Growth Rate
OECD	Organization for Economic Co-operation and Development
PMF	Private Manufacturing Firm
SME	Small and Medium-Sized Enterprises
SPO	State Planning Organization
SUM	Job Reallocation Rate
TURKSTAT	Turkish Statistical Institute

1. Introduction

The analysis of gross job flows in the labor market has been an outstanding issue among labor economists and macroeconomists in recent years. Stiglbauer et al. (2003) argue that macroeconomists, who conventionally have tried to analyze the labor market in terms of aggregate variables, have lately begun to pay more attention to the issues at the micro-level. Contini and Revelli (1997) highlight that;

> *In recent years, longitudinal data on firms, establishments and workers have become available on both sides of the ocean, providing the impulse for a new wave of empirical research on firm demography, job creation and destruction, mobility flows…Understanding of these phenomena is at cross-roads between labor economics and industrial economics, and may play a crucial role in explaining the linkage between micro-motives and macro-behavior.* (p.245)

Research in labor market dynamics concentrates on the two elements of aggregate employment growth: i) the number of jobs created at expanding and newly-born establishments (job creation) and ii) the number of jobs lost at declining and dying establishments (job destruction) (Foote, 1998). A succinct review of the literature shows that there exists a considerable amount of job creation and job destruction at all periods of the business cycle and even within narrowly defined sectors.

Having considered the existence of a substantial amount of job flows, economists address a wide range of reasons to study gross job flows. Analyzing gross job flows rather than net flows enables us to acquire further information on employment dynamics that is not offered by conventional employment statistics. Aggregate changes in employment camouflage an important amount of job reallocation in the view of the fact that jobs are simultaneously created and destroyed. For instance, if aggregate

employment grew 8 percent, this could be arisen from 13 percent of gross job creation and 5 percent of gross job destruction, or of 20 percent of gross job creation and 12 percent of gross job destruction). Utilizing plant or firm-level data over time provides important information about the underlying forces leading to changes in employment in the aggregate (Konings, 1995; Davis et al., 1996; Stiglbauer et al., 2003; Lawless and Murphy, 2008).

Stiglbauer et al. (2002) point out that the existence of large amount of job flows suggests that idiosyncratic shocks at the micro level are vitally important. Hence, looking only at aggregate employment figures misses an important part of the dynamics. "*It is possible to observe the gross job creation and job destruction occurring 'behind the scenes' by tracing the statistics backwards to individual firms*." (Voulgaris et al., 2005, p.289) As OECD (1994) underlines;

> *The traditional focus on net change masks much of the dynamics of employment. Regardless of whether net employment is rising or falling, large numbers of jobs are being created and destroyed. Attempts to understand this process of job turnover have resulted in a considerable theoretical and empirical literature.* (p.104)

Turkish economy, which adopted a more outward-oriented economic development strategy in the beginning of 1980s, draws attention to examine its job flow dynamics. In Turkey, as of 24 January 1980, a comprehensive stabilization and structural adjustment program was introduced. Foreign trade and later capital markets were liberalized to a large extent in the 1980s. However, the economy experienced some recessionary/crisis years during the 1990s. Two major crises hit the economy in years of 1994 and 2001 in addition to other recessionary years of 1991 and 1999. Turkish economy, which went through such a development process in the period 1980-2006, attracts attention to analyze its gross job flow dynamics. This thesis examines the

employment dynamics of the largest industrial firms in the Turkish economy during 1980-2006. The job flow analyses are also performed by the subperiods, which are determined by the above-mentioned developments in the Turkish economy over the period 1980-2006.

The analysis exploits data for the top industrial firms of Turkey, which are ranked by their sales from production figures by Istanbul Chamber of Industry (ISO). In Turkey, micro data is available only for the largest industrial firms. Besides their direct influence on the growth and employment of the Turkish manufacturing industry, the performance of these largest industrial firms affect the growth and employment level of the firms from which they purchase intermediate goods (i.e. outsourcing). Their demand for intermediate goods from domestic subcontractor firms gives rise to increasing production of the subcontractor firms, thereby in turn, contributing to their employment level.[1]

In the analyses, the measures of job creation and job destruction based on the methodology initially developed by Davis and Haltiwanger (1990, 1992) are used. As distinct from their analysis, in this study, the basic observational unit underlying job creation and destruction measures is the firm instead of a plant and there is neither entry nor exit of firms in the data. Since the data is composed of continuing firms only, this study will follow Blanchflower and Burgess (1996) and Faggio and Konnings (2003), among others, in the calculations of job flow rates.

The purpose of this thesis is to analyze the dynamics of employment growth, job gains, and job losses towards a better understanding of developments underlying employment growth of the largest industrial firms in the period 1980-2006. The results show how employment dynamics of these firms has been evolved over the business

[1] A TV interview with the Chair of Istanbul Chamber of Industry (ISO) Tanıl Küçük in July 2008.

cycle in the period 1980-2006. The prominent characteristics of the employment behavior in different sub-periods are revealed with distinct combination of continuing firms. Besides, the job flow measures of the largest firms are compared by that of all private manufacturing firms in Turkey at two-digit sectoral level. The analysis is performed also using data for all private manufacturing firms, which are categorized according to their firm size.

The job flow statistics evinces i) how employment dynamics of the largest manufacturing firms react in different periods and crisis/recessionary years, ii) whether the largest private manufacturing firms differ from all-private manufacturing firms in terms of their job flow dynamics at sectoral level, iii) how the firm size categories differ in their employment dynamics. Finally, these findings are anticipated to help economists, policymakers, and the businesses developing a more comprehensive perception of the business cycles and to serve as basis information in implementing policies targeting these largest industrial firms.

The findings reveal that there exist both job creation and job destruction in all phases of the business cycle for the largest private industrial firms. Recessions/crises (booms) are typically times of high (low) job destruction and low (high) job creation. These firms are heterogeneous in employment behavior and their job reallocation process is long-term in nature. Overall results indicate that the largest public firms exhibit different employment dynamics from the largest private firms. The recessionary years are not manifested in the job flow statistics of the largest public firms. Furthermore, private manufacturing firms and the largest private manufacturing firms show distinct behavior in the face of aggregate disturbances at sectoral level.[2] The findings illustrate that large firms have a greater potential to create and destroy jobs

[2] Private manufacturing firms comprises all firm size groups.

than medium-size and small firms. Net employment growth rate increases with firm size. In addition, the different effects of recessions/crises on firm size groups are also remarkable.

The thesis is organized as follows. Chapter 2 sheds light on the theory and basic facts about gross job flows. Chapter 3 delineates the data and methodology of job flow analysis. Chapter 4 presents the analyses of gross job flows of the largest private industrial firms in Turkey for the period 1980-2006. In Chapter 5, the analyses are performed using data for the largest public industrial firms for the period 1980-2006. Chapter 6 presents a comparison of job flow dynamics of the largest private manufacturing firms and all private manufacturing firms in Turkey at sectoral level. Chapter 7 examines the job flows of Turkish private manufacturing industry by firm size. Finally, Chapter 8 recapitulates the results and discusses the policy implications.

2. Gross Job Flows: Theory and Basic Facts

This chapter addresses the theory and basic facts about the analysis of gross job flows. Section 2.1 points out the reasons for examining gross job flows, Section 2.2 delineates the factors that have effect on the gross job flows, and finally, Section 2.3 presents a brief survey of literature summarizes the basic facts from the literature.

2.1 Why to Analyze Gross Job Flows

The study of gross job flows is interesting and important for a number of reasons. Analyzing gross job flows rather than net flows enables us to acquire further information on employment dynamics that is not offered by conventional employment statistics. For instance, if aggregate employment grew 5 percent, this could be the result of 12 percent of gross job creation and 7 percent of gross job destruction, or of 30 percent gross job creation and 25 percent gross job destruction (Konings, 1995). Stiglbauer et al. (2003) emphasize that main advantage of looking at gross rather than net employment changes is that gross flows uncover patterns of job creation and job destruction and so reveal important information about the underlying forces that lead to changes in employment in the aggregate. They point out that taking into account only aggregate employment figures misses a significant part of the dynamics because idiosyncratic shocks at the micro level are vitally important.

Likewise, Davis et al. (1996) mention that, "*job creation and destruction figures offer a window into the diversity of firm-level employment outcomes masked by aggregate employment statistics*." (p.11) For a given net growth rate, higher rates of job creation facilitates finding a job, and higher rates of job destruction means less job

security for employed people. *"Higher rates of job creation and job destruction mean larger numbers of workers compelled to shuffle between jobs, and most likely, a greater incidence of unemployment."* (Davis et al., 1996, p.11) These rates together, release information about the behavior of employment growth across business units (Davis et al., 1996).

Blanchflower and Burgess (1996) highlight that, rates of job creation and destruction are two statistics based on the employment growth distribution, which give us more information than can be obtained by just looking at the mean or variance. Furthermore, they are economically meaningful concepts, and their study has led to a lot of empirical and theoretical research.

Konings (1995) argues that gross job flows can signal the amount of structural change an economy is going through:

> *Shifts in product demand can lead to simultaneous contraction and expansion of firms within the same sector, as well as across sectors. This reallocation process is likely to imply substantial job and worker reallocation, thus involving transactions costs, like hiring, firing and search costs. Moreover, if the mobility of workers between firms or sectors is sluggish, structural unemployment will result (Lilien, 1982). Thus, in sum, gross job flows can give an indication of the amount of structural change an economy is undergoing."*[3] (p.5-6)

Garibaldi and Mauro (2000) highlight that many studies have attempted to elucidate why some countries have higher unemployment rates than others, but less attention has been devoted to countries' relative performance in job creation, or net employment growth. In this respect, they underline the advantages of shifting the focus to job creation: i) Employment is easier to measure than unemployment, since it does not rely on distinctions between individuals who are in the labor force and those who

[3] "(Gross) worker allocation at time *t* equals the number of persons who change place of employment or employment status between *t-1* and *t*." (Davis et al., 1996, p.12) See Davis et al. (1996) for further information.

are not; ii) For any given level of unemployment, increase in job creation raises a country's output, and, among other things, increases the number of workers relative to pensioners, thus reducing the cost of its social safety net; iii) Laws, programs, or labor agreements that make it relatively difficult or expensive to fire workers, appears to be unconnected to unemployment, but they are considerably related with low job creation (Garibaldi and Mauro, 2000).

Davis and Haltiwanger (1998) list many reasons to measure gross job flows and to study their behavior:

i) **Reallocation and business cycle**: "*Time-series data on gross flows shed new light on the nature of business cycles and provide a window into connection between recessions and the reallocation of workers and jobs."* (p.80) As an example, Davis and Haltiwanger (1998) state that the evidence for the U.S. manufacturing sector indicates that recessions are characterized by sharp jumps in job destruction rates but little change in job creation rates. They point out that this pattern holds in the U.S. manufacturing sector or every recession since 1937.

ii) **Identification in time-series analysis**: Time-series data on gross job flows enable to draw inferences about driving forces underlying aggregate economic fluctuations.[4]

iii) **Unemployment and wage determination**: The size of gross job flows throws light on the plausibility of alternative theories of unemployment and wage determination. For instance, evidence of the large magnitude of gross job flows stresses the empirical relevance of theories that model unemployment as a frictional phenomenon.

[4] See, for example, Davis and Haltiwanger (1996) and Caballero et al. (1997) (Davis and Haltiwanger (1998).

iv) **Local labor market spillovers**: Gross job flows based on the data of the geographic incidence and concentration paves the way for the study of wage and employment spillovers in local labor markets. This enables to analyze the impact of job creation and destruction on wages, employment, gross worker flows, population, and the tax base in different labor markets.

v) **Firm life cycle dynamics**: Cross-sectional evidence on gross job flows elucidates the life cycle dynamics of establishment/firm-level employment. For instance, Davis and Haltiwanger (1992) find that younger U.S. manufacturing plants have higher gross job flow rates with a strong and omnipresent pattern.

vi) **Reallocation and productivity growth**: Data on gross job flows enable to study the relation between reallocation process, and productivity growth and wages.[5]

vii) **Search theories:** "*Evidence on time-series properties of gross job flows has helped stimulate and guide a resurgence of research on dynamic equilibrium search theories and the role of search in aggregate fluctuations*." (Davis and Haltiwanger, 1998, p.80-81) Among the outstanding examples are Andolfatto (1996), Blanchard and Diamond (1990), Caballero and Hammour (1994), and Mortesen (1994).

viii) **Lumpiness, heterogeneity, and aggregation**: The magnitude and omnipresent nature of gross job flows call attention to the risks of reasoning about aggregate and industry-level dynamics from representative firm models. Moreover, Davis and Haltiwanger (1998) point out that data on gross job flows indicate remarkable lumpiness in establishment-level employment changes. The coexistence of lumpiness and heterogeneity signalize that aggregate employment dynamics are closely linked with establishment-level employment changes.

[5] Reallocation of jobs and factor inputs from less efficient to more efficient firms explains a large part of industry-level productivity gains. See Olley and Pakes (1992) and Baily et al. (1994) (Davis and Haltiwanger, 1998).

ix) **Quantitative theoretical analysis:** Data on gross job flows are used in the quantitative theoretical analyses of firing costs, the welfare implications of aggregate business cycles, the efficiency of the reallocation process, and the asset value of a worker.[6]

x) **Worker sorting and job assignment**: Several economic theories mention assignment problems that occur when workers are imperfect substitutes in production, or when their ability or willingness to work with cooperating factors vary.[7] Job flows play an important role in the adjustment of the assignment of workers to each other and to cooperating factors of production in the economy.

2.2 Factors Influencing Job Creation and Job Destruction

> *Changes in the number and mix of jobs at individual firms and production sites reflect many forces: the diffusion of new products and technologies, the success or failure of research and marketing efforts, negotiations with employees and labor organizations, learning by doing on the part of managers and workers, the costs of hiring, training and firing workers, the costs of adjusting co-operating factors of production, changes in the availability of inputs, competition from rivals, access to financial backing, ownership changes and corporate restructurings, regulatory and tax law changes, and the growth and decline of particular markets. As this list suggests, job creation and destruction are part of a larger process of adjustment, reallocation, and growth.* (Davis and Haltiwanger, 1999, p.2713)

Davis and Haltiwanger (1999) stress that job flows are closely linked to worker flows, unemployment behavior, individual wage dynamics, the evolution of firms and industries, economic restructuring, aggregate productivity growth, and etc. They point out that, much research on job flows is at the crossroads of labor economics,

[6] See Davis and Haltiwanger (1998) for references to these topics.
[7] Davis and Haltiwanger (1998) state that assignment models underlie the analysis of several important topics in labor economics, including dual labor markets, equalizing differences in wage payments, labor market sorting based on comparative and absolute advantage, and the organization of workers into teams and hierarchies.

macroeconomics, and industrial organization. Schuh and Triest (1999) underscore that product and process innovations, changes in relative input prices, the increasing openness of the economy, changes in the geographic distribution of consumers and potential workers, communications and transportation infrastructure, and business cycle fluctuations are among the forces driving the churning of jobs. Furthermore, a firm's labor demand depends on both the demand for firm's output and the changes in firm's cost structure. If the firm finds it profitable to increase employment, job creation occurs; if profit maximization entails a decline in employment, job destruction results (Schuh and Triest, 2000).

There are many empirical studies investigating the factors that might affect job creation and job destruction. One of the recent surges of interests is the link between international trade and job flows. Using empirical data from a longitudinal survey of small and medium-sized enterprises in the manufacturing sector in 1994-1997, Lefebvre and Lefebvre (2000) show that the relationship between exports and job creation is positive. Davis et al. (1996) analyze the relationship between job flow behavior and exposure to international trade. Their results show not systematic relationship between the magnitudes of gross job flows and exposure to international trade. However, the results indicate that in industries with high import shares, job destruction is elevated. Jansen and Turrini (2004) find that international trade reduces long-run unemployment by both increasing job creation and reducing job destruction. They find that trade integration has a direct impact on job destruction since it allows firms to defy shocks of a greater magnitude, whereas the effect on job creation is only indirect. Their model tends to give a clear-cut answer to the trade and jobs issue: "*the more trade is free, the lower will be the unemployment rate in the long run*." (p.488) In his study of Belgian manufacturing in the period 1998-2004, Pisu (2008)'s results suggest that at three-digit

industry levels, the shifts in employment between firms having different trading status account for 6 to 30 percent of total job reallocation. He finds that this effect is stronger for large than for small firms (Pisu, 2008).

In addition, Bauer and Lee (2007), among others, point out that labor market policies play an important role in the patterns of job creation and job destruction. Higher dismissal costs give rise to lower destruction rates and also lower creation rates as these costs make firms hesitant to employ additional employees.[8] Furthermore, other economic policies, such as tax policies and economic regulation, that encourage or restrain the formation and expansion of successful firms and, the closure and downsizing of unsuccessful ones, bring about the changes in job flow rates (Bauer and Lee, 2007). Garibaldi and Mauro (2000) present the findings of a study by IMF (International Monetary Fund) staff that has analyzed job creation over the past two decades in the industrial countries. According to their results, low dismissal costs and low taxation may have been important for rapid job creation, and accounted largely for the difference between Europe and the high-performing non-European countries.[9] In their study, Garibaldi and Mauro (2000) point to a variety of conclusions about the role of factors such as unemployment benefits, the strength of trade unions and their bargaining practices, and the level of taxation, employment protection legislation on job flows. They argue that higher unemployment benefits bring about higher unemployment and lower job creation in most theoretical models of the labor market. The role of taxation and the employment protection legislation is less clear-cut. Extensive

[8] Bauer and Lee (2007) underline that these and other labor law differences are likely to explain less of the wide variation across states than across countries because the institutional differences across countries tend to be larger.

[9] In terms of job creation rates, non-European countries including Australia, the United States, Canada, and New Zealand outstripped most Continental European countries, except the Netherlands and Switzerland (Garibaldi and Mauro, 2000).

employment protection and a higher level of overall taxation appear to reduce job creation (Garibaldi and Mauro, 2000).

An issue having a recent surge of interest is the interaction between growth and employment.[10] Among others, Zagler (2006) empirically investigated the link between economic growth and job creation and job destruction, along with the relationship between economic growth and unemployment. Using microeconometric evidence for the United Kingdom, the results show a significant and negative relation between unemployment and economic growth. His results evince that economic growth even more strongly influences job creation and job destruction. Hence, Zagler (2006) argues that in faster growing economies, many more people will be affected by unemployment, though for shorter periods.

On the one hand, Labonte (2004) argues that;

> *Many causes of job loss have been offered, including imports, trade deficits, offshore outsourcing, direct investment abroad, and restructuring. But economic theory suggests that all of these cause gross job loss, not net job loss. Historical experience is supportive: neither imports, the trade deficit, nor the implementation of trade liberalization agreements are correlated with net job loss. Theory suggests, and empirical evidence confirms, that only recessions cause net job loss.* (p.2)

[10] As Moreno-Galbis (2006) underscores, there has been a rising literature introducing growth into matching and search models of unemployment or matching and search frictions into growth models, starting with the work of Pissarides (1990). Among these works are Bean and Pissarides (1993), Merz (1995), Postel-Vinay (1998, 2002), Pissarides (2000), Brecher et al. (2002), Brauninger and Pannenberg (2002). However, the empirical evidence on the relationship between growth and employment is not clear-cut and difficult to interpret. Economic growth is not able to create sufficient employment opportunities at all times. There are many factors playing role in the interaction between these two concepts (e.g. interest rates, income taxation, hiring and firing costs, saving behavior, the level of unemployment benefits, labor costs, bargaining power of labor force). Please see Blanchard (2000), and Muscatelli and Tirelli (2001) for further information.

2.3 Basic Facts from the Literature

There is a considerable literature attempting to explain the size of and fluctuations in job flow measures.[11] Blanchflower and Burgess (1996) point out that there are two main approaches to consider. First approach concentrates on entry and exit data of firms/plants and the progress of entrants.[12] The second approach focuses more directly on labor market flows. Stimulation behind the renewal of interest in gross employment flows is owing to the studies of Dunne et al. (1989), and predominantly Davis and Haltiwanger (1990, 1992) Blanchflower and Burgess (1996).

Several studies enumerate the findings of gross job flows literature. A compilation of main findings in the job flow literature is as follows:[13]

1. The amount of job creation and destruction is remarkably large in all phases of the business cycle.

2. The large magnitude of gross job flows signifies a great deal of heterogeneity. "*Heterogeneity of behavior is the key-word, common to all these studies.*" (Contini and Revelli, 1997, p.245)

3. Gross job flows are pervasive and occur simultaneously in even very narrowly defined industries.

4. Job reallocation is high relative to net employment change.[14]

5. Job creation is pro-cyclical and job destruction is counter-cyclical.[15] However, the volatility of the two flows over the business cycle may differ.[16]

[11] See, Davis and Haltiwanger (1999) for an excellent survey of the literature.
[12] Some examples are Dunne et al. (1988), Baldwin and Gorecki (1991), Fotopoulos and Spence (1998), Abowd et al. (1999), and Kaya and Üçdoğruk (2002).
[13] Grey (1995), Davis et al. 1996, and Davis and Haltiwanger (1999) provide the basic facts of this literature with some references.
[14] Contini and Revelli (1997) articulate that the fact that gross flows are larger than net flows implies a great deal of heterogeneity. "*If all firms were alike, and each were hit by the same exogenous shocks, all would react equally, and net flows would coincide with gross flows. Similar arguments apply to jobs and workers*." (Contini and Revelli, 1997, p.246)

6. Job destruction rates exhibit greater cyclical variation than job creation rates. Hence, net employment change, as well as total job reallocation, is mainly driven by job destruction.[17]

7. Job creation and destruction are negatively correlated.

8. "Job reallocation is a persistent phenomenon. This implies that the observed job flows can not be accounted for by temporary layoff and recall policies." (Goméz-Salvador et al., 2004, p.10)

9. The question of which businesses (small or large) create the most jobs has been broadly discussed among economists and researchers. In the in the literature, there is not a consensus about the methodologies used in the analysis of job flow by firm size.

Before 1979, labor economists invariably found that most net new jobs were created by large firms. The analysis was performed by counting the number of jobs in each size group in the current time period and subtracting the number of jobs in the same size group in a previous period. The implicit assumption in this method is that the firms in each size group in the current period are the same firms as in the previous period. Put differently, the movement across size groups is ignored. This methodology was comparative statics (Kirchhoff and Greene, 1998).

> *It is clear that comparative static analysis during periods of economic growth will credit employment growth to the larger size classes while penalizing the smaller size classes by showing employment losses for firms grown large. During periods of economic decline, comparative statics penalizes larger size classes by exaggerating job losses while giving the smaller size classes credit for jobs they did not create.* (Kirchhoff and Greene, 1998, p.156)

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[15] Instead of 'countercyclical', the term 'anticyclical' is also used in the literature.
[16] See Goméz-Salvador et al. (2004) for further information.
[17] In particular, this is a noteworthy feature of plant-level data in the case of U.S. manufacturing. Recessions are characterized by a sharp increase in job destruction accompanied by a relatively mild slowdown in job creation (Davis et al., 1996).

In the mid-70s, David Birch generated a new database for the U.S., defining each firm in a base year and measured its individual location and employment behavior in each successive year. His method was dynamic; he identified individual firms in time t and traced their individual employment size changes until time $t + n$. The net gains or losses experienced by each firm were then summed into the size class they belonged to at the beginning of the period. Then, Birch (1979) reported that 82 percent of the net new jobs were created by small firms. Starting with the work of Birch (1979), small firms have been considered as the major creators of jobs. This is called the small business job creation hypothesis (cited by Kirchhoff and Greene, 1998).[18]

However, a number of researchers attacked on this research. The debate was dominantly regarding the statistical methods used in the analysis (Kirchhoff and Greene, 1998).[19] Davis et al. (1993) argue that there are a number of statistical fallacies, which lead to an upward bias in job creation by small firms. Utilizing the U.S. Bureau of the Census' Longitudinal Data File (LDF) on manufacturing firms they examined job creation in manufacturing in the period 1973-1988. Davis et al. (1996) point out that migrations across the firm size categories create a size distribution fallacy that gives rise to the impression of a growing small business sector, especially during periods of slow economic growth. Furthermore, they argue that classifying firms into size groups using base year employment results in regression fallacy (i.e., regression to the mean bias) (Davis et al. 1993; 1996).[20] Then, they suggest a way to correct for this bias by defining firm size as an average of two or more periods.

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[18] Among the examples to the studies supporting the role of small firms are Goméz-Salvador et al. (2004) and Hijzen et al. (2007).

[19] See Kirchhoff and Greene (1998) for a detailed survey of the other criticisms that mix comparative static and dynamic methodologies.

[20] "On average, firms classified as large in the base year are more likely to have experienced a recent transitory increase in employment. Since transitory movements reverse themselves, firms that are large in the base year are relatively likely to contract. Likewise, firms classified as small in the base year are more likely to have experienced a recent transitory decrease in employment. Hence, firms that are small in the base year are relatively likely to expand…This regression phenomenon (i.e., regression to the firm's long-

Nevertheless, Kirchhoff and Greene (1998) argue that;

> *This measure represents data massaging in the absence of any empirical data that demonstrates the statistical bias of regression to the mean nor any economic theory that suggests using average plant size*. (p.162)

Nevertheless, as Goméz-Salvador et al. (2004) point out an important limitation of the existing empirical studies on job flows is the lack of internationally comparable job flow statistics. "*Differences in definitions, sampling intervals, sectoral coverage, and sampling frame may engender misleading interpretations of the cross-country differences in estimated job flows*." (Goméz-Salvador et al., 2004, p.7)

run size) creates the illusion that small firms systematically outperform large ones." (Davis et al. , 1996, p.67-68)

3. Data and Methodology

3.1 Data Description

The employment flow measures utilized in the analyses of the largest firms are constructed from firm-level employment data for the top industrial firms in Turkey over the period 1980-2006. These largest industrial firms are ranked by their sales from production figures.[21] Average employment in the sample is 1223 employees over the period 1980-2006.[22]

Istanbul Chamber of Industry (ISO) commenced to announce the largest 100 industrial firms of Turkey in 1968. This number rose to 300 in 1977 and 500 in 1980. Since 1980, ISO unveils the largest 500 industrial firms in Turkey. In 1990s, they started to provide data for the firms that follow the first 500 (325 firms in 1991 and 250 firms between 1992 and 1997). Since 1997, ISO has been releasing data for the second largest 500 industrial firms following the top 500.

The data for the largest industrial firms is arranged so that only continuing manufacturing firms are used in the job flow analysis (See Appendix A2.1). The analyses are performed for several sub-periods as well. Since entry and exit are not observed, the composition of these continuing firms changes in each sub-period.

The data for all private manufacturing industry is obtained from TURKSTAT (Turkish Statistical Institute). The data is at 4-digit sectoral level and covers the period 1980-2001. See Appendix A2.3 for the sectors analyzed in TURKSTAT's data and ISO's data.

[21] ISO aggregates the largest industrial companies into the sub-sectors. The sectors are classified and assigned codes according to the International Standard Industrial Classification (ISIC) Series M, Rev.2 (ISO, 2004) (See Appendix A2.2).

[22] See Appendix A2.4 and A2.5 for the average employment figures of private and public firms in the period 1980-2006 and its subperiods.

3.2 Methodology

3.2.1 Basic Concepts of Job Flows

Davis et al. (1996) define job as an employment position filled by a worker. Accordingly, the definitions of job creation and destruction originally proposed by Davis et al. (1996, p.10) are as follows:

"*(Gross) job creation at time t equals employment gains summed over all business units that expand or start up between t - 1 and t."*

"*(Gross) job destruction at time t equals employment losses summed over all business units that contract or shut down between t - 1 and t.*"

> *Net employment change in an economy is the result of firm expansion and firm entry on the one hand and firm contraction and firm exit on the other. The employment flows underlying this firm behavior are referred to as 'gross flows of jobs'.* (Acquisti and Lehmann, 2000, p.6)

Let's denote the level of employment at firm *i* in period *t* with E_{it} and let ΔE_{it} be the change in employment between the period *t* and *t-1*. J^+ represents the set of firms in sector J with $\Delta E_{it}>0$ and J^- is the set of firms in sector J with $\Delta E_{it}<0$. [23]

Gross job creation in sector *j* at time *t* is

$$[3.1] \qquad C_{jt} = \sum_{i \in J^+} \Delta E_{ijt} = \sum_{i \in J^+} (E_{ij,t} - E_{ij,t-1})$$

[23] J^+ stands for firms entering or expanding employment between the period *t* and *t-1*, while J^- symbolizes firms downsizing employment or exiting the market.

Gross job destruction in sector *j* at time *t* is

$$[3.2] \qquad D_{jt} = \sum_{i \in J^-} \left| \Delta E_{ijt} \right| = \sum_{i \in j^-} \left| (E_{ij,t} - E_{ij,t-1}) \right|$$

Job creation and job destruction rates are determined as the number of people whose jobs are created / destroyed deflated by the average employment in that industry (Davis et al., 1996).

Gross job creation rate in sector *j* at time *t* is

$$[3.3] \qquad POS_{jt} = \frac{1}{X_{jt}} \sum_{i} (E_{ij,t} - E_{ij,t-1})^{+}$$

and gross job destruction rate in sector *j* at time *t* is

$$[3.4] \qquad NEG_{jt} = \frac{1}{X_{jt}} \sum_{i} \left| (E_{ij,t} - E_{ij,t-1})^{-} \right|$$

where *i* and *j* indicate firm and sector, respectively, $(E_{ijt} - E_{ij,t-1})^{+}$ is firm *i*'s positive change in employment, $\left| (E_{ijt} - E_{ij,t-1})^{-} \right|$ is the absolute value of a firm's negative change in employment, and X_{jt} is the size of the sector, defined as the average employment in sector *j* in *t-1* and *t* (Davis et al., 1996).[24]

[24] X_{ijt} is defined as the average of employment in periods *t* and *t-1*: $X_{ijt} = 0.5(E_{ijt} + E_{ij,t-1})$ (Davis et al, 1996).

To verbalize, gross job creation rate is the sum of all positive changes across all firms in that sector in that year divided by size of the sector. Put differently, this rate is the weighted sum of all positive net growth rates in the economy or in the sector. Gross job destruction rate equals to the sum of the absolute value of all negative employment changes across all firms in that sector divided by the size of the sector. The job destruction rate is the absolute value of the decline in employment in contracting firms as a fraction of total employment.

Establishment or firm level growth rates can be defined as the actual change in employment from *t-1* to *t,* divided by the average level of employment in those two years:

[3.5] $$g_{ijt} = \frac{\Delta E_{ijt}}{X_{ijt}} = \frac{(E_{ij,t} - E_{ij,t-1})}{0.5(E_{ij,t} + E_{ij,t-1})}$$

Having formulated the growth rate, Davis et al. (1996) express sectoral rates of gross job creation and destruction as size-weighted sums of firm level growth rates in the following way (See Appendix A1.1):

[3.6] $$c_{jt} = \frac{C_{jt}}{X_{jt}} = \sum_{i \in J^+} (\frac{X_{ij,t}}{X_{jt}}) g_{ij,t}$$

and

[3.7] $$d_{jt} = \frac{D_{jt}}{X_{jt}} = \sum_{i \in J^-} \left(\frac{X_{ij,t}}{X_{jt}}\right) \left| g_{ij,t} \right|$$

Davis and Haltiwanger (1992) suggest that this calculation yields growth rates in the closed interval [-2, 2], with endpoints corresponding to births and deaths. As they underline, this method offers key advantages relative to log differences of employment at *t-1* and *t* and growth rates calculated on initial employment, because it allows births and deaths to enter the analysis by bounding firm-level growth rates between -2 and 2. This attribute of the growth rate measures assures that the measures are symmetric about zero and bounded. In the case of either $E_{ij,t-1}$ or E_{ijt} is zero, implying that there is birth or death, growth rate measure takes the values of 2 and -2, respectively. As Davis and Haltiwanger (1999) stress, the average employment in the denominator ensures to "*accommodate births and deaths in an integrated manner*." (p.2718) On the other hand, if conventional growth rate is used and the denominator is simply $E_{ij,t-1}$, births and deaths are reflected as exaggerated rates of job creation and destruction. However, since deaths and births are not observed in this study, the interval in question will be smaller.

It is noteworthy that the growth measure formulated in equation [3.5] is monotonically related to the conventional growth rate measure and the two are virtually equivalent for small growth rates. Let the conventional growth rate measure be defined as

[3.8] $$g_{ij,t}{}^{c} = \frac{E_{ij,t} - E_{ij,t-1}}{E_{ij,t-1}}$$

Then the two growth rate measures are interrelated by the identity

[3.9] $g_{it}^{c} = 2g_{it}/(2-g_{it})$ (Davis et al., 1996)

Davis et al. (1996) include the plants that start up and shut down to their definitions of (gross) job creation and destruction, respectively. Because the data used in this analysis consists of continuing firms only, there is neither entry nor exit. Therefore, our definitions of job creation and destruction are for expanding and shrinking firms, correspondingly.

With this in mind, the definitions of job creation and job destruction in this study are as follows:

(Gross) job creation at time *t* equals employment gains summed over all firms that expand between *t-1* and *t*.

(Gross) job destruction at time *t* equals employment losses summed over all firms that contract between *t-1* and *t*.

The studies in the literature measure job creation and destruction utilizing plant-level or firm-level employment changes.[25] In this study, the basic observational unit underlying job creation and destruction measures is the firm. "*As distinguished from plant, a firm or company is an economic and legal entity that encompasses one or more plants and, possibly, administrative offices that specialize in management functions*." (Davis et al., 1996, p.9)

[25] A plant (or an establishment) can be defined as a particular physical location at which production of goods or services takes place.

To compute the rates of job creation and destruction, gross job creation and gross job destruction are divided by lagged employment, as there is neither entry nor exit of firms in the data of this study. Just as in this case, Blanchflower and Burgess (1996) and Faggio and Konnings (2003) compute job creation as the sum of all employment gains in expanding firms in a given year divided by the total employment at the beginning of the year and define job destruction as the sum of all employment losses in contracting firms in a given year divided by total employment at the beginning of the year. Faggio and Konnings (2003) state that;

> *Given the nature of our dataset, we cannot interpret firm entry or exit in our sample as firm entry or exit from the market place. Thus, we apply the standard definition of job flow rates and not the one suggested by Davis and Haltiwanger (1990, 1992), which divides employment change by the average of employment in periods t and t-1 and is appropriate in treating symmetrically entry and exit.* (p.134)

Hence, gross job creation and job destruction rates defined in this study are as follows:

[3.10] $$JCR_{jt} = \frac{1}{E_{j,t-1}} \sum_{i} (E_{ij,t} - E_{ij,t-1})^{+}$$

[3.11] $$JDR_{jt} = \frac{1}{E_{j,t-1}} \sum_{i} \left| (E_{ij,t} - E_{ij,t-1}) \right|^{-}$$

where *i* and *j* indicate firm and sector, respectively, $(E_{ijt} - E_{ij,t-1})^{+}$ is firm *i*'s positive change in employment, and $\left|(E_{ijt} - E_{ij,t-1})^{-}\right|$ is the absolute of a firm's negative change.

Job creation and destruction are computed as the difference in employment in business units between two years. If, for example, a firm enlarges by 15 employees between 1997 and 1998, then the firm contributes 15 jobs to the 1998 job creation. If another firm contracts by 20 employees over the same time interval, it contributes 20 jobs to the 1998 job destruction.

3.2.2 Other Related Concepts and Measures of Job Flows

Other associated measures in job flows literature are the net employment change, gross job reallocation, and excess job reallocation. Net employment growth in sector *j* at time *t* is defined as the difference between the job creation and job destruction rate:

[3.12] $$NET_{jt} = JCR_{jt} - JDR_{jt}$$

Net employment change is a measure to compare gross job flows with net flows. Davis et al. (1996) accentuate that job creation and destruction figures decompose the net employment change into a component associated with growing firms and a component associated with shrinking firms.

Davis et al. (1996) suggest that a useful way to summarize the heterogeneity in plant/ firm level employment outcomes is to count the number of jobs that either disappear from contracting plants/firms or newly appear at expanding plants/firms. They refer to this job destruction and creation activity as job reallocation "*because it entails the reshuffling of job opportunities across locations*." (p.12) (Gross) job reallocation (or total job turnover) at time *t* is the sum of all plant/firm-level employment gains and losses that take place between *t-1* and *t*. This measure equals the sum of job creation and job destruction (Davis et al., 1996):

[3.13] $$SUM_{jt} = JCR_{jt} + JDR_{jt}$$

An associated measure of labor market churning is excess job reallocation. Bauer and Lee (2007) define excess job reallocation as the amount of job reallocation that goes on above and beyond what would have been necessary to accommodate a given net employment growth. This measure equals the difference between (gross) job reallocation and the absolute value of net employment change (Davis et al., 1996):

[3.14] Excess job reallocation = Gross Job Reallocation Rate - $\left|\right.$Net employment change$\left|\right.$

$$= \text{SUM} - \left|\text{NET}\right|$$

For instance, job creation and destruction rates are 10 percent and 12 percent, respectively. Then, job reallocation rate, 22 percent, is 20 percent in "excess" of what

would have been required to obtain the net employment change of 2 percent (Bauer and Lee, 2007).[26]

This measure is important in the sense that;

> *Gross job reallocation rises with simultaneous job creation and destruction, but-unlike excess job reallocation-it also rises with the absolute value of net employment change. For this reason, excess job reallocation is a more appropriate index of simultaneous creation and destruction than gross job reallocation.* Davis and Haltiwanger (1999, p.2717)

Even when aggregate net employment is unchanged, job reallocation may be very high. However, this measure can provide a misleading indication of job churning when all, or most, of the action is either in creation or in destruction. A better measure in the long run is excess job reallocation (Schuh and Triest, 2000). If, all firms have contracted by 12 percent and that no firm expanded employment then gross would give a job reallocation rate of 12 percent even though no job reallocation occurred.

Furthermore, Davis et al. (1996) and Acquisti and Lehmann (2000), among others, suggest that excess job reallocation can be thought as an index of firm heterogeneity with respect to job creation and destruction in an economy or a given sector. Put differently, it is *"an index of simultaneous job creation and destruction.*" Davis and Haltiwanger (1999, p.2717)

> *Excess job reallocation rate captures the dispersion of firm growth rates around the mean rate of employment change. Importantly, this both reflects differing circumstances facing firms and implies that firms within industries, regions and size classes are not homogeneous, as is traditionally assumed in economics.* (OECD, 1994, p.104)

[26] Davis and Haltiwanger (1992) decompose the excess job reallocation rate into the between and within components. "*One component represents the contribution of reshuffling employment among sectors, and the other component represents the contribution of excess job reallocation within sectors*." (p.847) See Davis and Haltiwanger (1992) for further information.

Faggio and Konings (2001) and Caballero and Hammour (2000) suggest that while the gross job creation rate and the gross job destruction rate measure the flexibility of the labor market, gross job reallocation and, in particular, excess job reallocation can be interpreted also as an index of restructuring.

The last measure used in the job flow analysis is the index of intra-industry job reallocation. To investigate whether job reallocation process reflects sectoral shifts or job reallocations within any sector, the following index of intra-industry job reallocation is constructed (Davis and Haltiwanger, 1992) in period *t*:[27]

$$[3.15] \qquad index_t = 1 - \frac{\sum_j \left| NET_{jt} \right|}{\sum_j SUM_{jt}}$$

where *j* stands for the sector. Index$_t$ is the share of total firm-level job reallocation that is due to job reallocation in excess of net aggregate employment change of the particular sector (See Appendix A1.5). The values of index fall within the interval [0, 1]. The left endpoint represents the cases where all firms within the sector have either net job creation or job destruction; and the right endpoint refers to cases where the net change in job flows of the sector is zero, and therefore every job lost is offset by a job created simultaneously in the same sector (Brülhart, 2000). The index value 0 indicates that job reallocation in an industry is exclusively between-industry and 1 indicates that it is completely within-industry.

[27] This study follows Konings (1995) in the notational use of the formula. See also Konings (1995), Bilsen and Konings (1998), and Brülhart (2000).

3.2.3 Persistence

> *Given substantial and frequent job creation and job destruction, it is important to investigate whether the new jobs persist or whether they are transitory in nature. This might be important for policy reasons. If economic policy focuses on encouraging firms to create jobs, it is important that these newly created jobs are not of short duration, but that the effect is long term.* (Konings, 1995, p.11)

Following Davis et al. (1996), measuring persistence in this study focuses on the persistence of the typical newly created or newly destroyed job rather than on the persistence of the typical existing job or the persistence of firm size.

"The N-period persistence of job creation is the percentage of newly created jobs at time t that remain filled at each subsequent sampling date through time t+N." (Davis et al., 1996, p.21-22)

"The N-period persistence of job destruction is the percentage of newly destroyed jobs at time t that do not reappear at any subsequent sampling date through time t+N." (Davis et al., 1996, p.21-22)

Persistence of job creation (destruction) in period *t* is the fraction of jobs created (destroyed) in period *t* that still exist (not exist) through period *t+k* at the same firms. Davis et al (1996, p.191) provide a counting rule: Let E_{it} denotes employment in firm *i* at time *t.*

i) If $E_{ij,t+k} \geq E_{ij,t,}$ then all of the new jobs at firm *i* in period *t* are said to be present in *t+k.*

ii) If $E_{ij,t+k} \leq E_{ij,t-1}$, then none of the new jobs at firm *i* in period *t* are present in *t+k.*

iii) If $E_{ij,t+k} \in [E_{ij,t-1}, E_{ijt}]$, then $(E_{ij,t+k} - E_{ij,t-1})$ of the new jobs at firm *i* in period *t* are present in *t+k.*

In line with this rule, let $\delta_{ijt}(k)$ be the number of jobs newly created at firm *i* in period *t* that are present in period *t+k*, and let $P^{c}_{ijt}(k)= \min\{ \delta_{ijt}(1), \delta_{ijt}(2),\ldots \delta_{ijt}(k)\}$. To verbalize, $P^{c}_{ijt}(k)$ equals the number of newly created jobs at firm *i* in period *t* that remain present in all periods from *t+1* through *t+k*. Summing $P^{c}_{ijt}(k)$ over all expanding firms at time *t,* and dividing by gross job creation at time *t*, gives the measure of the k-period persistence rate for jobs created at time *t* (Davis and Haltiwanger, 1996):[28]

$$[3.16] \qquad P^{c}_{jt}(k)=\sum_{i\in I_t^{+}} \frac{P^{c}_{ijt}(k)}{C_{jt}}$$

The one-year persistence rate for jobs destroyed is computed in a similar way. By means of corresponding definitions and notation, the k-period persistence rate for job destruction is given by

$$[3.17] \qquad P^{d}_{jt}(k)=\sum_{i\in I_t^{+}} \frac{P^{d}_{ijt}(k)}{D_{jt}}.$$

[28] It is worth reminding that our data differ from the data of Davis and Haltiwanger (1992, 1996) in the sense that ours includes firms rather than establishments and continuing firms only.

4. Gross Job Flows of the Largest Industrial Firms in Turkey (1980-2006)

The top industrial firms play an important role in the Turkish economy. Top 500 companies were made up of 7.7 percent of national income in 1983. This number rose to 12.5 percent in 1988 and became approximately 11 percent in the following 10 years. Their contribution to national income increased to 12.8 percent in 1997, smoothed around 10 percent since 2002, and exceeded 13 percent in 2002, 2003, and 2004 (Ertuna, 2005). The corresponding figure was 13 percent in 2005 and became 13.1 percent in 2006[29]. In 2006, top 1000 industrial firms engendered 14.2 percent of national income in 2006. The contribution of top 1000 industrial firms to the gross value added in Turkish industry is 55.4 percent in 2006. Furthermore, these firms play an important role through their export performance in the Turkish economy. They carry out 43.9 percent of Turkish exports on average. During 1983–2004, exports of these firms increased by 13.5 times (Ertuna, 2005).

As for the employment side, Ertuna (2005) states that since manufacturing industry is capital intensive, the contribution of top 500 industrial firms to employment is relatively smaller than their contribution to exports and national income. As the income level increases, relative number of workers in agriculture and manufacturing industry declines while that number increases in services sector. Industrialization gives rise to more machines and robots with high technology and less labor force. For this reason, Ertuna (2005) argues that the contribution of top 500 industrial firms to employment is not expected to be high. Top 500 firms employed 627 thousand workers in 1983 and 716 thousand workers in 1989. (3.6 percent of total labor force in Turkey)

[29] Please see <http://www1.iso.org.tr/tr/web/statiksayfalar/Meclis_Konusmalari_22-08-07.aspx<> for further information.

The number of employed declined to 530 thousand in 2000 (2.2 percent of total labor force in Turkey). Although Ertuna (2005) argues that this is in part due to increasing outsourcing, he points out that outsourcing cannot be an important reason as the value added of top 500 firms keeps their level in national income. He also emphasizes the role of declining share of public firms in top 500.

This chapter lays out some simple facts about job creation and destruction behavior of the largest private industrial firms by using data for the period of 1980-2006. Examining changes in job creation and destruction rates reveals some intriguing findings on the employment dynamics of these firms. The analyses are presented in relevant cuts of the entire period as well.

The findings show that there are both job creation and job destruction in all phases of the business cycle for the largest private industrial firms. Recessions/crises (booms) are usually times of high (low) job destruction and low (high) job creation. The rates of job creation and job destruction follow a different pattern in the 1980s in comparison to the period 1990-2006. For these firms, the job reallocation process is long-term in nature. In addition, firms are heterogeneous in their employment behavior and there is not a general trend in terms of the cyclicality of their job reallocation.

4.1 Gross Job Flows of the Largest Private Industrial Firms (1980-2006)

4.1.1 Magnitude of Gross Job Flows

Table 4.1 reports gross and net flows of employment per year for the 48 largest Turkish industrial firms over the period 1981-2006.[30] The average annual job creation

[30] It should be noted that firm level data include merely the changes in total firm employment and do not capture within-firm reallocation. This analysis disregards the reallocation of workers between plants

rate is 6.2 percent with a standard deviation of 0.031, while the average annual job destruction rate is 4.3 percent with a corresponding standard deviation of 0.027. The annual average gross job reallocation rate is 10.4 percent and excess job reallocation rate is 6.1 percent.

To fathom how to place these figures in mind, a comparison to some other studies is essential. However, as Goméz-Salvador et al. (2004) point out, an important limitation of the existing empirical studies on job flows is the lack of internationally comparable job flow statistics. Under these circumstances, this study gives place to some of the most analogous studies in the literature. One of these similar studies is Konings (1995) which analyzes the large UK manufacturing firms for the period 1973-1986. He finds a job creation rate of 1.6 percent and job destruction rate of 5.6 percent on average. The U.S. gross job flow rates of large plants (more than 1000 employees) had an average job creation rate of 6 percent and job destruction rate of 7.8 percent between 1972 and 1986 (Davis and Haltiwanger, 1992). Goméz-Salvador et al. (2004) examine job flows in the 1990s for a sample of 13 European countries using a dataset of continuing firms that covers all sectors. Job creation rates vary between 4.4 percent in Germany and 8.6 percent in Spain and job destruction rates from 3 percent in Finland and 4.4 percent in the UK. Job reallocation rate is around 10 percent on average in the EU. While Austria and Germany have lowest job reallocation rates (7.9 percent and 8.1 percent respectively), Spain and Italy have the highest (12.1 percent and 12.3 percent) rates.[31]

Figure 4.1 plots the gross job flows and Figure 4.2 illustrates merely job creation and job destruction rates for all 48 firms over time. What is immediately apparent in

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within one firm. As Konings (1995) and Faggio and Konings (2003), among others, point out, the results for job creation and destruction are likely lower bound to the actual levels of job creation and destruction.

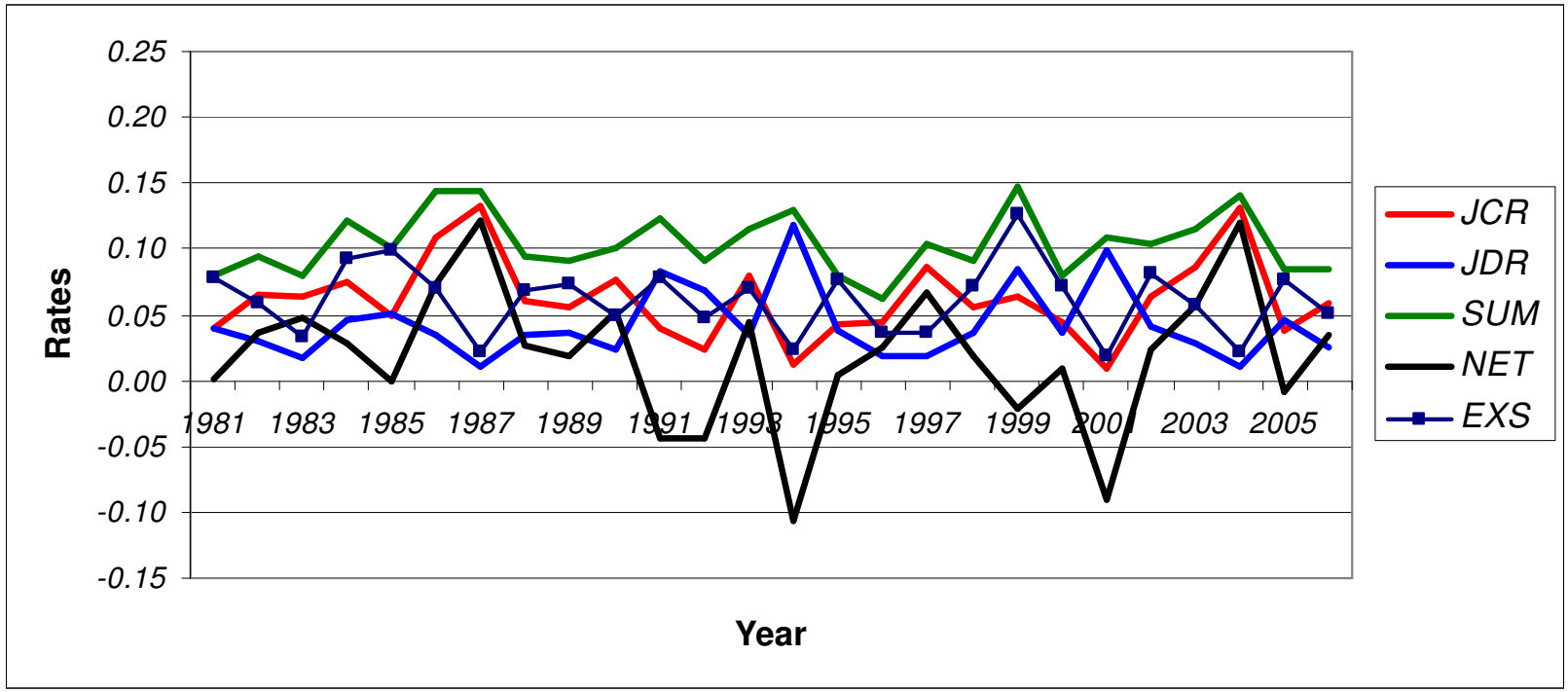
[31] See Appendix 3 for a summary of empirical studies on gross job flows (i.e international comparisons).

Table 4.1 Gross Job Flows of 48 Continuing Private Firms (1980–2006)

Year	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
1981	1779	1729	0.0402	0.0390	0.0792	0.0011	0.0402	0.0781
1982	2897	1296	0.0653	0.0292	0.0946	0.0361	0.0653	0.0585
1983	2928	766	0.0637	0.0167	0.0804	0.0471	0.0637	0.0333
1984	3600	2211	0.0748	0.0460	0.1208	0.0289	0.0748	0.0919
1985	2490	2543	0.0496	0.0507	0.1003	-0.0011	0.0507	0.0992
1986	5454	1760	0.1088	0.0351	0.1439	0.0737	0.1088	0.0702
1987	7172	596	0.1332	0.0111	0.1443	0.1222	0.1332	0.0221
1988	3648	2061	0.0604	0.0341	0.0945	0.0263	0.0604	0.0682
1989	3409	2258	0.0550	0.0364	0.0914	0.0186	0.0550	0.0728
1990	4867	1533	0.0771	0.0243	0.1014	0.0528	0.0771	0.0486
1991	2598	5565	0.0391	0.0837	0.1228	-0.0446	0.0837	0.0782
1992	1513	4308	0.0238	0.0678	0.0916	-0.0440	0.0678	0.0476
1993	4813	2133	0.0793	0.0351	0.1144	0.0441	0.0793	0.0703
1994	743	7454	0.0117	0.1176	0.1293	-0.1059	0.1176	0.0234
1995	2382	2179	0.0420	0.0384	0.0805	0.0036	0.0420	0.0769
1996	2492	1050	0.0438	0.0185	0.0623	0.0253	0.0438	0.0369
1997	4979	1049	0.0854	0.0180	0.1033	0.0674	0.0854	0.0360
1998	3427	2245	0.0553	0.0362	0.0915	0.0191	0.0553	0.0725
1999	3985	5355	0.0631	0.0848	0.1479	-0.0217	0.0848	0.1262
2000	2727	2211	0.0439	0.0356	0.0795	0.0083	0.0439	0.0712
2001	572	6237	0.0091	0.0996	0.1088	-0.0905	0.0996	0.0183
2002	3613	2321	0.0635	0.0408	0.1042	0.0227	0.0635	0.0815
2003	4972	1683	0.0854	0.0289	0.1143	0.0565	0.0854	0.0578
2004	8045	657	0.1308	0.0107	0.1415	0.1201	0.1308	0.0214
2005	2640	3192	0.0383	0.0463	0.0847	-0.0080	0.0463	0.0766
2006	4070	1710	0.0596	0.0250	0.0846	0.0345	0.0596	0.0500
Mean	3531	2769	0.0616	0.0427	0.1043	0.0189	0.0738	0.0611
Standard Deviation	1740	1784	0.0306	0.0271	0.0233	0.0529	0.0266	0.0265

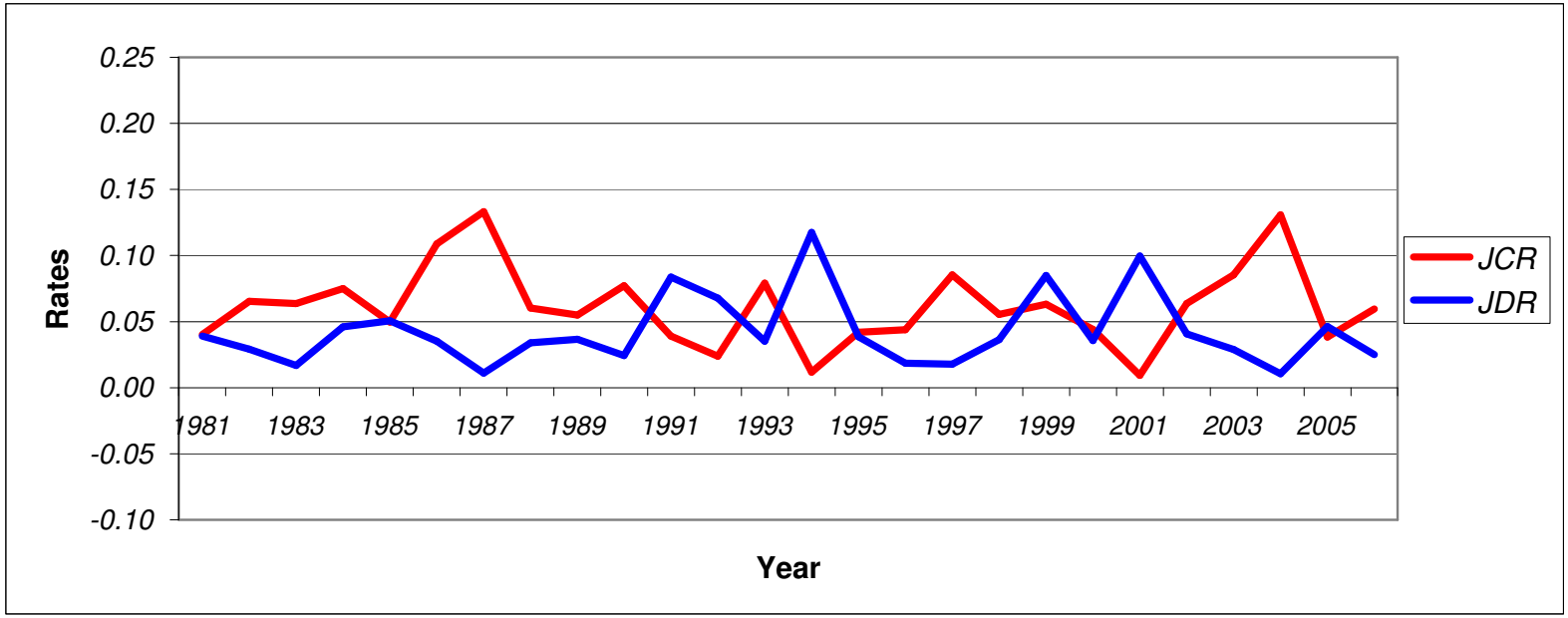
Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Figure 4.1 Gross Job Flows of 48 Continuing Private Firms (1980–2006)



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Figure 4.2 Job Creation and Job Destruction of 48 Continuing Private Firms (1981–2006)



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Figures 4.1 and Figure 4.2 is that increasing (decreasing) job creation is generally accompanied by declining (increasing) job destruction. Rates of job creation and destruction are inversely correlated with a correlation coefficient of -0.68.

A prominent fact is the dominance of job creation rate over job destruction rate until 1991. The only exception to this is the year 1985 in which job destruction rate is very slightly higher than job creation rate. After 1991, these rates pursue a pattern such that sometimes job creation and sometimes job destruction takes over the lead.

In the period 1981-2006, the average rate of job reallocation is 10.4 percent implying that virtually one in ten jobs are either destroyed or created over an average twelve-month interval (See Table 4.1).[32] On one hand, an average excess job reallocation rate of 6.1 percent of employment per year indicates that even during years with unchanged total employment, some fraction of employment opportunities alter locations (Davis et al., 1996).

4.1.2 Cyclicality of Gross Job Flows

Comparing the standard deviation of the job creation rate (0.0306) with the standard deviation of the job destruction rate (0.0271) reveals that there is a small asymmetry between the rates of job creation and job destruction, in which the job creation rate is slightly more variable than the job destruction rate over the period (See Table 4.1). As the variances of job creation and job destruction differ more, the cyclical asymmetry of job creations and destructions amplify. In this case, the magnitude of asymmetry is small due to the tiny difference between variances.

[32] Konings (1995) finds an average gross job reallocation rate of 7.2 percent in his study of large UK manufacturing firms in 1972-1986. The available evidence points to high job reallocation rates in U.S. industry groups. Davis et al. (1996) reports an average job reallocation rate of 20 percent for manufacturing industry in 1973-1988.

As distinct from this result, Davis et al. (1996) and Foote (1998) highlight that a key stylized fact in this literature is that job destruction varies more over time than job creation. Davis and Haltiwanger (1990, 1992) and Davis et al. (1996) find that the correlation between job reallocation and net employment growth is negative for all the relevant cuts of their sample in the period 1973-86, and claim this as evidence in favor of the countercyclical behavior of job reallocation.

> *A major focus of work involving gross job flows is the cyclical correlation between reallocation intensity (as measured by SUM), and aggregate economic activity (as measured by NET). The sign of this correlation is negative if and only if the variance of job destruction is larger than that of job creation.* (Foote, 1998, p.813)

This is because the covariance of SUM_{ij} and NET_{ij} is simply var (JCR_{ij}) - var (JDR_{ij}) (Foote, 1998) (See Appendix A1.2). Since the variance of job creation is greater than that of the job destruction for the period 1980-2006, the correlation between gross job reallocation and net employment growth is found to be a positive number, 0.17.[33] Therefore, gross job reallocation does not exhibit a countercyclical pattern of variation as distinct from many studies in the literature.

Goméz-Salvador et al. (2004) state that;

> *Job creation and destruction are negatively correlated but not perfectly. This implies that, although job creation is clearly pro-cyclical and job destruction is counter-cyclical, the volatility of the two flows over the business cycle may differ. Estimates for the US, Canada, and the UK show that the increase in job destruction during economic downturns tends to be stronger than the increase in job creation during upturns, resulting in counter-cyclical movements in job reallocation. The cyclical behaviour of job reallocation is less clear for countries in Europe, where job reallocation tends to be a-cyclical or slightly pro-cyclical.* (p.9)

[33] But the correlation coefficient is insignificant.

Table 4.2 Cyclical Characteristics of Job Flows of Largest Firms

Correlation between Rates of	Correlation
Job Creation and Net Employment Growth	0.93
Job Destruction and Net Employment Growth	-0.90
Job Reallocation and Net Employment Growth	0.17
Job Creation and Job Destruction	-0.68

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

There are two components in job reallocation: job creation and job destruction. Job creation is pro-cyclical; it declines in recessions. Job destruction is countercyclical; it increases in recessions. Table 4.2 presents time series correlations involving net and gross job flow rates. The table confirms that job destruction is countercyclical (i.e., inversely correlated with net employment change), and that job creation is pro-cyclical i.e., positively correlated with net employment change). Table 4.2 also documents that job reallocation is not countercyclical. This observation restates that variability of job creation exceeds that of job destruction. Therefore, though not strong, there exists an asymmetric behavior of job creation and job destruction in the period 1981-2006.

To clarify the underlying reasons for asymmetry, there exist some arguments in the literature. In models like Mortensen and Pissarides (1994), in which each firm has one job, the asymmetric behavior of job creation and job destruction is explained in terms of search theory. A negative shock causes immediate dismissals; on the other hand, after a positive shock, job creation will take time because of search effort. Contini and Revelli (1997) stress that another explanation of the asymmetry between job creation and job destruction is related with adjustment costs: Firing costs are fixed whilst hiring costs are variable. "*Thus, firms create new jobs following positive demand*

shocks, and focus on layoffs when negative shocks exceed a threshold, which is a function of the fixed firing cost." (Contini and Revelli, 1997, p.254)

Contini and Revelli (1997) state that;

> *The story behind the asymmetry of job creations and destructions has led a number of macro-oriented, business cycle scholars to conjecture 'the cleansing effect of recessions' (Blanchard and Diamond (1990), Caballero and Hammour (1991)).*
>
> *We suspect that industrial economists would have a simple intuitive explanation of the cleansing hypothesis, which we find also -- perhaps in somewhat different words -- in Steindl (1945): in good times the pie is large, and there is room for all firms to eat from it. When bad times hit, the name of the game for large incumbents is labor-saving reorganization (it has been so at least since the first oil crisis). Thus all strive to stay afloat, restructuring sets in, natural selection becomes tighter with many firms going bankrupt and others gaining market share at the expense of the former. Hence the distribution of growth rates spreads out, many jobs are destroyed in big chunks, some (fewer) are created.* (Contini and Revelli, 1997, p.254)

Table 4.1, Figure 4.1, and Figure 4.2 show that, recessions (booms) are times of high (low) job destruction and low (high) job creation. The only exception to this is the year 1999 in which both job creation and job destruction rise.[34] However, the net employment growth was negative (-2.2 percent) in 1999.

4.1.3 Labor Flexibility

Haltiwanger and Vodopivec (2002) deem a labor market to be flexible in the case of simultaneous contraction and expansion of firms. In parallel to Haltiwanger and Vodopivec (2002), Faggio and Konings (2003) suggest that one measure of labor market flexibility is the rate of gross job reallocation. Faggio and Konings (2003) state

[34] The economic growth rate was recorded as -6.4 percent in Turkey in 1999.

that, "*in a flexible labor market, workers can move and jobs can be easily created/destroyed to meet new economic conditions*." (p.1)

In this study, job reallocation rate ranges between 6.2 percent in 1996 and 14.8 percent in 1999, with an overall average of 10.4 percent. The highest labor market flexibility occurred in 1999, with 14.8 percent (See Table 4.1). It is again worth noting that an accurate comparison with other studies is not possible because of the differences in the definition of "large" firms, sectoral coverage, and sampling interval. Nevertheless, the job reallocation rate is not high as in the case for the large firms in Davis and Haltiwanger (1992).[35]

Excess job reallocation rate has its highest value in the year of 1999. The year of 1999 has the highest job reallocation rate and excess job reallocation rate, with a job creation rate of 6.3 percent and a job destruction rate of 8.5 percent. In addition, 1985 figures (5 percent of JCR and 5 percent of JDR) stand out with their concurrent job creation and job destruction rates.

Davis and Haltiwanger (1999) stress that excess job reallocation is a more appropriate index of simultaneous creation and destruction than gross job reallocation because gross job reallocation rises with simultaneous job creation and destruction, but it also increases with the absolute value of net employment change. For example, gross job reallocation rates are 14.4 percent and 14 percent in 1987 and 2004, respectively; however, there is considerable difference between the rates of job creation and job

[35] In their study of transition countries in the period 1993-1997, Faggio and Konings (2003) find that gross job reallocation rates for Poland, Bulgaria, and Slovenia fluctuate around 9 percent, for Estonia it is somewhat higher, on average 16 percent and for Romania its average is around 12 percent. Konings (1995) finds an annual average gross job reallocation rate of 7.2 percent for the large UK manufacturing firms in the period 1973-1986. In Davis and Haltiwanger (1992), U.S. manufacturing sector (1972-1986) has job reallocation rates ranging from 17.3 percent in 1980 to 23.3 percent in 1975. In their analysis, as the firms gets larger (in terms of number of employees), job reallocation rate declines from 30 percent to 13.8 percent.

destruction (See Table 4.1). Therefore, excess job reallocation is proved to be the indicator of simultaneous job creation and job destruction.

As Broersma and Gautier (1997b) emphasize, the absolute value of net employment change can be interpreted as the minimally required amount of job reallocation. If all firms were homogeneous, job reallocation would be equal to the net employment change. Therefore, excess job reallocation shows the importance of simultaneous job creation and destruction, in other words, the heterogeneity, within a particular sector. A non-zero value of excess job reallocation rate signifies that firms are not homogenous (Broersma and Gautier, 1997b).[36]

For the largest continuing firms in this study, average excess job reallocation is found to be 6.1 percent. This simple fact shows the flexibility in the distribution of job opportunities of the largest firms across locations. Furthermore, simultaneous job creation and job destruction signifies heterogeneous firm behavior concerning employment decisions.[37]

Davis and Haltiwanger (1999) and Haltiwanger (2000) put forward some explanations for cross-sectional heterogeneity in plant-level and firm-level employment adjustments.[38] One possible reason for the heterogeneity in firm-level outcomes is the "*considerable uncertainty that surrounds the development, adoption, distribution, marketing, and regulation of new products and production techniques*." (Haltiwanger, 2000, p.5) Another likely explanation is that disparities in entrepreneurial and managerial ability give rise to differences in job and productivity growth rates among firms. "*These*

[36] Broersma and Gautier (1997b) find an excess job reallocation rate of 5.8 percent for continuing Dutch manufacturing firms in the period 1979-1993. If they also include entries and exits, excess job reallocation rate equals 13.4 percent. They suggest that this relatively high value shows that there is tremendous heterogeneity among firms in the manufacturing sector.
[37] Konings (1995) comes up with a similar result in his analysis of large continuing UK manufacturing firms.
[38] See Davis and Haltiwanger (1999) for theories of heterogeneity.

differences include the abilities to identify and develop new products, to organize production activity, to motivate workers and to adapt to changing circumstances." (Haltiwanger, 2000, p.6) Other reasons that drive heterogeneity in job growth outcomes stem from firm specific conditions and disturbances. Energy costs, labor costs, and timing of changes in factor costs differ across locations. Cost differences lead to different employment and investment decisions among otherwise similar firms (Haltiwanger, 2000).

> *These decisions, in turn, influence the size and type of labor force and capital stock that a business carries into the future. Thus, current differences in cost and demand conditions induce contemporaneous heterogeneity in firm-level job and productivity growth, and they also cause businesses to differentiate themselves in ways that lead to heterogeneous responses to common shocks in the future.* (Haltiwanger, 2000, p.6)

Besides, slow diffusion of information about technology, distribution channels, marketing strategies, and consumer tastes can be accounted for other sources of firm-level heterogeneity in productivity and job growth (Davis and Haltiwanger, 1999; Haltiwanger, 2000).

4.1.4 Persistence

It is necessary to scrutinize whether the new jobs persist or whether they are temporary. It is important to view this persistence measure as an indicator of the persistence of job opportunities. Table 4.3 reports the one-year persistence rates for annual job creation ($FJCR_{t1}$) and job destruction ($FJDR_{t1}$) for the period 1981-2005 and Figure 6.3 plots the corresponding persistence measures. The average one-year persistence rate in job creation is 80 percent, while in job destruction the rate is 73 percent. This indicates that the majority of new jobs last for more than one year, but

also the majority of destroyed jobs will not be recreated after one year. The results also reveal that job creation is more likely to persist than job destruction for one year. In other words, the typical newly created job represents a more persistent firm-level employment change than does the typical newly destroyed job. This signals the asymmetric nature of gross job flows. The figures indicate that the job reallocation process is long-term in nature for the largest private industrial firms in Turkey.

These results are similar to those reported in Davis and Haltiwanger (1992) for the US and Konings (1995) for the UK in the way that the majority of new jobs last for more than one year and also the majority of destroyed jobs will not be recreated after one year. Davis and Haltiwanger (1992) compute an average one-year persistence rate of job creation of 67 percent and of job destruction of 81 percent. The one-year average persistence rates for job creation and job destruction in Konings (1995) are 62 percent and 81 percent, respectively. The common point in these papers is that the persistence in job destruction is higher than the persistence in job creation.[39]

Table 4.3 One-Year Persistence Rates of the Largest 48 Continuing Private Firms (1981–2005)

Year	$FJCR_{t1}$	$FJDR_{t1}$
1981	0.82	0.80
1982	0.96	0.77
1983	0.83	0.95
1984	0.81	0.73
1985	0.69	0.13
1986	0.98	0.26
1987	0.80	0.53
1988	0.72	0.71
1989	0.91	0.85
1990	0.81	0.93
1991	0.57	0.85
1992	0.94	0.74
1993	0.33	0.89

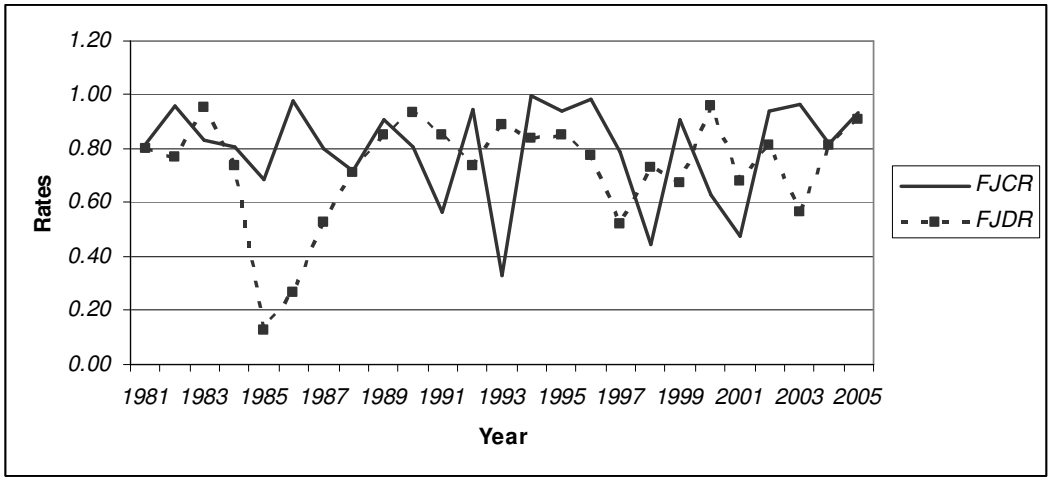
[39] Davis and Haltiwanger (1992) is a study on large plants (more than 1,000 employees) and Konings (1995) analyzes job creation and destruction of the largest continuing UK manufacturing firms.

Year	$FJCR_{t1}$	$FJDR_{t1}$
1994	1.00	0.84
1995	0.94	0.85
1996	0.98	0.77
1997	0.79	0.52
1998	0.45	0.73
1999	0.91	0.67
2000	0.63	0.96
2001	0.48	0.68
2002	0.94	0.81
2003	0.96	0.57
2004	0.82	0.81
2005	0.94	0.91
Mean	0.80	0.73
Std	0.18	0.20

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

However, a high persistence in job creation and job destruction does not necessarily imply low worker turnover. For example, in one year, a firm hires five people, the next year it fires them all and hires six more. The subsequent year it fires six and hires seven more, and so on. The measure of persistence signifies that the job opportunities are highly persistent in this firm, while the people occupying these jobs are transient.

Figure 4.3 One-Year Persistence Rates of the Largest 48 Continuing Private Firms (1981–2005)



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

The persistence rate denotes the survival rate for new jobs. It is used to underline the symmetry between the treatment of newly created and newly destroyed jobs. The survival rate is utilized while comparing the survival properties of new jobs with those of existing jobs. In the annual data, eight in ten newly created jobs survive for at least for one year, and nearly seven in ten newly destroyed jobs fail to recreated one-year later (Davis et al., 1996). It is possible to compare the persistence properties of newly created and existing jobs. Table 4.1 reports an average job destruction rate of about 4.3 percent during the period 1981-2005, which is equivalent to saying that about 95.7 percent of jobs survive at least for one year on average. In comparison, Table 4.3 reports that about 80 percent of newly created jobs survive at least one year. Consequently, newly created jobs offer lower one-year survival rates than do all existing jobs.

An interesting pattern emerges in the data on time variation in persistence rates. Table 4.3 and Figure 4.3 evince that the persistence rate of job creation decreases and persistence rate of job destruction increases one year before of the recessionary years of 1991, 1994, 1999, and 2001.[40] On the other hand, we cannot say that jobs created during a recession are less likely to survive than jobs created during an expansion. For instance, while persistence rate of job creation is low in 1991 and 2001, the corresponding rate is pretty high in 1994 and 1999. This also indicates the differing nature and effects of the non-expansionary periods on these firms.

Persistency in job creation and job destruction indicates the economy's ability to provide long-term job opportunities. Under the assumption of stationarity, the average duration of a job opportunity is the inverse of the job destruction rate (Konings, 1995). Given the average job destruction rate of 4.3 percent, the average job duration is

[40] GDP growth rates were 0.3 percent in 1991, -6.1 percent in 1994, -6.4 percent in 1999, and -9.4 in 2001 in Turkey.

computed as 23 years for the largest 48 industrial firms during the period 1980-2006. In comparison, Davis and Haltiwanger (1992) find that the average rate of job destruction for large U.S. manufacturing plants (more than 1,000 employees) is 7.8 percent and this implies average job duration of 13 years. The average rate of job destruction for their entire sample is 9.98 percent, which means an average job duration of 10 years. Konings (1995) finds the average job duration as 18 years, given an average job destruction rate of 5.6 percent (Konings, 1995).

In sum, i) one-year survival rate for existing jobs is about 95.7 percent; ii) newly created jobs show a smaller one-year survival rate- about 80 percent; iii) about 73 percent of newly destroyed jobs fail to reappear at the same location one year later. According to the Table 6.3, the average persistence rate for job creation exceeds that of job destruction in the period 1981-2005. That is, the annual job creation and destruction figures basically reflect persistent firm-level employment changes. Thus, with Davis et al. (1996)'s saying, new jobs are not risky in the sense that, with relatively high probability, they survive beyond one year. Destructed jobs reflect persistent firm-level employment movements in the sense that, with high probability, these jobs are not likely to reopen within one-year.

4.2 Gross Job Flows of the Largest Private Industrial Firms for the Subperiods

4.2.1 1980-1989 Period

The analyses of gross and net flows of employment for the largest private industrial firms are performed by using the employment figures of 95 continuing firms

in the period 1981-1989. The findings reveal that job creation rate averages 6.4 percent per year with a standard deviation of 0.018, while job destruction rate is 3.1 percent with a corresponding standard deviation of 0.012. The annual average gross job reallocation rate is 9.5 percent and excess job reallocation rate is 5.7 percent. These relative magnitudes reflect the continuing increase in employment over this period with the exception of the year 1981 (See Table A4.1 in Appendix 4).

In line with the results of 1980-1989 in Table 4.1, Table A4.1 and Figure A4.1 in Appendix 4 show that rising (declining) job creation is usually accompanied by declining (rising) job destruction. The correlation coefficient between the rates of job creation and destruction is -0.88. The negative relationship between job creation and job destruction rates is stronger compared to the corresponding correlation for the largest continuing 48 firms in the period 1981-2006.

Jobs are simultaneously created and destroyed over the business cycle. This implies heterogeneous firm behavior concerning employment decisions. Excess job reallocation rate has its highest values in 1985 and 1989, thereby indicating the maximum concurrent job creation and destruction in the period. These years are also the years in which labor flexibility is at the highest amount. Job reallocation rate ranges between 8.2 percent in 1988 and 10.9 percent in 1987, with an overall average of 9.5 percent. Labor market flexibility does not change much during the period as both job reallocation and excess job reallocation have the lowest standard deviations of all sub-periods (0.010 and 0.016, respectively) (See Table A4.1 in Appendix 4).

Comparing the standard deviation of the job creation rate (0.019) with that of the job destruction rate (0.012) reveals that there is an asymmetry between the job creation

and job destruction rate. The job creation rate is slightly more variable than the job destruction rate over the period.[41]

Job creation is pro-cyclical and job destruction is countercyclical in this period. Because the variance of job creation is greater than that of the job destruction, the correlation between gross job reallocation and net employment growth is found to be a positive number, 0.74. Computing the significance of correlation coefficient between job reallocation and net employment growth for all periods, reveals that the only the positive and significant correlation coefficient belongs to the period 1980-1989.[42] In this time interval, gross job reallocation exhibits a pro-cyclical pattern of variation.

Job creation and destruction rates follow a pattern such that job creation rate always dominates job destruction rate, with only exception in the year 1981. After 1981, the largest industrial firms show a pretty good performance in the 1980s. In 1987, net employment growth has its maximum value with the rate of 8.5 percent (See Table A4.1 and Figure A4.1 in Appendix 4).

The average one-year persistence rate of job creation ($FJCR_{t1}$) is 84 percent, whilst in job destruction the rate ($FJDR_{t1}$) is 59 percent (See Table A4.2 in Appendix 4). These rates signal that the greater part of new jobs is not transient in one year and also the majority of destroyed jobs fail to reappear one year later. The average job destruction rate of 3.1 percent implies that the average duration of a job opportunity is 32 years in the period of 1980-1989. This is the highest duration compared to other

[41] For example, Boeri (1996) states that the case of Italy is symmetric based on scale effects, which tend to magnify the time variation of JCR relative to JDR, thereby inducing a positive correlation between SUM and NET. On the other hand, similar study to this one, Konings (1995) suggests that from comparing the standard deviation of the job creation rate, 0.008, with the standard deviation of the job destruction rate, 0.035, he concludes that there is a strong asymmetry between the job creation and job destruction rate, in which the job destruction rate is more variable than the job creation rate over the business cycle.

[42] Correlation coefficient for the period 1980-1989 is significant at 5 percent level.

periods in the analysis. Besides, an important point is that the persistence in job creation is pretty higher than the persistence in job destruction.

4.2.2 1989-1996 Period

The gross and net flow statistics for the largest private industrial firms are computed by utilizing the employment figures of 252 continuing firms in the period 1989-1996 (See Table A4.3 in Appendix 4). The results show that job creation rate averages 5 percent per year with a standard deviation of 0.016, while job destruction rate is 6.5 percent with a corresponding standard deviation of 0.027. The annual average gross job reallocation rate is 11.5 percent and excess job reallocation rate is 8 percent. In this period, job destruction rates are higher than the rates of job creation until the year of 1995. That is, net employment growth is negative until 1995. Therefore, the rates of job creation and job destruction follow a different pattern from the continuing firms during the period 1980-1989.

Rising (diminishing) job creation typically comes along with diminishing (rising) job destruction. The correlation coefficient between the rates of job creation and destruction is -0.89 (See Figure A4.2 in Appendix 4).

There exist simultaneous job creation and job destruction over the business cycle, therefore indicating heterogeneous firm behavior. Excess job reallocation rate has its highest values in 1990 and 1993. Maximum concurrent job creation and destruction, hence, labor flexibility, take place in these years. The continuing firms in this period have more labor flexibility compared to the continuing firms in 1980-1989.

Opposing to the continuing firms in the period 1980-1989, this combination of firms in this interval exhibit a higher variability in job destruction than that of job creation as their standard deviations indicate (See Table A4.3 in Appendix 4). Higher

variance of job destruction than that of the job creation, results in negative correlation between gross job reallocation and net employment growth (-0.75).[43] In this time interval, gross job reallocation displays a countercyclical pattern of variation

The average one-year persistence rate in job creation ($FJCR_{t1}$) is 69 percent, whilst in job destruction the rate ($FJDR_{t1}$) is 83 percent (See Table A4.4 in Appendix 4). These rates show that the larger amount of newly created jobs is not transitory in one year and also the greater parts of destroyed jobs do not reappear after one year. The average job destruction rate of 6.5 percent in this period implies that the average duration of a job opportunity is 15 years in the period of 1989-1996. It is an outstanding fact that the persistence rate of job destruction exceeds that of job creation in this period. This is a sign of asymmetry between job creation and job destruction.

4.2.3 1996-2006 Period

The analyses of gross and net flows of employment for the largest private industrial firms are performed by using the employment figures of 316 continuing firms in the period 1996-2006 (See Table A4.5 in Appendix 4). The findings evince that job creation rate averages 7.5 percent per year with a standard deviation of 0.022, while the rate of average job destruction is 4.6 percent with a corresponding standard deviation of 0.019. The annual average gross job reallocation rate is 12.1 percent and excess job reallocation rate is 8 percent (See Table A4.5 in Appendix 4). In this period, job destruction dominates job creation merely in 1999 and in 2001.[44] It is striking fact that rising (declining) job creation generally goes with declining (rising) job destruction (See

[43] This is the only negative and significant correlation coefficient in the sub-periods of 1980-2006.

[44] In 1999, job creation rate declines and job destruction rate increases. It is worth noting that the 48 continuing firms during the period 1980-2006, both job creation and job destruction rates increase.

Figure A4.3 in Appendix 4). The correlation coefficient between the rates of job creation and destruction is -0.83.

Jobs are simultaneously created and destroyed over the business cycle. This implies heterogeneous firm behavior regarding employment decisions. Excess job reallocation rate has its highest values in 1999 and 2002, thereby indicating the maximum concurrent job creation and destruction in the period. These years are also the years in which labor flexibility is at maximum (See Table A4.5 in Appendix 4).

The fact that the variance of job creation is greater than that of the job destruction results in a positive correlation between gross job reallocation and net employment growth (0.24). However, the correlation coefficient is insignificant.

The average one-year persistence rate in job creation ($FJCR_{t1}$) is 80 percent, while in job destruction the rate($FJDR_{t1}$) is 75 percent (Stable A4.6 in Appendix 4). These rates signal that the majority of new jobs survive at least one year and also the greater part of destroyed jobs will not be recreated after one year. It is a prominent finding that the persistence rate of job creation exceeds that of job destruction in this period. The average duration of a job opportunity is 22 years in the period of 1989-2006. An important point is that the typical newly created job represents a more persistent firm-level employment change than does the typical newly destroyed job, thereby signaling the asymmetric nature of gross job flows.

4.2.4 1980-1996 Period

In order to make a comparison between 1980-1989 and 1989-1996, the analyses are done for the 76 continuing firms during the period 1980-1996. Table A4.7 and Figure A4.4 in Appendix 4 show gross and net flows of employment for the largest

industrial private firms over the period 1980-1989 and Table A4.8 and Figure A4.5 demonstrate the related findings for 1989-1996. Table A4.9 and Figure A4.6 combine the results for 1980-1996.

As the results illustrate, the rates of job creation and job destruction average 6.8 percent and 3.1 percent, respectively, during 1980-1989. In the period 1989-1996, average job creation declines abruptly to 4.1 percent and average job destruction goes up to 6.1 percent. These severe changes signal that the performance of these firms in 1980s outperformed their performance in 1990-1996 in terms of net employment growth. This result is compatible with the findings of the analyses performed in Section 4.2.1 and 4.2.2. For the entire period of 1980-1996, the rate of average job creation is computed as 5.6 percent, while job destruction rate averages 4.4 percent. Overall, net employment growth is positive.

Rising (declining) job creation typically goes with (rising) job destruction in this period. The correlation coefficients between the rates of job creation and destruction are -0.74 and -0.70 for the periods 1980-1989 and 1990-1996, correspondingly. The coefficient becomes -0.75 for the period 1980-1996.

There is simultaneous job creation and job destruction over the business cycle. This implies heterogeneity in the employment decisions of these firms. Average excess job reallocation rate rises from 5.2 percent in 1980-1989 to 6.5 percent in 1990-1996, thus signifying some amount of increase in labor flexibility.

The correlation coefficients between gross job reallocation and net employment growth are 0.59 (significant) in 1980-1989, -0.60 (insignificant) in 1990-1996 and -0.17 (insignificant) in 1980-1996. Thus, job reallocation exhibits a pro-cyclical pattern in the period 1980-1989.

Table A4.10, A4.11, and A4.12 in Appendix 4 report the one-year persistence rates of job creation ($FJCR_{t1}$) and job destruction ($FJDR_{t1}$) for the periods 1981-1989, 1990-1995, and 1981-1995. The findings suggest that average persistency of job creation, which was 0.85 in 1981-1989, declined to 0.72 in the period 1990-1996, whilst the average persistency of job destruction increased from 0.63 to 0.86. Contrary to the 1981-1989, the persistence rate of job creation stays below that of job destruction in 1990-1996. The average durations of a job opportunity are 38, 16, and 22 years for the periods 1981-1989, 1990-1996, and 1981-1996, respectively. Hence, the existence of a downtrend in 1990-1996, in comparison with 1980-1989 is easily discernable. Nevertheless, these rates signal that the greater part of new jobs is not transitory in one year and also the majority of destroyed jobs will not be reconstituted after one year.

4.2.5 1989-2006 Period

This section utilizes data for 151 continuing firms during 1989-2006 to provide opportunity for comparing 1989-1996 and 1997-2006 periods. Table A4.13 and Figure A4.7 in Appendix 4 show the analysis of gross and net flows of employment for the largest industrial private firms over the period 1990-1996 and Table A4.14 and Figure A4.8 demonstrate the corresponding findings for 1996-2006. Table A4.15 and Figure A4.9 incorporate the results for 1990-2006.

In the period 1990-1996, job creation rate averages 5.2 percent per year, while the rate of average job destruction is 6.3 percent. In the period 1997-2006, average job creation goes up to 6.8 percent and average job destruction goes down to 4.5 percent. There exists a relative recovery in terms of creating net employment when the two

periods are compared. For the entire period of 1990-2006, the rate of average job creation is 6.1 percent, while job destruction rate averages 5.3 percent.

The findings also disclose that increasing (declining) job creation generally accompanied with declining (increasing) job destruction. The correlation coefficients between the rates of job creation and destruction are -0.80 and -0.62 for 1980-1989 and 1990-1996, respectively. Thus, negative relation between job creation and job destruction weakens in 1996-2006. The coefficient is realized as -0.71 for 1980-1996.

Jobs are concurrently created and destroyed over the business cycle, thereby implying heterogeneous firm behavior regarding employment decisions. Average excess job reallocation rates are quite close in 1980-1989 (7.9 percent) and in 1990-1996 (7.8 percent). Therefore, labor flexibility roughly stayed the same.

The correlation between gross job reallocation and net employment growth -0.59 (insignificant) in 1990-1996, 0.28 (insignificant) in 1997-2006 and -0.008 (insignificant) in 1990-2006. Hence, job reallocation does not exhibit a countercyclical or pro-cyclical variation in these periods.

Table A4.16, A4.17, and A4.18 in Appendix 4 report the one-year persistence rates of job creation ($FJCR_{t1}$) and job destruction ($FJDR_{t1}$) for 1990-1995, 1996-2005, and 1990-2005. The findings indicate that average persistency of job creation, which was 0.72 in 1990-1995, increased to 0.82 in the period 1996-2005, whilst the average persistency of job destruction decreased from 0.84 to 0.77. Nevertheless, these rates indicate that the greater part of new jobs is not transient in one year and also the majority of destroyed jobs will not be recreated after one year. The average durations of a job opportunity are 16, 22 and 19 years for the periods 1990-1996, 1997-2006, and 1990-2006, respectively.

4.2.6 Gross Job Flows of the Largest Private Industrial Firms that Continue in Successive Two-years (1981-2006)

This section analyzes the gross job flows of the largest private industrial firms that continue in consecutive two-years.[45] The results help elucidating the employment dynamics of the firms, which at least took place twice in the list of the largest industrial firms in Turkey between 1980 and 2006. It is important to keep in mind that the firms in this analysis include the 48 continuing firms during 1980-2006. Because those 48 continuing firms are the firms that achieved to stay in ISO's ranking list during 1980-2006, they can be enunciated as the most successful of the all-largest firms ever took place in ISO's ranking list during that period.

The findings reveal that throughout 1981-2006, job creation rate averages 7.7 percent per year, while job destruction rate is 5.6 percent on average (See Table A4.19, Figure A4.10, and Figure A4.11 in Appendix 4). To remind, 48 continuing firms during 1981-2006 in Section 4.1 had a job creation rate of 6.2 percent and job destruction rate of 4.3 percent on average (See Table 4.1). As is seen, the rates of job creation and job destruction are lower for the most successful (48 continuing) firms compared to the largest private industrial firms that continue in consecutive two-years.

The annual average gross job reallocation rate is 13.3 percent and excess job reallocation rate is 9.1 percent in this period. 48 continuing firms had 10.4 percent of job reallocation and 6.1 percent of excess job reallocation. The two-year successive continuing firms have relatively higher rates of gross job allocation and excess job reallocation than that of the 48 continuing firms in the period 1980-2006. Therefore, the most successful 48 continuing firms during 1980-2006 firms are less heterogeneous and

[45] For example, for the analyses of the year 1981, the employment figures of the firms that exist in ISO's data in 1980 and in 1981; for the analyses of 1982, the employment figures of the firms that exist in ISO's data in 1981 and in and 1982, and so on, are used.

less flexible in terms of reshuffling jobs. Furthermore, this signifies that the two-year successive continuing firms experienced more restructuring in this period.

As is the case in the other analyses of these firms, rising (declining) job creation is typically accompanied by declining (rising) job destruction. The correlation coefficients between the rates of job creation and destruction are found to be -0.65. The correlation between gross job reallocation and net employment growth is -0.11, but insignificant. Therefore, job reallocation does not exhibit either a countercyclical or a pro-cyclical pattern.

Finally, comparing standard deviations of job creation and job destruction rates displays that the most successful 48 continuing firms during 1980-2006 have more volatile job creation and job destruction rates than those of two-year successive continuing firms (See Table A4.19 in Appendix 4 and Table 4.1).

4.3 Conclusions and Policy Implications

Having presented the statistical portrait, some implications can be developed for economic policy and, more generally, with Davis et al. (1996)'s saying, to illustrate how the measurement and analysis of job flows inform our thinking about the economy. To this end, this section recapitulates the findings of employment dynamics of the largest industrial firms in Turkey and draws some policy implications.

4.3.1 Job Creation and Job Destruction over the Business Cycle

There exist both job creation and job destruction in all phases of the business cycle. The behavior of gross job flows during the business cycle provides an indication of the employment dynamics.

The rates of job creation and job destruction follow a different pattern in the period 1981-1990 compared to the rest of the entire period. An almost similar pattern to 1980s is observed between the years of 2002 and 2004. While job creation always dominates the job destruction until 1991, from that moment on job destruction takes over in some years. The highest net employment growth was experienced in 1987.[46] In the years of crises and/or recessions, such as in 1991, 1994, and 2001 when the economic growth is negative or close to zero, these firms suffer from an abrupt increase in job destruction rates and decline in job creation rates. However, the recessionary year 1999 is exceptional in that job creation rate goes up in this year, as is revealed in the analysis in Section 4.1 and 4.2.5.[47] The job flow dynamics suggests that there exists restructuring in the year 1999.[48]

The year 1991 is characterized by high job destruction rates and low job creation rates. The lowest job creation rate realized during the period is 1 percent, which occurred in 2001. The year 1994 has the second lowest job creation rate of 1.2 percent. The economic crisis in 2001, resulted in -9.4 percent of GDP growth in the Turkish economy, seems to have affected the largest industrial firms deeply. Furthermore, a prominent finding is the higher job destruction rate (11.8 percent) in 1994 compared to that of the year 2001 figure (10 percent). Having hit the bottom in 2001 crisis, rising rates of job creation in the following years signals a recovering period. However, a sharp decline in job creation occurs from 13 percent to 4 percent after 2004. The maximum rate of average job destruction is realized during the period 1989-1996 with the rate of 6.5 percent. 1996-2006 is the period that the rate of average job creation is the highest (7.5 percent).

[46] This fact is clear in both the analyses of continuing firms in the periods 1981-1996 and 1981-2006.
[47] Section 4.1 examines the period 1980-2006 and Section 4.2.5 analyzes 1989-2006.
[48] Nonetheless, according to the analysis of the largest private industrial firms that continue in successive two-years, the rates of both job creation and job destruction decrease in 1999 (See Section 4.2.6)

Job creation and job destruction coexist in both recessions and booms. Recessions (booms) are typically times of high (low) job destruction and low (high) job creation. As expected in the literature, the correlation between the rates of job creation and job destruction is negative and significant for all periods.

4.3.2 Persistence of Job Creation and Job Destruction

One-year persistence rates of job creation and job destruction are pretty high for all periods. The highest persistence rate for job creation and the lowest persistence rate of job destruction are realized in the period 1981-1989 with the rates of 0.84 and 0.60, respectively. The comparison of persistence rates for the periods 1981-1989 and 1990-1996 in Section 4.2.4 reveals the analogous finding that the period 1981-1989 has relatively lower persistence rate of job destruction and higher persistence rate of job creation.

The persistence results show that i) the persistence in job creation is high, ii) the persistence in job destruction is high, and iii) the persistence in job creation is higher than the persistence in job destruction (See Table 4.3). In brief, the figures indicate that the job reallocation process is long-term in nature for the largest industrial firms in Turkey.

Konings (1995) argue that if economic policy concentrates on encouraging the firms to create jobs, it is of importance that these newly created jobs be not of short duration, but that the effect is long term. Having considered the finding that these large firms have high rates of persistence for job creation, it can be inferred that the economic policy focusing on encouraging these firms to create jobs would be in point. On the other hand, one-year persistence rate for job destruction is also high for these firms. Created jobs persist but destroyed jobs persist not to be recreated as well. It is also

worth noting that in recessionary times, there is not a common trend of persistence rates.

4.3.3 Labor Flexibility and Heterogeneity

The overall picture shows that these largest firms are heterogeneous in their employment behavior. Its degree varies in subperiods, however. The greatest heterogeneity and labor flexibility are observed in the period 1989-2006.

Job creation and job destruction are large compared to the net changes in employment for these largest firms. Job reallocation seems to be the highest in the period 1996-2006, while net employment growth rate has its uppermost value in the period 1981-1989. Faggio and Konings (2001), among others, suggest that gross job reallocation rate measure the flexibility of the labor market, in particular, excess job reallocation can be interpreted as an index of restructuring. The findings show that the highest excess job reallocation occurred in the period 1989-1996. Comparing the excess job reallocation figures of 1989-1996 with those of 1997-2006 by using the same set of continuing firms, reveals those excess job reallocation rates are 7.9 and 7.8, respectively. Therefore, it can be said that 1989-2006 period is a restructuring period for these firms.

The rate of excess job reallocation is relatively lower in the period 1980-1989. Turkish economy adopted an outward-oriented development strategy in the 1980s after the import substitution years. During 1981-1989, Turkish manufacturing industry had positive growth rates. The largest private firms in the Turkish manufacturing industry also experienced positive rates of net employment growth in this period. They had a pattern with high job creation and low job destruction. After 1980s, some recessionary

and crisis years hit the economy and thus the largest firms as well, as is revealed in the analysis. Heterogeneity and labor flexibility increased.[49]

4.3.4 Cyclicality of Gross Job Flows

One of the important findings in this chapter is that there is not a common trend in terms of the cyclicality of job reallocation. Job reallocation is pro-cyclical in the period 1981-1989, whilst it is countercyclical in 1990-1996. Job turnover does not have a clear cyclical pattern in the periods 1997-2006 and 1980-2006.[50]

Job flow statistics also have remarkable implications for the study of macroeconomics. It is certainly intuitive enough to have more (less) job creation and less (more) job destruction during economic expansion (recession). However, a much more controversial issue is related with the cyclicality of job reallocation (Joseph et al., 2004). Messina and Vallanti (2006) highlight that while all studies report a pro-cyclical movement of job creation and a counter-cyclical movement of job destruction, the volatility of these two flows over the business cycle differs across countries.

Job creation rates exhibit greater cyclical variation than job destruction rates in the 1980s. A higher variability of job creation over the business cycle results in a pro-cyclical movement of job reallocation in the 1980s. Stiglbauer et al. (2002) suggest that the pro-cyclicality of job reallocation may stem from high firing costs that obstruct destruction of jobs. They stress that the process of job destruction takes more time, is more costly, and thereby spreads out over more periods culminating in a lower volatility of job destruction rates. Moreover, Messina and Valanti (2006) emphasize that when firing is costly and time-consuming, the asymmetry in the cyclical pattern of job

[49] See the possible reasons for heterogeneity in Section 4.1.
[50] The correlation coefficients between net employment growth and gross job reallocation are insignificant for these time intervals.

creation and job destruction disappears, as job destruction becomes less responsive to the cycle. Joseph et al. (2004) point out that unemployment benefits and in particular, wage rigidities have a positive effect on the job reallocation pro-cyclicality. Their results suggest that the direction and size of the effects of employment protection on job flow dynamics depends on the degree of wage rigidity.

> *With high wage rigidities, firing costs have a negative impact on the relative job destruction rate volatility (with respect to the job creation rate volatility) and increase the pro-cyclicality of the job turnover rate.* (Joseph et al., 2004, p.453)

Job destruction rates exhibit greater cyclical variation than job creation rates in the period 1990-1996. Recessions are characterized by an increase in job destruction, accompanied by a relatively mild slowdown in job creation, thereby culminating in countercyclical behavior of job turnover.

> *This finding has led to several theories of business cycle dynamics that emphasize the 'cleansing' effects of recessions, during which costly reallocation activities can be concentrated when the value of foregone production is low.* (Pivetz et al., 2001, p.10)

As Ilmakunnas and Maliranta (2003) underline, the subject of countercyclicality of job reallocation induces the theoretical research to attempt to elucidate it.[51] Some studies examine the existence of the phenomenon, particularly in Europe.[52] However, more information is required about different countries and industries, and cyclical conditions (Ilmakunnas and Maliranta, 2003).

Given the symmetry between job creation and job destruction over the business cycle, it is expected that there is no clear cyclicality in job reallocation rate. The

[51] See Ilmakunnas and Maliranta (2003) for further information.
[52] See, for instance, Boeri (1996).

findings suggest that the there exists symmetry between job creation and job destruction in the period 1997-2006, whereas they are asymmetric in 1981-1989 and 1990-1996. The existence of symmetry is contrary to the theories of higher turbulence in recessions reviewed in Davis et al. (1996).[53] The structure of the existing asymmetry differs, though. Job destruction is more volatile than job creation in 1990-1996, while it is the reverse in 1981-1989. This resulted in countercyclical variation in job reallocation in the period 1990-1996 and pro-cyclicality in job reallocation in the period 1981-1989.

These different patterns of job reallocation in different time periods entail that macroeconomic models of the business cycle vary. The job flows data should help economists, policymakers, and the business community developing a more comprehensive perception of business cycles (Pivetz et al., 2001).

As Ilmakunnas and Maliranta (2003) argue, the research on gross job flows has left many open questions.

> *The literature shows that the measurement of the flows is very sensitive to the properties of the data…Since the solutions adopted for these issues vary greatly across countries, international comparisons are difficult and have to be treated with caution. It is easier to examine industries over time or to make comparisons across industries within one country*. (Ilmakunnas and Maliranta, 2003, p.1)

Therefore, for this study as well, an accurate comparison with other studies is not possible because of the disparities in the definition of large firms, sectoral coverage, and sampling interval.

The largest industrial firms have a direct effect on the growth and employment level of the Turkish manufacturing industry along with an indirect influence on the performance of the firms from which they purchase intermediate goods (i.e. outsourcing). Their demand for intermediate goods from domestic subcontractor firms

[53] Stiglbauer et al. (2003) attains a similar result for the case of Austria.

gives rise to increasing production of the subcontractor firms, thereby in turn, contributing to their employment level. If, economic circumstances (e.g. a low exchange rate, high production cost) induce these firms to import the intermediate goods from foreign firms, subcontractor domestic firms would be affected inversely. The opposite scenario is likely as well.

Therefore, to analyze and to fathom the largest industrial firms in terms of many dimensions including the aspect of job flows would be useful to deduce some policy implications. These, in turn would help enhancing the competition in the Turkish industry. Therefore, the findings summarized in this chapter would be expected to serve as basis information in applying policies targeting these largest industrial firms.

5. Gross Job Flows of the Largest Public Industrial Firms (1980-2006)

This chapter documents some simple facts about job flows of the largest public industrial firms by utilizing data for the period 1980-2006. Examining changes in job creation and destruction rates reveals the employment dynamics of these firms. The analyses are presented for the periods 1981-1989, 1990-1996, 1997-2006, and 1981-2006. [54]

The findings show that the largest public firms exhibit different employment dynamics from the largest private firms analyzed in Chapter 4. Although they have some findings in common, overall results indicate that the firm-type (public or private) makes difference in the pattern of job flows. The recessionary years are not reflected in the job flow statistics of the largest public firms. They exhibit different patterns of job creation and job destruction during 1981-2001.

5.1 1980-1989 Period

The gross job flow measures for 20 continuing public firms during 1980-1989 are provided in Table 5.1 and Figure 5.1. The Figure clearly demonstrates that increasing (decreasing) job creation generally comes along with declining (increasing) job destruction. They are negatively correlated with a correlation coefficient of -0.84.

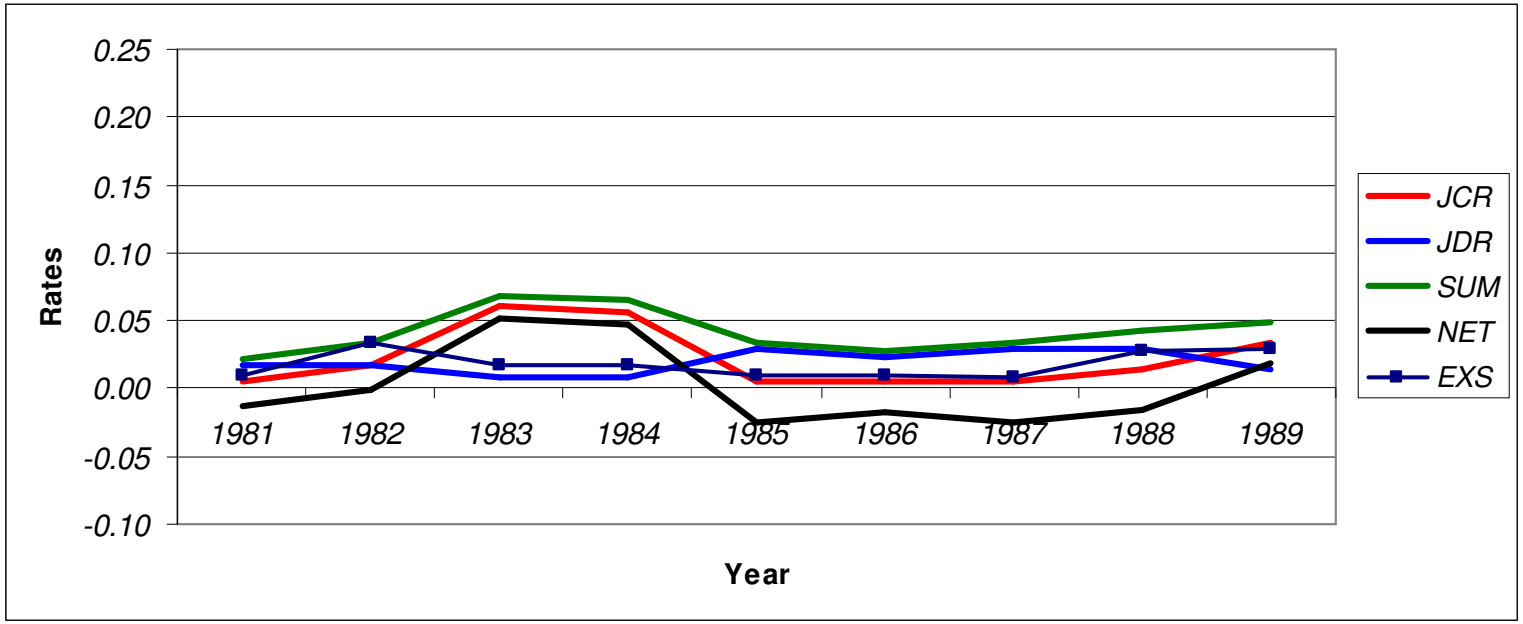
[54] See Appendix A2.5 for the average and total annual employment levels of these firms.

Table 5.1 Gross Job Flows of the 20 Largest Public Industrial Firms (1981–1989)

Year	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
1981	282	1116	0.0045	0.0178	0.0222	-0.0133	0.0178	0.0090
1982	1025	1035	0.0165	0.0167	0.0332	-0.0002	0.0167	0.0330
1983	3730	511	0.0601	0.0082	0.0684	0.0519	0.0601	0.0165
1984	3698	578	0.0567	0.0089	0.0655	0.0478	0.0567	0.0177
1985	338	2001	0.0049	0.0293	0.0342	-0.0243	0.0293	0.0099
1986	341	1502	0.0051	0.0225	0.0276	-0.0174	0.0225	0.0102
1987	290	1934	0.0044	0.0295	0.0339	-0.0251	0.0295	0.0088
1988	873	1858	0.0137	0.0291	0.0427	-0.0154	0.0291	0.0273
1989	2097	923	0.0333	0.0147	0.0480	0.0187	0.0333	0.0293
Mean	1408	1273	0.0221	0.0196	0.0418	0.0025	0.0328	0.0180
Standard Deviation	1429	573	0.0226	0.0084	0.0161	0.0300	0.0156	0.0096

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Figure 5.1 Gross Job Flows of the 20 Largest Public Industrial Firms (1981–1989)



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Job creation is pro-cyclical and job destruction is countercyclical.[55] Job creation exceeds job destruction only in the years of 1983, 1984, and 1989.

Job creation rate averages 2.2 percent per year with a standard deviation of 0.023, while the average job destruction rate is 2 percent with a corresponding standard deviation of 0.008. Both rates are quite lower than those of private firms.[56] These measures point to nearly no change in the employment level of the largest public firms in this period.

In this period, the variance of job creation is greater than that of the job destruction as in the case of private firms. Hence, the correlation between gross job reallocation and net employment growth is found to be a (significant) positive number; 0.90. Recessions are characterized by a decrease in job creation, accompanied by a relatively mild increase in job destruction. This correlation coefficient is much higher than that of private firms, thus implying that the pro-cyclicality of job reallocation is stronger for public firms in this period.

The annual average gross job reallocation rate is 4.2 percent and excess job reallocation rate is 1.8 percent. Pretty low rate of job reallocation indicates that public firms do not have heterogeneous firm behavior concerning employment decisions as much as private firms. Accordingly, labor flexibility is very low.

Table 5.2 reports the one-year persistence rates of job creation ($FJCR_{t1}$) and job destruction ($FJDR_{t1}$). The average one-year persistence rate of job creation is 80 percent, while in job destruction the rate is 75 percent. These rates signal that the greater part of new jobs is not temporary in one year and also the majority of destroyed jobs

[55] The (significant) correlation coefficients between job destruction and net employment growth, and job creation and net employment growth are -0.91, 0.98, respectively.
[56] The average rates of job creation and job destruction were 6.4 percent and 3.1 percent for the continuing private firms in the period 1981-1989 (See Section 4.1.1).

will not be recreated after one year. The average job destruction rate of 2 percent implies that the average duration of a job opportunity is 50 years in the period of 1980-1989.

Table 5.2 One-Year Persistence Rates 20 Continuing Public Firms (1981-1988)

Year	$FJCR_{t1}$	$FJDR_{t1}$
1981	0.68	0.58
1982	0.96	0.62
1983	0.93	0.40
1984	0.70	0.92
1985	1.00	0.99
1986	0.94	1.00
1987	0.22	0.64
1988	1.00	0.86
Mean	0.80	0.75
Std Deviation	0.27	0.22

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

5.2 1990-1996 Period

For the period of 1990-1996, the job flow statistics for 32 largest continuing public firms are reported in Table 5.3 and Figure 5.2. The results of the analyses show that the rates of job creation and destruction are inversely linked with a correlation coefficient of -0.46, but the coefficient is insignificant.

Job creation rate averages 1.8 percent per year with a standard deviation of 0.024. In comparison to the rate in the period 1981-1989, the continuing public firms have lower job creation rate during 1990-1996. This period witnesses a high job

destruction rate of 8.1 percent on average with a standard deviation of 0.048. Job creation is pro-cyclical and job destruction is countercyclical.[57]

For these public firms, job creation rate is higher than job destruction rate only in 1991. In this period, the year 1991 is the most successful year for public firms in terms of net employment growth, whereas private firms have the lowest net employment growth rate in 1991.[58] The gross job flows of the largest public firms do not seem to be affected much by the course of the economy as much as private firms do. Having considered that the firms are exposed to same aggregate disturbances, this finding also signifies that the firm type (public or private) has a great importance on employment dynamics. Although the largest public firms have negative net employment growth rate (-6.5 percent) in the year of 1994 crisis, they have lower net employment growth rates in other years, such as in 1993 (-11.6 percent).[59]

In this period, the volatility of job destruction is greater than that of the job creation as in the case of private firms. As a result, the correlation between gross job reallocation and net employment growth is found to be a negative number; -0.65. However, the coefficient is insignificant.

The annual average gross job reallocation rate is 10 percent and excess job reallocation rate is 2.8 percent. The higher rate of job reallocation compared to the 1981-1989 period, signals that public firms have heterogeneous firm behavior in this period. In line with this, labor flexibility is higher than that of the continuing public firms in the period 1981-1989.

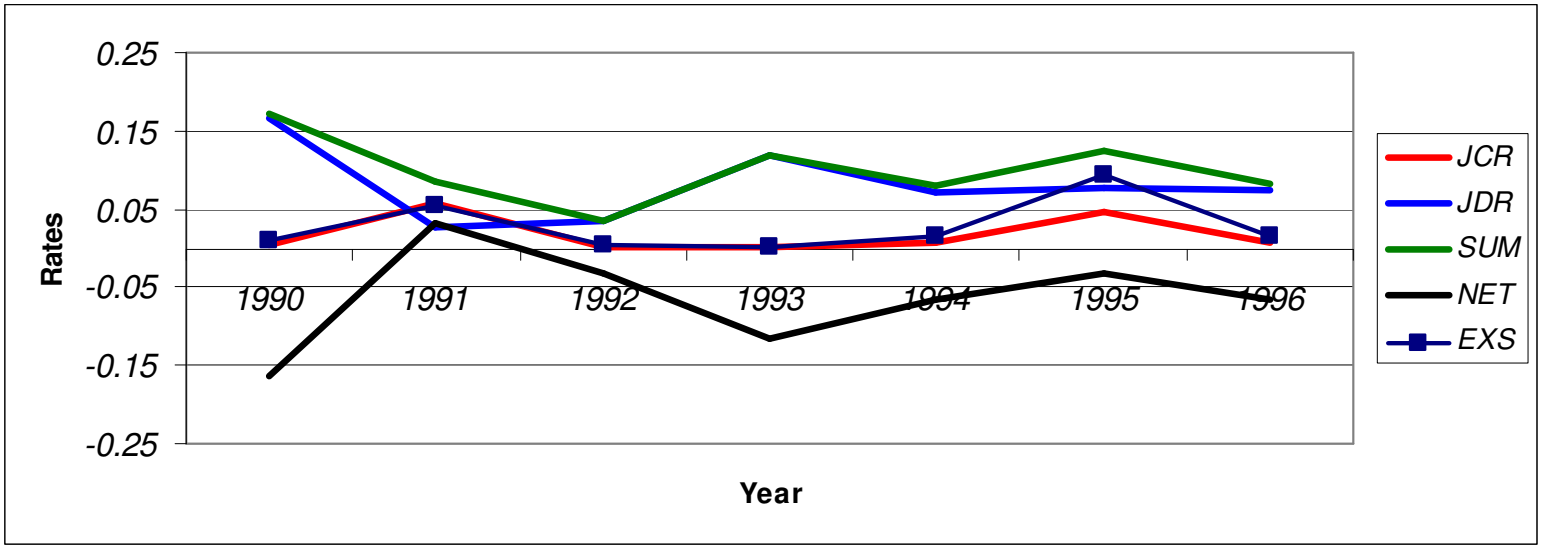
[57] The (significant) correlation coefficients between job destruction and net employment growth, and job creation and net employment growth are -0.94 and 0.73, respectively.
[58] See Section 4.2.2 for the analysis of private firms.
[59] In Turkey, GDP growth rate was 8.1 percent in 1993.

Table 5.3 Gross Job Flows of the 32 Largest Public Industrial Firms (1990–1996)

Year	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
1990	867	34106	0.0042	0.1668	0.1710	-0.1625	0.1668	0.0085
1991	10020	4571	0.0585	0.0267	0.0852	0.0318	0.0585	0.0534
1992	336	6079	0.0019	0.0344	0.0363	-0.0325	0.0344	0.0038
1993	164	20074	0.0010	0.1174	0.1184	-0.1164	0.1174	0.0019
1994	1175	10916	0.0078	0.0723	0.0800	-0.0645	0.0723	0.0156
1995	6659	11010	0.0471	0.0779	0.1250	-0.0308	0.0779	0.0942
1996	1111	10140	0.0081	0.0740	0.0821	-0.0659	0.0740	0.0162
Mean	2905	13842	0.0184	0.0813	0.0997	-0.0630	0.0859	0.0277
Standard Deviation	3856	10214	0.0239	0.0482	0.0428	0.0629	0.0434	0.0341

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Figure 5.2 Gross Job Flows of the 32 Largest Public Industrial Firms (1990-1996)



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table 5.4 One-Year Persistence Rates 32 Continuing Public Firms (1990-1995)

Year	$FJCR_{t1}$	$FJDR_{t1}$
1990	0.08	0.71
1991	0.92	1.00
1992	0.00	0.99
1993	0.00	0.95
1994	0.55	0.92
1995	0.78	0.98
Mean	0.39	0.93
Std Deviation	0.41	0.11

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table 5.4 illustrates the one-year persistence rates of job creation ($FJCR_{t1}$) and job destruction ($FJDR_{t1}$). The average one-year persistence rate of job creation is 39 percent, whilst in job destruction the rate is 93 percent. These rates articulate that the greater part of new jobs is temporary in one year and the majority of destroyed jobs will not be recreated after one year. It is apparent that the persistence rate for job creation is very low along with a rising persistence rate of job destruction. Furthermore, the average job destruction rate of 8.1 percent implies that the average duration of a job opportunity is 12 years in the period 1990-1996.

5.3 1997-2006 Period

Table 5.5 and Figure 5.3 demonstrate the job flow statistics for the largest 10 continuing firms in the period 1997-2006. Job creation rate averages 1.8 percent per year with a standard deviation of 0.016, while the average job destruction rate is 5.6 percent with a standard deviation of 0.029. Compared to the corresponding rates of the largest private firms in this period, public firms have lower rate of job creation and higher rate of job destruction rates.[60] The relation between job creation and job destruction does not exhibit a clear pattern[61]

Table 5.5 demonstrates that the annual average gross job reallocation rate is 7.4 percent. The continuing public firms in this period display a more heterogeneous behavior and labor flexibility than 1981-1989. The highest rate of excess job reallocation is realized in

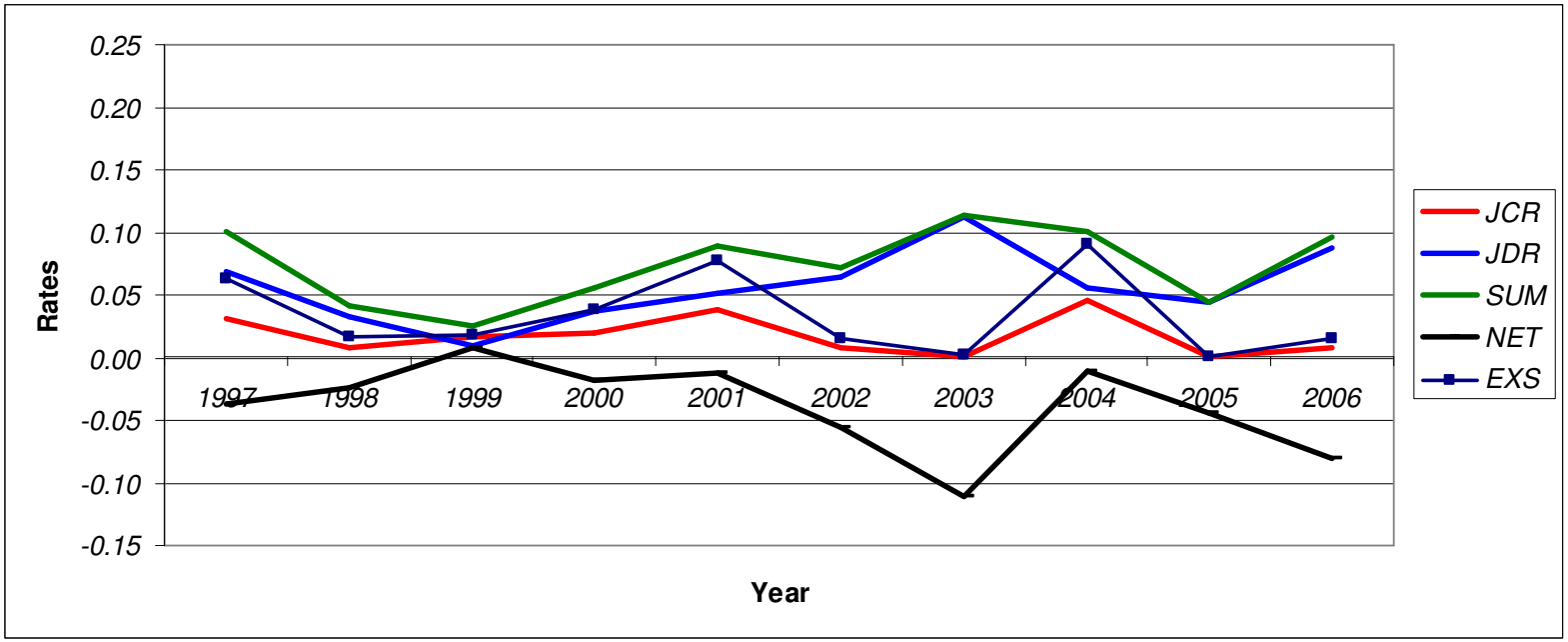
[60] The average rates of job creation and job destruction were 7.5 percent and 4.6 percent for private firms in the period 1997-2006.
[61] The correlation coefficient between the rates of job creation and job destruction is -0.19 and insignificant.

Table 5.5 Gross Job Flows of the 10 Largest Public Industrial Firms (1997–2006)

Year	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
1997	1513	3312	0.0314	0.0688	0.1002	-0.0374	0.0688	0.0629
1998	392	1499	0.0085	0.0323	0.0408	-0.0239	0.0323	0.0169
1999	758	398	0.0168	0.0088	0.0256	0.0080	0.0168	0.0176
2000	884	1685	0.0194	0.0370	0.0563	-0.0176	0.0370	0.0388
2001	1722	2290	0.0384	0.0511	0.0896	-0.0127	0.0511	0.0769
2002	338	2829	0.0076	0.0640	0.0716	-0.0563	0.0640	0.0153
2003	53	4672	0.0013	0.1119	0.1132	-0.1107	0.1119	0.0025
2004	1685	2080	0.0454	0.0560	0.1014	-0.0106	0.0560	0.0908
2005	0	1609	0.0000	0.0438	0.0438	-0.0438	0.0438	0.0000
2006	263	3097	0.0075	0.0882	0.0957	-0.0807	0.0882	0.0150
Mean	761	2347	0.0176	0.0562	0.0738	-0.0386	0.0570	0.0337
Standard Deviation	667	1188	0.0159	0.0293	0.0305	0.0359	0.0279	0.0322

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Figure 5.3 Gross Job Flows of the 10 Largest Public Industrial Firms (1997-2006)



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table 5.6 One-Year Persistence Rates 10 Continuing Public Firms (1997-2005)

Year	$FJCR_{t1}$	$FJDR_{t1}$
1997	0.85	1.00
1998	1.00	0.89
1999	0.37	0.40
2000	0.96	1.00
2001	0.44	1.00
2002	0.00[a]	1.00
2003	0.57	0.69
2004	0.51	1.00
2005	0.00	0.84
Mean	0.52	0.87
Std	0.37	0.21

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

a) There is no job creation in 2002.

this period (3.4 percent).

Job creation is pro-cyclical and job destruction is countercyclical.[62] Since the variance of job destruction is greater than that of the job creation, the correlation between gross job reallocation and net employment growth is a negative number; -0.55. This significant negative relationship means that job reallocation is countercyclical.

Table 5.2 reports the one-year persistence rates of job creation ($FJCR_{t1}$) and job destruction ($FJDR_{t1}$). The average one-year persistence rate of job creation is 52 percent, whilst in job destruction the rate is 87 percent. These rates signal that the almost half of the newly created jobs is not transient in one year and also the greater part of destroyed jobs will not reappear after one year. The average job destruction rate of 5.6 percent implies that the average duration of a job opportunity is 17 years in the period 1997-2006.

5.4 Gross Job Flows of the Largest Public Industrial Firms that Continue in Successive Two-years (1981-2006)

This section analyzes the gross job flows of the largest public industrial firms that continue in consecutive two-years.[63] The results help clarifying the employment dynamics of the public firms, which at least took place twice (but consecutively) in the list of the largest industrial firms in Turkey between 1980 and 2006.

[62] The (significant) correlation coefficients between job destruction and net employment growth, and job creation and net employment growth are -0.90 and 0.60, respectively.

[63] For example, for the analyses of the year 1981, the employment figures of the firms that exist in ISO's data in 1980 and in 1981; for the analyses of 1982, the employment figures of the firms that exist in ISO's data in 1981 and in and 1982, and so on, are utilized.

Table 5.7 and Figure 5.4 depict the job flow statistics of these public firms. Job creation rate averages 2.3 percent per year while the average rate of job destruction is 5.6 percent in 1981-2006. Thus, the average net employment growth is negative over the period. There is a significant inverse correlation between the rates of job creation and job destruction with a correlation coefficient of -0.42. The annual average gross job reallocation rate is 7.9 percent and the rate of excess job reallocation averages 3.5 percent in this period.

The Figure 5.5, which illustrates the rates of job creation and job destruction only, makes clear that there is a nested structure of job creation and job destruction until 1992. This structure disappears after that year leaving its place to a picture that job destruction dominates job creation during the period 1992-2006. Indeed, excluding the year 1991, it can be said that the job destruction rate exceeds job creation rate in the period 1990-2006. As a matter of fact, Figure 5.4 evinces three different patterns over 1981-2006. These periods are 1981-1991, 1992-2000, and 2001-2006. 1981-1991 is a period in which the rates of job creation and job destruction have a nested structure. The common point in the periods 1992-2000 and 2001-2006 is the dominance of job destruction over job creation. However, the average rate of job destruction moves to a higher level in the period 2001-2006.[64] Besides, the average rate of job creation declines in this period in comparison to its rate in 1991-2000.[65]

Redoing the analysis with this combination of largest public firms reveals that

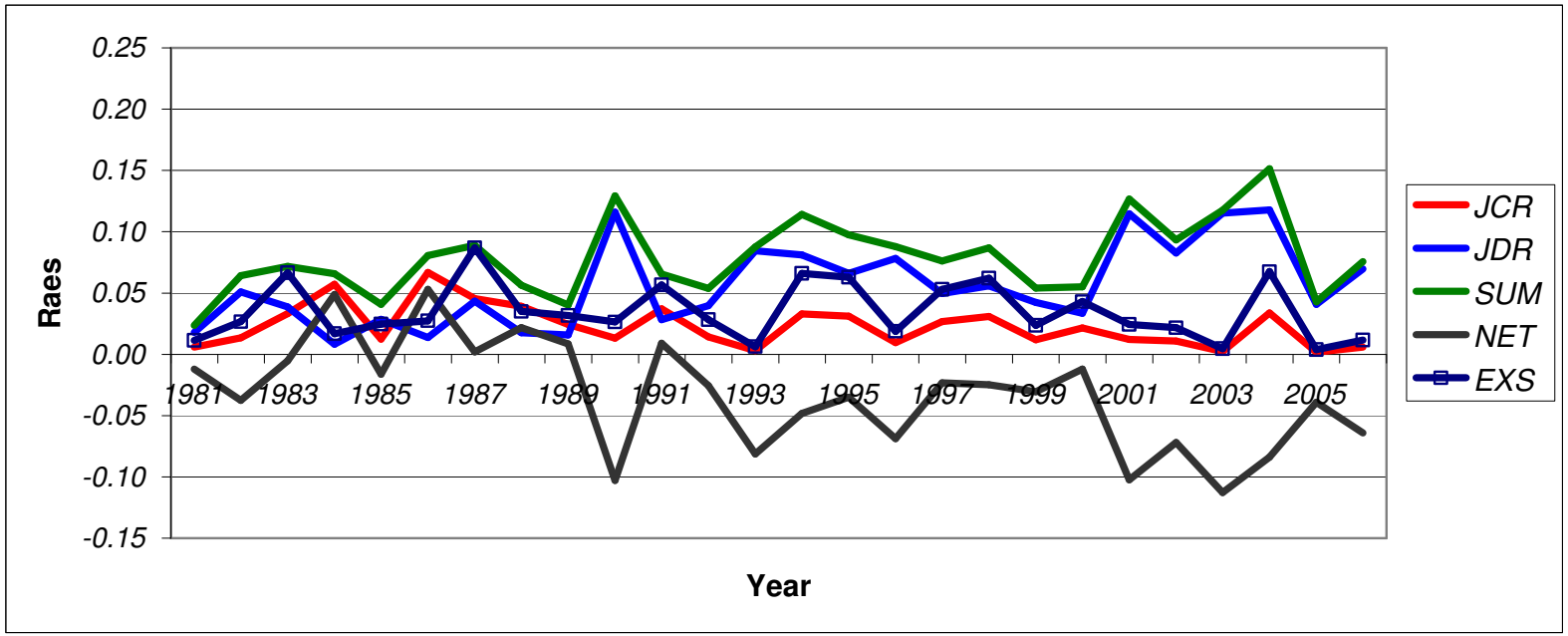
[64] The average rate of job destruction is 5.9 percent in the period 1992-2000, whereas it is 9 percent on average in the period 2001-2006.
[65] The average rate of job destruction is 2 percent in the period 1992-2000, whereas it is 1.1 percent on average in the period 2001-2006.

Table 5.7 Gross Job Flows of the Largest Public Industrial Firms that Continue in Successive Two-years (1981-2006)

Year	Number of continuing firms	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
1981	49	1287	4000	0.0058	0.0179	0.0236	-0.0121	0.0179	0.0115
1982	54	3167	12120	0.0133	0.0509	0.0642	-0.0376	0.0509	0.0266
1983	54	7151	8294	0.0332	0.0385	0.0717	-0.0053	0.0385	0.0664
1984	59	11070	1614	0.0573	0.0084	0.0657	0.0490	0.0573	0.0167
1985	66	3105	7170	0.0124	0.0286	0.0409	-0.0162	0.0286	0.0247
1986	69	19843	4047	0.0668	0.0136	0.0804	0.0532	0.0668	0.0272
1987	75	14596	13942	0.0454	0.0434	0.0888	0.0020	0.0454	0.0868
1988	70	12274	5477	0.0391	0.0174	0.0565	0.0216	0.0391	0.0349
1989	68	8117	5260	0.0244	0.0158	0.0402	0.0086	0.0244	0.0316
1990	69	4299	37918	0.0132	0.1160	0.1292	-0.1029	0.1160	0.0263
1991	101	11950	9083	0.0373	0.0283	0.0656	0.0089	0.0373	0.0566
1992	91	4775	13445	0.0141	0.0397	0.0538	-0.0256	0.0397	0.0282
1993	81	1029	27185	0.0032	0.0844	0.0876	-0.0812	0.0844	0.0064
1994	75	7551	18569	0.0331	0.0813	0.1144	-0.0483	0.0813	0.0661
1995	74	7596	16015	0.0314	0.0662	0.0975	-0.0348	0.0662	0.0628
1996	60	2067	17136	0.0094	0.0783	0.0877	-0.0689	0.0783	0.0189
1997	56	5001	9344	0.0265	0.0496	0.0761	-0.0230	0.0496	0.0530
1998	57	6298	11306	0.0311	0.0558	0.0869	-0.0247	0.0558	0.0622
1999	52	1946	6969	0.0118	0.0422	0.0540	-0.0304	0.0422	0.0236
2000	50	4056	6339	0.0215	0.0336	0.0551	-0.0121	0.0336	0.0430
2001	42	2046	19185	0.0122	0.1147	0.1269	-0.1024	0.1147	0.0245
2002	37	1484	11325	0.0108	0.0827	0.0935	-0.0718	0.0827	0.0217
2003	31	225	11293	0.0023	0.1152	0.1175	-0.1129	0.1152	0.0046
2004	25	3876	13531	0.0337	0.1177	0.1514	-0.0840	0.1177	0.0674
2005	20	145	3114	0.0019	0.0408	0.0427	-0.0389	0.0408	0.0038
2006	15	359	4293	0.0058	0.0698	0.0756	-0.0639	0.0698	0.0117
Mean	58	5589	11461	0.0230	0.0558	0.0788	-0.0328	0.0613	0.0349
Standard Deviation	21	4967	8033	0.0171	0.0342	0.0310	0.0443	0.0298	0.0230

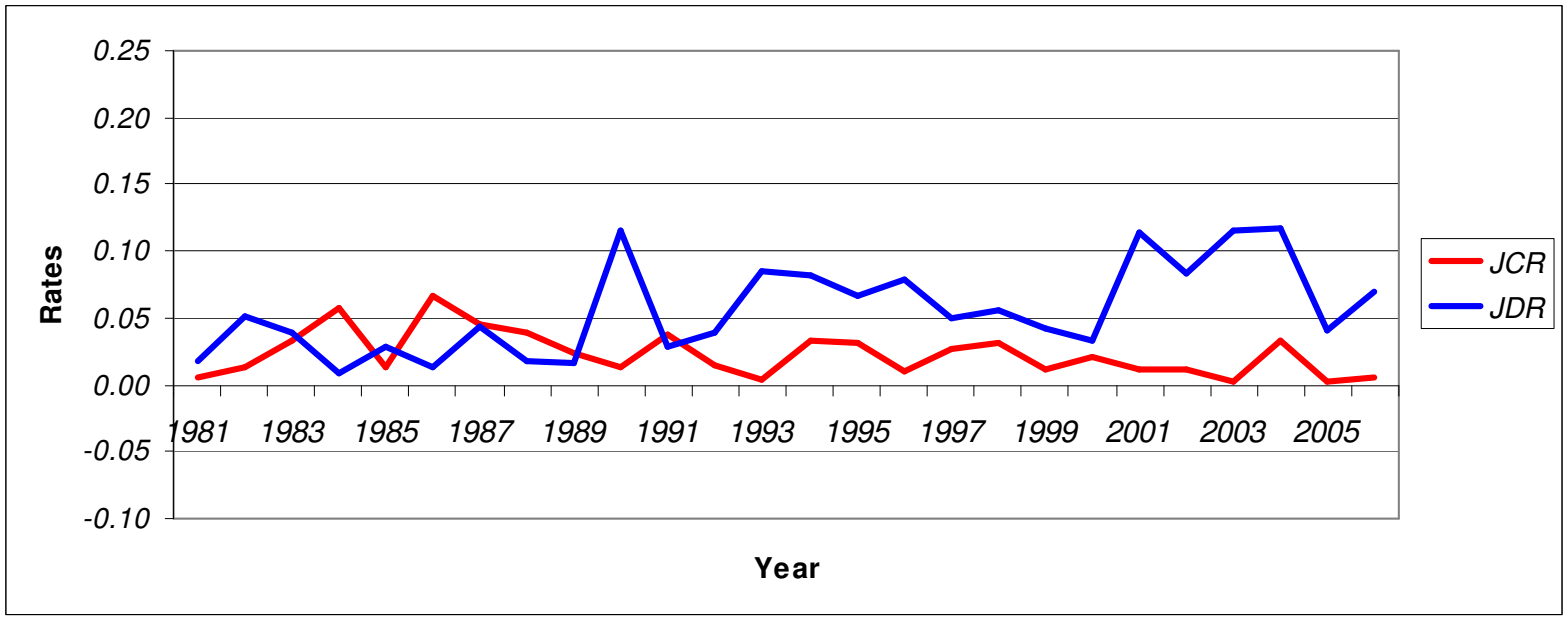
Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Figure 5.4 Gross Job Flows of the Largest Public Industrial Firms that continue in successive two-years (1981-2006)



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Figure 5.5 Gross Job Flows of the Largest Public Industrial Firms that Continue in Successive Two-years (1981-2006)



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

job creation is pro-cyclical and job destruction is countercyclical.[66] This result is in line with those found in previous sections in this chapter. Furthermore, the negative significant correlation between job reallocation and net employment (-0.64) evinces that job reallocation exhibits a countercyclical variation. This also means that job destruction is more volatile than job creation as Table 5.7 reveals.

It is worth noting that one-year persistence rates cannot be computed for this section, as we need the employment figures of continuing firms for three consecutive years but we have data for two consecutive years.

5.5 Concluding Remarks

This chapter revealed some basic facts about the employment behavior of the largest public industrial firms by utilizing data for the period 1980-2006. Having delineated the job flow statistics of the largest public industrial firms, this section summarizes the findings and presents some concluding remarks.

5.5.1 Job Creation and Job Destruction over the Business Cycle

The largest public firms display different patterns of job creation and job destruction in the subperiods. The findings in Sections 5.1, 5.2, and 5.3 reveal that there is a nested structure of job creation and job destruction until 1992. This structure disappears after that year leaving its place to a picture that job destruction dominates job

[66] The (significant) correlation coefficients between job destruction and net employment growth, and job creation and net employment growth are -0.94 and 0.71, respectively.

creation. Indeed, excluding the year 1991, it can be said that job destruction rate exceeds job creation rate in the period 1990-2006. Furthermore, the analysis using the continuing firms in two-consecutive years for the period 1981-2006 has similar results in Section 5.4. Section 5.4 evinces that, moreover, average rate of job destruction moves to a higher level in the period 2001-2006. Besides, the average rate of job creation declines in this period in comparison to its rate in 1991-2000.

The relationship between the rates job creation and job destruction is clear for only 1981-1989 and in the analysis performed by using firms that continue in successive two-years for the period 1981-2006. In these two periods, job creation rate and job destruction rate have a significant negative relationship. The link between these rates is not clear for other periods.

It is also a salient fact that the recessionary years are not reflected in the job flow statistics of the largest public firms. In the years of crises and/or recessions, such as in 1991, 1994, 1999, and 2001 when the GDP growth is negative or close to zero in Turkey, there is no decline in the net employment growth rate of these firms. However, only 2001 crisis appears to affect the continuing firms in two-successive years with -10.2 percent net employment growth rate. This negative effect of the crisis is not apparent for the continuing public firms in the period 1997-2006. Therefore, the most successful largest public firms are not influenced by the 2001 crisis, however as the sample widens, that is, more public firms are added to the analyses by means of taking into account the continuing firms in two-consecutive years, the impact of crisis could be seen on the employment dynamics of the public firms.

5.5.2 Persistence of Job Creation and Job Destruction

For the largest public industrial firms, one-year persistence rate of job creation monotonically declines from the period of 1981-1989 to 1997-2006. Meanwhile, the corresponding rate for job destruction is lowest in 1981-1989 and highest in 1990-1996.

The persistence results imply that i) the persistence in job creation is high only in the period 1981-1989, ii) the persistence in job destruction is high in all periods, and iii) the persistence in job destruction is higher than the persistence in job creation except in the period 1981-1989. In short, the figures indicate that the job reallocation process is not long-term in nature for the largest public industrial firms in Turkey after 1990s.

5.5.3 Labor Flexibility and Heterogeneity

Labor flexibility and heterogeneity is generally low for the largest public firms. The largest public firms do not seem to show heterogeneous behavior in all periods regarding their employment decisions. Job reallocation rate is quite low (4.2 percent) in 1981-1989, implying that heterogeneity and labor flexibility are very low. The relatively higher rate of job reallocation is realized in the periods 1990-1996 and 1997-2006. This signals that these periods have greater amount of heterogeneity and labor flexibility for the largest public firms. Excess job reallocation is highest (3.4 percent) in the period 1997-2006 but still lower in comparison to private firms (8 percent). The low excess job reallocation rates for all sub-periods signal very low level of restructuring in these firms.

5.5.4 Cyclicality of Gross Job Flows

One of the important findings in this chapter is that job reallocation is pro-cyclical in the period 1981-1989, whilst it is countercyclical in 1990-1996, 1997-2006, and 1981-2006. This is another way of saying that the volatility of job destruction is greater than that of the job creation in all subperiods except the period 1981-1989. A higher variability of job creation than job destruction rates over the business cycle results in a pro-cyclical pattern for job reallocation in the 1980s. That is, job reallocation increases as the net employment growth rises for the largest public firms in these years. This result is similar to that of the largest private firms in the same period.[67]

Job destruction rates exhibit greater cyclical variation than job creation rates in the period 1990-1996 and 1997-2006. Changes in job destruction are accompanied by a relatively mild variation in job creation, thus resulting in countercyclical behavior of job reallocation.[68] Hence, there exists asymmetry between job creation and job destruction during 1980-2006.

As is seen, the largest public firms exhibit very different employment dynamics from the largest private firms analyzed in Chapter 4. One outstanding common point of the largest public and private firms is related with their job flow behavior in the 1980s. Both types of firms have relatively better performance in terms of net employment growth rates, high persistence rates of job creation, and pro-cyclicality in job reallocation rates in the 1980s. It is interesting that the cyclicality of job reallocation turns out to be countercyclical after the year 1990 for both public and

[67] See Chapter 4 for the possible reasons for pro-cyclicality.
[68] See Chapter 4 for the issue of countercyclicality.

private firms.[69] Therefore, in 1990s, recessions are characterized by an increase in job destruction, accompanied by a relatively moderate slowdown in job creation. Public firms seem to be not affected as much as private firms by recessions/crises.

The analysis in this chapter sheds light on the job flow behavior of the largest public firms in 1980-2006. To examine and figure out the employment dynamics of these firms would be useful in comparing their behavior with those of private firms. This assessment would be of importance in implementing policies as well. Since public firms turns out to be a relatively homogenous group of firms, their response to policies may not differ much. Along with Chapter 4, this chapter shows that the firm-type (public or private) makes difference in the pattern of job flows.

[69] The largest private firms have a countercyclical pattern in job reallocation in the period 1990-1996.

6. Gross Job Flow Measures by Sectors

This chapter presents a comparison of the job flow dynamics of the private manufacturing firms (PMFs) and the largest private manufacturing firms (LPMFs) at sectoral level.[70] The findings reveal that there is no common response of LPMFs and PMFs to the recessionary/crisis years at sectoral level; they show distinct behavior in the face of aggregate disturbances. The firms are heterogeneous; as a matter of fact, the LPMFs have more heterogeneity and labor flexibility in most of the sectors in comparison to PMFs. Cyclicality in job reallocation changes by sectors but most of the sectors have pro-cyclical pattern of variation. The results also evince that job reallocation occurred almost evenly within-sector and between-sectors thereby implying that firm-level heterogeneity and sectoral disturbances or economy wide disturbances with differential sectoral effects have equal impact on job reallocation.

In Section 6.1 is dealt with a general outlook to the sectoral job flow statistics of the LPMFs in the Turkish economy. The sectoral job flow measures are reported and interpreted for the periods 1981-1989, 1990-1996, and 1997-2006.[71] Section 6.2 discusses seven two-digit sectors separately by means of a comparison of the PMFs and the LPMFs in Turkey for the period 1981-2001.[72] Finally, Section 6.3 includes some concluding remarks.

[70] For the sake of simplicity, largest private manufacturing firm and private manufacturing firm are abbreviated as LPMF and PMF, respectively.

[T]The composition of continuing firms differs in these periods. Performing the analysis for the whole period would have left tiny number of continuing firms per sector.

[72] In both data, sectors are grouped according to ISIC Rev 2.

6.1 A General Outlook on the Largest Private Manufacturing Firms by Sectors

Using the dataset in Chapter 4, this section outlines the job flow statistics of the LPMFs by sectors.[73] The results for the period 1981-1989 evince that the average rate of job creation varies from 3.1 percent in 'textile, wearing apparel, and leather industries' to 11 percent in 'manufacture of food, beverages, and tobacco' (See Table A4.20, Figure A4.12, and Figure A4.13 in Appendix 4). Average job destruction rate is highest in the 'manufacture of fabricated metal products, machinery and equipment, transport equipment, professional and scientific and measuring and controlling equipment' (4.8 percent), while it is lowest in the 'basic metal industries' (1.7 percent).

It is apparent that there is considerable cross-industry variation in the gross job reallocation rate, implying that firm heterogeneity exists within sectors as well. The lowest average gross job reallocation rate, 5.4 percent, belongs to the 'textile, wearing apparel and leather industries' while the highest rate is 15.2 percent in the 'manufacture of food, beverages, and tobacco'. Furthermore, these figures indicate that the highest and lowest levels of heterogeneity are in the sectors of 'food, beverages and tobacco' and 'textile, wearing apparel and leather', respectively. The average excess job reallocation rates also indicate that LPMFs in the 'food, beverages, and tobacco' sector experienced a restructuring and created relatively higher amount of jobs than other sectors in this period. The sector of 'fabricated metal products, machinery and equipment, transport equipment, professional and scientific and measuring and controlling equipment' follows it closely. The 'manufacture of non-metallic mineral

[73] See Appendix A2.2 for the list of the names of the sectors in the analysis.

products, except products of petroleum and coal' has the lowest excess job reallocation rate of 2.4 percent on average in the period 1981-1989.

The 'manufacture of food, beverages, and tobacco' takes the lead again with its highest job creation rate of 7.1 percent in the period 1990-1996 (See Table A4.21, Figure A4.14 and A4.15 in Appendix 4). The average rates of job creation, job destruction, and thus job reallocation are lowest in the 'manufacture of chemicals and chemical petroleum, coal, rubber, and plastic products' compared to other sectors in this period. The 'manufacture of non-metallic mineral products, except products of petroleum and coal' has the smallest amount of job creation and job reallocation rates on average. The 'manufacture of wood and wood products including furniture' seems to be the most successful in terms of its average net employment growth of 7.5 percent in the period 1997-2006.[74]

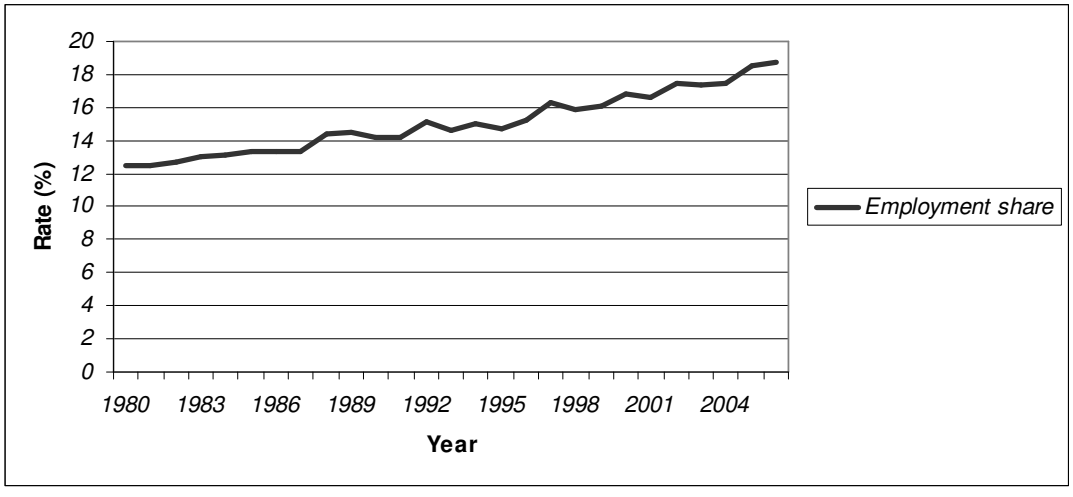
In the period 1981-1989, the average rate of job creation is greater than job destruction for all sectors. This situation reverses in the period 1990-1996 except for the sectors of 'textile, wearing apparel and leather' and 'food, beverages and tobacco'. 1997-2006 is the period in which the average net employment growth excluding 'manufacture of non-metallic mineral products, except products of petroleum and coal' is positive for all sectors. The most successful sector in terms of average net employment growth is the 'manufacture of wood and wood products including furniture'. The highest amount of heterogeneity and labor flexibility exists in the sector of 'food, beverages, and tobacco' in the period 1997-2006 (See Table A4.22, Figure A4.16, and Figure A4.17 in Appendix 4).

[74] The job flows statistics of the 'manufacture of wood and wood products including furniture' is not available for the period 1981-1996 because of the small number of firms in this group.

6.2 The Comparison of the Private Manufacturing Firms and the Largest Private Manufacturing Firms in Turkey (1980-2001)

Manufacturing industry plays an important role in the development process of a country. In developing countries, initially the share of manufacturing industry increases as the result of the structural change. In the advanced phases of this change, manufacturing's share starts to decline, leaving its place to service sector (Syrquin, 1988). Doğruel and Doğruel (2008) highlight that, the share of manufacturing industry has increased in Turkey in the period 1970-2006. During this period, the employment share of the manufacturing sector in total employment increased from 9.7 percent to 18.8 percent in Turkey. Its share in GNP rose from 15.7 percent to 25.3 percent. It is worth noting that in the growing years of the Turkish economy, manufacturing sector growth rates were greater than the GNP growth rates (Doğruel and Doğruel, 2008).

Figure 6.1 Employment Share of Turkish Manufacturing Industry in Total Employment



Source: Doğruel and Doğruel (2008)

This section evinces a sectoral comparison of gross job flow statistics between PMFs and the LPMFs in Turkey in the period 1981-2001. The data for the LPMFs exported from Chapter 6 is aggregated into sectors. The data for all private manufacturing industry is obtained from TURKSTAT (Turkish Statistical Institute) at 4-digit sectoral level.[75] The findings will show i) how sectors in the Turkish manufacturing industry differ in their employment dynamics over time and ii) whether the job flow dynamics of the largest firms diverge from that of overall private manufacturing industry.

In each section is given some information about the role of the sector in the Turkish manufacturing industry. The sectoral classification in our analyses is based on ISIC Rev.2. The references in the literature releasing information about the sectors are classified according to ISIC (International Standard Industrial Classification) Rev.3, which is a disaggregated classification compared to ISIC Rev.2. In the following sections are given some information about the sectors by using the references based on ISIC Rev.3. However, the analyses are performed based on the employment figures of the 2-digit sectors classified according to ISIC Rev.2.[76]

6.2.1 Textile, Wearing Apparel, and Leather Industries

Turkish textile sector is one of the leading sectors in the Turkish manufacturing industry.[77] It was the engine of the export boom that Turkey experienced in the first half

[75]It is worth noting that the unavailability of firm-level data may cause some information loss in the job flow statistics.
[76] See Appendix A2.3
[77] The three different industries of textile, wearing apparel, and leather are combined in the 2-digit name of 'textile, wearing apparel, and leather industries' according to ISIC Rev.2.

of the 1980s and have generated almost 40 percent of export revenue since the early 1990s (Taymaz, 2002).

In the beginning of 1980s, an outward-oriented development strategy has been adopted in Turkey.

> *After January 24, 1980 economic reforms, the textiles and wearing apparel industry has developed mainly due to the export oriented economic policies, the use of incentive measures for investment, and the supports introduced for the import of machinery equipment and auxiliary materials. As a result, the international competitiveness of the textiles and clothing industry has increased, along with important increases achieved in the exports.* (State Planning Organization (SPO), 2004, p.22)

> *As a labor-intensive industry, employment shares of textile and wearing apparel show significant increases since 1980. The share of textiles fluctuated around 20 percent since the mid 1990s, and then jumped to 24-25 percent in the second half of 1990s. The clothing sector had a continuous increase in manufacturing employment share, from 1.7 percent in 1981 to 11.4 percent in 1996. Its share declined to some extent in 1997-2000, due to economic crises in Turkey.* (Taymaz, 2002 p.3)

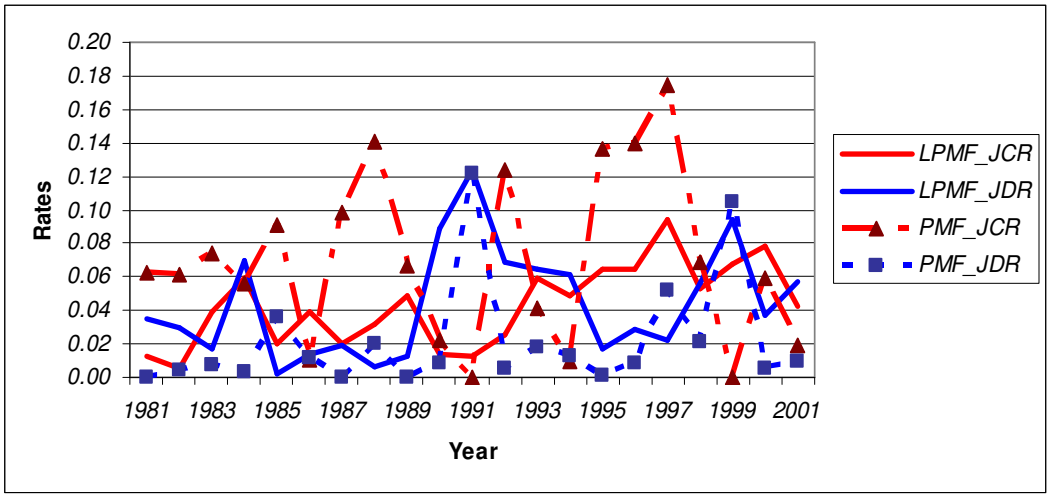
According to the 2006 figures, textile is the largest sector with its share of 12.33 percent in the Turkish manufacturing industry and 16.91 percent in manufacturing employment. Doğruel and Doğruel (2008) point out that, in the period 1992-2006, while the volume of production in textile is above the average of whole manufacturing sector, the rise in employment, lags behind that of the total manufacturing sector. This signifies that the investments in machinery equipment bring about less need for labor. This might limit the job creation in this sector but in the meantime, this sector is important in creating jobs by the virtue of its highest production and employment share in the manufacturing industry (Doğruel and Doğruel, 2008).

Table 6.1 Job Flow Rates of the Largest Private Manufacturing Firms (LPMFs) and Private Manufacturing Firms (PMFs): Manufacture of Textile, Wearing Apparel, and Leather

Year	LPMFs						Year	PMFs					
	JCR	JDR	SUM	NET	MAX	EXS		JCR	JDR	SUM	NET	MAX	EXS
1981	0.0132	0.0353	0.0485	-0.0221	0.0353	0.0264	**1981**	0.0621	0.0000	0.0621	0.0621	0.0621	0.0000
1982	0.0050	0.0294	0.0345	-0.0244	0.0294	0.0101	**1982**	0.0615	0.0039	0.0653	0.0576	0.0615	0.0078
1983	0.0395	0.0174	0.0569	0.0221	0.0395	0.0349	**1983**	0.0738	0.0072	0.0809	0.0666	0.0738	0.0144
1984	0.0594	0.0698	0.1292	-0.0104	0.0698	0.1188	**1984**	0.0558	0.0027	0.0585	0.0531	0.0558	0.0053
1985	0.0202	0.0019	0.0221	0.0183	0.0202	0.0038	**1985**	0.0905	0.0361	0.1266	0.0544	0.0905	0.0722
1986	0.0387	0.0136	0.0523	0.0252	0.0387	0.0271	**1986**	0.0102	0.0114	0.0216	-0.0012	0.0114	0.0204
1987	0.0204	0.0189	0.0393	0.0015	0.0204	0.0378	**1987**	0.0982	0.0000	0.0982	0.0982	0.0982	0.0000
1988	0.0316	0.0064	0.0380	0.0252	0.0316	0.0127	**1988**	0.1403	0.0202	0.1606	0.1201	0.1403	0.0405
1989	0.0489	0.0131	0.0620	0.0357	0.0489	0.0262	**1989**	0.0671	0.0001	0.0673	0.0670	0.0671	0.0003
1990	0.0133	0.0887	0.1020	-0.0754	0.0887	0.0266	**1990**	0.0217	0.0090	0.0307	0.0128	0.0217	0.0179
1991	0.0125	0.1236	0.1361	-0.1111	0.1236	0.0250	**1991**	0.0000	0.1221	0.1221	-0.1220	0.1221	0.0000
1992	0.0251	0.0686	0.0936	-0.0435	0.0686	0.0502	**1992**	0.1238	0.0056	0.1294	0.1182	0.1238	0.0112
1993	0.0590	0.0643	0.1233	-0.0054	0.0643	0.1180	**1993**	0.0418	0.0180	0.0598	0.0238	0.0418	0.0360
1994	0.0487	0.0618	0.1105	-0.0132	0.0618	0.0974	**1994**	0.0095	0.0126	0.0220	-0.0031	0.0126	0.0189
1995	0.0644	0.0172	0.0817	0.0472	0.0644	0.0345	**1995**	0.1364	0.0008	0.1372	0.1356	0.1364	0.0016
1996	0.0646	0.0286	0.0932	0.0360	0.0646	0.0572	**1996**	0.1398	0.0080	0.1477	0.1318	0.1398	0.0159
1997	0.0940	0.0222	0.1501	0.0385	0.0943	0.1116	**1997**	0.1745	0.0516	0.2261	0.1229	0.1745	0.1032
1998	0.0534	0.0563	0.1290	-0.0129	0.0709	0.1161	**1998**	0.0691	0.0208	0.0898	0.0483	0.0691	0.0415
1999	0.0676	0.0939	0.1480	0.0430	0.0955	0.1049	**1999**	0.0000	0.1047	0.1047	-0.1047	0.1047	0.0000
2000	0.0787	0.0367	0.1668	0.0314	0.0991	0.1353	**2000**	0.0589	0.0056	0.0645	0.0532	0.0589	0.0113
2001	0.0426	0.0576	0.1522	-0.0581	0.1051	0.0941	**2001**	0.0188	0.0099	0.0287	0.0089	0.0188	0.0198
Mean	0.0429	0.0441	0.0938	-0.0025	0.0636	0.0604	**Mean**	0.0692	0.0214	0.0907	0.0478	0.0802	0.0209
Standard Deviation	0.0243	0.0327	0.0455	0.0424	0.0295	0.0438	**Standard Deviation**	0.0512	0.0332	0.0521	0.0688	0.0469	0.0261

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry) and TURKSTAT (Turkish Statistical Institute).

Figure 6.2 Job Flow Rates of the LPMFs and the PMFs: Manufacture of Textile, Wearing Apparel, and Leather



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry) and TURKSTAT (Turkish Statistical Institute).

Table 6.1 reports the job flow statistics of the PMFs and the LPMFs in the period 1981-2001. Table 6.1 and Figure 6.2 illustrate that, average job creation moves to a higher level as from 1993 for PMFs. Job creation rate for PMFs averages at 6.9 percent, while the corresponding rate is 4.3 percent for the LPMFs. The rate of average job destruction is lower for PMFs in the period 1981-2001. It is an outstanding fact that largest firms of 'textile, wearing apparel, and leather industries' destroy jobs at a higher rate on average during 1981-2001 period. Overall, the largest firms in this sector have a lower performance than PMFs in this sector in terms of net employment growth.

The correlation between job destruction rates of PMFs and the LPMFs is positive and significant; 0.56. In addition, the net employment growth rates of PMFs and LPMFs is positively correlated with a significant correlation coefficient of 0.45. Therefore, job destruction and net employment growth rates of the LPMFs and PMFs

move in the same direction. On the other hand, there are no significant correlations between job creation and job destruction rates of the LPMFs, job creation and job destruction rates of PMFs, and job creation rates between the LPMFs and PMFs in this sector.

It is apparent that the volatility of job creation and job destruction is higher for PMFs than the LPMFs.[78] This is an expected result considering that the LPMFs are the largest firms; it is a more homogenous group compared to the other. Job creation rate is more volatile relative to job destruction rate for PMFs. As the significant correlation between job reallocation rate and net employment growth rate (0.43) evinces, PMFs shows a pro-cyclical job reallocation over the business cycle. The LPMFs have no clear cyclical pattern of job reallocation.

The year 1991 is the worst year for both the LPMFs and PMFs in this sector because job destruction rates reach 12 percent level for both. Along with low job creation rates, they have the lowest net employment growth rates in 1991. On the other side, the behavior of LPMFs and PMFs hold different views in 1999. LPMFs exhibit a great heterogeneity with 6.7 percent job creation rate and 9.4 percent job destruction rate in this year, while PMFs have high job destruction rate (10 percent) and no job creation. The common point is their having of negative net employment growth rates. The textile and apparel sector has been affected by the Asian crisis in 1999.

According to the input-output tables in 2002, textile sector has strong backward linkage with itself and chemicals sector. On the other hand, its forward linkage is low (Doğruel and Doğruel, 2008). As Valadkhani (2003) states;

[78] The difference in the variation of job destruction rates of PMFs and the LPMFs is not much, though.

> *A thriving sector with a high backward linkage stimulates the activities in other industries through its increased input demand, which is the other sectors' final output. A booming sector with a high forward linkage can also stimulate the other sectors by means of its output supply, because final output in that sector is the other sectors' inputs. However, the effectiveness (of a sector with higher forward linkage) on economic growth depends upon whether there is enough demand for the output of that sector or not*. (Valadkhani, 2003, p.3)[79]

Increase in job creation in one sector implies that more people are employed in this sector. This, in turn, means that their spending will increase, as these employed people are consumers. Then, the increase in the aggregate demand in the economy gives rise to a stimulus to other sectors to raise their output, and hence employment level. Therefore, textile sector could affect the output of chemicals sector and itself, and thus, their job flows.

To sum up, the statistical portrait of job flows in the 'textile, wearing apparel, and leather industries' in the period 1981-2001 reveals that i) PMFs have a greater capacity to create jobs than the LPMFs in this sector, ii) the LPMFs and PMFs have different reactions to the recessions/crises, iii) PMFs have a better performance in terms of net employment growth, iv) job destruction rates of the LPMFs and PMFs move in the same direction, whereas their job creation rates do not, v) the LPMFs show a pro-cyclical job reallocation over the business cycle, vi) volatility of job creation is lower in the group of the LPMFs compared to PMFs in the sector, and vii) the LPMFs have more heterogeneity and labor flexibility.

[79] For example, Valadkhani (2003) presents stylized facts concerning the negative impact of the collapse of Ansett as Australia's second largest airline on the sectoral employment using the latest input-output table. Ansett was operating within the air and space transport industry, which had relatively strong backward and forward linkages. Valadkhani (2003) found that due to the domino and multiplier effect, each additional job lost at Ansett led to a loss of more than three extra jobs in the economy as a whole.

6.2.2 Manufacture of Food, Beverages, and Tobacco

Manufacture of food and beverages is one of the largest sectors in the economy in terms of both production and employment. As of 2006, it has a 9.67 percent production share and 11.76 percent employment share in total manufacturing. In both categories, the manufacture of food and beverages rank third in the Turkish manufacturing industry (Doğruel and Doğruel, 2008).

This sector is important with its capacity to create jobs. However, the rate of increase in job creation lags behind the average of the entire manufacturing sector. Doğruel and Doğruel (2008) argue that this will not change as long as this sector is domestic market-oriented. The close shares of production and employment in total manufacturing industry indicate that this sector is neutral in the capacity of job creation. The employment share of the 'manufacture of tobacco' is low. There is not any significant change in the employment level in this sector in the period 1985-2006 (Doğruel and Doğruel, 2008).

In Section 6.1 is mentioned that the largest firms in the 'manufacture of food, beverages, and tobacco' has the largest job creation rate on average in the periods 1981-1989 and 1990-1996. In the period 1997-2006, the sector loses its position to the woods sector. However, it is the leading sector by having the largest job destruction rate on average in the period 1997-2006.

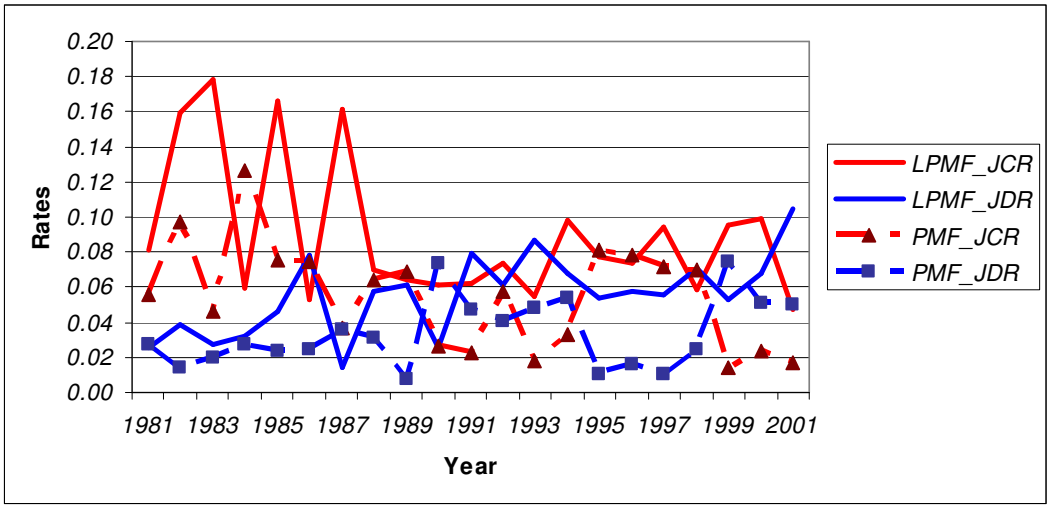
Table 6.2 shows that the average rates of job creation and destruction of the LPMFs are larger than those of PMFs. In other words, the largest firms in 'food, beverages, and tobacco' sector create and destroy relatively more jobs. Figure 6.3 depicts that, the difference between the rates of job creation and job destruction of the

Table 6.2 Job Flow Rates of the Largest Private Manufacturing Firms (LPMFs) and Private Manufacturing Firms (PMFs): Manufacture of Food, Beverages, and Tobacco

	LPMFs							PMFs					
Year	JCR	JDR	SUM	NET	MAX	EXS	Year	JCR	JDR	SUM	NET	MAX	EXS
1981	0.0813	0.0258	0.1071	0.0556	0.0813	0.0515	**1981**	0.0559	0.0270	0.0828	0.0289	0.0559	0.0539
1982	0.1591	0.0383	0.1975	0.1208	0.1591	0.0767	**1982**	0.0971	0.0137	0.1108	0.0834	0.0971	0.0274
1983	0.1779	0.0278	0.2057	0.1501	0.1779	0.0556	**1983**	0.0459	0.0200	0.0659	0.0259	0.0459	0.0400
1984	0.0596	0.0320	0.0916	0.0276	0.0596	0.0640	**1984**	0.1260	0.0275	0.1536	0.0985	0.1260	0.0551
1985	0.1657	0.0459	0.2116	0.1198	0.1657	0.0918	**1985**	0.0759	0.0231	0.0991	0.0528	0.0759	0.0463
1986	0.0531	0.0783	0.1314	-0.0252	0.0783	0.1062	**1986**	0.0744	0.0247	0.0991	0.0498	0.0744	0.0493
1987	0.1611	0.0141	0.1751	0.1470	0.1611	0.0281	**1987**	0.0368	0.0361	0.0729	0.0006	0.0368	0.0722
1988	0.0703	0.0571	0.1273	0.0132	0.0703	0.1142	**1988**	0.0637	0.0314	0.0951	0.0323	0.0637	0.0628
1989	0.0644	0.0611	0.1255	0.0033	0.0644	0.1221	**1989**	0.0687	0.0071	0.0758	0.0616	0.0687	0.0142
1990	0.0609	0.0256	0.0864	0.0353	0.0609	0.0511	**1990**	0.0266	0.0737	0.1003	-0.0471	0.0737	0.0532
1991	0.0626	0.0795	0.1421	-0.0169	0.0795	0.1252	**1991**	0.0223	0.0473	0.0696	-0.0249	0.0473	0.0447
1992	0.0732	0.0617	0.1349	0.0114	0.0732	0.1235	**1992**	0.0573	0.0407	0.0980	0.0166	0.0573	0.0813
1993	0.0551	0.0866	0.1416	-0.0315	0.0866	0.1101	**1993**	0.0179	0.0477	0.0656	-0.0298	0.0477	0.0358
1994	0.0977	0.0677	0.1654	0.0301	0.0977	0.1353	**1994**	0.0329	0.0535	0.0864	-0.0206	0.0535	0.0658
1995	0.0775	0.0533	0.1308	0.0242	0.0775	0.1066	**1995**	0.0813	0.0100	0.0913	0.0713	0.0813	0.0200
1996	0.0736	0.0573	0.1309	0.0163	0.0736	0.1146	**1996**	0.0782	0.0164	0.0946	0.0618	0.0782	0.0328
1997	0.0943	0.0558	0.1501	0.0385	0.0943	0.1116	**1997**	0.0718	0.0102	0.0820	0.0616	0.0718	0.0205
1998	0.0580	0.0709	0.1290	-0.0129	0.0709	0.1161	**1998**	0.0695	0.0244	0.0939	0.0451	0.0695	0.0488
1999	0.0955	0.0525	0.1480	0.0430	0.0955	0.1049	**1999**	0.0140	0.0742	0.0882	-0.0602	0.0742	0.0280
2000	0.0991	0.0677	0.1668	0.0314	0.0991	0.1353	**2000**	0.0236	0.0511	0.0747	-0.0275	0.0511	0.0472
2001	0.0471	0.1051	0.1522	-0.0581	0.1051	0.0941	**2001**	0.0172	0.0500	0.0672	-0.0327	0.0500	0.0345
Mean	0.0899	0.0554	0.1453	0.0344	0.0967	0.0971	**Mean**	0.0551	0.0338	0.0889	0.0213	0.0667	0.0445
Standard Deviation	0.0408	0.0227	0.0333	0.0571	0.0367	0.0307	**Standard Deviation**	0.0299	0.0196	0.0198	0.0465	0.0201	0.0176

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry) and TURKSTAT (Turkish Statistical Institute).

Figure 6.3 Job Flow Rates of the Largest Private Manufacturing Firms (LPMFs) and Private Manufacturing Firms (PMFs): Manufacture of Food, Beverages, and Tobacco



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry) and TURKSTAT (Turkish Statistical Institute).

LPMFs and PMFs in the sector is pretty clear until 1988. From this year on, job creation and job destruction rates exhibit a nested structure.

The correlation between job creation and job destruction rates are -0.58 and -0.75 for the LPMFs and PMFs, respectively. On the other hand, there are no significant correlations between the job destruction rates of the LPMFs and PMFs and job creation rates between the LPMFs and PMFs. As revealed by the positive and significant correlations between job reallocation and net employment growth rates (0.60 and 0.55, respectively), the LPMFs and PMFs exhibit pro-cyclical job reallocation.The reaction of the LPMFs and PMFs to 2001 crisis differs in this sector. The LPMFs have more abrupt rise in job destruction and decline in job creation, whilst there is a small decline in job creation rate almost no change in the job destruction rate of PMFs. On the other hand, PMFs seem to be affected by 1999 recession more; job creation rate decreased from 6.9

percent to 1.4 percent and job destruction rate increased from 2.4 percent to 7.4 percent in this year. However, the largest firms experienced a rise in their job creation rates and decline in job destruction rates, thereby giving rise to a positive change in net their employment growth. In addition, the 1994 crisis did not seem to affect this sector.

The LPMFs in the 'manufacture of food, beverages, and tobacco' draw attention by having high average job reallocation and excess job reallocation rates during 1980-2001. There is a large amount of reshuffling in these largest firms. They also show greater volatility in the rates of job creation and job destruction. Furthermore, heterogeneity is more among LPMFs as suggested by the high average rates of job reallocation of 14.5 percent and excess job reallocation rate of 9.7 percent in the period 1981-2001.

According to input-output tables in 2002, manufacture of food and beverages has strong backward linkage with itself and agricultural sector (Doğruel and Doğruel, 2008). Therefore, job creation and job destruction in this sector is both affecting and being affected by the job flows in agriculture sector and itself.

In sum, the statistical portrait of job flows in the 'manufacture of food, beverages, and tobacco' in the period 1981-2001 reveals that i) the LPMFs have a greater capacity to create jobs than PMFs in this sector, ii) the LPMFs and PMFs have different reactions to the recessions/crises, ii) the LPMFs have a better performance in terms of net employment growth, iii) neither job creation nor job destruction rates of the LPMFs and PMFs move in the same direction, iv) the LPMFs and PMFs exhibit pro-cyclical job reallocation over the business cycle, v) volatility of job creation and job destruction is higher in the group of the LPMFs, vi) overall heterogeneity and labor flexibility are higher in the group of the LPMFs, and vii) while the LPMFs have higher

average rates of job creation and job destruction in the period 1981-1988, the corresponding rates for both groups become closer after 1988.

6.2.3 Manufacture of Paper and Paper Products; Printing and Publishing

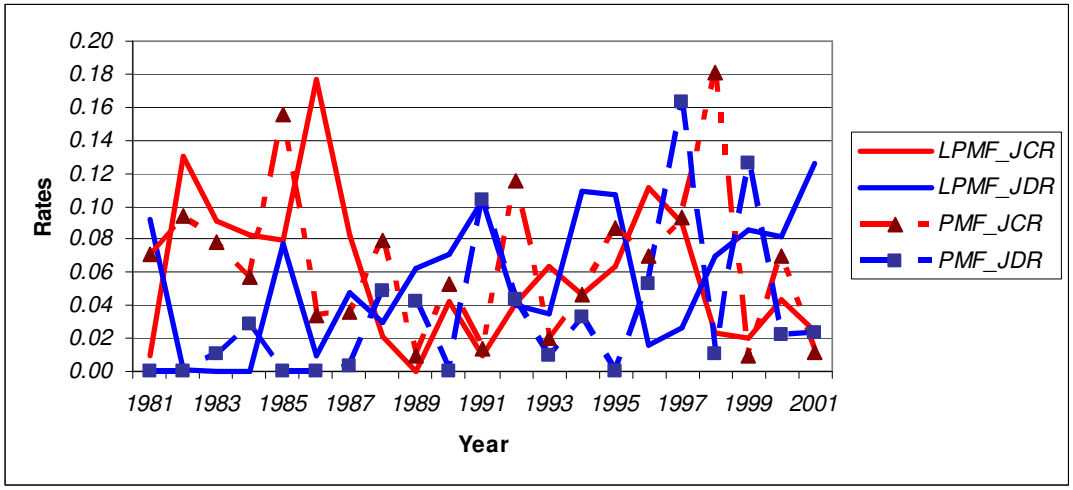
The 'manufacture of paper and paper products' constitutes 1.75 percent of production and 1.57 percent of employment in the total manufacturing industry in 2006. Despite its small share, the sector has a central position with its strong forward linkage to the production of packaging material. The production and employment shares of 'printing and publishing' are 1.57 percent and 1.24 percent, respectively, in the total manufacturing industry (Doğruel and Doğruel, 2008).

Table 6.3 shows that the average rates of job creation and job destruction rates are 6 percent and 5.7 percent for the LPMFs, respectively. Corresponding rates for PMFs are 6.6 percent and 3.4 percent on average in the period 1981-2001. That is, net employment change is relatively higher in PMFs than in the LPMFs, which have almost no change in that rate. Table 6.3 evinces that the volatility of job creation and job destruction rates is higher in the groups of PMFs than the LPMFs. The table also reveals that heterogeneity and labor flexibility are greater in the group of the largest firms as suggested by the average excess job reallocation rate of 5.3 percent in the period.

Job creation is pro-cyclical and job destruction is countercyclical in both groups of firms. There is no clear relationship between the in the job flow measures of the LPMFs and PMFs. The only significant correlation coefficient exists between job creation and destruction rates of the LPMFs (-0.66). These results suggest that employment dynamics of the LPMFs and PMFs are quite different in this sector.

In 2001 crisis, the LPMFs are affected by rising job destruction and declining job creation rates. However, PMFs react to the crisis by declining job creation along with no change in job destruction. The recessionary year 1999 influences PMFs rigorously by generating -11.7 percent of net employment growth. The LPMFs, too, experience a decline in the net employment growth rate but not much severe. PMFs react to the recessionary year 1991 by diminishing job creation and increasing job destruction, however, they are not affected by the 1994 crisis. The LPMFs in this sector respond to

Figure 6.4 Job Flow Rates of the Largest Private Manufacturing Firms (LPMFs) and Private Manufacturing Firms (PMFs): Manufacture of Paper and Paper Products; Printing and Publishing



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry) and TURKSTAT (Turkish Statistical Institute).

these recession/crisis years by curtailing job creation and increasing job destruction rates. Therefore, the job flow responses of the LPMFs and PMFs to the fluctuations in the economy vary.

Table 6.3 Job Flow Rates of the Largest Private Manufacturing Firms (LPMFs) and Private Manufacturing Firms (PMFs): Manufacture of Paper and Paper Products; Printing and Publishing

	LPMFs							PMFs					
Year	**JCR**	**JDR**	**SUM**	**NET**	**MAX**	**EXS**	**Year**	**JCR**	**JDR**	**SUM**	**NET**	**MAX**	**EXS**
1981	0.0096	0.0924	0.1021	-0.0828	0.0924	0.0193	**1981**	0.0706	0.0000	0.0706	0.0706	0.0706	0.0000
1982	0.1302	0.0014	0.1316	0.1288	0.1302	0.0028	**1982**	0.0943	0.0000	0.0943	0.0943	0.0943	0.0000
1983	0.0905	0.0000	0.0905	0.0905	0.0905	0.0000	**1983**	0.0785	0.0103	0.0888	0.0682	0.0785	0.0206
1984	0.0830	0.0000	0.0830	0.0830	0.0830	0.0000	**1984**	0.0567	0.0282	0.0850	0.0285	0.0567	0.0564
1985	0.0798	0.0777	0.1575	0.0021	0.0798	0.1554	**1985**	0.1555	0.0000	0.1555	0.1555	0.1555	0.0000
1986	0.1765	0.0094	0.1860	0.1671	0.1765	0.0189	**1986**	0.0334	0.0000	0.0334	0.0334	0.0334	0.0000
1987	0.0830	0.0480	0.1311	0.0350	0.0830	0.0961	**1987**	0.0362	0.0032	0.0394	0.0330	0.0362	0.0064
1988	0.0217	0.0295	0.0512	-0.0078	0.0295	0.0434	**1988**	0.0798	0.0490	0.1288	0.0307	0.0798	0.0981
1989	0.0000	0.0621	0.0621	-0.0621	0.0621	0.0000	**1989**	0.0095	0.0421	0.0515	-0.0326	0.0421	0.0190
1990	0.0426	0.0705	0.1132	-0.0279	0.0705	0.0853	**1990**	0.0530	0.0000	0.0530	0.0530	0.0530	0.0000
1991	0.0099	0.1036	0.1135	-0.0937	0.1036	0.0199	**1991**	0.0139	0.1037	0.1176	-0.0898	0.1037	0.0277
1992	0.0408	0.0402	0.0810	0.0006	0.0408	0.0804	**1992**	0.1158	0.0432	0.1590	0.0725	0.1158	0.0864
1993	0.0631	0.0344	0.0975	0.0287	0.0631	0.0689	**1993**	0.0197	0.0092	0.0290	0.0105	0.0197	0.0185
1994	0.0460	0.1087	0.1548	-0.0627	0.1087	0.0921	**1994**	0.0464	0.0326	0.0790	0.0138	0.0464	0.0652
1995	0.0640	0.1073	0.1713	-0.0433	0.1073	0.1280	**1995**	0.0872	0.0000	0.0872	0.0872	0.0872	0.0000
1996	0.1111	0.0160	0.1271	0.0951	0.1111	0.0319	**1996**	0.0698	0.0528	0.1226	0.0170	0.0698	0.1057
1997	0.0904	0.0266	0.1170	0.0638	0.0904	0.0532	**1997**	0.0933	0.1624	0.2557	-0.0692	0.1624	0.1866
1998	0.0231	0.0696	0.0927	-0.0464	0.0696	0.0462	**1998**	0.1806	0.0101	0.1907	0.1705	0.1806	0.0202
1999	0.0199	0.0852	0.1051	-0.0653	0.0852	0.0398	**1999**	0.0097	0.1264	0.1362	-0.1167	0.1264	0.0195
2000	0.0430	0.0811	0.1241	-0.0381	0.0811	0.0860	**2000**	0.0699	0.0224	0.0923	0.0475	0.0699	0.0448
2001	0.0243	0.1259	0.1501	-0.1016	0.1259	0.0486	**2001**	0.0112	0.0238	0.0349	-0.0126	0.0238	0.0223
Mean	0.0596	0.0566	0.1163	0.0030	0.0897	0.0531	**Mean**	0.0660	0.0343	0.1002	0.0317	0.0812	0.0380
Standard Deviation	0.0447	0.0398	0.0348	0.0771	0.0319	0.0434	**Standard Deviation**	0.0463	0.0450	0.0574	0.0710	0.0458	0.0477

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry) and TURKSTAT (Turkish Statistical Institute).

According to the input-output tables in 2002, the 'manufacture of paper and paper products; printing and publishing' has backward linkage with itself, energy sector, and manufacture of chemicals (Doğruel and Doğruel, 2008). Thus, job creation and job destruction in this sector both affect and being affected by the job flows in those sectors with which it has a backward linkage.

To sum up, the statistical representation of job flows in the 'manufacture of paper and paper products; printing and publishing' in the period 1981-2001 signifies that i) PMFs have a greater capacity to create jobs than LPMFs in this sector, ii) LPMFs and PMFs have different reactions to the recessions/crises, ii) PMFs have a better performance in terms of net employment growth, iii) neither job creation nor job destruction rates of LPMFs and PMFs move in the same direction, iv) there is no clear cyclical pattern of variation in job turnover for both firm groups over the business cycle, v) volatility of job creation and job destruction is higher for PMFs, and vi) overall heterogeneity and labor flexibility are higher in the group of LPMFs.

6.2.4 Manufacture of Chemicals and Chemical Petroleum, Coal, Rubber and Plastic Products

The 'manufacture of chemicals and chemical products excluding drugs and medicine' constitutes 8.81 percent of production and 3.20 percent of employment in the total manufacturing industry in 2006. While 'manufacture of drugs and medicines' is made up of 3.06 percent of production and 1.68 percent of employment, 'manufacture of plastic and rubber products' has a 4.45 percent production and 4.81 percent employment shares in the total manufacturing industry in 2006 (Doğruel and Doğruel, 2008).

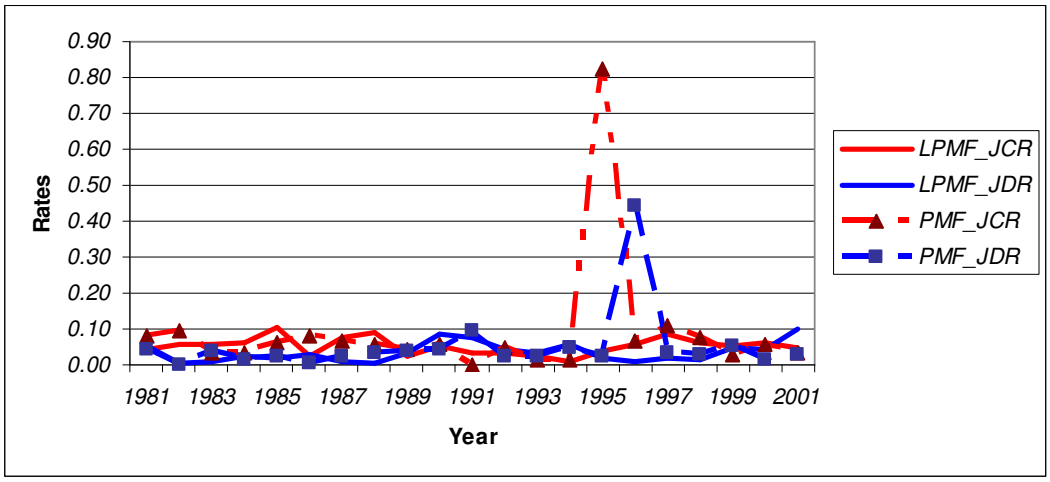
Table 6.4 Job Flow Rates of the Largest Private Manufacturing Firms (LPMFs) and Private Manufacturing Firms (PMFs): Manufacture of Chemicals and Chemical Petroleum, Coal, Rubber and Plastic Products

	LPMFs							PMFs					
Year	**JCR**	**JDR**	**SUM**	**NET**	**MAX**	**EXS**	**Year**	**JCR**	**JDR**	**SUM**	**NET**	**MAX**	**EXS**
1981	0.0417	0.0523	0.0940	-0.0107	0.0523	0.0833	**1981**	0.0824	0.0414	0.1238	0.0409	0.0824	0.0829
1982	0.0565	0.0050	0.0616	0.0515	0.0565	0.0100	**1982**	0.0959	0.0012	0.0971	0.0948	0.0959	0.0023
1983	0.0565	0.0073	0.0638	0.0492	0.0565	0.0145	**1983**	0.0351	0.0398	0.0749	-0.0047	0.0398	0.0702
1984	0.0626	0.0228	0.0854	0.0398	0.0626	0.0457	**1984**	0.0328	0.0165	0.0493	0.0164	0.0328	0.0330
1985	0.1039	0.0203	0.1242	0.0836	0.1039	0.0407	**1985**	0.0606	0.0245	0.0851	0.0361	0.0606	0.0490
1986	0.0237	0.0284	0.0521	-0.0047	0.0284	0.0474	**1986**	0.0802	0.0039	0.0841	0.0762	0.0802	0.0079
1987	0.0761	0.0072	0.0833	0.0689	0.0761	0.0144	**1987**	0.0672	0.0215	0.0887	0.0458	0.0672	0.0429
1988	0.0903	0.0059	0.0962	0.0845	0.0903	0.0118	**1988**	0.0575	0.0325	0.0900	0.0250	0.0575	0.0650
1989	0.0234	0.0351	0.0586	-0.0117	0.0351	0.0469	**1989**	0.0445	0.0383	0.0828	0.0062	0.0445	0.0766
1990	0.0514	0.0872	0.1386	-0.0358	0.0872	0.1028	**1990**	0.0577	0.0411	0.0988	0.0166	0.0577	0.0822
1991	0.0335	0.0763	0.1098	-0.0427	0.0763	0.0670	**1991**	0.0001	0.0968	0.0969	-0.0967	0.0968	0.0002
1992	0.0323	0.0438	0.0762	-0.0115	0.0438	0.0647	**1992**	0.0457	0.0260	0.0718	0.0197	0.0457	0.0521
1993	0.0257	0.0317	0.0574	-0.0060	0.0317	0.0514	**1993**	0.0157	0.0248	0.0405	-0.0091	0.0248	0.0314
1994	0.0116	0.0556	0.0673	-0.0440	0.0556	0.0233	**1994**	0.0135	0.0491	0.0626	-0.0356	0.0491	0.0270
1995	0.0388	0.0184	0.0572	0.0204	0.0388	0.0368	**1995**	0.8234	0.0259	0.8493	0.7975	0.8234	0.0518
1996	0.0561	0.0112	0.0673	0.0450	0.0561	0.0224	**1996**	0.0662	0.4414	0.5077	-0.3752	0.4414	0.1325
1997	0.0864	0.0212	0.1076	0.0652	0.0864	0.0424	**1997**	0.1115	0.0310	0.1425	0.0806	0.1115	0.0619
1998	0.0605	0.0165	0.0771	0.0440	0.0605	0.0331	**1998**	0.0770	0.0289	0.1059	0.0481	0.0770	0.0577
1999	0.0529	0.0468	0.0996	0.0061	0.0529	0.0935	**1999**	0.0277	0.0526	0.0803	-0.0250	0.0526	0.0554
2000	0.0613	0.0409	0.1022	0.0204	0.0613	0.0818	**2000**	0.0575	0.0123	0.0699	0.0452	0.0575	0.0246
2001	0.0491	0.0978	0.1469	-0.0486	0.0978	0.0983	**2001**	0.0354	0.0278	0.0632	0.0076	0.0354	0.0556
Mean	0.0521	0.0348	0.0870	0.0173	0.0624	0.0491	**Mean**	0.0899	0.0513	0.1412	0.0386	0.1159	0.0506
Standard Deviation	0.0237	0.0269	0.0275	0.0425	0.0217	0.0294	**Standard Deviation**	0.1704	0.0916	0.1880	0.1986	0.1834	0.0307

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry) and TURKSTAT (Turkish Statistical Institute).

Table 6.4 shows the job flow measures for the LPMFs and PMFs in this sector. The findings show that the average rate of net employment growth is higher for PMFs compared to that of the LPMFs. As Figure 6.5 illustrates, an outlier value in the group of PMFs in the year 1995 hinders to see the pattern of job flows in other years.[80] Therefore, the analysis is redone by excluding this outlier value. Table 6.5 and Figure 6.6 depict the rates job creation and job destruction of PMFs and LPMFs after removing the sub-sector that outlier belongs.

Figure 6.5 Job Flow Rates of the Largest Private Manufacturing Firms (LPMFs) and Private Manufacturing Firms (PMFs): Manufacture of Chemicals and Chemical Petroleum, Coal, Rubber and Plastic Products

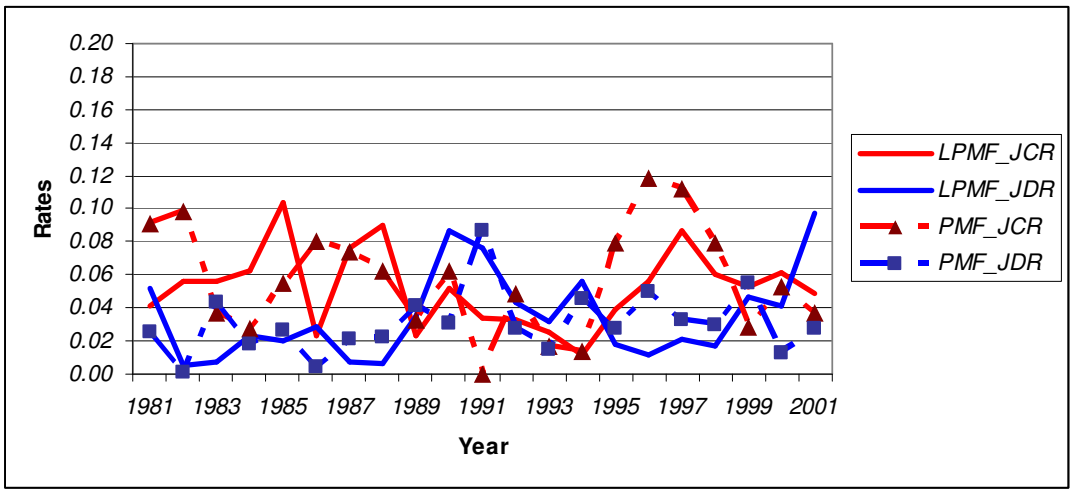


Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry) and TURKSTAT (Turkish Statistical Institute).

Figure 6.6 discloses the variation the rates of the LPMFs and PMFs. Removing the outlier value causes a decline to 5.8 percent in the average job creation of PMFs over the period 1981-2001. However, this rate is still above that of the LPMFs. Both figures

[80] The sector of No.3511 (manufacture of basic industrial chemicals except fertilizer) has an outlier value in 1995.

Figure 6.6 Job Flow Rates of the Largest Private Manufacturing Firms (LPMFs) and Private Manufacturing Firms (PMFs): Manufacture of Chemicals and Chemical Petroleum, Coal, Rubber and Plastic Products (Sector No.3511 excluded)



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry) and TURKSTAT (Turkish Statistical Institute).

signal a pro-cyclical pattern of variation in the job reallocation of PMFs. Besides, after removing the outlier, the correlation between job creations rates of the LPMFs and PMFs is found to be a significant positive number; 0.38. Apart from that, there is not any significant relationship between the rates of these two firm groups.

The Tables 6.4 and 6.5 reveal that both PMFs and the LPMFs respond to the recessionary/crisis years by diminishing job creation and increasing job destruction rates. The volatility of job creation rate is greater in the group of PMFs, while the higher variation in job destruction rate occurs among the LPMFs. Table 6.5 demonstrates that PMFs and the LPMFs have close excess job reallocation rates on average, thereby implying similar heterogeneity and labor flexibility levels in this sector during the period 1981-2001.

Table 6.5 Job Flow Rates of the Largest Private Manufacturing Firms (LPMFs) and Private Manufacturing Firms (PMFs): Manufacture of Chemicals and Chemical Petroleum, Coal, Rubber and Plastic Products (Sector No.3511 excluded)

	LPMFs							PMFs					
Year	**JCR**	**JDR**	**SUM**	**NET**	**MAX**	**EXS**	**Year**	**JCR**	**JDR**	**SUM**	**NET**	**MAX**	**EXS**
1981	0.0417	0.0523	0.0940	-0.0107	0.0523	0.0833	**1981**	0.0912	0.0253	0.1164	0.0659	0.0912	0.0505
1982	0.0565	0.0050	0.0616	0.0515	0.0565	0.0100	**1982**	0.0983	0.0013	0.0996	0.0971	0.0983	0.0025
1983	0.0565	0.0073	0.0638	0.0492	0.0565	0.0145	**1983**	0.0374	0.0429	0.0804	-0.0055	0.0429	0.0749
1984	0.0626	0.0228	0.0854	0.0398	0.0626	0.0457	**1984**	0.0271	0.0178	0.0449	0.0093	0.0271	0.0356
1985	0.1039	0.0203	0.1242	0.0836	0.1039	0.0407	**1985**	0.0553	0.0266	0.0819	0.0287	0.0553	0.0532
1986	0.0237	0.0284	0.0521	-0.0047	0.0284	0.0474	**1986**	0.0803	0.0043	0.0846	0.0760	0.0803	0.0086
1987	0.0761	0.0072	0.0833	0.0689	0.0761	0.0144	**1987**	0.0736	0.0212	0.0948	0.0525	0.0736	0.0423
1988	0.0903	0.0059	0.0962	0.0845	0.0903	0.0118	**1988**	0.0626	0.0223	0.0849	0.0402	0.0626	0.0446
1989	0.0234	0.0351	0.0586	-0.0117	0.0351	0.0469	**1989**	0.0325	0.0411	0.0736	-0.0086	0.0411	0.0651
1990	0.0514	0.0872	0.1386	-0.0358	0.0872	0.1028	**1990**	0.0628	0.0309	0.0937	0.0318	0.0628	0.0619
1991	0.0335	0.0763	0.1098	-0.0427	0.0763	0.0670	**1991**	0.0001	0.0873	0.0874	-0.0872	0.0873	0.0002
1992	0.0323	0.0438	0.0762	-0.0115	0.0438	0.0647	**1992**	0.0482	0.0276	0.0758	0.0205	0.0482	0.0553
1993	0.0257	0.0317	0.0574	-0.0060	0.0317	0.0514	**1993**	0.0166	0.0144	0.0310	0.0023	0.0166	0.0288
1994	0.0116	0.0556	0.0673	-0.0440	0.0556	0.0233	**1994**	0.0142	0.0452	0.0594	-0.0311	0.0452	0.0283
1995	0.0388	0.0184	0.0572	0.0204	0.0388	0.0368	**1995**	0.0795	0.0270	0.1066	0.0525	0.0795	0.0540
1996	0.0561	0.0112	0.0673	0.0450	0.0561	0.0224	**1996**	0.1180	0.0494	0.1674	0.0686	0.1180	0.0988
1997	0.0864	0.0212	0.1076	0.0652	0.0864	0.0424	**1997**	0.1123	0.0323	0.1445	0.0800	0.1123	0.0645
1998	0.0605	0.0165	0.0771	0.0440	0.0605	0.0331	**1998**	0.0798	0.0301	0.1099	0.0497	0.0798	0.0602
1999	0.0529	0.0468	0.0996	0.0061	0.0529	0.0935	**1999**	0.0282	0.0548	0.0830	-0.0266	0.0548	0.0564
2000	0.0613	0.0409	0.1022	0.0204	0.0613	0.0818	**2000**	0.0525	0.0128	0.0653	0.0396	0.0525	0.0257
2001	0.0491	0.0978	0.1469	-0.0486	0.0978	0.0983	**2001**	0.0371	0.0275	0.0647	0.0096	0.0371	0.0551
Mean	0.0521	0.0348	0.0870	0.0173	0.0624	0.0491	**Mean**	0.0575	0.0306	0.0881	0.0269	0.0651	0.0460
Standard Deviation	0.0237	0.0269	0.0275	0.0425	0.0217	0.0294	**Standard Deviation**	0.0328	0.0189	0.0307	0.0438	0.0271	0.0242

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry) and TURKSTAT (Turkish Statistical Institute).

According to the input-output tables in 2002, this sector has backward linkage with itself and mining and quarrying (Doğruel and Doğruel, 2008). Therefore, job creation and job destruction in this sector is both affecting and being affected by the job flows of these sectors.

To sum up, job flow statistics in the 'manufacture of chemicals, chemical petroleum, coal, rubber, and plastic products' in the period 1981-2001 implies that i) PMFs have a greater capacity to create jobs than the LPMFs in this sector (even after the sub-sector with outlier is removed), ii) the LPMFs and PMFs have similar reactions to the recessions/crises, ii) PMFs have a better performance in terms of net employment growth, iii) taking out the outlier value results in a significant positive relation between job creation rates of two groups of firms, iv) job reallocation of PMFs exhibit pro-cyclical pattern of variation over the business cycle, v) volatility of job creation rate is greater in the group of PMFs, whilst the higher variation in job destruction rate is realized among the LPMFs, and vi) overall heterogeneity and labor flexibility are alike in both firm groups.

6.2.5 Manufacture of Non-metallic Mineral Products, except Products of Petroleum and Coal

As of 2006, this sector has 4.59 percent of production share and 8.08 percent employment share in total manufacturing. It ranks eighth in production, while it ranks fourth in employment share in the Turkish manufacturing industry. Turkey rank first in the exportation of cement in the world. In the period 1985-2006, the increase in private

production in this sector moved parallel with employment. However, they slowed down during 2000-2003 (Doğruel and Doğruel, 2008).

Table 6.6 shows that, the average job creation and destruction rates of the LPMFs are 4.1 percent and 4.4 percent, respectively. In this period, PMFs experienced 5.5 percent of job creation and 3.8 percent of job destruction on average in this sector. Therefore, while the LPMFs have a negative rate of net employment, PMFs have a small but positive rate during 1981-2001.

It is evident that job creation dominates job destruction for the LPMFs during 1982-1988 and during 1981-1989 for PMFs. Another salient fact as illustrated in Figure 6.7 is the movement in the average job destruction rates to a higher level for both the LPMFs and PMFs after 1989. The average job destruction of the LPMFs increases from 1.8 percent to 6.4 percent from period 1981-1989 to 1990-2001. As for PMFs, the corresponding rates are 1.5 percent and 5.5 percent for these two periods in that order.

There is a significant positive correlation between job destruction rates of the LPMFs and PMFs (0.64). On the other hand, there are no significant correlations between job creation rates of both groups of firms, job creation and job destruction rates of the LPMFs, and job creation and destruction rates of PMFs. Hence, among the measures of job flow dynamics, only job destruction rates of the LPMFs and PMFs move together in this sector.

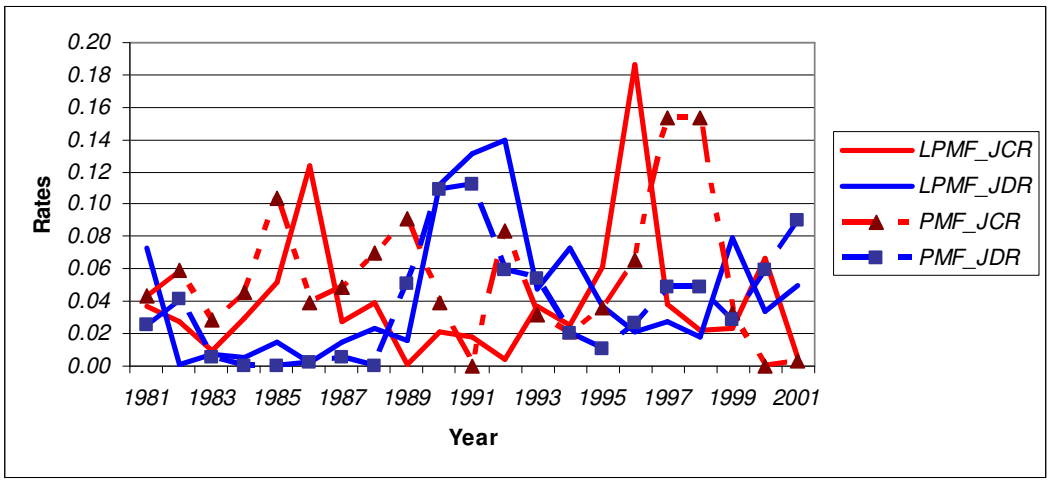
Table 6.6 evinces that heterogeneity and labor flexibility are greater among PMFs as suggested by the average excess job reallocation rate of 4.3 percent in the period 1981-2001. In addition, job creation rates of PMFs are slightly more volatile than that of LMPFs, whereas it is the opposite case for job destruction volatility.

Table 6.6 Job Flow Rates of the Largest Private Manufacturing Firms (LPMFs) and Private Manufacturing Firms (PMFs): Manufacture of Non-metallic Mineral Products, except Products of Petroleum and Coal

	LPMFs							PMFs					
Year	JCR	JDR	SUM	NET	MAX	EXS	Year	JCR	JDR	SUM	NET	MAX	EXS
1981	0.0367	0.0729	0.1095	-0.0362	0.0729	0.0734	**1981**	0.0430	0.0257	0.0687	0.0172	0.0430	0.0515
1982	0.0274	0.0011	0.0285	0.0263	0.0274	0.0022	**1982**	0.0589	0.0411	0.1000	0.0179	0.0589	0.0821
1983	0.0097	0.0076	0.0173	0.0021	0.0097	0.0152	**1983**	0.0281	0.0056	0.0338	0.0225	0.0281	0.0113
1984	0.0301	0.0052	0.0353	0.0249	0.0301	0.0104	**1984**	0.0456	0.0000	0.0456	0.0456	0.0456	0.0000
1985	0.0520	0.0148	0.0668	0.0372	0.0520	0.0296	**1985**	0.1035	0.0000	0.1035	0.1035	0.1035	0.0000
1986	0.1236	0.0023	0.1259	0.1214	0.1236	0.0045	**1986**	0.0394	0.0026	0.0421	0.0368	0.0394	0.0053
1987	0.0279	0.0151	0.0430	0.0128	0.0279	0.0302	**1987**	0.0488	0.0048	0.0536	0.0440	0.0488	0.0096
1988	0.0395	0.0234	0.0629	0.0161	0.0395	0.0468	**1988**	0.0695	0.0000	0.0695	0.0695	0.0695	0.0000
1989	0.0014	0.0155	0.0169	-0.0141	0.0155	0.0028	**1989**	0.0910	0.0513	0.1423	0.0396	0.0910	0.1026
1990	0.0211	0.1120	0.1331	-0.0908	0.1120	0.0423	**1990**	0.0387	0.1086	0.1473	-0.0699	0.1086	0.0774
1991	0.0178	0.1308	0.1486	-0.1130	0.1308	0.0356	**1991**	0.0000	0.1119	0.1119	-0.1119	0.1119	0.0000
1992	0.0037	0.1399	0.1436	-0.1362	0.1399	0.0074	**1992**	0.0839	0.0588	0.1428	0.0251	0.0839	0.1177
1993	0.0374	0.0474	0.0848	-0.0100	0.0474	0.0748	**1993**	0.0318	0.0537	0.0855	-0.0219	0.0537	0.0636
1994	0.0256	0.0731	0.0987	-0.0475	0.0731	0.0512	**1994**	0.0214	0.0199	0.0413	0.0015	0.0214	0.0399
1995	0.0608	0.0372	0.0980	0.0237	0.0608	0.0744	**1995**	0.0362	0.0105	0.0466	0.0257	0.0362	0.0210
1996	0.1859	0.0211	0.2071	0.1648	0.1859	0.0423	**1996**	0.0656	0.0269	0.0925	0.0388	0.0656	0.0537
1997	0.0381	0.0279	0.0659	0.0102	0.0381	0.0557	**1997**	0.1539	0.0484	0.2023	0.1056	0.1539	0.0967
1998	0.0223	0.0175	0.0398	0.0047	0.0223	0.0351	**1998**	0.1539	0.0484	0.2023	0.1056	0.1539	0.0967
1999	0.0229	0.0798	0.1027	-0.0569	0.0798	0.0458	**1999**	0.0324	0.0290	0.0614	0.0034	0.0324	0.0580
2000	0.0665	0.0343	0.1008	0.0321	0.0665	0.0686	**2000**	0.0000	0.0598	0.0598	-0.0598	0.0598	0.0000
2001	0.0054	0.0494	0.0548	-0.0441	0.0494	0.0108	**2001**	0.0029	0.0900	0.0929	-0.0871	0.0900	0.0058
Mean	0.0408	0.0442	0.0850	-0.0034	0.0669	0.0361	**Mean**	0.0547	0.0380	0.0927	0.0167	0.0714	0.0425
Standard Deviation	0.0428	0.0420	0.0493	0.0689	0.0469	0.0247	**Standard Deviation**	0.0431	0.0345	0.0501	0.0599	0.0383	0.0407

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry) and TURKSTAT (Turkish Statistical Institute).

Figure 6.7 Job Flow Rates of the Largest Private Manufacturing Firms (LPMFs) and Private Manufacturing Firms (PMFs): Manufacture of Non-metallic Mineral Products, except Products of Petroleum and Coal



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry) and TURKSTAT (Turkish Statistical Institute).

The reaction of the LPMFs and PMFs to 1999 recession is different. There is a rise in job destruction rate of the LPMFs from 1.8 percent to 8 percent, whereas a small increase in job creation is observed in the meantime. On the other hand, PMFs experience an abrupt decline in job creation from 15.4 percent to 3.2 percent in 1999. The job destruction rate declined from 4.8 percent to 2.9 percent. It seems that the LPMFs were affected by 2001 crisis by having a decline in job creation and an increase in job destruction. There was almost no change in job creation rate of PMFs but its job destruction rate rises from 6 percent to 9 percent in 2001. In 1994 crisis, while job destruction of the LPMFs increase, the rate declines for PMFs. In this year, both groups of firms have lower job creation rates compared to the year of 1993. In terms of net employment growth, 1996 is a prospering year for the LPMFs for this sector, whereas 1997 and 1998 are the best years for PMFs.

The sector has backward linkage with itself, mining, and energy sector. Hence, any change in job creation and job destruction in this sector can affect the employment dynamics of these sectors.

To recapitulate, the statistical portrait of job flows in the 'manufacture of chemicals and chemical petroleum, coal, rubber and plastic products' in the period 1981-2001 evinces that i) PMFs have a greater capacity to create jobs than all firms in this sector, ii) the LPMFs and PMFs have different reactions to the recessions/crises, ii) PMFs have a better performance in terms of net employment growth, iii) job destruction rates of PMFs and the LPMFs move in the same direction, iv) there is no clear cyclical pattern of variation in job reallocation over the business cycle, v) volatility of job creation is roughly the same but volatility of job destruction is higher in the group of the largest firms, vi) overall heterogeneity and labor flexibility are higher in the group of the PMFs, and vii) there is a movement in the average job destruction rates to a higher level for both the LPMFs and PMFs after 1989.

6.2.6 Manufacture of Basic Metal Industries

'Manufacture of basic metal industries' is one of the largest sectors in Turkish manufacturing. As of 2006, this sector has 7.85 percent of production share and 5.23 percent employment share in total manufacturing. Doğruel and Doğruel (2008) argue that the job creation capacity of this sector is low as the increase in its volume of production is lower than the average increase in total manufacturing industry.

Table 6.7 reports that the average job creation and job destruction rates of LPMFs are 5.3 percent and 3.6 percent, correspondingly. PMFs have 6 percent of job creation and 3.4 percent of job destruction. Hence, the net employment growth is 1.7

percent for the LPMFs and 2.6 percent for PMFs on average during 1981-2001. It is evident that both job creation and job destruction rates of PMFs are more volatile than that of the LPMFs. Comparing the average excess job reallocation rates reveals that LPMFs have more heterogeneity and labor flexibility on average during 1981-2001.

The correlation between job destruction rates of the LPMFs and PMFs is 0.50 (significant). Besides, job creation and job destruction rates of PMFs are significantly correlated with a correlation coefficient of -0.47. On the other hand, there are no significant correlations between job creation rates of the LPMFs and PMFs, and job creation and destruction rates of the LPMFs. Therefore, among the measures of job flow dynamics, only job destruction rates of the LPMFs and PMFs in this sector move together. The correlation between job reallocation and net employment growth rates of PMFs is 0.58, suggesting a pro-cyclical job reallocation.

The LPMFs and PMFs have lower job creation and higher job destruction rates in 2001 relative to 2000 figures. Furthermore, the decline in net employment growth rates in 1999 suggests that both the LPMFs and PMFs were affected inversely by the 1999 recession. Although 1994 crisis gave rise to a decline in job creation and an increase in job destruction rates for PMFs, the LPMFs experienced an increase in both job creation and job destruction rates. The recessionary year 1991 stood with the highest net employment growth for both groups in this sector.

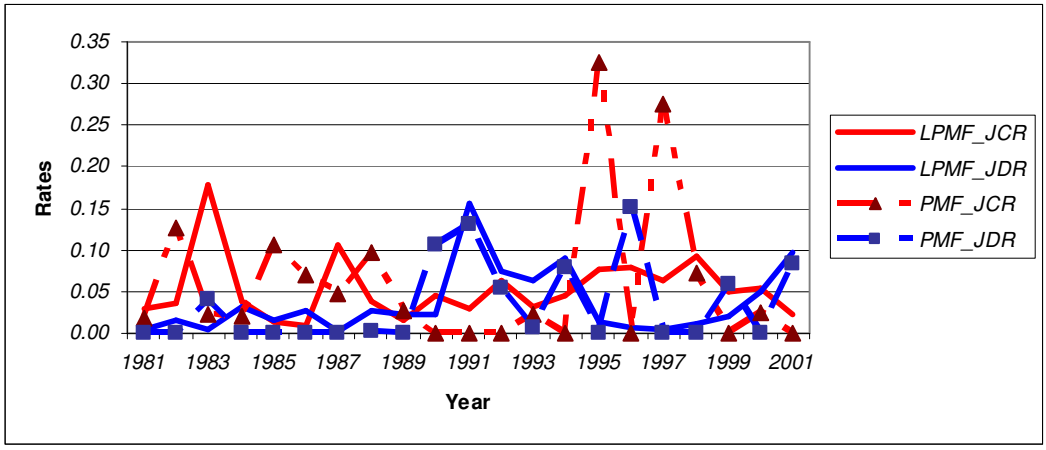
The sector has backward linkage with itself and energy sector (Doğruel and Doğruel, 2008). Hence, any change in job creation and job destruction in this sector can be reflected in the employment dynamics of itself and energy sector.

Table 6.7 Job Flow Rates of the Largest Private Manufacturing Firms (LPMFs) and Private Manufacturing Firms (PMFs): Manufacture of Basic Metal Industries

	LPMFs							PMFs					
Year	**JCR**	**JDR**	**SUM**	**NET**	**MAX**	**EXS**	**Year**	**JCR**	**JDR**	**SUM**	**NET**	**MAX**	**EXS**
1981	0.0299	0.0044	0.0343	0.0255	0.0299	0.0088	**1981**	0.0175	0.0000	0.0175	0.0175	0.0175	0.0000
1982	0.0351	0.0153	0.0505	0.0198	0.0351	0.0307	**1982**	0.1261	0.0000	0.1261	0.1261	0.1261	0.0000
1983	0.1787	0.0052	0.1839	0.1735	0.1787	0.0105	**1983**	0.0221	0.0415	0.0636	-0.0194	0.0415	0.0442
1984	0.0382	0.0311	0.0692	0.0071	0.0382	0.0622	**1984**	0.0211	0.0000	0.0211	0.0211	0.0211	0.0000
1985	0.0145	0.0162	0.0307	-0.0017	0.0162	0.0289	**1985**	0.1067	0.0000	0.1067	0.1067	0.1067	0.0000
1986	0.0091	0.0265	0.0356	-0.0174	0.0265	0.0182	**1986**	0.0694	0.0000	0.0694	0.0694	0.0694	0.0000
1987	0.1063	0.0030	0.1093	0.1033	0.1063	0.0059	**1987**	0.0463	0.0000	0.0463	0.0463	0.0463	0.0000
1988	0.0373	0.0280	0.0653	0.0093	0.0373	0.0560	**1988**	0.0973	0.0028	0.1002	0.0945	0.0973	0.0057
1989	0.0164	0.0215	0.0379	-0.0051	0.0215	0.0328	**1989**	0.0280	0.0000	0.0280	0.0280	0.0280	0.0000
1990	0.0462	0.0237	0.0699	0.0225	0.0462	0.0473	**1990**	0.0000	0.1058	0.1058	-0.1058	0.1058	0.0000
1991	0.0303	0.1554	0.1857	-0.1251	0.1554	0.0606	**1991**	0.0000	0.1313	0.1313	-0.1313	0.1313	0.0000
1992	0.0623	0.0743	0.1366	-0.0120	0.0743	0.1247	**1992**	0.0000	0.0545	0.0545	-0.0545	0.0545	0.0000
1993	0.0312	0.0635	0.0947	-0.0323	0.0635	0.0624	**1993**	0.0215	0.0062	0.0277	0.0153	0.0215	0.0124
1994	0.0462	0.0895	0.1357	-0.0433	0.0895	0.0924	**1994**	0.0000	0.0797	0.0797	-0.0797	0.0797	0.0000
1995	0.0769	0.0146	0.0915	0.0623	0.0769	0.0292	**1995**	0.3252	0.0000	0.3252	0.3252	0.3252	0.0000
1996	0.0801	0.0075	0.0876	0.0726	0.0801	0.0151	**1996**	0.0000	0.1520	0.1520	-0.1520	0.1520	0.0000
1997	0.0628	0.0055	0.0683	0.0573	0.0628	0.0109	**1997**	0.2750	0.0000	0.2750	0.2750	0.2750	0.0000
1998	0.0932	0.0113	0.1045	0.0818	0.0932	0.0227	**1998**	0.0714	0.0000	0.0714	0.0714	0.0714	0.0000
1999	0.0494	0.0207	0.0701	0.0287	0.0494	0.0415	**1999**	0.0000	0.0580	0.0580	-0.0580	0.0580	0.0000
2000	0.0538	0.0503	0.1041	0.0035	0.0538	0.1006	**2000**	0.0258	0.0000	0.0258	0.0258	0.0258	0.0000
2001	0.0232	0.0961	0.1194	-0.0729	0.0961	0.0465	**2001**	0.0000	0.0845	0.0845	-0.0845	0.0845	0.0000
Mean	0.0534	0.0364	0.0898	0.0170	0.0681	0.0432	**Mean**	0.0597	0.0341	0.0938	0.0256	0.0923	0.0030
Standard Deviation	0.0386	0.0391	0.0448	0.0635	0.0421	0.0322	**Standard Deviation**	0.0890	0.0493	0.0789	0.1204	0.0797	0.0099

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry) and TURKSTAT (Turkish Statistical Institute).

Figure 6.8 Job Flow Rates of the Largest Private Manufacturing Firms (LPMFs) and Private Manufacturing Firms (PMFs): Manufacture of Basic Metal Industries



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry) and TURKSTAT (Turkish Statistical Institute).

In sum, the statistical portrait of job flows in the 'manufacture of basic metal industries' in the period 1981-2001 reveals that PMFs have a slightly greater capacity to create jobs than the LPMFs in this sector, ii) the LPMFs and PMFs have different reactions to the recessions/crises, ii) PMFs have a better performance in terms of net employment growth, iii) job destruction rates of PMFs and the LPMFs move in the same direction, iv) PMFs display pro-cyclical job reallocation over the business cycle, v) volatility of job creation and job destruction is higher in the group of PMFs, vi) the LPMFs have more heterogeneity and labor flexibility and, vii) PMFs have positive net employment growth rates in the period 1981-1989 (excluding the year 1983), while it has some years positive and some years negative rates after 1990.

6.2.7 Manufacture of Fabricated Metal Products, Machinery and Equipment, Transport Equipment, Professional and Scientific and Measuring and Controlling Equipment

'Manufacture of fabricated metal products except machinery and equipment' is one of the medium-size sectors in the Turkish manufacturing industry with 4.10 percent of production and 5.43 percent of employment shares in 2006. 'Manufacture of machinery and equipment not elsewhere classified' represents 5.65 percent of production and 7.21 percent of employment shares in total manufacturing industry in 2006. In addition, another subsector in this sector, 'manufacture of office, computing, and accounting machinery', has a very small share of 0.1 percent.

Table 6.8 illustrates that, the average job creation and destruction rates of the LPMFs are 7.6 percent and 5.9 percent, respectively. The corresponding rates for PMFs are 6 percent and 3.2 percent. Hence, the net employment growth is 1.7 percent for the LPMFs and 2.8 percent for the PMFs on average during 1981-2001.

The correlation coefficient between job creation and destruction rate for LPMFs is -0.68 and the corresponding coefficient is -0.59 for PMFs.[81] Job destruction rates of LPMFs and PMFs are positively correlated with the coefficient of 0.56. The correlation between net employment growth rates of the LPMFs and PMFs is found to be 0.48. In addition, job reallocation of the LPMFs is pro-cyclical as is revealed by the significant correlation coefficient of 0.56.

This sector, particularly after 1990, draws attention with its sensitivity to the recessionary/crisis years. PMFs in this sector had positive rates of net employment growth during 1980s (except the year 1989). Table 6.8 indicates that these firms had declining job creation and increasing job destruction rates in the years

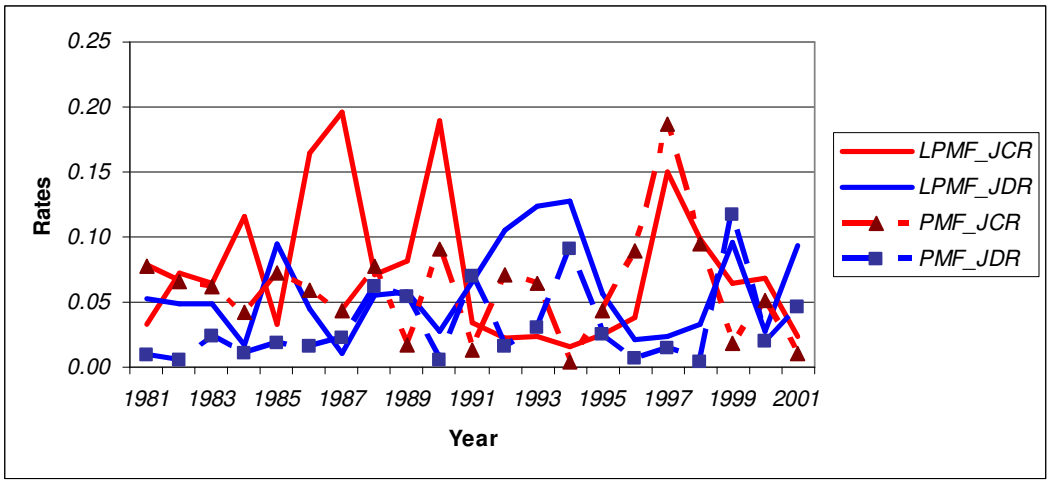
[81] Both correlation coefficients are significant.

Table 6.8 Job Flow Rates of the Largest Private Manufacturing Firms (LPMFs) and Private Manufacturing Firms (PMFs): Manufacture of Fabricated Metal Products, Machinery and Equipment, Transport Equipment, Professional and Scientific, Measuring, and Controlling Equipment

	LPMFs							PMFs					
Year	**JCR**	**JDR**	**SUM**	**NET**	**MAX**	**EXS**	**Year**	**JCR**	**JDR**	**SUM**	**NET**	**MAX**	**EXS**
1981	0.0324	0.0528	0.0853	-0.0204	0.0528	0.0648	**1981**	0.0782	0.0089	0.0870	0.0693	0.0782	0.0178
1982	0.0722	0.0482	0.1204	0.0241	0.0722	0.0964	**1982**	0.0664	0.0052	0.0716	0.0611	0.0664	0.0105
1983	0.0644	0.0491	0.1136	0.0153	0.0644	0.0982	**1983**	0.0625	0.0243	0.0868	0.0382	0.0625	0.0485
1984	0.1161	0.0166	0.1327	0.0995	0.1161	0.0332	**1984**	0.0419	0.0104	0.0524	0.0315	0.0419	0.0208
1985	0.0333	0.0942	0.1275	-0.0609	0.0942	0.0666	**1985**	0.0727	0.0181	0.0908	0.0545	0.0727	0.0363
1986	0.1644	0.0453	0.2097	0.1192	0.1644	0.0905	**1986**	0.0590	0.0160	0.0750	0.0430	0.0590	0.0320
1987	0.1961	0.0109	0.2070	0.1851	0.1961	0.0218	**1987**	0.0429	0.0217	0.0647	0.0212	0.0429	0.0434
1988	0.0713	0.0548	0.1261	0.0164	0.0713	0.1097	**1988**	0.0778	0.0614	0.1392	0.0164	0.0778	0.1228
1989	0.0819	0.0582	0.1401	0.0237	0.0819	0.1164	**1989**	0.0171	0.0534	0.0705	-0.0363	0.0534	0.0342
1990	0.1901	0.0273	0.2174	0.1627	0.1901	0.0547	**1990**	0.0910	0.0056	0.0966	0.0854	0.0910	0.0112
1991	0.0342	0.0657	0.1000	-0.0315	0.0657	0.0685	**1991**	0.0127	0.0693	0.0820	-0.0565	0.0693	0.0255
1992	0.0219	0.1052	0.1271	-0.0834	0.1052	0.0437	**1992**	0.0711	0.0155	0.0866	0.0555	0.0711	0.0311
1993	0.0231	0.1243	0.1474	-0.1012	0.1243	0.0463	**1993**	0.0638	0.0308	0.0946	0.0330	0.0638	0.0616
1994	0.0163	0.1273	0.1436	-0.1110	0.1273	0.0326	**1994**	0.0040	0.0911	0.0951	-0.0872	0.0911	0.0080
1995	0.0256	0.0563	0.0819	-0.0308	0.0563	0.0511	**1995**	0.0439	0.0248	0.0687	0.0191	0.0439	0.0497
1996	0.0377	0.0207	0.0584	0.0170	0.0377	0.0414	**1996**	0.0894	0.0068	0.0962	0.0826	0.0894	0.0136
1997	0.1495	0.0234	0.1729	0.1261	0.1495	0.0468	**1997**	0.1874	0.0142	0.2016	0.1732	0.1874	0.0284
1998	0.0992	0.0328	0.1320	0.0664	0.0992	0.0656	**1998**	0.0950	0.0039	0.0989	0.0910	0.0950	0.0078
1999	0.0644	0.0964	0.1608	-0.0320	0.0964	0.1288	**1999**	0.0186	0.1169	0.1355	-0.0984	0.1169	0.0371
2000	0.0681	0.0281	0.0962	0.0400	0.0681	0.0562	**2000**	0.0514	0.0193	0.0707	0.0320	0.0514	0.0387
2001	0.0241	0.0937	0.1178	-0.0696	0.0937	0.0482	**2001**	0.0104	0.0455	0.0558	-0.0351	0.0455	0.0207
Mean	0.0755	0.0586	0.1342	0.0169	0.1013	0.0658	**Mean**	0.0599	0.0316	0.0914	0.0283	0.0748	0.0333
Standard Deviation	0.0569	0.0353	0.0418	0.0849	0.0442	0.0298	**Standard Deviation**	0.0404	0.0307	0.0333	0.0635	0.0325	0.0253

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry) and TURKSTAT (Turkish Statistical Institute).

Figure 6.9 Job Flow Rates of the Largest Private Manufacturing Firms (LPMFs) and the Turkish Private Manufacturing Firms (PMFs): Manufacture of Fabricated Metal Products, Machinery and Equipment, Transport Equipment, Professional and Scientific, Measuring, and Controlling Equipment



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry) and TURKSTAT (Turkish Statistical Institute).

of 1991, 1994, 1999, and 2001. The 2001 crisis had the inverse impact on the PMFs. Apart from 1989 and those years, the net employment growth rates were continuously positive during 1981-2001. The LPMFs did not only have negative employment rates in these recessionary/crisis years but also in some other years.

The LPMFs in this sector have higher rates of average job reallocation and excess job reallocation than that of PMFs during 1980-2001. There is a larger amount of reshuffling in these largest firms. Heterogeneity and labor flexibility are observed a greater amount compared to PMFs as well. They also show greater volatility in the rates of job creation and job destruction.

This sector has backward linkage largely with itself and basic metal industries according to input-output tables in 2002 (Doğruel and Doğruel, 2008). Hence, any

change in job creation and job destruction in this sector can be reflected in the employment dynamics of itself and basic metal industries.

In a nutshell, the job flows statistics of the 'manufacture of fabricated metal products, machinery and equipment, transport equipment, professional and scientific, measuring, and controlling equipment' in the period 1981-2001 discloses that i) the LPMFs have a greater capacity to create jobs than PMFs in this sector, ii) the LPMFs and PMFs behave similarly by decreasing net employment growth rates in the face of the recessions/crises, ii) the LPMFs have a better performance in terms of net employment growth, iii) the rates of job destruction and net employment growth of the LPMFs and PMFs are positively related, iv) job reallocation of the LPMFs is pro-cyclical over the business cycle, v) volatility of job creation and job destruction is higher in the group of the LPMFs, and vi) the LPMFs have more heterogeneity and labor flexibility compared to PMFs.

6.3 The Summary of Average Net and Gross Job Flow Rates by Sectors

The summary statistics of average net and gross rates by sectors are presented in Table 6.9. Except the manufacture of 'food, beverages and tobacco', the rates of job creation of PMFs are above that of the LPMFs. On the other hand, job destruction rates

Table 6.9 The Summary of Average Net and Gross Rates by Sector (1981-2001) (Mean Annual Rates in Percentages)

Sector (ISIC Rev.2 Code)	LPMFs				PMFs			
	JCR	JDR	SUM	NET	JCR	JDR	SUM	NET
Manufacture of food, beverages and tobacco (31)	8.99	5.54	14.53	3.44	5.51	3.38	8.89	2.13
Textile, wearing apparel and leather industries 32	4.29	4.41	9.38	-0.25	6.92	2.14	9.07	4.78
Manufacture of paper and paper products; printing and publishing (34)	5.96	5.66	11.63	0.30	6.60	3.43	10.02	3.17
Manufacture of chemicals and chemical petroleum, coal, rubber and plastic products (35)	5.21	3.48	8.70	1.73	8.99[a]	5.13	14.12	3.86
Manufacture of non-metallic mineral products, except products of petroleum and coal (36)	4.08	4.42	8.50	-0.34	5.47	3.80	9.27	1.67
Basic metal industries (37)	5.34	3.64	8.98	1.70	5.97	3.41	9.38	2.56
Manufacture of fabricated metal products, machinery and equipment, transport equipment, professional and scientific and measuring and controlling equipment (38)	7.55	5.86	13.42	1.69	5.99	3.16	9.14	2.83

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry) and TURKSTAT (Turkish Statistical Institute).

a) Removing Sector No.3511 (manufacture of basic industrial chemicals except fertilizer**)**, which has an outlier value in 1995, from the analysis results in a job creation rate of 5.7 percent on average in the period 1981-2001.

of the LPMFs are exceeding that of PMFs excluding the 'manufacture of chemicals and chemical petroleum, coal, rubber and plastic products'. In terms of net employment growth, the most successful sectors are the 'chemicals and chemical petroleum, coal, rubber and plastic products' for PMFs and 'food, beverages and tobacco' for the LPMFs.

6.4 Quantifying the Role of Between-Sector and Within-Sector Employment Shifts: Index of Intra-Industry Job Reallocation

To scrutinize whether job reallocation process reflects sectoral shifts or job reallocations within any sector, this section utilizes the index of intra-industry job reallocation mentioned in Section 3.2.2.

The values of index fall within the interval [0, 1]. The left endpoint represents the cases where all firms within the sector have either net job creation or job destruction; and the right endpoint refers to cases where the net change in job flows of the sector is zero, and therefore every job lost is offset by a job created simultaneously in the same sector (Brülhart, 2000). The index value 0 indicates that job reallocation in an industry is exclusively between-industry and 1 indicates that it is completely within-industry.

Table 6.10 Index of Intra-Industry Job Reallocation

Year	Index
1981	0.64
1982	0.20
1983	0.58
1984	0.46
1985	0.20
1986	0.51
1987	0.36
1988	0.50

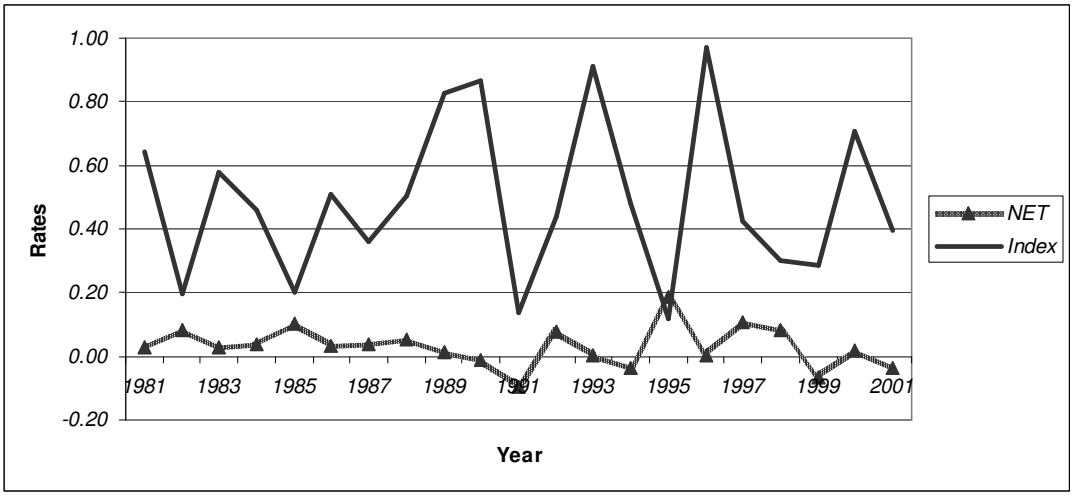
Year	Index
1989	0.83
1990	0.86
1991	0.13
1992	0.44
1993	0.91
1994	0.48
1995	0.12[a]
1996	0.97
1997	0.42
1998	0.30
1999	0.29
2000	0.71
2001	0.40
Mean	**0.49**

Source: Calculated by the author using data from TURKSTAT.

a) Removing Sector No.3511 (manufacture of basic industrial chemicals except fertilizer), which has an outlier value in 1995, from the analysis results in an index value of 0.56 in 1995. Then, the mean value for index turns out to be 0.50 for the period 1981-2001

Table 6.10 reports the index for the years 1981–2001.[82] Figure 6.10 shows how this index varies over the business cycle. The correlation coefficient between the index and

Figure 6.10 Index of Intra-Industry Job Reallocation and Net Employment Growth



Source: Calculated by the author using data from TURKSTAT.

[82]The information for the 'manufacture of wood and wood products including furniture (33)' and 'other manufacturing industries (39)' is taken into account while computing the index of Intra-Industry Job Reallocation.

net employment growth is -0.92 for the period 1981-1990, however, this significant negative relation between them disappears as of 1991. The correlation between net employment growth and index is -0.27 (insignificant) for the period 1981-2001.[83] The negative relationship between index and NET during 1981-1990 is clear in Figure 6.10**.** This countercyclical movement of the index of intra-industry job reallocation suggests that in good times jobs are reallocated more across sectors, while in bad times jobs are reallocated more within sectors. In bad times, firms within the same sector both expand and contract. The increased job reallocation between sectors in good times suggests that it is during booms that restructuring of firms across the sectors occurs. The increased job reallocation across sectors during booms signals a restructuring of the economy as a whole, which suggests a reallocation of jobs from declining sectors to growing sectors (Konings, 1995).

> *The endogenous growth literature claims that economic growth drives this intrasectoral structural change, i.e. a change within the sectoral composition of the economy (Romer, 1990). The introduction of new modes of production, which allow for a more efficient allocation of resources, or the innovation of a new product line itself, which augments the value of the product, form the essence of the growth process, but necessitate the decline of existing products or production techniques alongside. In that respect, differentiated products and markets will be more exposed to intrasectoral structural change than traditional homogenous markets and goods*. (Zagler, 2006, p.672-673)

The yearly average of index is 0.49. Therefore, on average, job reallocation occurred almost equally within sector and between sectors.[84] The 1981, 1989, 1990,

[83] This negative relationship weakens when the sector no.3511 removed from the analysis.

[84] Removing the sector no.3511 (manufacture of basic industrial chemicals except fertilizer) results in an index value of 0.50 on average for the period 1981–2001.

1996 and 2000, are the years that job reallocation occurred predominantly within sectors.[85]

In their study of transition economies of Romania, Bulgaria, and Hungary, Bilsen and Konings (1998) interpret the index as follows;

> *While at the start of transition, job reallocation occurred predominantly between sectors, later on in the transition job reallocation occurred also within sectors. The severe misallocation of resources under the old system indicates that reallocation of labor between sectors should be higher at the start of transition than later as more market-oriented allocation of resources emerges. With transition well under way a "healthy" process of reallocation takes place within sectors*. (p.438)

As Davis et al. (1996) suggest the years with high excess job reallocation are considered the years in which much of the job reallocation represents within-sector shifts rather than between-sector shifts. Their results show that between-sector shifts cannot account for excess job reallocation for the U.S. manufacturing sector. In this case, they argue that their findings of relatively few between-sector shifts provide little support for the view that high rates of job reallocation arise primarily because of sectoral disturbances or economy wide disturbances with differential sectoral effects. Instead, the results point towards the view that job reallocation is fundamentally driven by plant-level heterogeneity in labor demand. In the light of this interpretation, the average index calculated, 0.49 implies that sectoral disturbances or economy wide disturbances with differential sectoral effects, and firm-level heterogeneity in labor demand have roughly equal effect on job reallocation.

[85] This classification is crude and more information can probably be revealed if a more disaggregated classification is utilized. This is not feasible with the current data.

In comparison to the U.S. manufacturing sector, between-sector shifts in the Turkish manufacturing industry constitutes a relatively higher portion. This may stem from the relative easiness in the shifts of unskilled labor between sectors given that unskilled labor is abundant in Turkey.

6.5 Which Sectors Create the Most Jobs?

Following Davis et al. (1996), this section examines the cross-sector variation in gross job flows from a different angle. To this end, Table 6.11 displays the percentages of job creation and destruction accounted for by each two-digit manufacturing industry (See Appendix A1.6).[86] Sector employment shares largely determine which sectors contribute most to the creation and destruction of jobs. The Table 8.13 evinces that four manufacturing sectors - Manufacture of food, beverages and tobacco (31), Textile, wearing apparel and leather industries (32), Manufacture of chemicals and chemical petroleum, coal, rubber and plastic products (35), Manufacture of fabricated metal products, machinery and equipment, transport equipment, professional and scientific and measuring and controlling equipment (38) - account for 84 percent of job creation and 82 percent of job destruction in the Turkish manufacturing.[87]

[86] To construct Table 6.12, in addition to the information in Table 6.9, the average rates of job creation and job destruction for the 'manufacture of wood and wood products including furniture (ISIC Rev.2 No.33)' and 'other manufacturing industries (ISIC Rev.2 No. 39)' are computed for the period 1981–2001 as well. The average job creation and destruction rates for the sector no.33 are 7.5 percent and 3.7 percent, while the corresponding rates for sector no.39 are 9.5 percent and 4.1 percent.

[87] The numbers in the parenthesis represent the sectoral codes according to ISIC Rev.2.

Table 6.11 Job Creation and Job Destruction by Two-digit Sectoral Level (1981–2001): Weighted by Employment Share

Sector (ISIC Rev.2 Code)	PMFs		
	JCR	JDR	Employment Share
Manufacture of food, beverages and tobacco (31)	0.12	0.16	13.9
Textile, wearing apparel and leather industries (32)	0.36	0.24	33.7
Manufacture of wood and wood products including furniture (33)	0.03	0.00	2.3
Manufacture of paper and paper products; printing and publishing (34)	0.03	0.03	2.9
Manufacture of chemicals and chemical petroleum, coal, rubber and plastic products (35)	0.14	0.17	9.8[a]
Manufacture of non-metallic mineral products, except products of petroleum and coal (36)	0.07	0.10	8.2
Basic metal industries (37)	0.04	0.05	4.5
Manufacture of fabricated metal products, machinery and equipment, transport equipment, professional and scientific and measuring and controlling equipment (38)	0.22	0.25	24.0
Other Manufacturing industries (39)	0.00	0.00	0.7

Source: Calculated by the author using data from TURKSTAT.

a) Removing Sector No.3511 (manufacture of basic industrial chemicals except fertilizer), culminates in an employment share of 9 percent for the period 1981–2001. Accordingly, the JCR and JDR becomes 13 percent and 15 percent, respectively.

6.6 A Summary of Findings and Concluding Remarks

This chapter scrutinizes the gross job flow dynamics of the Turkish manufacturing industry at sectoral level, presenting along with a comparison of PMFs

and the LPMFs. This section reviews the findings in this chapter and deduces some policy implications.

6.6.1 Job Creation and Job Destruction Dynamics by Sectors

Four manufacturing sectors - manufacture of food, beverages and tobacco (31), textile, wearing apparel and leather industries (32), manufacture of chemicals and chemical petroleum, coal, rubber and plastic products (35), manufacture of fabricated metal products, machinery and equipment, transport equipment, professional and scientific and measuring and controlling equipment (38) - account for 84 percent of job creation and 82 percent of job destruction in the Turkish manufacturing.

As is evinced by the job flow statistics, the LPMFs have a larger capacity to create jobs in sectors 'food, beverage, and tobacco (31) and 'manufacture of fabricated metal products, machinery and equipment, transport equipment, professional and scientific and measuring and controlling equipment (38)'. In all other sectors, the average rate of job creation rate is higher in the group of PMFs. Besides, excluding the sectors of 'food, beverages and tobacco (31)' and the 'manufacture of fabricated metal products, machinery and equipment, transport equipment, professional and scientific and measuring and controlling equipment (38)', PMFs have a better performance in terms of net employment growth than the LPMFs.

Evidently, employment expanded in most of the sectors. However, it contracted in the groups of the LPMFs for the 'textile, wearing apparel, and leather industries (32)' and 'manufacture of non-metallic mineral products, except products of petroleum and coal (36)'. The net employment growth performance of the LPMFs in these sectors lags behind the overall net employment growth in these sectors.

There is no common pattern of responses of the LPMFs and PMFs to the recessionary/crisis years. These two groups of firms show distinct behavior in the face of these aggregate disturbances. Both the LPMFs and PMFs in all sectors are affected by the 2001 crisis deeply. The 1994 crisis has diverse effects on different sectors and between LPMFs and PMFs within sectors. Furthermore, sectors such as 'food, beverage, and tobacco (31)', 'textile, wearing apparel, and leather industries (32)', and 'basic metal industries (37)' are the sectors that the LPMFs increased job creation rates in 1999 recession. On the other hand, the 'manufacture of chemicals and chemical petroleum, coal, rubber and plastic products (35)', and 'manufacture of fabricated metal products, machinery and equipment, transport equipment, professional and scientific and measuring and controlling equipment (38)' react to the recessions/crisis by decreasing job creation rates and increasing job destruction rates in both groups of the LPMFs and PMFs.

In the crisis years, the reaction of the manufacturing sector to the contraction in the economy varies. In 1994 crisis, the rate of contraction in the manufacturing sector was larger than the overall economy. On the other hand, the situation is reversed in 1999 and 2001 crises; the rate of contraction in the manufacturing sector fell behind that of the overall economy. On the grounds of these facts, Doğruel and Doğruel (2008) point out that the structure of the Turkish manufacturing industry has strengthened. The years after 1990 are important for the Turkish manufacturing industry due to both rising global integration and joining Customs Union (CU) in 1996 (Doğruel and Doğruel, 2008).

6.6.2 Cyclicality of Job Flows by Sectors

It is an outstanding fact that job destruction rates of PMFs and LPMFs move in the same direction for the sectors of 'textile, wearing apparel, and leather industries (32)', 'non-metallic mineral products, except products of petroleum and coal (36)', 'basic metal industries (37)', and 'fabricated metal products, machinery and equipment, transport equipment, professional and scientific and measuring and controlling equipment (38)'. The only sector that has a positive significant relationship between the job creation rates of PMFs and LPMFs is the 'manufacture of chemicals and chemical petroleum, coal, rubber and plastic products (35)'. It is worth mentioning that the net employment growth rates of PMFs and the LPMFs in this sector move in the same direction. As for the sectors 'food, beverage, and tobacco (31)'and 'paper and paper products; printing and publishing (34)', there is neither job creation nor job destruction rates of the LPMFs and PMFs move in the same direction.

Job reallocation of PMFs exhibits a pro-cyclical pattern of variation in the sectors 'food, beverage, and tobacco (31)', 'textile, wearing apparel, and leather industries (32)', 'chemicals and chemical petroleum, coal, rubber and plastic products (35)', and 'basic metal industries (37)'. Job reallocation of LPMFs shows pro-cyclicality in the manufacture of 'food, beverage, and tobacco (31)' and 'fabricated metal products, machinery and equipment, transport equipment, professional and scientific and measuring and controlling equipment (38)'. There is no clear cyclical pattern of variation in job reallocation for the other sectors of 'paper and paper products; printing and publishing (34)' and 'non-metallic mineral products, except products of petroleum and coal (36)' over the business cycle.

In terms of volatility in job creation rates, the LPMFs takes the lead in the sectors of 'food, beverage, and tobacco (31)' and 'fabricated metal products, machinery and equipment, transport equipment, professional and scientific and measuring and controlling equipment (38)', while PMFs forges ahead in the sectors of 'textile, wearing apparel, and leather industries (32)', 'paper and paper products; printing and publishing (34)', 'chemicals and chemical petroleum, coal, rubber and plastic products (35)', 'non-metallic mineral products, except products of petroleum and coal (36)', and 'basic metal industries (37)'. The findings signify that volatility of job destruction in the groups of LPMFs is higher in sector of 'food, beverage, and tobacco (31)', 'chemicals and chemical petroleum, coal, rubber and plastic products (35)', 'non-metallic mineral products, except products of petroleum and coal (36)', and 'fabricated metal products, machinery and equipment, transport equipment, professional and scientific and measuring and controlling equipment (38)'. PMFs have greater job destruction variation in the manufacture of 'paper and paper products; printing and publishing (34)' and 'basic metal industries (37)'.

6.6.3 Heterogeneity by Sectors

Gross job reallocation indicates the number of jobs being reshuffled in the economy and serves as a measure of volatility signaling which industries are undergoing the most change (Hamdani, 1998). The resulting job flow statistics reveal that the LPMFs have greater heterogeneity and labor flexibility in all sectors except 'chemicals and chemical petroleum, coal, rubber and plastic products (35)' and 'non-

metallic mineral products, except products of petroleum and coal (36)' in the period 1981-2001.[88]

Goméz-Salvador et al. (2004) underline that;

> *Gross job flows may be considered a proxy for labor market flexibility to the extent that they provide a measure of the responsiveness of the labor market to changes in economic conditions. In recent years, several studies have estimated job creation and destruction from longitudinal data at plant or firm level. Studies on gross job flows have shown that a high number of jobs are simultaneously created and destroyed in the economy even when the employment growth is close to zero. This provides evidence on the complexity of the dynamics underlying the adjustment process in the labor market and the heterogeneity in the behavior of both workers and firms*. (p.7)

Broersma and Gautier (1997b) argue that heterogeneity of firms in their employment behavior implies that;

> *The theoretical concept of the representative firm may have to be abandoned and replaced by theories that can take account of employment heterogeneity. Finally, we stress the point that the main source of reallocation comes from firms within the same sector. Hence, idiosyncratic shocks of individual firms may be more important for explaining employment shifts, and thus unemployment, than sectoral or aggregate shocks*. (p.62)

It is difficult to classify firms into groups with homogenous behavior. Heterogeneity of firm behavior suggests that firms probably display different reactions to policy actions (Davis et. al, 1996). Bilsen and Konings (1998) suggest that differences in reallocation of jobs and the patterns of job creation and destruction in different sectors may stem from different potential market niches or of varying degrees of competition faced by firms in these sectors.

[88] The LPMFs and PMFs have almost the same level of heterogeneity and labor flexibility in the sector of 'chemicals and chemical petroleum, coal, rubber and plastic products (35)', whereas PMFs have more heterogeneity and labor flexibility in the sector of 'non-metallic mineral products, except products of petroleum and coal (36)'. When excess job reallocation is considered as a measure for heterogeneity, PMFs have more heterogeneity in the sector of 'basic metal industries (37) as well.

The findings also evince that job reallocation occurred almost evenly within-sector and between-sectors. Therefore, sectoral disturbances or aggregate disturbances with differential sectoral effects, and firm-level heterogeneity have nearly equal impact on job reallocation (Davis et al., 1996). The increased job reallocation between sectors in the times when the net employment growth is rising, suggests that it is during booms that restructuring of firms across the sectors occurs. Konings (1995) argues that the increased job reallocation across sectors during economic upsurges signals a restructuring of the economy as a whole, which implies a reallocation of jobs from declining sectors to growing sectors.

This study is important in unveiling the differences in job flow dynamics across sectors in the Turkish manufacturing industry and bringing light on the disparities between the job flows of the LPMFs and PMFs. The employment dynamics they displayed during 21 years elucidates the job flow characteristics at sectoral level and reveals the heterogeneity between and within sectors. To the best of our knowledge, this is the first attempt to study these issues using data originated from Turkey.

7. Gross Job Flows of Turkish Private Manufacturing Industry by Firm Size (1980-2001)

Chapter 6 found variations in job creation and job destruction across industries. Davis et al. (1996) suggest that as the size distributions of firms vary significantly across industries, differences in job flow behavior across different firm sizes can possibly throw light on the cross industry variation in job creation and destruction rates. Another reason, suggested by Davis et al. (1996), prompting to examine the role of firm size is the existence of strong links between firm size and key economic outcomes like the level and inequality of wages, workforce quality, the pace of technological innovation, and the likelihood of unionization. High excess job reallocation rates found in some sectors in the previous chapter stimulate to investigate whether firm size provides to categorize firms into groups with relatively homogenous patterns of employment change (Davis et al., 1996).

In the light of these, this chapter examines whether there are differences in job flow behavior between firm sizes in the Turkish manufacturing sector in the period 1980-2001. The findings illustrate that large firms have a greater potential to create and destroy jobs in comparison to medium-size and small firms. Indeed, net job growth rate increases with firm size. There is a cyclical asymmetry in the process of change between job creation and job destruction in all firm size groups. The pro-cyclical pattern of variation in job reallocation for all firm size groups means that all groups of firms tend to reshuffle their labor force in the periods of economic expansion. Heterogeneity and labor flexibility are relatively higher in medium-size and large firms

compared to small firms. Furthermore, the different effects of recession/crises on the firm size groups are also striking.

To elaborate on these general results, Section 7.1 presents the gross job flow analysis of the private manufacturing firms by firm size. Section 7.2 summarizes the results.

7.1 Gross Job Flow Analysis

The analysis of gross job flows is performed by using 4-digit data for the Turkish manufacturing industry provided by the TURKSTAT (Turkish Statistical Institute). Firms in the private manufacturing sector is classified into three groups: Private firms with i) 10-100 employees (small firms), ii) 100-500 employees (medium-size firms), and iii) 500 or more employees (large firms).

The method used in computing the job flow statistics in this study is similar to the method of comparative statics, one of the methods surveyed by Kirchhoff and Greene (1998).[89] This method appears to be the only way that could be used with 4-digit sectoral level data.

Before moving to the analysis, some limitations and potential drawbacks in the analysis should be mentioned. First, since firm or establishment level data is not available, the most widely defined data (at 4-digit sectoral level) is utilized in the analysis. This may give rise to some information loss while computing the gross flow measures. Second, a fallacy may arise because firms can migrate between size

[89] See Section 2.3 in Chapter 2.

categories from one year to the next. Having considered that the data is based on 4-digit sectors in the manufacturing industry, a firm which increased in size and moved from small firm category to medium-size category, causes a rise in job creation rate of medium-size firm category and job destruction in small firm category.[90] Keeping the likelihood of these drawbacks in mind, Table 7.1, 7.2, and 7.3 display the net and gross job flow rates by three groups of firm sizes for the period 1981–2001.

Table 7.1 Net and Gross Job Flow Rates by Firm Size Category: Small Firms (10–100 employees)

Year	JCR	JDR	SUM	NET	MAX	EXS
1981	0.0973	0.0195	0.1167	0.0778	0.1014	0.0306
1982	0.0665	0.0254	0.0919	0.0412	0.0738	0.0362
1983	0.0403	0.0360	0.0763	0.0043	0.0587	0.0352
1984	0.0176	0.0501	0.0676	-0.0325	0.0510	0.0334
1985	0.1759	0.0100	0.1859	0.1660	0.1759	0.0199
1986	0.0242	0.0598	0.0840	-0.0356	0.0678	0.0324
1987	0.0188	0.0559	0.0747	-0.0371	0.0601	0.0293
1988	0.0401	0.0382	0.0782	0.0019	0.0519	0.0527
1989	0.0372	0.0546	0.0918	-0.0174	0.0801	0.0234
1990	0.0194	0.0843	0.1037	-0.0649	0.0854	0.0366
1991	0.0105	0.0654	0.0759	-0.0549	0.0674	0.0171
1992	0.2700	0.0042	0.2742	0.2658	0.2700	0.0084
1993	0.0271	0.0476	0.0747	-0.0205	0.0559	0.0376
1994	0.0230	0.0511	0.0741	-0.0281	0.0591	0.0300
1995	0.0584	0.0331	0.0915	0.0252	0.0667	0.0496
1996	0.0701	0.0142	0.0842	0.0559	0.0736	0.0213
1997	0.1022	0.0299	0.1321	0.0723	0.1022	0.0597
1998	0.1237	0.0060	0.1297	0.1176	0.1237	0.0121
1999	0.0083	0.0834	0.0917	-0.0751	0.0834	0.0166
2000	0.0224	0.0420	0.0645	-0.0196	0.0519	0.0252
2001	0.0505	0.0321	0.0827	0.0184	0.0725	0.0204
Mean	0.0621	0.0401	0.1022	0.0219	0.0873	0.0299
Std. Deviation	0.0639	0.0229	0.0484	0.0829	0.0510	0.0131

Source: Calculated by the author using data from TURKSTAT.

[90] As is mentioned in Section 9.1, Davis et al. (1996) address a similar fallacy stemming from size distribution. When size is determined by the base year employment in firm-level data, this causes a fallacy as firms migrate between size categories. However, this situation is different from our case in that our data is 4-digit level data and the size is not determined according to the base employment year in this study.

Table 7.2 Net and Gross Job Flow Rates by Firm Size Category: Medium-Size Firms (100–500 employees)

Year	JCR	JDR	SUM	NET	MAX	EXS
1981	0.1084	0.0692	0.1776	0.0393	0.1387	0.0779
1982	0.1603	0.0213	0.1816	0.1390	0.1603	0.0426
1983	0.1004	0.0462	0.1466	0.0542	0.1066	0.0802
1984	0.1125	0.0574	0.1699	0.0552	0.1267	0.0864
1985	0.1229	0.0791	0.2020	0.0438	0.1571	0.0897
1986	0.1578	0.0372	0.1950	0.1205	0.1578	0.0745
1987	0.1249	0.0293	0.1542	0.0957	0.1288	0.0508
1988	0.1004	0.0702	0.1706	0.0302	0.1136	0.1141
1989	0.0846	0.0618	0.1464	0.0228	0.1062	0.0804
1990	0.0618	0.0633	0.1251	-0.0015	0.0867	0.0768
1991	0.0520	0.0795	0.1315	-0.0274	0.0986	0.0659
1992	0.0929	0.0801	0.1730	0.0127	0.1268	0.0925
1993	0.1069	0.0367	0.1435	0.0702	0.1127	0.0618
1994	0.0287	0.0955	0.1242	-0.0668	0.0968	0.0548
1995	0.1377	0.0235	0.1612	0.1142	0.1391	0.0442
1996	0.1331	0.0617	0.1948	0.0713	0.1485	0.0925
1997	0.1953	0.0212	0.2165	0.1741	0.1953	0.0423
1998	0.0617	0.0539	0.1157	0.0078	0.0827	0.0660
1999	0.0394	0.0697	0.1091	-0.0303	0.0802	0.0579
2000	0.1001	0.0292	0.1293	0.0709	0.1115	0.0356
2001	0.0338	0.0903	0.1241	-0.0566	0.0975	0.0532
Mean	0.1007	0.0560	0.1568	0.0447	0.1225	0.0686
Std. Deviation	0.0439	0.0233	0.0309	0.0632	0.0298	0.0205

Source: Calculated by the author using data from TURKSTAT.

Table 7.3 Net and Gross Job Flow Rates by Firm Size Category: Large Firms (500 or more employees)

Year	JCR	JDR	SUM	NET	MAX	EXS
1981	0.0684	0.0371	0.1055	0.0313	0.0718	0.0675
1982	0.0954	0.0438	0.1392	0.0516	0.1011	0.0764
1983	0.1336	0.0721	0.2057	0.0615	0.1732	0.0649
1984	0.2251	0.0065	0.2316	0.2186	0.2251	0.0129
1985	0.1993	0.0521	0.2514	0.1472	0.2263	0.0501
1986	0.1136	0.1368	0.2504	-0.0232	0.2247	0.0514
1987	0.1021	0.0260	0.1280	0.0761	0.1022	0.0517
1988	0.1373	0.0398	0.1771	0.0975	0.1373	0.0796
1989	0.0834	0.0754	0.1587	0.0080	0.1237	0.0702
1990	0.1141	0.0759	0.1901	0.0382	0.1602	0.0598
1991	0.0142	0.3012	0.3154	-0.2869	0.3051	0.0207
1992	0.0234	0.1100	0.1333	-0.0866	0.1120	0.0427
1993	0.0815	0.0582	0.1397	0.0233	0.1168	0.0459
1994	0.0948	0.0487	0.1435	0.0460	0.1264	0.0341
1995	0.4760	0.0421	0.5181	0.4339	0.4790	0.0780
1996	0.4056	0.1756	0.5812	0.2300	0.5313	0.0997
1997	0.2234	0.1232	0.3466	0.1001	0.2921	0.1090
1998	0.1929	0.0395	0.2324	0.1534	0.1929	0.0790
1999	0.0925	0.1897	0.2822	-0.0972	0.2064	0.1516
2000	0.1097	0.1044	0.2141	0.0053	0.1891	0.0501
2001	0.1891	0.1348	0.3240	0.0543	0.2725	0.1029
Mean	0.1512	0.0901	0.2413	0.0611	0.2081	0.0666
Std. Deviation	0.1129	0.0693	0.1238	0.1406	0.1186	0.0317

Source: Calculated by the author using data from TURKSTAT.

Comparing Table 7.1, 7.2, and 7.3 reveals that the rates of job creation, job destruction, and net employment growth increase monotonically with firm size. Table 7.4 presents a summary of the results for the firm size groups in the period 1981-2001.

Table 7.4 Net and Gross Job Flow Rates by Firm Size Category: Aggregated Table (1981–2001)

Firm Size	JCR	JDR	SUM	NET	MAX	EXS	Employment Share
10 to 100 employees	0.0621	0.0401	0.1022	0.0219	0.0873	0.0299	32.4
100 to 500 employees	0.1007	0.0560	0.1568	0.0447	0.1225	0.0686	35.0
500 or more employees	0.1512	0.0901	0.2413	0.0611	0.2081	0.0666	32.6

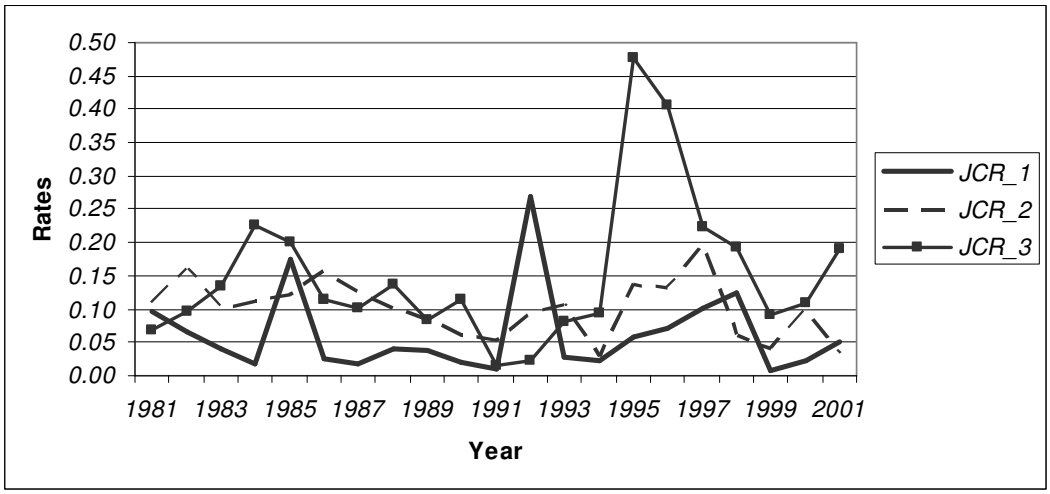
Source: Calculated by the author using data from TURKSTAT.

The job creation rate averages 6.2 percent of employment per year for firms with 10-100 employees, 10 percent for firms with 100-500 employees, and 15 percent for firms with 500 or more employees. Thus, large firms create new jobs at a much higher gross rate than small firms do. On the other side, job destruction rates rise with firm size as well. It averages 4 percent of employment per year for firms with 10-100 employees, 5.6 percent for firms with 100-500 employees, and 9 percent for firms with 500 or more employees. Hence, large firms also destroy jobs at a much higher rate than small firms do. To see the this statistical portrait in a compact form, Figure 7.1 and Figure 7.2 illustrate the rates of job creation and destruction according to firm size, where the numbers 1, 2 and 3 following the JCR and JDR with a dash line represents the corresponding rates for the firms with 10-100 employees, 100-500 employees, and 500 or more employees, respectively.[91]

[91] The sector of No. 3511 (Manufacture of basic industrial chemicals except fertilizer) has an outlier value in the large firm category in 1995. When the analysis is redone excluding this value, the average rate of job creation is found to be 13.9 percent for the large firm category in the period 1981-2001.

Job creation is pro-cyclical and job destruction is countercyclical for all firm size groups during 1981-2001.[92] The correlation coefficient between the rates of job creation and job destruction is -0.77 and -0.74 for small and medium-size firms. The corresponding rate for large firms is negative (-0.14) but insignificant. Furthermore, job reallocation rate is pro-cyclical for all firm size groups but the strength of pro-cyclicality is getting looser as the size of the firm increases.[93]

Figure 7.1 Job Creation Rates by Firm Size Category (1981–2001)

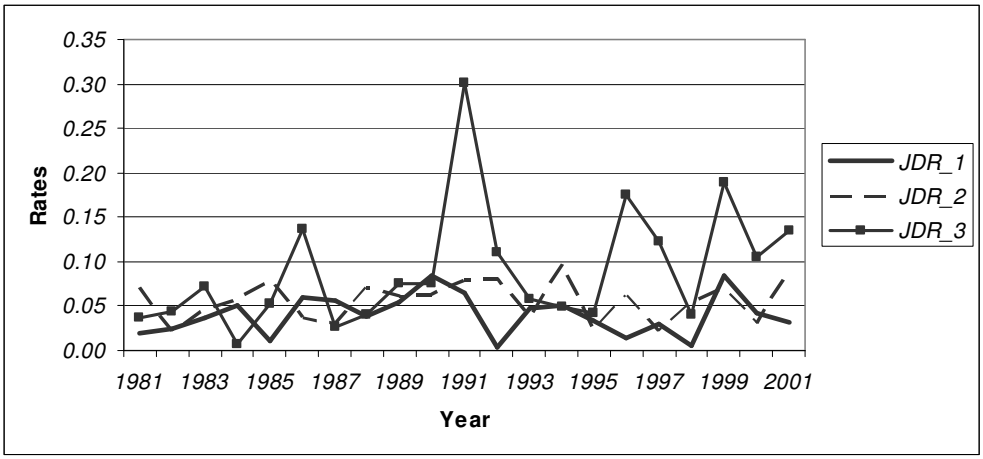


Source: Calculated by the author using data from TURKSTAT.

Table 7.4 displays that job reallocation rate goes up as the size of the firm rises. The greatest amount of reshuffling of jobs occurred in the period 1981-1989 for medium-size firms and in the period 1990-2001 for large firms. The corresponding periods are the times that heterogeneity and labor flexibility are the greatest in these groups. Furthermore, the average rate of job reallocation of large firms increased in the

[92] The correlation coefficients between job creation and net employment growth are positive and significant, and those between job destruction and net employment growth are negative and significant.
[93] The correlation coefficients between the rates of net employment growth and job reallocation are 0.89, 0.71, and 0.46 for small, medium-size, and large firms, respectively. All coefficients are significant.

Figure 7.2 Job Destruction Rates by Firm Size Category (1981–2001)



Source: Calculated by the author using data from TURKSTAT.

period 1990-2001. Small firms are less heterogeneous and have less labor flexibility in comparison to other firm groups

Excess job reallocation, which measures how much job creation and job destruction is realized above the quantity needed to accommodate net contraction or expansion, exhibits an almost inverse U-shape. The rates evince that medium-size and large firms experienced more heterogeneity and labor flexibility compared to small firms. In addition, the rates of job creation and job destruction for large firms are much more volatile than that of other firm size groups.

Tables 7.1, 7.2, 7.3, and 7.4 show that the recessionary year 1991 affected all firm-size groups negatively in terms of net employment growth. The large firms are influenced more severely, though. The 1994 crisis seems to impinge on all groups negatively except the large firms (firms with 500 or more employees). The recessionary year 1999 seems to influence all groups rigorously. A pretty high decline in their net employment growth is observed in 1999. Small and large firms experienced a larger decline compared to medium-size firms in 1999. The findings also reveal that 2001

crisis affected the medium-size firms severely but other groups did not seem to be influenced; even the rates of job creation for the small and large firms increased in 2001. Besides, job destruction rate of small firms declined.

Table 7.5 Job Flow Rates by Firm Size Category: Separated into Sub-periods

	JCR	JDR	SUM	NET	MAX	EXS
10-100 employees						
1981-1989	0.0575	0.0388	0.0964	0.0187	0.0801	0.0326
1990-2001	0.0655	0.0411	0.1066	0.0244	0.0926	0.0279
100-500 employees						
1981-1989	0.1191	0.0524	0.1715	0.0667	0.1328	0.0774
1990-2001	0.0870	0.0587	0.1457	0.0282	0.1147	0.0620
500 or more employees						
1981-1989	0.1287	0.0544	0.1831	0.0743	0.1539	0.0583
1990-2001	0.1681	0.1169	0.2850	0.0512	0.2487	0.0728

Source: Calculated by the author using data from TURKSTAT.

Table 7.5 documents the job flow statistics of different firm sizes by the sub-periods of 1981-1989 and 1990-2001. The findings evince that large firms have the highest job creation rate in both periods compared to other firm size groups. However, these large firms also have the highest job destruction rates in these periods. The average rate of job destruction of all firm size groups increased in the 1990-2001 period compared to 1981-1989 period. Among the firm size groups, large firms had the biggest rise. From 1981-1989 to 1990-2001, there was a little rise in the net employment growth rate of small firms, whereas medium-size and large firms experienced a decline. It is a salient fact that medium-size firms followed the large firms very closely in the period 1981-1989, however, the rates of job creation and job destruction of large firms

increase and become considerably far from the rates of small and medium-size firms in the period 1990-2001.

Following Davis et al. (1996), the shares of gross job creation and destruction according to firm size category are presented in Table 7.6 (See Appendix A1.4). As the table reveals, large firms created 42 percent of new manufacturing jobs over the period. They also destroyed most of the lost manufacturing jobs. As the firm size increases, the shares of both gross job creation and gross job destruction go up. Having taken into account the almost equal shares of employment illustrated in the last column of the Table 7.4, the role of large firms in both job creation and job destruction is remarkable in the Turkish private manufacturing industry. Large firms account for a disproportionately large share of job creation and job destruction.

Table 7.6 Gross Job Flow Shares by Firm Size (1981–2001)

Firm Size	Gross Job Creation Shares	Gross Job Destruction Shares
10-100 employees	0.23	0.23
100-500 employees	0.35	0.30
500 or more employees	0.42	0.47

Source: Calculated by the author using data from TURKSTAT.

Table 7.7 documents the rates of job creation and job destruction weighted by employment shares of firm sizes for the period 1981-2001 (See Appendix A1.5). The resulting rates are similar to those reported in Table 7.6, reflecting that the large firms are the largest creator and destructor of jobs and small firms play a minor role in terms of both creation and destruction rates.

Table 7.7 Job Creation and Job Destruction by Firm Size (1981–2001): Weighted by Employment Share

Firm Size	JCR	JDR	Employment Share
10 to 100 employees	0.19	0.21	32.4
100 to 500 employees	0.34	0.32	35.0
500 or more employees	0.47	0.47	32.6

Source: Calculated by the author using data from TURKSTAT.

7.2 A Summary of Findings and Concluding Remarks

Using the available data source from TURKSTAT, this chapter provides job flow statistics of the private firms in the Turkish manufacturing sector classified by firm size. To the best of our knowledge, these findings are the first to look at the gross job flow measures of the Turkish manufacturing industry.

7.2.1 Job Creation and Job Destruction by Firm Size

The results of the analysis show that large firms have a great potential to create jobs. These firms destroy jobs by a considerable amount as well. Therefore, they dominate in the creation and destruction of jobs in the Turkish private manufacturing sector. However, the contribution of large firms to net employment growth is highest compared to other firm size groups (See Table 7.5, 7.6, and 7.7). As firm size rises, net job growth rate increases. Small firms tend to destroy jobs in more moderate contractions than other firm size groups.

This result is in contrast to the many theoretical models predicting that firm size and the variation of employment growth are negatively correlated (Voulgaris et al., 2005). Voulgaris et al. (2005) state that "*small firms may have lower labor costs and lower costs of adjustment, which provide them with higher flexibility in adjusting to economic fluctuations compared to large-sized firms.*" (p.299) Several country studies show the existence of diminishing rate of job creation or an increasing rate of job destruction as the firm size increases. Contini and Revelli (1997) point out that this has popularized the idea that the contribution of small firms to job creation has been a key factor since the mid seventies. They argue, however, that it is a weak argument; small firms create many jobs, but also destroy many.[94]

Recessionary years such as 1991 and 1999 have negative effects on net employment growth rates in all firm size groups. On the other hand, 1994 crisis did not influence large firms and only medium-size firms are affected by 2001 crisis. Therefore, aggregate disturbances have diverse effects on different firm size groups.

In the 1980s, the rates of job creation and job destruction of large and medium-size firms are close. In the period 1990-2001, the rates of job creation and job destruction of large firms increase and turn out to be noticeably far from the rates of small and medium-size firms in the period 1990-2001. Thus, this time small and medium-size firms have close rates in this period. It is also worth noting that large and medium-size firms have lower performance in terms of net employment growth in 1990-2001 compared to their performance in the period 1981-1989.

[94]Indeed, there is no consensus regarding the methodologies used in the analysis of job flows by firm size. See Section 2.3 in Chapter 2 for a brief literature survey about this discussion.

7.2.2 Cyclicality of Job Creation and Job Destruction by Firm Size

Job creation is pro-cyclical and job destruction is countercyclical for all firm size groups in the period 1981-2001. The job flow behavior of large firms is more volatile than that of other firm size groups. Job turnover exhibits a pro-cyclical pattern of variation for all firm size groups. This means that job creation is more volatile than job destruction. Therefore, firms in all size groups tend to reshuffle their labor force in the periods of economic upsurge. There exists a cyclical asymmetry in the process of change between job losses and job gains in all firm size groups. Nevertheless, the degree of this pro-cyclicality alleviates as the firm size grows.

7.2.3 Heterogeneity and Labor Flexibility by Firm Size

As the rates of (excess) job reallocation evinces, large and medium-size firms have more labor flexibility than small firms. In fact, as the firm size increases, labor flexibility rises. Simultaneous job creation and job destruction is higher in the groups of medium-size and large firms.

Firms are heterogeneous when different sizes are considered. Broersma and Gautier (1997a) argue that;

> *This, however, may hardly come as a surprise, as nowadays it is a well-established fact from labor market studies using micro-economic data that there is no such thing as a 'representative firm*'. (p.212)

It should be mentioned that the degree of heterogeneity found in this analysis is not so high compared to analogous studies in the literature. For example, Davis et al.

(1996) find much higher excess job reallocation rates in their studies of U.S. manufacturing sector in the period 1973-1988.[95] In their study, the excess reallocation rate decreases in the size of the firm. Bockerman and Maliranta (2001) argue that the size effect of reallocation rates can be explained, at least partly, by the fact that large firms can smooth out the idiosyncratic disturbances that hit smaller units. However, the results found in this chapter evinces that the lowest rates of excess job reallocation belongs to small firms in the Turkish manufacturing sector.

This study is the first attempt to study the job flow dynamics of the Turkish private manufacturing industry. The different responses of different firm sizes to recessions/crisis make us to consider the importance of idiosyncratic factors in the face of aggregate disturbances. Heterogeneity of firms' behavior suggests that businesses may show different responses to policy actions. Therefore, this type of analysis is expected to serve as basis information in the case of implementation of the laws and economic policies that can influence the magnitude, patterns, and costs of job flows (Davis et al., 1996).

[95] Using the average firm size method, they classify firms in a more disaggregated form than this study. In their study, averaging the excess job reallocation rates in their study over classes reveals that the excess job reallocation rates are 22 percent, 16.7 percent, and 13 percent for small, medium-size and large firms, respectively.

8. Conclusion

This thesis aims to investigate the dynamics of employment growth of the largest industrial firms in the period 1980-2006. The results show how employment dynamics of these firms has been evolved over the business cycle by presenting the outstanding characteristics of the employment behavior in different sub-periods. Moreover, the job flow measures of the largest firms are compared by that of all private Turkish manufacturing firms at two-digit sectoral level. The analysis is performed also using data for all private manufacturing firms, which are classified by firm size.

The largest industrial firms have a direct effect on the growth and employment level of the Turkish manufacturing industry along with an indirect influence on the performance of the firms from which they purchase intermediate goods (i.e. outsourcing). Their demand for intermediate goods from domestic subcontractor firms gives rise to increasing production of the subcontractor firms, thereby in turn, contributing to their employment level.

Chapter 4 suggests that there exist both job creation and job destruction in all phases of the business cycle for the largest industrial firms. It is remarkable that the rates of job creation and job destruction follow a different pattern in the 1980s in comparison to the period 1990-2006. An almost analogous pattern to 1980s is observed between the years of 2002 and 2004. While job creation always dominates the job destruction until 1991, from that moment on job destruction takes over in some years.

There is simultaneous job creation and job destruction in both recessions and booms. Recessions/crises (booms) are typically times of high (low) job destruction and

low (high) job creation. As expected in the literature, the rates of job creation and job destruction move in opposite directions for all periods.

Furthermore, the job reallocation process is long-term in nature for the largest private industrial firms in Turkey. It can be inferred that the policies focusing on encouraging these firms to create jobs would be in point. As Armington and Acs (2004) suggest, a high persistence rate implies more stable employment. High rates of gross job creation are considered as desirable if they result in high net growth rates. However, the same high job creation rates are viewed as undesirable if large proportions of those new jobs are lost within the next few years (Armington and Acs, 2004). It should be noted that created jobs persist but destroyed jobs also persist for the largest private industrial firms. In the light of these, the most successful period is 1981-1989.

There is not a general trend in terms of the cyclicality of job reallocation. Job reallocation is pro-cyclical in the period 1981-1989, whilst it is countercyclical in 1990-1996. Therefore, while recessions are characterized by a decline in job creation, accompanied by a relatively moderate increase in job destruction in the 1980s; they are typified by an increase in job destruction, along with a relatively moderate slowdown in job creation in 1990-1996. Job reallocation does not have a clear cyclical pattern in the periods 1997-2006 and 1980-2006. Hence, there exists asymmetry between job creation and job destruction in 1981-1989 and 1990-1996. These different patterns of job reallocation in different time periods entail that macroeconomic models of the business cycle vary.

Turkish economy adopted an outward-oriented development strategy in the 1980s after the import substitution years. During 1981-1989, Turkish manufacturing industry had positive growth rates. In the same period, the largest private firms in the

Turkish manufacturing industry experienced positive rates of net employment growth. They had a pattern of high job creation and low job destruction. After 1980s, some recessionary and crisis years hit the economy and thus the largest firms as well. The existing labor flexibility and heterogeneity in the employment behavior of these firms increased as of 1990. When other largest private firms are added to the analyses by means of taking into account the continuing firms in two-consecutive years, the overall results do not differ much.

The largest public firms display different patterns of job creation and job destruction during 1981-2001. While there is a nested structure of these rates until 1992, it disappears after that year leaving its place to the dominance of job destruction over job creation. There is an increase in job destruction level in the period 2001-2006. It is also a salient fact that the recessionary years are not reflected in the job flow statistics of the largest public firms. However as the sample widens, that is, more public firms are added to the analyses by means of taking into account the continuing firms in two-consecutive years, the impact of crises could be seen on the employment dynamics of the public firms. This implies that the most successful largest industrial public firms are more resistant to the aggregate disturbances compared to the continuing largest public firms in two-consecutive years.

As discussed in Chapter 5, labor flexibility and heterogeneity is generally low for the largest public firms but there is a rise after 1990 as in the case of largest private firms. Job reallocation process is not long-term in nature for them as of 1990. Job reallocation is pro-cyclical in the period 1981-1989, whilst it is countercyclical in 1990-1996, 1997-2006, and 1981-2006. Consequently, there exists asymmetry between job creation and job destruction for the largest public firms during 1980-2006.

As is seen, the largest public firms exhibit different employment dynamics from the largest private firms analyzed in Chapter 4. The overall results indicate that firm-type (public or private) makes difference in the pattern of job flows. In comparison to private firms, public firms are a relatively homogenous group of firms. Therefore, their response to policies may not differ much. However, public and private firms have some results in common as well. The periods of 1981-1989 and 1990-1996 are characterized by similar cyclical variations of these firms. For both type of firms, changes in job creation are accompanied by a relatively mild variation in job destruction, thus resulting in pro-cyclical behavior of job reallocation during in the period 1981-1989. On the other hand, changes in job destruction go with a comparatively mild variation in job creation, thereby implying countercyclical behavior of job reallocation during 1990-1996. Another outstanding common finding for the largest public and private firms is related with their job flow behavior in the 1980s. Besides the pro-cyclicality in their job reallocation, both types of firms have relatively better performance in terms of net employment growth and high persistence rates of job creation in the 1980s.

An accurate comparison with other studies is not possible because of the differences in the definition of large firms, sectoral coverage, and sampling interval. It is easier to examine industries over time or to make comparisons across industries within one country as suggested by Ilmakunnas and Maliranta (2003).

To this end, Chapter 6 analyzes the gross job flow dynamics of the Turkish manufacturing industry at sectoral level by comparing PMFs and the LPMFs. The results indicate that four manufacturing sectors - food, beverages and tobacco (31), textile, wearing apparel and leather industries (32), chemicals and chemical petroleum,

coal, rubber and plastic products (35), and fabricated metal products, machinery and equipment, transport equipment, professional and scientific and measuring and controlling equipment (38)- account for 84 percent of job creation and 82 percent of job destruction in the Turkish manufacturing.

Excluding the sectors of 'food, beverages and tobacco' (31) and 'fabricated metal products, machinery and equipment, transport equipment, professional and scientific and measuring and controlling equipment (38)', PMFs have a better performance in terms of net employment growth than the LPMFs during 1981-2001.

Employment expanded in most of the sectors in the Turkish manufacturing industry in the period 1981-2001, whereas it contracted in the groups of LPMFs for the 'textile, wearing apparel, and leather industries (32)' and 'manufacture of non-metallic mineral products, except products of petroleum and coal (36)'. The net employment growth performance of the largest firms in these sectors lags behind the overall net employment growth in these sectors.

It is an outstanding fact that job destruction rates of PMFs and the LPMFs move in the same direction for the sectors of 'textile, wearing apparel, and leather industries (32)', 'non-metallic mineral products, except products of petroleum and coal (36)', 'basic metal Industries (37)', and 'fabricated metal products, machinery and equipment, transport equipment, professional and scientific and measuring and controlling equipment (38)'. Job creation and net employment growth rates of PMFs and the LPMFs are in parallel in the sector of 'chemicals and chemical petroleum, coal, rubber and plastic products (35)'. It is worth mentioning that the net employment growth rates of PMFs and the LPMFs move in the same direction for this sector as well.

There is no common response of LPMFs and PMFs to the recessionary/crisis years at sectoral level. These two groups of firms show distinct behavior in the face of aggregate disturbances. Cyclicality in job reallocation changes by sectors. Most of the sectors have pro-cyclical pattern of variation.

Chapter 6 reveals that compared to PMFs, the LPMFs have greater heterogeneity and labor flexibility in all sectors except 'manufacture of chemicals and chemical petroleum, coal, rubber and plastic products (35)' and 'manufacture of non-metallic mineral products, except products of petroleum and coal (36)' in the period 1981-2001. As Davis et al. (1996) argue that the heterogeneity of firms' behavior may give rise to different responses to policy actions. Therefore, this type of analysis is expected to serve as basis information in the case of implementation of the laws and economic policies that can affect the magnitude, patterns, and costs of job flows (Davis et al., 1996).

The findings also evince that job reallocation occurred almost evenly within-sector and between-sectors. Therefore, sectoral disturbances or economy wide disturbances with differential sectoral effects, and firm-level heterogeneity have almost equal impact on job reallocation. Broersma and Gautier (1997a) argue that heterogeneity of firms in their employment behavior implies that the theoretical concept of the representative firm may have to be replaced by theories that can take account of employment heterogeneity. It is not easy to categorize firms into groups with homogenous behavior. Heterogeneity of firm behavior suggests that firms probably display different reactions to policy actions (Davis et. al, 1996). Bilsen and Konings (1998) point out that the disparities in reallocation of jobs and the patterns of job

creation and destruction in different sectors may stem from diverse potential market niches or varying degrees of competition faced by firms in these sectors.

Chapter 7 brings light on the job flow statistics of the private firms in the Turkish manufacturing sector according to firm size. The results show that large firms have a great potential to create and to destroy jobs. However, their contribution to net employment growth is greatest compared to other firm size groups. As firm size grows, net job growth rate increases.

While the rates of job creation and job destruction of large and medium-size firms are close in the 1980s, these rates for large firms increase and turn out to be noticeably far from the rates of small and medium-size firms in the period 1990-2001. Thus, this time small and medium-size firms have close rates as of 1990. It is also worth noting that large and medium-size firms have lower performance in 1990-2001 than in the period 1981-1989.

Job creation is pro-cyclical and job destruction is countercyclical for all firm size groups in the period 1981-2001. The job flow behavior of large firms is more volatile than that of other firm size groups. Job turnover exhibits a pro-cyclical pattern of variation for all firm size groups as well, thereby signaling that job creation is more volatile than job destruction. Hence, firms in all size groups tend to reshuffle their labor force in the periods of economic upsurge. There exists a cyclical asymmetry in the process of change between job losses and job gains in all firm size groups. Yet the degree of this pro-cyclicality alleviates as the firm size grows.

Simultaneous job creation and job destruction is higher in the groups of medium-size and large firms. This finding suggests that heterogeneity and labor flexibility are relatively higher in these firm size groups than that of small firms. The

diverse effects of the recession/crises on different firm size groups are also outstanding. These different responses of firm sizes to recessions/crisis induce us to consider the importance of firm-type and firm-specific factors in the face of aggregate disturbances. This matter paves the way for further research to scrutinize the decomposition of firm-level growth in order to discover the role of idiosyncratic disturbances in the net employment growth of the firms.

Various motives for examining gross job flows are mentioned in Chapter 2. This thesis aims to elucidate the dynamics of employment for the largest industrial firms in Turkey camouflaged by the net changes. Efforts to fathom the process of job flows have resulted in a substantial theoretical and empirical literature. Having brought some light on the dynamics of job flows of the largest firms in Turkey and unveiling the differences in job flow dynamics across sectors in the Turkish manufacturing industry and on the disparities between the job flows of largest private manufacturing firms and all private manufacturing firms; these findings are expected to help economists, policymakers, and the businesses developing a more comprehensive perception of the business cycles in terms of firm size and sectoral coverage and to serve as basis information in applying policies targeting these largest industrial firms. The findings also paves way for further examinations about the links between the key factors influencing job creation and job destruction, cited in Chapter 2.

Appendix

Appendix 1 Measures of Gross Flows

A1.1 (Gross) Job Creation and Job Destruction

Sectoral rates of gross job creation and destruction are size-weighted sums of firm level growth rates:

[A1.1] $$c_{jt} = \frac{C_{jt}}{X_{jt}} = \frac{\sum_i (E_{ij,t} - E_{ij,t-1})^+}{0.5(E_{j,t} + E_{j,t-1})}$$

which equals to

[A1.2] $$c_{jt} = \frac{C_{jt}}{X_{jt}} = \sum_{i \in J^+} (\frac{X_{ij,t}}{X_{jt}}) g_{ij,t}$$

where $$\sum_i (\frac{X_{ij,t}}{X_{jt}}) g_{it,t} = \sum_i \left[\frac{0.5(E_{ij,t} + E_{ij,t-1})}{0.5(E_{j,t} + E_{j,t-1})} \frac{(E_{ij,t} - E_{ij,t-1})}{0.5(E_{ij,t} + E_{ij,t-1})} \right]$$

$$= \sum_i \frac{(E_{ij,t} - E_{ij,t-1})}{0.5(E_{j,t} + E_{j,t-1})}$$

$$= \frac{1}{0.5(E_{j,t} + E_{j,t-1})} \sum_i (E_{ij,t} - E_{ij,t-1})$$

$$= \frac{1}{X_{jt}} \sum_{i} (E_{ij,t} - E_{ij,t-1})$$

Likewise, gross job destruction rate can be expressed as

[A1.3] $$d_{jt} = \frac{D_{jt}}{X_{jt}} = \sum_{i \in J^-} (\frac{X_{ij,t}}{X_{jt}}) \left| g_{ij,t} \right|$$

A1.2 Covariance of SUM and NET

Covariance of SUM and NET is var (*JCR*) - var (*JDR*). The algebraic extension of this equality is provided below:

[A1.4] $$Var(SUM + NET) = Var(SUM) + Var(NET) + 2Cov(SUM, NET)$$

Then, from [A1.4],

[A1.5] $$Cov(SUM, NET) = \frac{Var(SUM + NET) - Var(SUM) - Var(NET)}{2}$$

$$Cov(SUM, NET) = \frac{Var(SUM + NET) - [Var(SUM) + Var(NET)]}{2}$$

Since

[A1.6] $$Var(SUM) = Var(JCR + JDR) = Var(JCR) + Var(JDR)$$

$$+2Cov(JCR, JDR)$$

and

[A1.7] $$Var(NET) = Var(JCR - JDR) = Var(JCR) + Var(JDR)$$

$$-2Cov(JCR, JDR)$$

therefore, [A1.5] is

[A1.7] $$Cov(SUM, NET) = \frac{Var(SUM + NET)}{2} -$$

$$\frac{[Var(JCR) + Var(JDR) + 2Cov(JCR, JDR + Var(JCR) + Var(JDR) - 2Cov(JCR, JDR)]}{2}$$

[A1.8] $$Cov(SUM, NET) = \frac{Var(SUM + NET) - 2[Var(JCR) + Var(JDR)]}{2}$$

[A1.9] $$Cov(SUM, NET) = \frac{Var(SUM + NET)}{2} - [Var(JCR) + Var(JDR)]$$

Let's substitute $Var(SUM + NET)$ with $4Var(JCR)$; i.e

$$Var(SUM + NET) = Var(JCR + JDR + JCR - JDR) = 4Var(JCR)$$

[A1.9] $$Cov(SUM, NET) = \frac{4Var(JCR)}{2} - Var(JCR) - Var(JDR)$$

[A1.10] $$Cov(SUM, NET) = Var(JCR) - Var(JDR)$$

A1.3 Index of Intra-Industry Job Reallocation

Industry-level measure of excess job reallocation is as follows:

[A1.11] $$index_t = \frac{(JCR_{jt} + JDR_{jt} - \left|JCR_{jt} - JDR_{jt}\right|)}{JCR_{jt} + JDR_{jt}}$$

A1.4 Share of Gross Job Creation according to Firm Size

The share of gross job creation is calculated as follows:

(Gross job creation of the related firm size over the period)/ Total gross job creation of all firms over the period)

The share for the gross job destruction is calculated analogously.

A1.5 Job Creation and Job Destruction by Firm Size: Weighted by Employment Share

JCR:

(Employment share of Firm Size 1 x Job Creation Rate of Firm Size 1)/ [(Employment share of Firm Size 1 x Job Creation Rate of Firm Size 1) + (Employment share of Firm Size 2 x Job Creation Rate of Firm Size 2) +…+ (Employment share of Firm Size *t* x Job Creation Rate of Firm Size *t*)]

JDR is calculated analogously.

A1.6 Job Creation and Job Destruction Rates by Two-Digit Sectoral Level: Sectors: Weighted by Employment Shares

JCR:

(Employment share of Sector 1 x Job Creation Rate of Sector 1)/ [(Employment share of Sector 1x Job Creation Rate of Sector 1) + (Employment share of Sector 2 x Job Creation Rate of Sector 2) + (Employment share of Sector 3 x Job Creation Rate of Sector 3) +…+ (Employment share of Sector *t* x Job Creation Rate of Sector *t*)]

JDR is calculated analogously.

Appendix 2

A2.1 Data Arrangement (ISO's data)

- Data is arranged in such a way that only the continuing firms are used in the analyses**.**

- Public and private firms are grouped based on the data provided by ISO.
- In each of the analysis of the periods of 1980–1989, 1990–1996, 1996-2006, and 1980-2006, a self-consistent method is used in terms of grouping public and private firms. However, a private firm in the period of 1980–1989 might take place in public firms in 1990–1996. The similar consistent method is also applied to the analysis of the continuing firms of consecutive years for the period 1980-2006. The firm that causes inconsistency in terms of public-private transformation are kept out from the analysis of the corresponding period.

- Some firms were called up to investigate their outlier figures. Among these, some gave detailed information about the employment figures (Menderes Tekstil, Nuh Çimento, Egeplast Plastik).
- A firm, which has an outlier value in any year, has been removed from all the analyses to maintain the homogeneity.
- The number of firms removed from the analyses is shown in Table A2.1 below.

Table A2. 1 The Number of Continuing Firms Removed from the Analysis

	1980-1989	**1989-1996**	**1996-2006**	**1980-2006**	**1980-1996**	**1989-2006**
Outlier	5 firms	6 firms	6 firms	2 firms	2 firms	4 firms
Problematic public-private firm distinction	9 firms	7 firms	8 firms	5 firms	8 firms	10 firms

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A2.1 demonstrates the number of continuing firms removed from the analysis because of the problematic public-private firm distinction and outlier observation.

A2.2 Sectors in ISO's data

ISO aggregates industrial companies into 12 sub-sectors (The industrial codes are provided in parentheses)[96] :

1-Mining and Quarrying (21)

2- Food, Beverage, and Tobacco Industries (31)

3- Textile, Wearing Apparel, Leather Industries (32)

4- Wood Products and Furniture Industries (33)

5- Paper and Paper Products, Printing and Publishing Industries (34)

6- Manufacture of Chemicals and Chemical, Petroleum, Coal, Rubber and Plastic Products (35)

7- Non-metallic Mineral Products Industries (36)

8- Basic Metal Industries (37)

9- Fabricated Metal Products, Machinery and Equipment, Professional Measuring and Controlling Equipment Industries (38)

10- Automotive Industries (38)

11- Other Manufacturing Industries (39)

12- Electricity Industries (40)

The continuing firms in the analysis belong to eight sub-sectors: Food, Beverage and Tobacco Industries; Textile, Wearing Apparel, Leather Industries; Paper and Paper Products, Printing and Publishing Industries; Manufacture of Chemicals and Chemical, Petroleum, Coal, Rubber and Plastic Products; Non-metallic Mineral Products Industries; Basic Metal Industries; Fabricated Metal Products, Machinery and

[96] The codes are according to the International Standard Industrial Classification (ISIC) Series M, Rev.2 (ISO, 2004).

Equipment, Professional Measuring and Controlling Equipment Industries; and Automotive Industries.[97]

A2.3 Sectors in ISO's and TURKSTAT's Data

In both ISO's and TURKSTAT's data, sectors are grouped according to ISIC Rev 2. In ISO's data, sectors are provided at 3-digit level as listed below. However, there are no continuing firms belonging to some 3-digit sector numbers (i.e. 323, 324, 353, and 385) in ISO's data. Therefore, in order to make an accurate comparison between LPMFs and PMFs at sectoral level in Chapter 6, these sectors are excluded from the sectoral analyses of PMFs.

31 Food, Beverage, and Tobacco Industries

311 Food manufacturing

312 Manufacture of food products not elsewhere classified

313 Beverage industries

314 Tobacco manufactures

32 Textile, wearing apparel and leather industries

321 Manufacture of textiles

322 Manufacture of wearing apparel, except footwear

[97] Other sub-sectors in the whole data of ISO are Mining and Quarrying (21), Wood Products and Furniture Industries (33), Other Manufacturing Industries (39), and Electricity Industries (40). Because the analyses are performed with manufacturing firms only, the sub-sectors Mining and Quarrying and Electricity Industries are excluded from the analysis. In addition, sub-sectors of Wood Products and Furniture Industries (33) and Other Manufacturing Industries (39) left out on account of the fact that they have very few number of continuing firms for the analysis.

323 Manufacture of leather and products of leather, leather substitutes and fur, except footwear and wearing apparel

324 Manufacture of products of leather and leather substitutes, except footwear and wearing apparel

33 Manufacture of wood and wood products including furniture

331 Manufacture of wood and wood cork products, except furniture

332 Manufacture of furniture and fixtures, except primarily of metal

34 Manufacture of paper and paper products; printing and publishing

341 Manufacture of paper and paper products

342 Printing, publishing and allied industries

35 Manufacture of chemicals and chemical petroleum, coal, rubber and plastic products

351 Manufacture of industrial chemicals

352 Manufacture of other chemical products

353 Petroleum refineries

354 Manufacture of miscellaneous products of petroleum and coal

355 Manufacture of rubber products

356 Manufacture of plastic products not elsewhere classified

36 Manufacture of non-metallic mineral products, except products of petroleum and coal

361 Manufacture of pottery, china and earthenware

362 Manufacture of glass and glass products

369 Manufacture of other non-metallic mineral products

37 Basic metal industries

371 Iron and steel basic industries

372 Non-ferrous metal basic industries

38 Manufacture of fabricated metal products, machinery and equipment, transport equipment, professional, scientific, measuring, and controlling equipment

381 Manufacture of fabricated metal products, except machinery and equipment

382 Manufacture of machinery except electrical

383 Manufacture of electrical machinery, apparatus, appliances and supplies

384 Manufacture of transport equipment

385 Manufacture of professional and scientific, and measuring and controlling equipment not elsewhere classified, and of photographic and optical goods

39 Other manufacturing industries

A2.4 Average Employment Levels (Private Firms)

A2.4.1 Average Employment Levels of 48 Continuing Firms (1980-2006)

Table A2. 2 Average Employment Levels of 48 Continuing Firms (1980-2006)

Year	Average Employment
1980	923
1981	924
1982	957
1983	1002
1984	1046
1985	1045
1986	1122
1987	1259
1988	1292
1989	1316
1990	1385
1991	1323
1992	1265
1993	1321
1994	1181
1995	1185
1996	1215
1997	1318
1998	1343
1999	1293
2000	1304
2001	1186
2002	1213
2003	1281
2004	1435
2005	1424
2006	1473
Mean	1223
Standard Deviation	155

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A2. 3 Average and Total Employment Figures of 95 Continuing Private Firms (1980–1989)

Private Sector	Average Employment	Total Employment
1980	847	80502
1981	830	78829
1982	865	82158
1983	909	86367
1984	946	89855
1985	960	91207
1986	1008	95780
1987	1094	103896
1988	1122	106598
1989	1138	108102

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A2. 4 Average and Total Employment Figures of 252 Continuing Private Firms (1990–1996)

Private Sector	Average Employment	Total Employment
1989	859	216571
1990	853	214918
1991	795	200430
1992	763	192311
1993	759	191259
1994	717	180600
1995	729	183813
1996	765	192795

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A2. 5 Average and Total Employment Figures of 316 Continuing Private Firms (1996–2006)

Private Sector	Average Employment	Total Employment
1996	718	226816
1997	775	244747
1998	798	252254
1999	789	249416
2000	816	257770
2001	776	245067
2002	789	249380
2003	830	262146
2004	896	283093
2005	916	289569
2006	946	299059

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A2. 6 Average and Total Employment Figures of 76 Continuing Private Firms (1980–1996)

Year	Average Employment	Total Employment
1980	864	65672
1981	844	64176
1982	888	67518
1983	926	70367
1984	964	73301
1985	986	74951
1986	1051	79895
1987	1148	87271
1988	1180	89648
1989	1194	90712
1990	1197	90953
1991	1118	85004
1992	1073	81518
1993	1104	83898
1994	999	75893
1995	1005	76344
1996	1022	77706

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A2. 7 Average and Total Employment Figures of 151 Continuing Private Firms (1989–2006)

Year	Average Employment	Total Employment
1989	951	143655
1990	971	146624
1991	912	137659
1992	871	131562
1993	862	130156
1994	818	123567
1995	826	124660
1996	872	131694
1997	1015	134015
1998	1020	137705
1999	951	143538
2000	974	147144
2001	916	138291
2002	931	140598
2003	961	145150
2004	1045	157752
2005	1072	161807
2006	1082	163396

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

A2.5 Average and Total Employment Levels (Public Firms)

Table A2. 8 Average and Total Employment Figures of 20 Continuing Public Firms (1980-1989)

Public Sector	Average Employment	Total Employment
1980	3143	62866
1981	3102	62032
1982	3101	62022
1983	3262	65241
1984	3418	68361
1985	3335	66698
1986	3277	65537
1987	3195	63893
1988	3145	62908
1989	3204	64082

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A2. 9 Average and Total Employment Figures of 32 Continuing Public Firms (1989-1996)

Public Sector	Average Employment	Total Employment
1989	6391	204513
1990	5352	171274
1991	5523	176723
1992	5343	170980
1993	4721	151070
1994	4417	141329
1995	4281	136978
1996	3998	127949

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A2. 10 Average and Total Employment Figures of 10 Continuing Public Firms (1996-2006)

Public Sector	Average Employment	Total Employment
1996	4814	48142
1997	4634	46343
1998	4524	45236
1999	4560	45596
2000	4480	44795
2001	4423	44227
2002	4174	41736
2003	3712	37117
2004	3672	36722
2005	3511	35113
2006	3228	32279

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Appendix 3 International Comparisons

Table A3. 1 International Comparison of Annual Gross Job Flow Rates

Country	Period	Coverage	Firm Unit	JC	JD	Net growth	Job Reallocation	Source
Australia	1984-1985	Manufacturing	Establishments	16,1	13,2	3,9	29,3	Borland and Home (1994)
Canada	1974-1992	Manufacturing	Establishments	10,9	11,1	-0,2	21,9	Baldwin et al. (1998, Table 2)
Canada	1983-1991	All employees	Firms	14,5	11,9	2,6	26,3	OECD (1996, Table 2)
Chile	1976-1986	Manufacturing	Establishments	13	13,9	-1	26,8	Roberts (1996, Table 2.1)
Colombia	1977-1991	Manufacturing	Establishments	12,5	12,2	0,3	24,6	Roberts (1996, Table 2.1)
Denmark	1983-1989	Private sector	Establishments	16	13,8	2,2	29,8	OECD (1996, Table 2)
Denmark	1981-1991	Manufacturing	Establishments	12	11,5	0,5	23,5	Albaek and Sorensen (1996, Table 2)
Finland	1986-1991	All employees	Establishments	10,4	12	-1,6	22,4	OECD (1996, Table 2)
France	1984-1992	Private sector	Establishments	13,9	13,2	0,6	27,1	OECD (1996, Table 2)
France	1985-1991	Manufacturing	Firms	10,2	11	-0,8	21,2	Nocke (1994, Table 3)
France	1985-1991	Non-manufacturing	Firms	14,3	11,8	2,4	26,1	Nocke (1994, Table 3)
Germany	1983-1990	All employees	Establishments	9	7,5	1,5	16,5	OECD (1996, Table 2)
Germany (Lower Saxony)	1979-1993	Manufacturing	Establishments	4,5	5,2	0,7	9,7	Wagner (1995, TableA2.1)
Italy	1984-1993	Private sector	Firms	11,9	11,1	0,8	23	Contini et al. (1995, Table 3.1)
Israel	1971-1972	Manufacturing	Establishments	9,7	8,2	1,5	17,9	Gronau and Regev (1997)
Morocco	1984-1989	Manufacturing	Firms	18,6	12,1	6,5	30,7	Roberts (1996, Table 2.1)
Netherlands	1979-1993	Manufacturing	Firms	7,3	8,3	-1	15,6	Gautier (1997, Table 3.3)
New Zealand	1987-1992	Private sector	Establishments	15,7	19,8	-4,1	35,5	OECD (1996, Table 2)
Norway	1976-1986	Manufacturing	Establishments	7,1	8,4	-1,2	15,5	Klette and Mathiassen (1996, Table 1)
Sweden	1985-1992	All employees	Establishments	14,5	14,6	-0,1	29,1	OECD (1996, Table 2)

Country	Period	Coverage	Firm Unit	JC	JD	Net growth	Job Reallocation	Source
USA	1973-1993	Manufacturing	Establishments	8,8	10,2	-1,3	19	Baldwin et al. (1998, Table 1)
UK	1985-1991	All employees	Firms	8,7	6,6	2,1	15,3	OECD (1996, Table 2)
USA	1973-1988	Manufacturing	Plants	9,1	10,3	-1,1	19,4	Davis, Haltiwanger, and Schuh (1996, p.19)
USA	1973-1989	Manufacturing	Large plants (more than 1000 employees)	6,0	7,8	-1,9	13,8	Davis and Haltiwanger (1992, Table 4)
UK	1972-1986	Manufacturing	Large UK Manufacturing Firms (993 firms)	1,6	5,6	-3,9	7,2	Konings (1995)
Great Britain	1979-80, 83-84, 89-90.	Private manufacturing	Public and private	3,8	6,9	-3,1	9,5	Blancflower and Burgess (1996)
Russia	1985-1992	Manufacturing	Firms (large and medium-size)	0,87	3,94	-3,06	4,81	Brown and Earle (2002, Table 1)
Russia	1992-1996	Manufacturing	Firms (large and medium-size)	2,09	11,23	-9,15	13,32	Brown and Earle (2002, Table 1)
Russia	1996-2000	Manufacturing	Firms (large and medium-size)	3,49	8,69	-5,2	12,17	Brown and Earle (2002, Table 1)
Poland	1994-1997	Manufacturing and nonmanufacturing	Firms (more than 1000 employees)	3,1	5,3	-2,2	8,4	Faggio and Konings (2001)
Estonia	1994-1997	Manufacturing and nonmanufacturing	Firms (more than 1000 employees)	12,9	9,3	3,6	22,2	Faggio and Konings (2001)
Slovenia	1994-1997	Manufacturing and nonmanufacturing	Firms (more than 1000 employees)	4,3	4,6	8,9	-0,3	Faggio and Konings (2001)
Bulgaria	1994-1997	Manufacturing and nonmanufacturing	Firms (more than 1000 employees)	2,2	4,2	-2	6,5	Faggio and Konings (2001)
Romania	1995-1997	Manufacturing and nonmanufacturing	Firms (more than 1000 employees)	3,2	6,2	-3,1	9,4	Faggio and Konings (2001)

Source: Davis and Haltiwanger (1999) and author's own compilations.

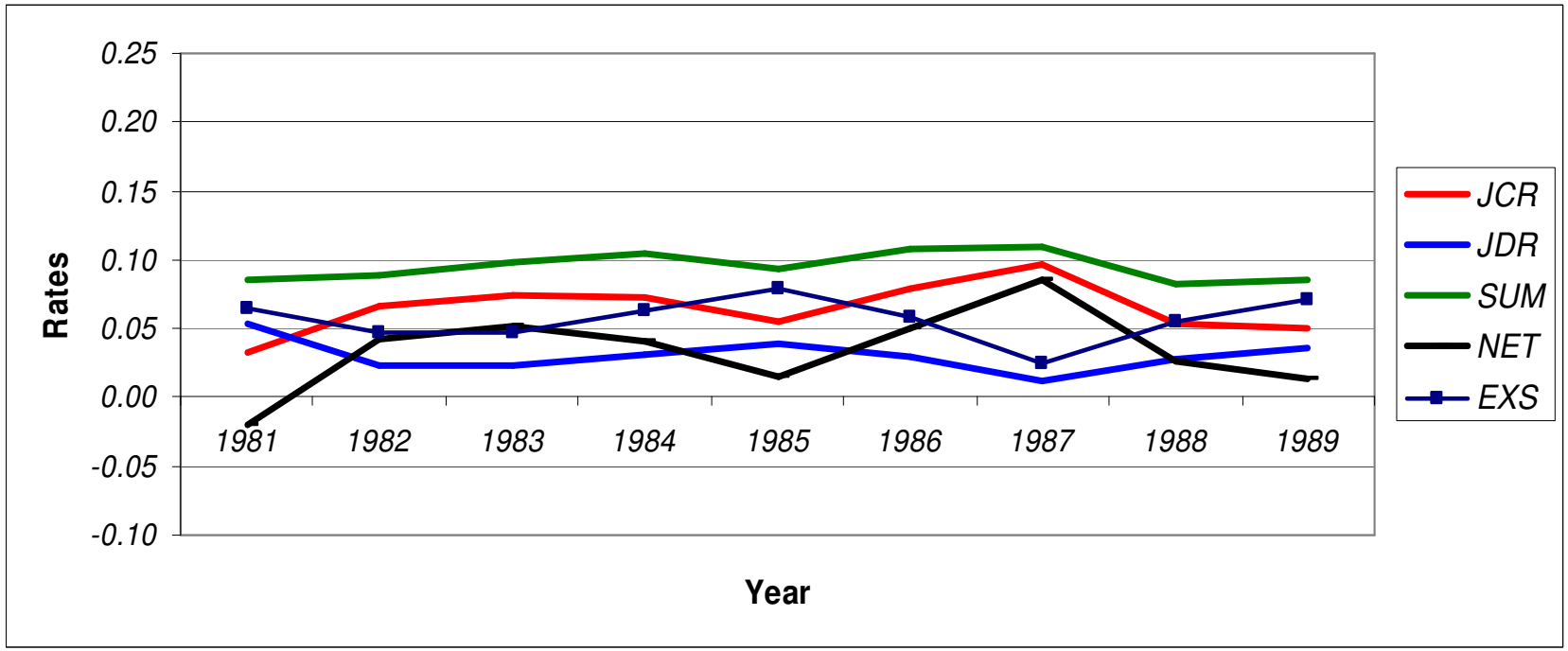
Appendix 4 The Analysis of Gross Job Flows

Table A4. 1 Gross Job Flows of 95 Continuing Private Firms (1981–1989)

Year	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
1981	2622	4295	0.0326	0.0534	0.0859	-0.0208	0.0534	0.0651
1982	5168	1839	0.0656	0.0233	0.0889	0.0422	0.0656	0.0467
1983	6153	1944	0.0749	0.0237	0.0986	0.0512	0.0749	0.0473
1984	6231	2743	0.0721	0.0318	0.1039	0.0404	0.0721	0.0635
1985	4889	3537	0.0544	0.0394	0.0938	0.0150	0.0544	0.0787
1986	7196	2623	0.0789	0.0288	0.1077	0.0501	0.0789	0.0575
1987	9265	1149	0.0967	0.0120	0.1087	0.0847	0.0967	0.0240
1988	5599	2897	0.0539	0.0279	0.0818	0.0260	0.0539	0.0558
1989	5320	3816	0.0499	0.0358	0.0857	0.0141	0.0499	0.0716
Mean	5827	2760	0.0643	0.0307	0.0950	0.0337	0.0666	0.0567
Standard Deviation	1798	1014	0.0189	0.0116	0.0101	0.0297	0.0155	0.0161

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Figure A4. 1 Gross Job Flows of 95 Continuing Private Firms (1981-1989)



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A4. 2 Persistence Rates of 95 Continuing Private Firms (1981–1989)

Year	$FJCR_{t1}$	$FJDR_{t1}$
1981	0.83	0.61
1982	0.92	0.75
1983	0.85	0.62
1984	0.84	0.77
1985	0.78	0.31
1986	0.96	0.34
1987	0.80	0.60
1988	0.77	0.77
Mean	0.84	0.60
Std Deviation	0.07	0.18

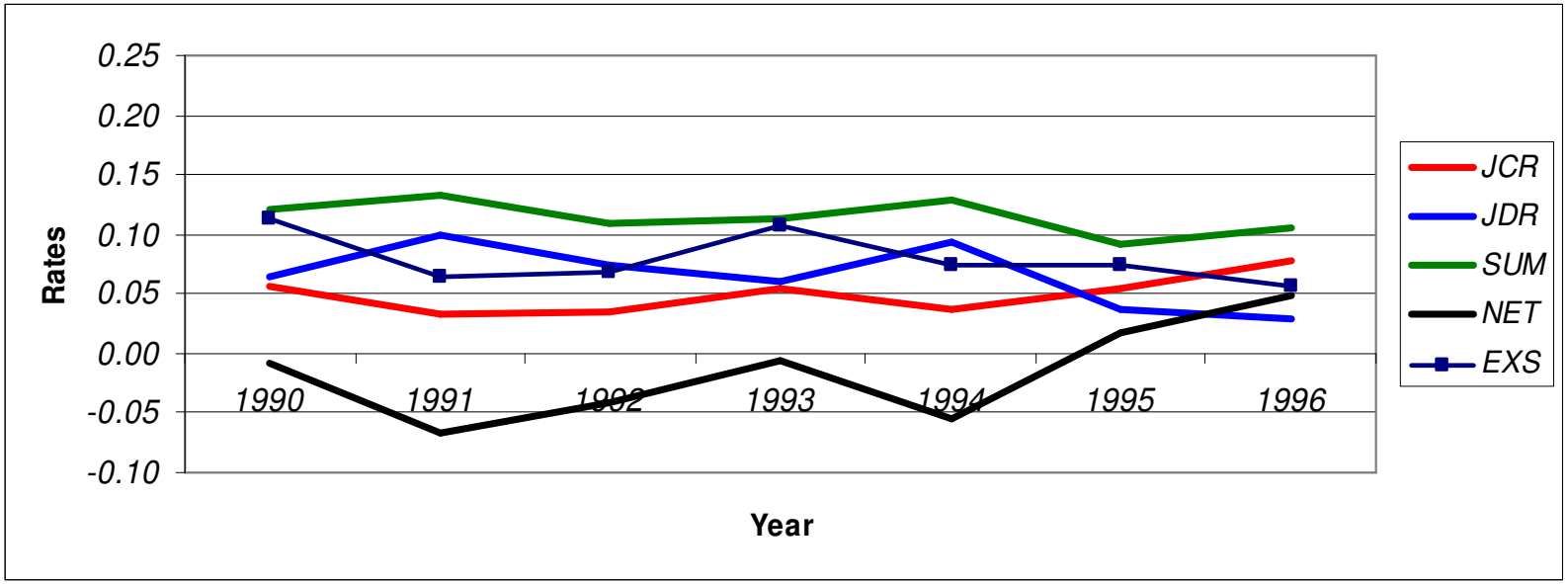
Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A4. 3 Gross Job Flows of 252 Continuing Private Firms (1990–1996)

Year	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
1990	12235	13888	0.0565	0.0641	0.1206	-0.0076	0.0641	0.1130
1991	6943	21431	0.0323	0.0997	0.1320	-0.0674	0.0997	0.0646
1992	6803	14922	0.0339	0.0744	0.1084	-0.0405	0.0744	0.0679
1993	10406	11458	0.0541	0.0596	0.1137	-0.0055	0.0596	0.1082
1994	7054	17713	0.0369	0.0926	0.1295	-0.0557	0.0926	0.0738
1995	9913	6700	0.0549	0.0371	0.0920	0.0178	0.0549	0.0742
1996	14200	5218	0.0773	0.0284	0.1056	0.0489	0.0773	0.0568
Mean	9651	13047	0.0494	0.0651	0.1145	-0.0157	0.0747	0.0798
Standard Deviation	2892	5779	0.0162	0.0265	0.0141	0.0415	0.0168	0.0219

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Figure A4. 2 Gross Job Flows of 252 Continuing Private Firms (1990–1996)



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A4. 4 Persistence Rates of 252 Continuing Private Firms (1990–1995)

Year	$FJCR_{t1}$	$FJDR_{t1}$
1990	0.73	0.93
1991	0.63	0.86
1992	0.68	0.81
1993	0.43	0.79
1994	0.80	0.83
1995	0.89	0.78
Mean	0.69	0.83
Std Deviation	0.16	0.05

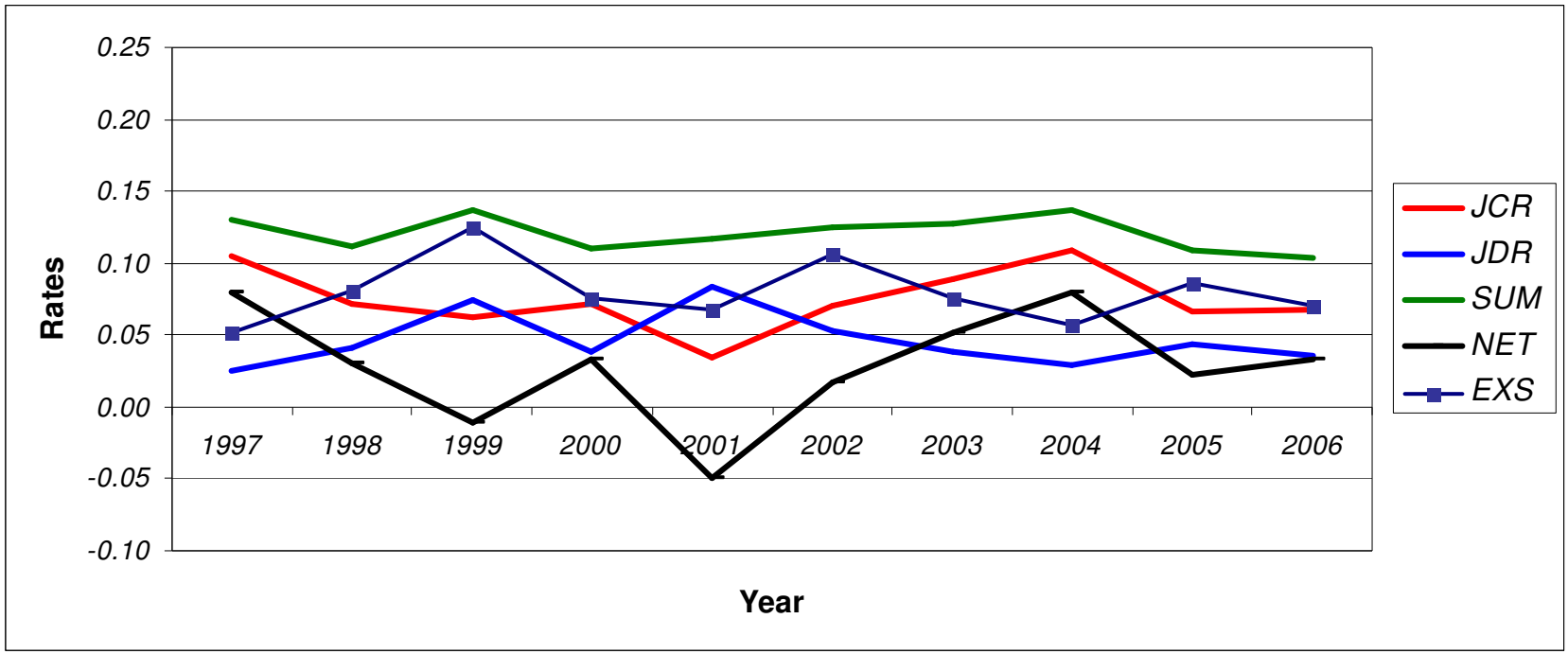
Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A4. 5 Gross Job Flows of 316 Continuing Private Firms (1997–2006)

Year	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
1997	23731	5800	0.1046	0.0256	0.1302	0.0791	0.1046	0.0511
1998	17404	9897	0.0711	0.0404	0.1115	0.0307	0.0711	0.0809
1999	15797	18635	0.0626	0.0739	0.1365	-0.0113	0.0739	0.1252
2000	17864	9510	0.0716	0.0381	0.1098	0.0335	0.0716	0.0763
2001	8731	21434	0.0339	0.0832	0.1170	-0.0493	0.0832	0.0677
2002	17400	13087	0.0710	0.0534	0.1244	0.0176	0.0710	0.1068
2003	22252	9486	0.0892	0.0380	0.1273	0.0512	0.0892	0.0761
2004	28457	7510	0.1086	0.0286	0.1372	0.0799	0.1086	0.0573
2005	18677	12201	0.0660	0.0431	0.1091	0.0229	0.0660	0.0862
2006	19737	10247	0.0682	0.0354	0.1035	0.0328	0.0682	0.0708
Mean	19005	11781	0.0747	0.0460	0.1207	0.0287	0.0807	0.0798
Standard Deviation	5219	4858	0.0217	0.0189	0.0121	0.0388	0.0153	0.0222

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Figure A4. 3 Gross Job Flows of 316 Continuing Private Firms (1997–2006)



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A4. 6 One-Year Persistence Rates of 316 Continuing Private Firms (1997–2006)

Year	$FJCR_{t1}$	$FJDR_{t1}$
1997	0.82	0.68
1998	0.61	0.75
1999	0.89	0.75
2000	0.71	0.83
2001	0.73	0.71
2002	0.88	0.77
2003	0.86	0.79
2004	0.84	0.73
2005	0.91	0.76
Mean	0.80	0.75
Std	0.10	0.04

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A4. 7 Gross Job Flows of 76 Continuing Private Firms during 1980–1996 (1981–1989)

Year	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
1981	2357	3853	0.0359	0.0587	0.0946	-0.0228	0.0587	0.0718
1982	4836	1494	0.0754	0.0233	0.0986	0.0521	0.0754	0.0466
1983	4078	1229	0.0604	0.0182	0.0786	0.0422	0.0604	0.0364
1984	5310	2376	0.0755	0.0338	0.1092	0.0417	0.0755	0.0675
1985	4530	2880	0.0618	0.0393	0.1011	0.0225	0.0618	0.0786
1986	7057	2113	0.0942	0.0282	0.1223	0.0660	0.0942	0.0564
1987	8353	977	0.1045	0.0122	0.1168	0.0923	0.1045	0.0245
1988	4907	2530	0.0562	0.0290	0.0852	0.0272	0.0562	0.0580
1989	4386	3322	0.0489	0.0371	0.0860	0.0119	0.0489	0.0741
Mean	5090	2308	0.0681	0.0311	0.0992	0.0370	0.0706	0.0571
Standard Deviation	1731	964	0.0217	0.0135	0.0149	0.0330	0.0186	0.0183

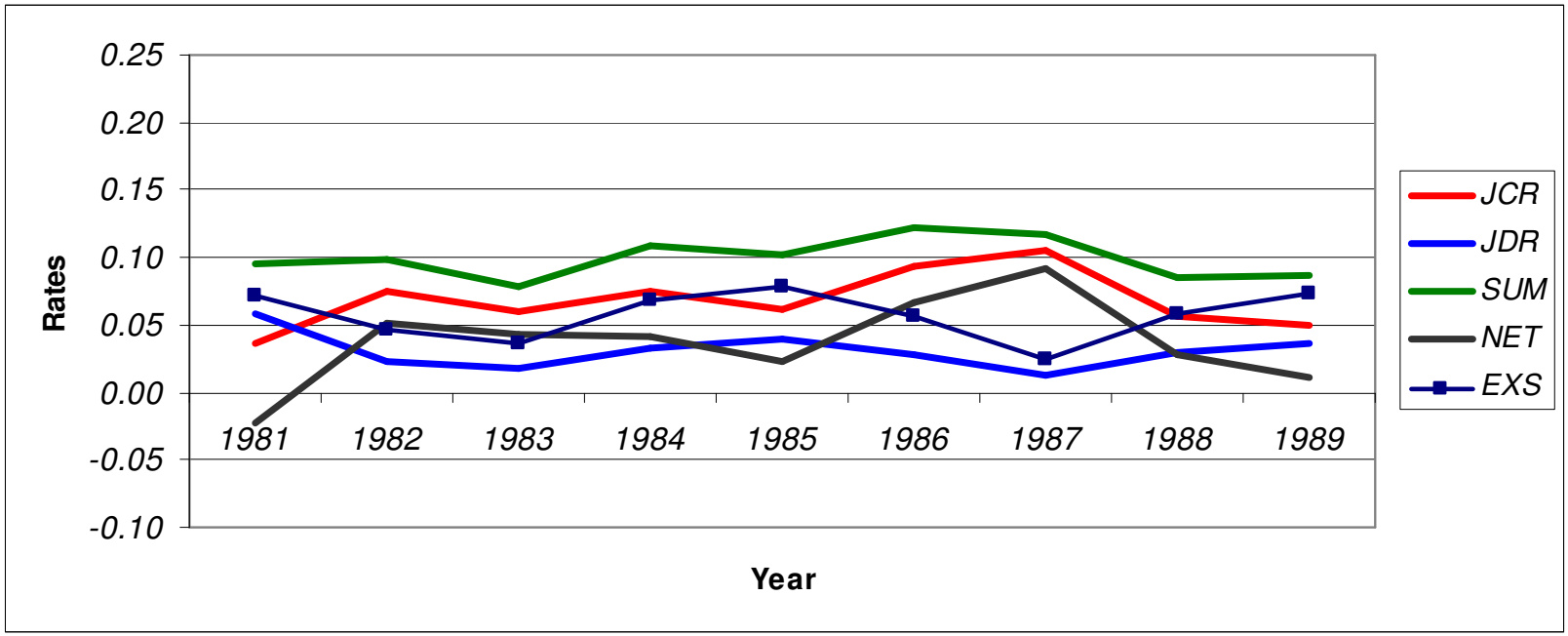
Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A4. 8 Gross Job Flows of 76 Continuing Private Firms during 1980–1996 (1990–1996)

Year	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
1990	5575	5334	0.0615	0.0588	0.1203	0.0027	0.0615	0.1176
1991	2702	8651	0.0297	0.0951	0.1248	-0.0654	0.0951	0.0594
1992	2563	6049	0.0302	0.0712	0.1013	-0.0410	0.0712	0.0603
1993	5432	3052	0.0666	0.0374	0.1041	0.0292	0.0666	0.0749
1994	1045	9050	0.0125	0.1079	0.1203	-0.0954	0.1079	0.0249
1995	3155	2704	0.0416	0.0356	0.0772	0.0059	0.0416	0.0713
1996	3149	1787	0.0412	0.0234	0.0647	0.0178	0.0412	0.0468
Mean	3374	5232	0.0405	0.0613	0.1018	-0.0209	0.0693	0.0650
Standard Deviation	1618	2885	0.0189	0.0318	0.0231	0.0469	0.0251	0.0286

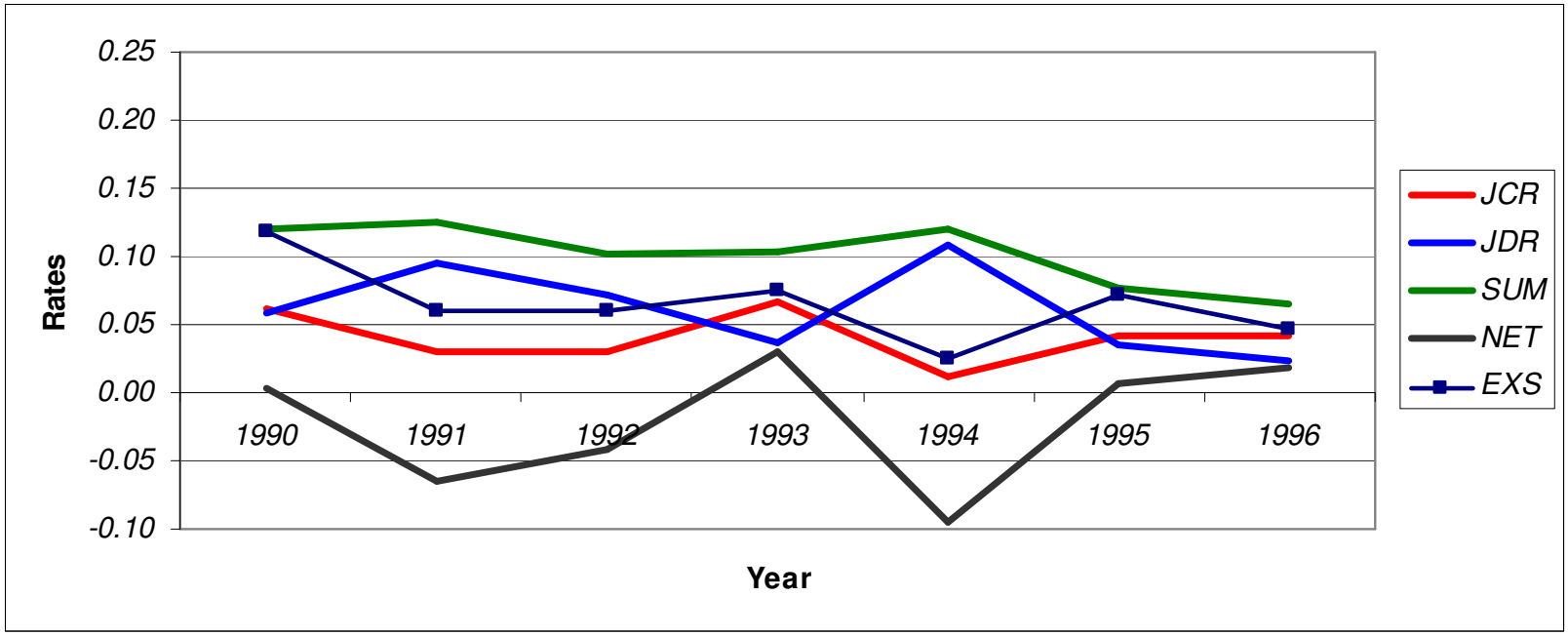
Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Figure A4. 4 Gross Job Flows of 76 Continuing Private Firms during 1980-1996 (1981-1989)



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Figure A4. 5 Gross Job Flows of 76 Continuing Private Firms during 1980-1996 (1990-1996)



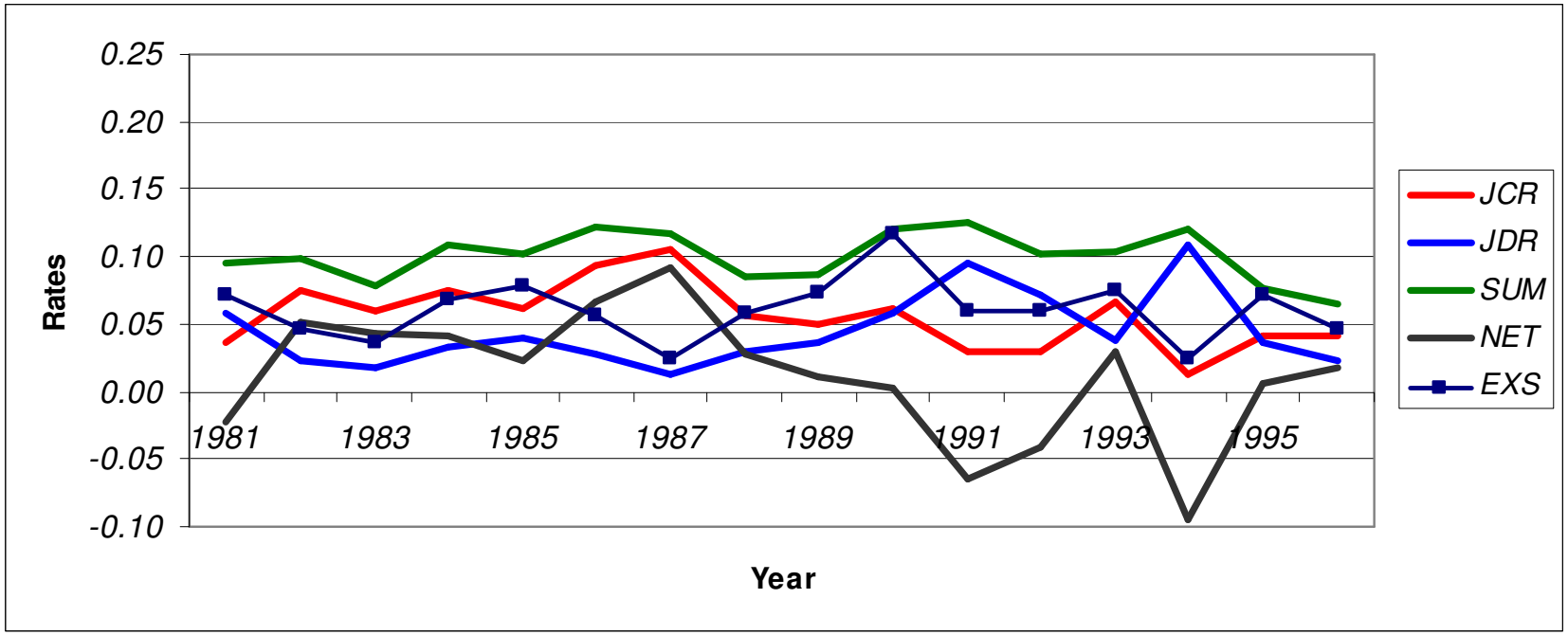
Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A4. 9 Gross Job Flows of 76 Continuing Private Firms during 1980–1996

Year	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
1981	2357	3853	0.0359	0.0587	0.0946	-0.0228	0.0587	0.0718
1982	4836	1494	0.0754	0.0233	0.0986	0.0521	0.0754	0.0466
1983	4078	1229	0.0604	0.0182	0.0786	0.0422	0.0604	0.0364
1984	5310	2376	0.0755	0.0338	0.1092	0.0417	0.0755	0.0675
1985	4530	2880	0.0618	0.0393	0.1011	0.0225	0.0618	0.0786
1986	7057	2113	0.0942	0.0282	0.1223	0.0660	0.0942	0.0564
1987	8353	977	0.1045	0.0122	0.1168	0.0923	0.1045	0.0245
1988	4907	2530	0.0562	0.0290	0.0852	0.0272	0.0562	0.0580
1989	4386	3322	0.0489	0.0371	0.0860	0.0119	0.0489	0.0741
1990	5575	5334	0.0615	0.0588	0.1203	0.0027	0.0615	0.1176
1991	2702	8651	0.0297	0.0951	0.1248	-0.0654	0.0951	0.0594
1992	2563	6049	0.0302	0.0712	0.1013	-0.0410	0.0712	0.0603
1993	5432	3052	0.0666	0.0374	0.1041	0.0292	0.0666	0.0749
1994	1045	9050	0.0125	0.1079	0.1203	-0.0954	0.1079	0.0249
1995	3155	2704	0.0416	0.0356	0.0772	0.0059	0.0416	0.0713
1996	3149	1787	0.0412	0.0234	0.0647	0.0178	0.0412	0.0468
Mean	4340	3588	0.0560	0.0443	0.1003	0.0117	0.0700	0.0606
Standard Deviation	1849	2464	0.0244	0.0273	0.0183	0.0484	0.0209	0.0228

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Figure A4. 6 Gross Job Flows of 76 Continuing Private Firms (1980-1996)



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A4. 10 One –Year Persistence Rates of 76 Continuing Private Firms (1981–1989)

Year	$FJCR_{t1}$	$FJDR_{t1}$
1981	0.82	0.57
1982	0.92	0.74
1983	0.85	0.81
1984	0.85	0.76
1985	0.80	0.17
1986	0.96	0.35
1987	0.81	0.66
1988	0.76	0.75
1989	0.86	0.84
Mean	0.85	0.63
Std Deviation	0.06	0.23

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A4. 11 One –Year Persistence Rates of 76 Continuing Private Firms (1990–1995)

Year	$FJCR_{t1}$	$FJDR_{t1}$
1990	0.77	0.97
1991	0.58	0.87
1992	0.82	0.78
1993	0.33	0.88
1994	0.92	0.83
1995	0.91	0.83
Mean	0.72	0.86
Std Deviation	0.23	0.07

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A4. 12 One –Year Persistence Rates of 76 Continuing Private Firms (1981–1995)

Year	$FJCR_{t1}$	$FJDR_{t1}$
1981	0.82	0.57
1982	0.92	0.74
1983	0.85	0.81
1984	0.85	0.76
1985	0.80	0.17
1986	0.96	0.35
1987	0.81	0.66
1988	0.76	0.75
1989	0.86	0.84
1990	0.77	0.97
1991	0.58	0.87
1992	0.82	0.78
1993	0.33	0.88
1994	0.92	0.83
1995	0.91	0.83
Mean	0.80	0.72
Std	0.16	0.21

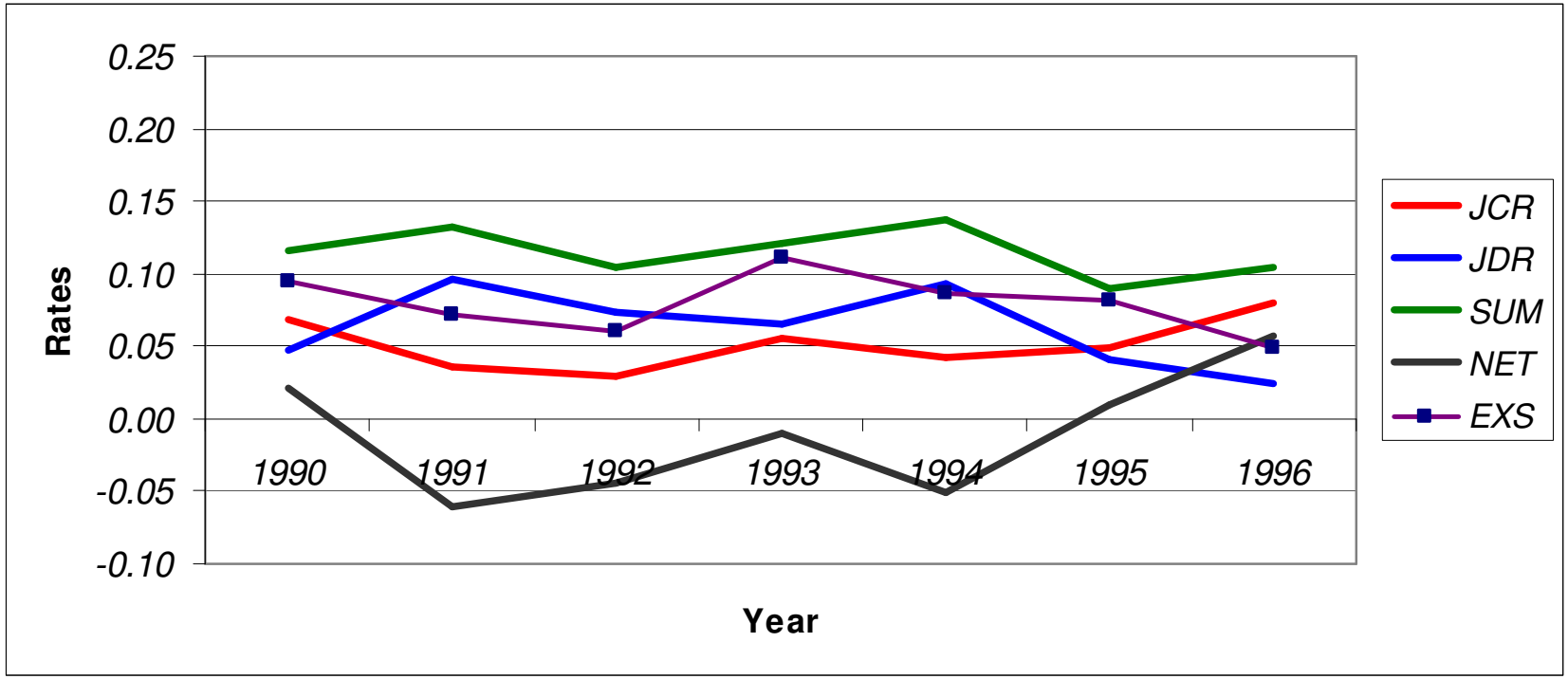
Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A4. 13 Gross Job Flows of 151 Continuing Private Firms during 1989–2006 (1990–1996)

Year	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
1990	9797	6828	0.0682	0.0475	0.1157	0.0207	0.0682	0.0951
1991	5254	14219	0.0358	0.0970	0.1328	-0.0611	0.0970	0.0717
1992	4104	10201	0.0298	0.0741	0.1039	-0.0443	0.0741	0.0596
1993	7267	8673	0.0552	0.0659	0.1212	-0.0107	0.0659	0.1105
1994	5588	12177	0.0429	0.0936	0.1365	-0.0506	0.0936	0.0859
1995	6129	5036	0.0496	0.0408	0.0904	0.0088	0.0496	0.0815
1996	10049	3015	0.0806	0.0242	0.1048	0.0564	0.0806	0.0484
Mean	6884	8593	0.0517	0.0633	0.1150	-0.0115	0.0756	0.0789
Standard Deviation	2283	3957	0.0179	0.0273	0.0166	0.0431	0.0165	0.0211

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Figure A4. 7 Gross Job Flows of 151 Continuing Private Firms during 1989-2006 (1990-1996)



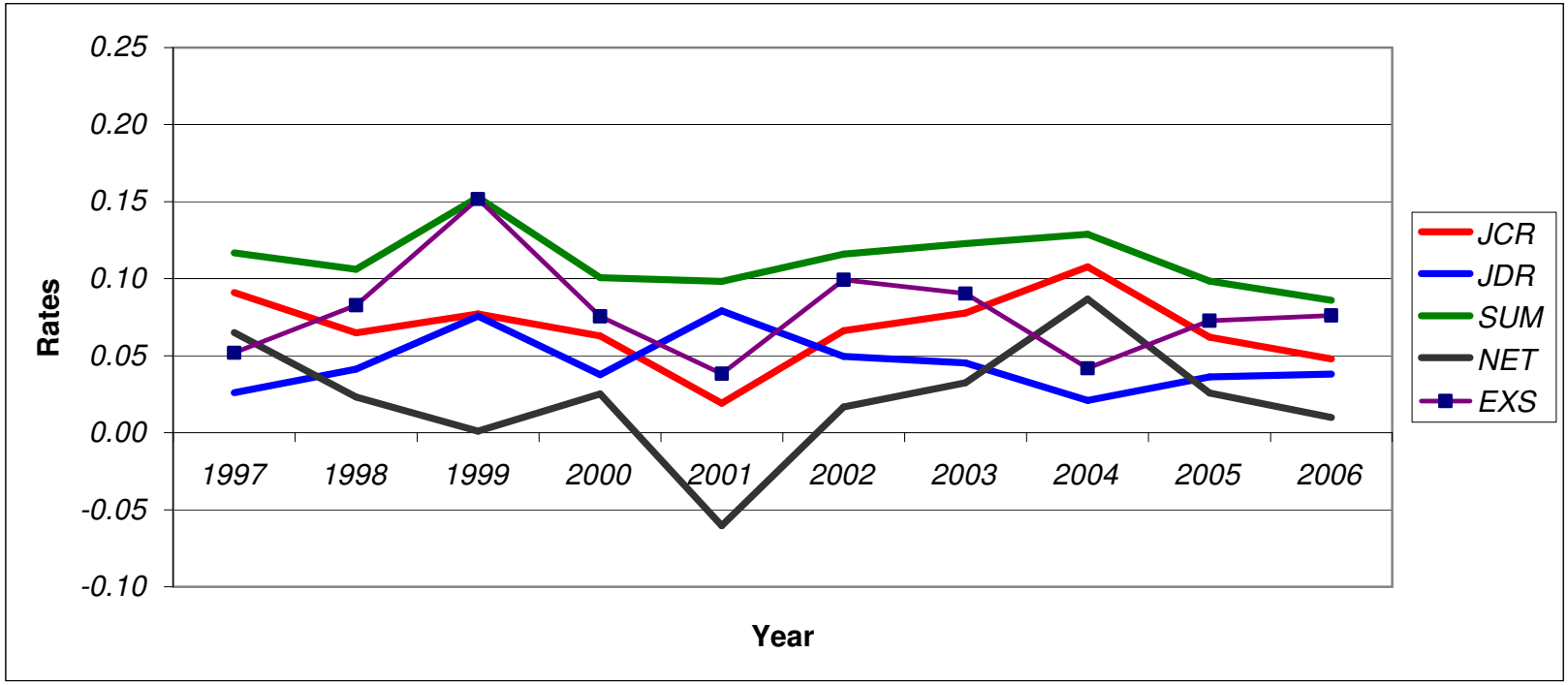
Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A4. 14 Gross Job Flows of 151 Continuing Private Firms during 1989–2006 (1997–2006)

Year	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
1997	11970	3420	0.0909	0.0260	0.1169	0.0649	0.0909	0.0519
1998	8670	5543	0.0647	0.0414	0.1061	0.0233	0.0647	0.0827
1999	10597	10430	0.0770	0.0758	0.1529	0.0012	0.0770	0.1517
2000	9026	5420	0.0629	0.0378	0.1006	0.0251	0.0629	0.0755
2001	2809	11662	0.0191	0.0793	0.0983	-0.0602	0.0793	0.0382
2002	9173	6866	0.0663	0.0496	0.1160	0.0167	0.0663	0.0993
2003	10906	6354	0.0776	0.0452	0.1228	0.0324	0.0776	0.0904
2004	15644	3042	0.1078	0.0210	0.1287	0.0868	0.1078	0.0419
2005	9794	5739	0.0621	0.0364	0.0985	0.0257	0.0621	0.0728
2006	7749	6160	0.0479	0.0381	0.0860	0.0098	0.0479	0.0761
Mean	9634	6464	0.0676	0.0450	0.1127	0.0226	0.0736	0.0781
Standard Deviation	3262	2717	0.0239	0.0191	0.0192	0.0388	0.0169	0.0328

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Figure A4. 8 Gross Job Flows of 151 Continuing Private Firms during 1989-2006 (1997-2006)



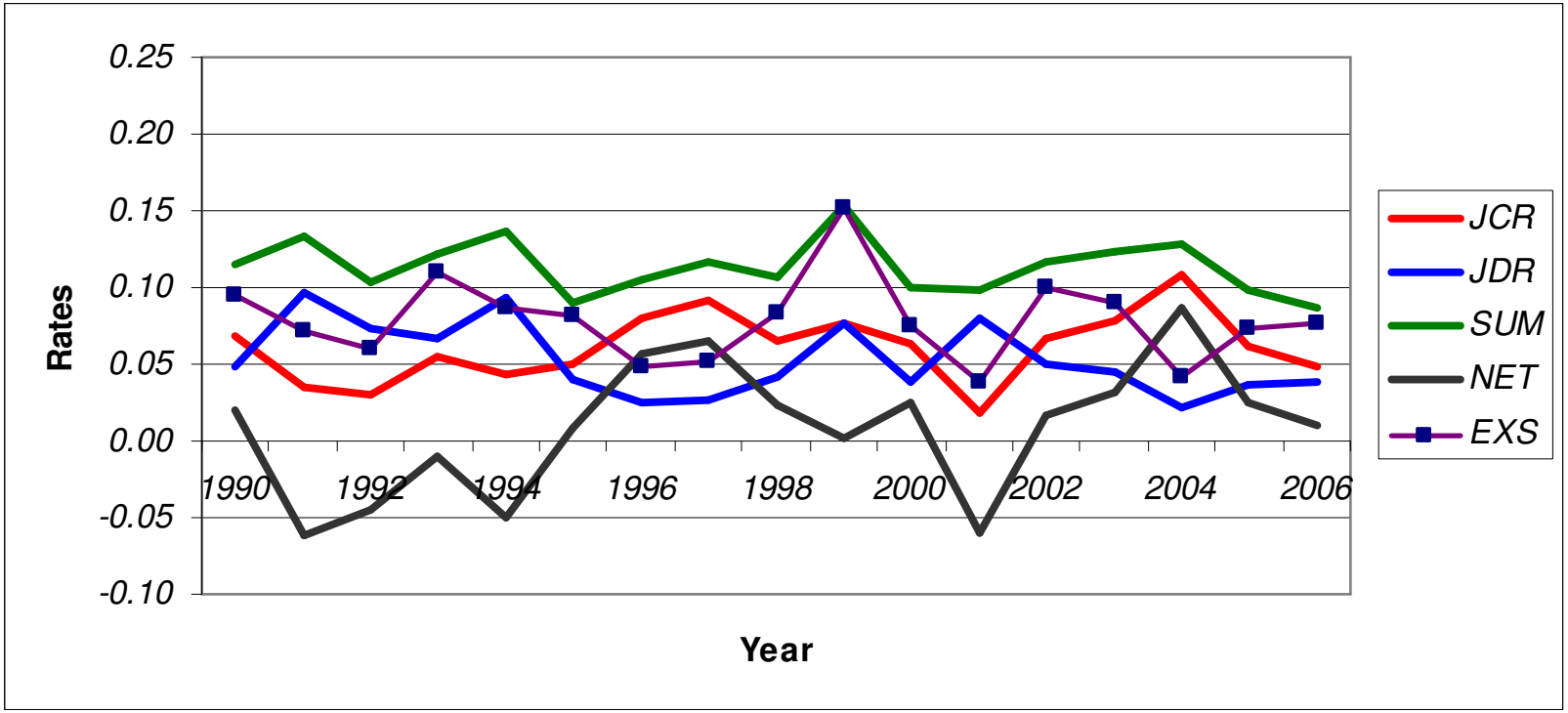
Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A4. 15 Gross Job Flows of 151 Continuing Private Firms during 1990–2006

Year	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
1990	9797	6828	0.0682	0.0475	0.1157	0.0207	0.0682	0.0951
1991	5254	14219	0.0358	0.0970	0.1328	-0.0611	0.0970	0.0717
1992	4104	10201	0.0298	0.0741	0.1039	-0.0443	0.0741	0.0596
1993	7267	8673	0.0552	0.0659	0.1212	-0.0107	0.0659	0.1105
1994	5588	12177	0.0429	0.0936	0.1365	-0.0506	0.0936	0.0859
1995	6129	5036	0.0496	0.0408	0.0904	0.0088	0.0496	0.0815
1996	10049	3015	0.0806	0.0242	0.1048	0.0564	0.0806	0.0484
1997	11970	3420	0.0909	0.0260	0.1169	0.0649	0.0909	0.0519
1998	8670	5543	0.0647	0.0414	0.1061	0.0233	0.0647	0.0827
1999	10597	10430	0.0770	0.0758	0.1529	0.0012	0.0770	0.1517
2000	9026	5420	0.0629	0.0378	0.1006	0.0251	0.0629	0.0755
2001	2809	11662	0.0191	0.0793	0.0983	-0.0602	0.0793	0.0382
2002	9173	6866	0.0663	0.0496	0.1160	0.0167	0.0663	0.0993
2003	10906	6354	0.0776	0.0452	0.1228	0.0324	0.0776	0.0904
2004	15644	3042	0.1078	0.0210	0.1287	0.0868	0.1078	0.0419
2005	9794	5739	0.0621	0.0364	0.0985	0.0257	0.0621	0.0728
2006	7749	6160	0.0479	0.0381	0.0860	0.0098	0.0479	0.0761
Mean	8502	7340	0.0611	0.0526	0.1136	0.0085	0.0744	0.0784
Standard Deviation	3145	3346	0.0225	0.0239	0.0177	0.0429	0.0162	0.0278

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Figure A4. 9 Gross Job Flows of 151 Continuing Private Firms during 1990-2006



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A4. 16 One –Year Persistence Rates of 76 Continuing Private Firms 1990–2005 (1990–1996)

Year	$FJCR_{t1}$	$FJDR_{t1}$
1990	0.76	0.88
1991	0.61	0.85
1992	0.69	0.82
1993	0.47	0.78
1994	0.84	0.85
1995	0.94	0.83
Mean	0.72	0.84
Std Deviation	0.17	0.04

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A4. 17 One –Year Persistence Rates of 76 Continuing Private Firms 1990–2005 (1996–2005)

Year	$FJCR_{t1}$	$FJDR_{t1}$
1996	0.90	0.82
1997	0.79	0.66
1998	0.64	0.69
1999	0.90	0.77
2000	0.72	0.90
2001	0.73	0.70
2002	0.84	0.77
2003	0.93	0.78
2004	0.87	0.72
2005	0.89	0.90
Mean	0.82	0.77
Std Deviation	0.10	0.08

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A4. 18 One –Year Persistence Rates of 76 Continuing Private Firms 1990–2005 (1990–2005)

Year	$FJCR_{t1}$	$FJDR_{t1}$
1990	0.76	0.88
1991	0.61	0.85
1992	0.69	0.82
1993	0.47	0.78
1994	0.84	0.85
1995	0.94	0.83
1996	0.90	0.82
1997	0.79	0.66
1998	0.64	0.69
1999	0.90	0.77
2000	0.72	0.90
2001	0.73	0.70
2002	0.84	0.77
2003	0.93	0.78
2004	0.87	0.72
2005	0.89	0.90
Mean	0.78	0.80
Standard Deviation	0.13	0.07

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

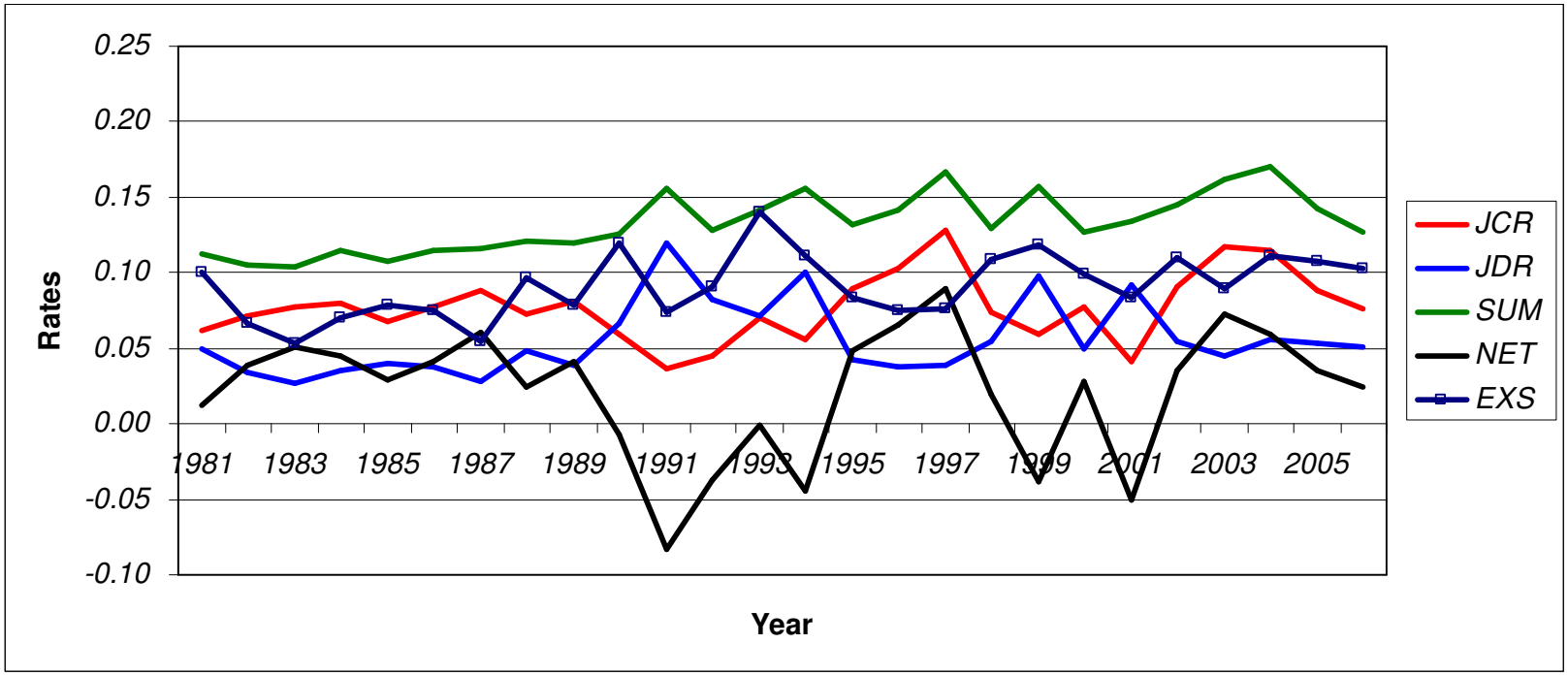
Table A4. 19 Gross Job Flows of the Largest Private Industrial Firms that Continue in Consecutive Two-years

Year	Number of continuing firms[a]	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
1981	261	9485	7679	0.0620	0.0502	0.1123	0.0118	0.0620	0.1005
1982	267	11688	5443	0.0717	0.0334	0.1051	0.0383	0.0717	0.0668
1983	299	14704	5002	0.0779	0.0265	0.1044	0.0514	0.0779	0.0530
1984	316	16697	7269	0.0802	0.0349	0.1152	0.0453	0.0802	0.0699
1985	319	15731	9103	0.0682	0.0395	0.1077	0.0287	0.0682	0.0790
1986	301	17614	8438	0.0780	0.0373	0.1153	0.0406	0.0780	0.0747
1987	318	21550	6698	0.0886	0.0275	0.1161	0.0610	0.0886	0.0550
1988	312	18520	12246	0.0728	0.0481	0.1209	0.0246	0.0728	0.0962
1989	314	20834	10070	0.0807	0.0390	0.1197	0.0417	0.0807	0.0780
1990	357	17005	18868	0.0598	0.0663	0.1261	-0.0065	0.0663	0.1195
1991	517	12415	40302	0.0368	0.1195	0.1563	-0.0827	0.1195	0.0736
1992	510	14205	26007	0.0452	0.0828	0.1280	-0.0376	0.0828	0.0904
1993	520	20860	21176	0.0703	0.0713	0.1416	-0.0011	0.0713	0.1405
1994	516	16683	30120	0.0555	0.1002	0.1556	-0.0447	0.1002	0.1109
1995	544	27826	12964	0.0898	0.0418	0.1316	0.0479	0.0898	0.0837
1996	572	35434	12890	0.1033	0.0376	0.1408	0.0657	0.1033	0.0751
1997	617	49274	14700	0.1283	0.0383	0.1666	0.0900	0.1283	0.0766
1998	756	32984	24337	0.0741	0.0547	0.1287	0.0194	0.0741	0.1093
1999	781	28757	47191	0.0594	0.0975	0.1569	-0.0381	0.0975	0.1188
2000	781	33377	21355	0.0776	0.0496	0.1272	0.0279	0.0776	0.0992
2001	771	18427	40994	0.0415	0.0924	0.1340	-0.0509	0.0924	0.0831
2002	787	38491	23333	0.0903	0.0547	0.1450	0.0355	0.0903	0.1094
2003	788	57484	21793	0.1173	0.0445	0.1618	0.0728	0.1173	0.0889
2004	813	58079	28202	0.1150	0.0558	0.1709	0.0592	0.1150	0.1117
2005	808	46527	28287	0.0885	0.0538	0.1423	0.0347	0.0885	0.1076
2006	790	40280	27310	0.0758	0.0514	0.1272	0.0244	0.0758	0.1028
Mean	536	26728	19684	0.0772	0.0557	0.1330	0.0215	0.0873	0.0913
Standard Deviation	211	14252	11700	0.0222	0.0243	0.0194	0.0424	0.0177	0.0213

Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

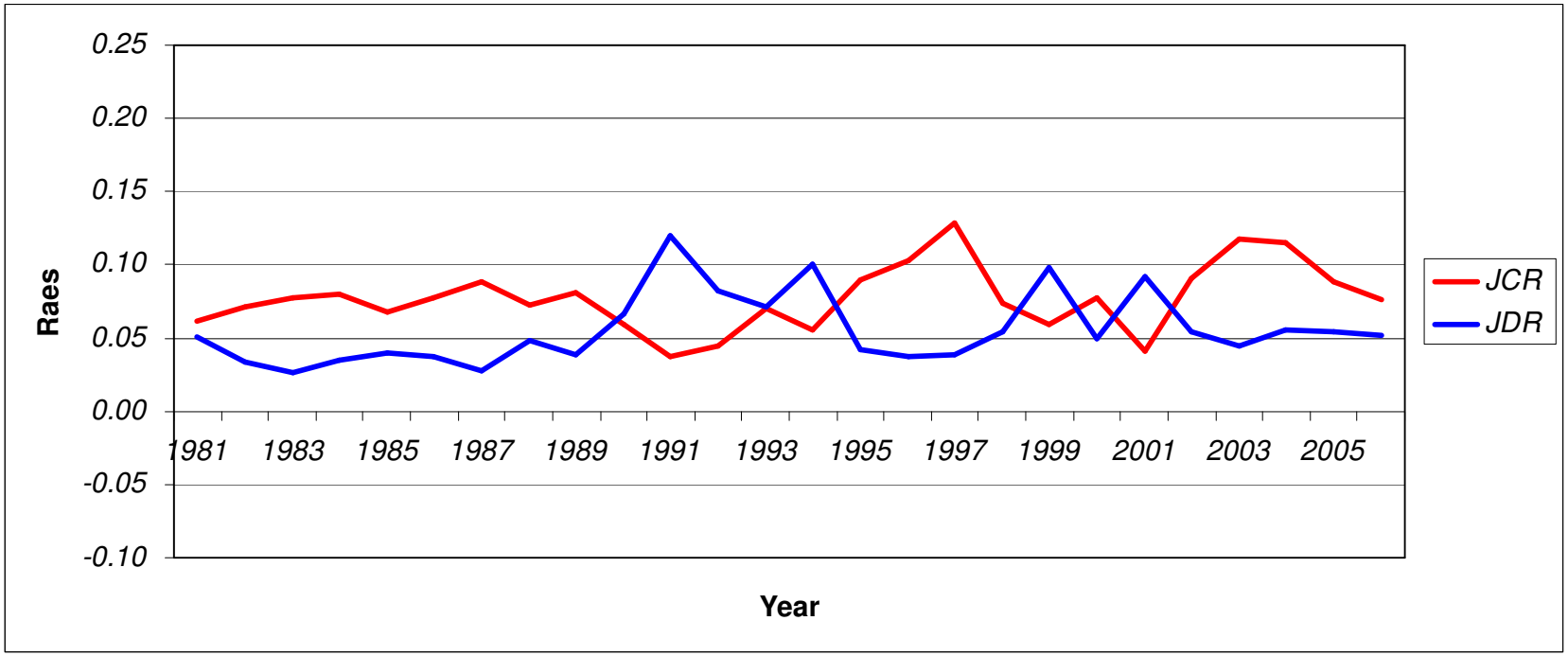
a) This represents the number of firms, which are continuing in two consecutive years (that year and previous year).

Figure A4. 10 Gross Job Flows of the Largest Private Industrial Firms that continue in consecutive two-years



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Figure A4. 11 Rates of Job Creation and Job Destruction for the Largest Private Industrial Firms that continue in consecutive two-years



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A4. 20 Job Flow Rates of the Largest Private Industrial Firms by Sectors (1981–1989)

2-Digit Name	Year	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
Manufacture of food, beverages and tobacco (31)	**1981**	398	126	0.0813	0.0258	0.1071	0.0556	0.0813	0.0515
	1982	822	198	0.1591	0.0383	0.1975	0.1208	0.1591	0.0767
	1983	1030	161	0.1779	0.0278	0.2057	0.1501	0.1779	0.0556
	1984	397	213	0.0596	0.0320	0.0916	0.0276	0.0596	0.0640
	1985	1134	314	0.1657	0.0459	0.2116	0.1198	0.1657	0.0918
	1986	407	600	0.0531	0.0783	0.1314	-0.0252	0.0783	0.1062
	1987	1203	105	0.1611	0.0141	0.1751	0.1470	0.1611	0.0281
	1988	602	489	0.0703	0.0571	0.1273	0.0132	0.0703	0.1142
	1989	559	530	0.0644	0.0611	0.1255	0.0033	0.0644	0.1221
	Mean	728	304	0.1103	0.0423	0.1525	0.0680	0.1131	0.0789
	Standard Deviation	327	189	0.0536	0.0203	0.0453	0.0672	0.0508	0.0319
Textile, wearing apparel and leather industries (32)	**1981**	203	544	0.0132	0.0353	0.0485	-0.0221	0.0353	0.0264
	1982	76	443	0.0050	0.0294	0.0345	-0.0244	0.0294	0.0101
	1983	580	256	0.0395	0.0174	0.0569	0.0221	0.0395	0.0349
	1984	892	1048	0.0594	0.0698	0.1292	-0.0104	0.0698	0.1188
	1985	300	28	0.0202	0.0019	0.0221	0.0183	0.0202	0.0038
	1986	586	205	0.0387	0.0136	0.0523	0.0252	0.0387	0.0271
	1987	317	293	0.0204	0.0189	0.0393	0.0015	0.0204	0.0378
	1988	491	99	0.0316	0.0064	0.0380	0.0252	0.0316	0.0127
	1989	778	209	0.0489	0.0131	0.0620	0.0357	0.0489	0.0262
	Mean	469	347	0.0308	0.0229	0.0536	0.0079	0.0371	0.0331
	Standard Deviation	269	307	0.0176	0.0204	0.0309	0.0224	0.0153	0.0341

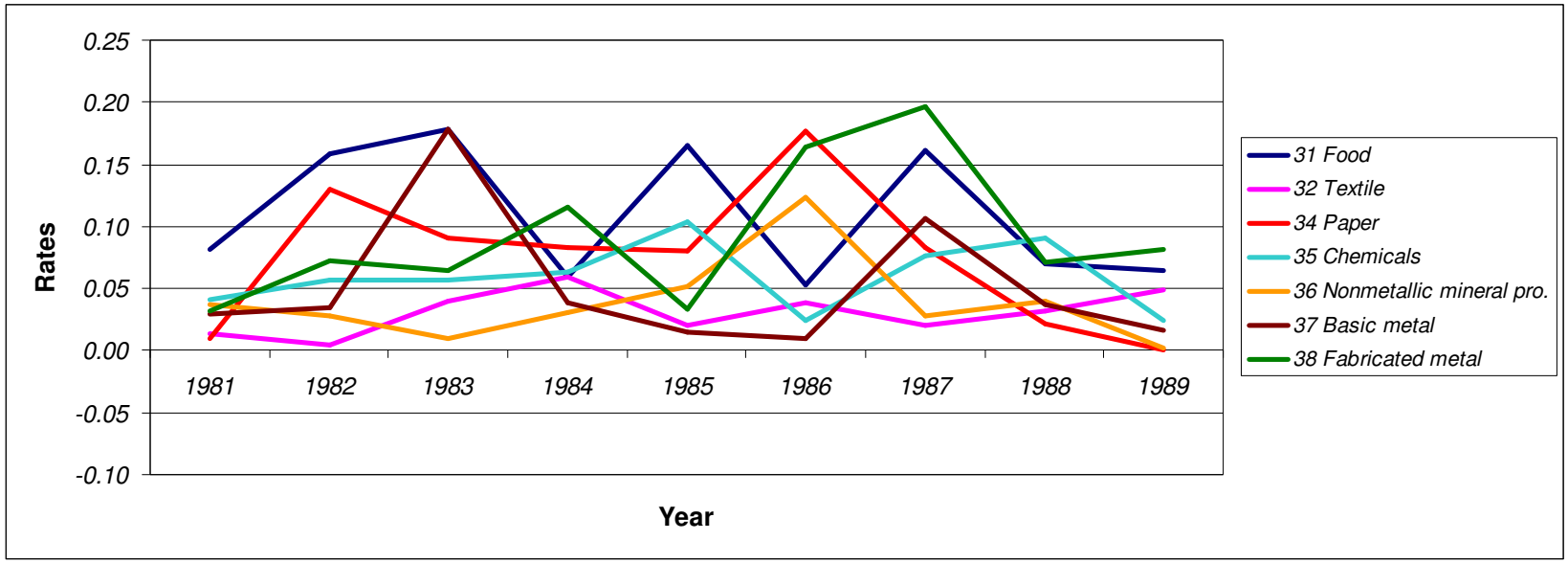
2-Digit Name	Year	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
Manufacture of paper and paper products; printing and publishing (34)	**1981**	15	144	0.0096	0.0924	0.1021	-0.0828	0.0924	0.0193
	1982	186	2	0.1302	0.0014	0.1316	0.1288	0.1302	0.0028
	1983	146	0	0.0905	0.0000	0.0905	0.0905	0.0905	0.0000
	1984	146	0	0.0830	0.0000	0.0830	0.0830	0.0830	0.0000
	1985	152	148	0.0798	0.0777	0.1575	0.0021	0.0798	0.1554
	1986	337	18	0.1765	0.0094	0.1860	0.1671	0.1765	0.0189
	1987	185	107	0.0830	0.0480	0.1311	0.0350	0.0830	0.0961
	1988	50	68	0.0217	0.0295	0.0512	-0.0078	0.0295	0.0434
	1989	0	142	0.0000	0.0621	0.0621	-0.0621	0.0621	0.0000
	Mean	135	70	0.0749	0.0356	0.1105	0.0393	0.0919	0.0373
	Standard Deviation	104	66	0.0575	0.0359	0.0445	0.0849	0.0414	0.0542
Manufacture of chemicals and chemical petroleum, coal, rubber and plastic products (35)	**1981**	336	422	0.0417	0.0523	0.0940	-0.0107	0.0523	0.0833
	1982	451	40	0.0565	0.0050	0.0616	0.0515	0.0565	0.0100
	1983	474	61	0.0565	0.0073	0.0638	0.0492	0.0565	0.0145
	1984	551	201	0.0626	0.0228	0.0854	0.0398	0.0626	0.0457
	1985	951	186	0.1039	0.0203	0.1242	0.0836	0.1039	0.0407
	1986	235	282	0.0237	0.0284	0.0521	-0.0047	0.0284	0.0474
	1987	751	71	0.0761	0.0072	0.0833	0.0689	0.0761	0.0144
	1988	953	62	0.0903	0.0059	0.0962	0.0845	0.0903	0.0118
	1989	268	402	0.0234	0.0351	0.0586	-0.0117	0.0351	0.0469
	Mean	552	192	0.0594	0.0205	0.0799	0.0389	0.0624	0.0350
	Standard Deviation	275	149	0.0277	0.0162	0.0232	0.0390	0.0244	0.0245

2-Digit Name	Year	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
Manufacture of non-metallic mineral products, except products of petroleum and coal (36)	**1981**	278	552	0.0367	0.0729	0.1095	-0.0362	0.0729	0.0734
	1982	200	8	0.0274	0.0011	0.0285	0.0263	0.0274	0.0022
	1983	73	57	0.0097	0.0076	0.0173	0.0021	0.0097	0.0152
	1984	226	39	0.0301	0.0052	0.0353	0.0249	0.0301	0.0104
	1985	400	114	0.0520	0.0148	0.0668	0.0372	0.0520	0.0296
	1986	987	18	0.1236	0.0023	0.1259	0.1214	0.1236	0.0045
	1987	250	135	0.0279	0.0151	0.0430	0.0128	0.0279	0.0302
	1988	358	212	0.0395	0.0234	0.0629	0.0161	0.0395	0.0468
	1989	13	143	0.0014	0.0155	0.0169	-0.0141	0.0155	0.0028
	Mean	309	142	0.0387	0.0175	0.0562	0.0212	0.0443	0.0239
	Standard Deviation	282	168	0.0352	0.0220	0.0392	0.0438	0.0353	0.0240
Basic metal industries (37)	**1981**	224	33	0.0299	0.0044	0.0343	0.0255	0.0299	0.0088
	1982	270	118	0.0351	0.0153	0.0505	0.0198	0.0351	0.0307
	1983	1401	41	0.1787	0.0052	0.1839	0.1735	0.1787	0.0105
	1984	351	286	0.0382	0.0311	0.0692	0.0071	0.0382	0.0622
	1985	134	150	0.0145	0.0162	0.0307	-0.0017	0.0162	0.0289
	1986	84	245	0.0091	0.0265	0.0356	-0.0174	0.0265	0.0182
	1987	966	27	0.1063	0.0030	0.1093	0.1033	0.1063	0.0059
	1988	374	281	0.0373	0.0280	0.0653	0.0093	0.0373	0.0560
	1989	166	218	0.0164	0.0215	0.0379	-0.0051	0.0215	0.0328
	Mean	441	155	0.0517	0.0168	0.0685	0.0349	0.0544	0.0282
	Standard Deviation	445	107	0.0556	0.0108	0.0499	0.0626	0.0536	0.0201

2-Digit Name	Year	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
Manufacture of fabricated metal products, machinery and equipment, transport equipment, professional and scientific and measuring and controlling equipment (38)	**1981**	656	1069	0.0324	0.0528	0.0853	-0.0204	0.0528	0.0648
	1982	1432	955	0.0722	0.0482	0.1204	0.0241	0.0722	0.0964
	1983	1308	997	0.0644	0.0491	0.1136	0.0153	0.0644	0.0982
	1984	2392	342	0.1161	0.0166	0.1327	0.0995	0.1161	0.0332
	1985	754	2134	0.0333	0.0942	0.1275	-0.0609	0.0942	0.0666
	1986	3499	963	0.1644	0.0453	0.2097	0.1192	0.1644	0.0905
	1987	4669	260	0.1961	0.0109	0.2070	0.1851	0.1961	0.0218
	1988	2011	1548	0.0713	0.0548	0.1261	0.0164	0.0713	0.1097
	1989	2350	1669	0.0819	0.0582	0.1401	0.0237	0.0819	0.1164
	Mean	2119	1104	0.0925	0.0478	0.1402	0.0447	0.1015	0.0775
	Standard Deviation	1308	605	0.0563	0.0242	0.0416	0.0760	0.0488	0.0332

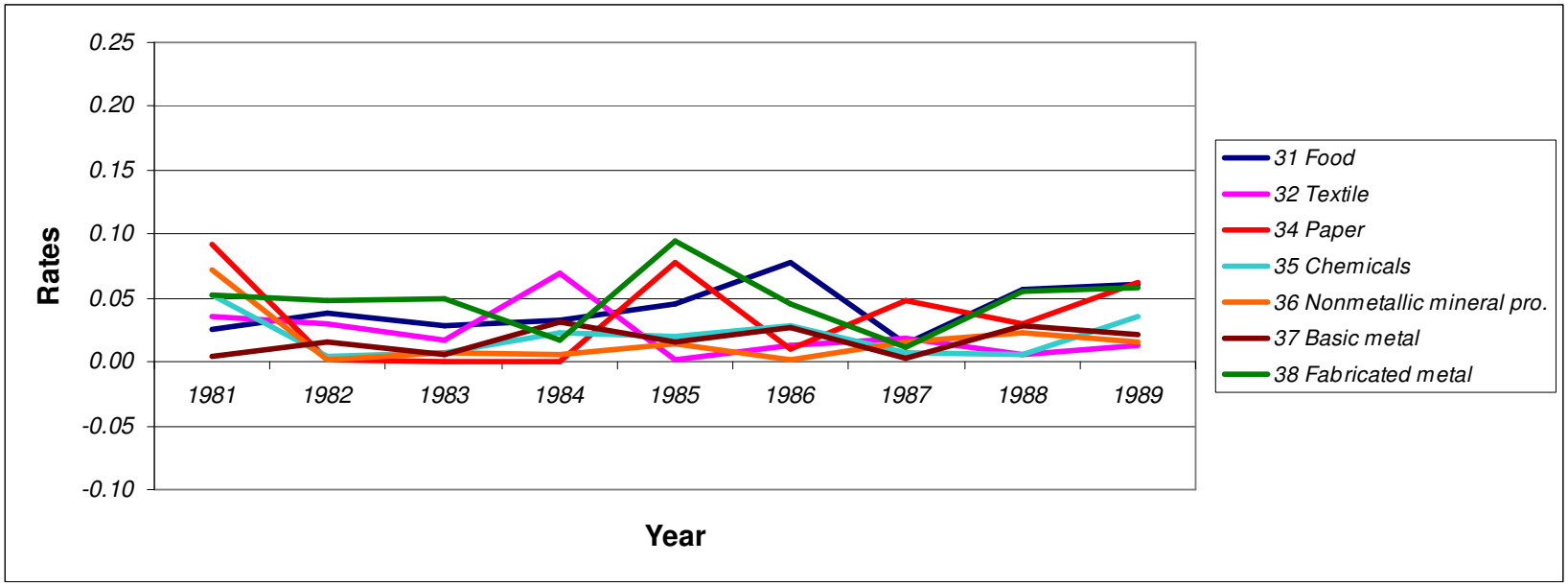
Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Figure A4. 12 Job Creation Rates of the Continuing Private Industrial Firms by Sectors (1981–1989)



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Figure A4. 13 Job Destruction Rates of the Continuing Private Industrial Firms by Sectors (1981–1989)



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A4. 21 Job Flow Rates of the Largest Private Industrial Firms by Sectors (1990–1996)

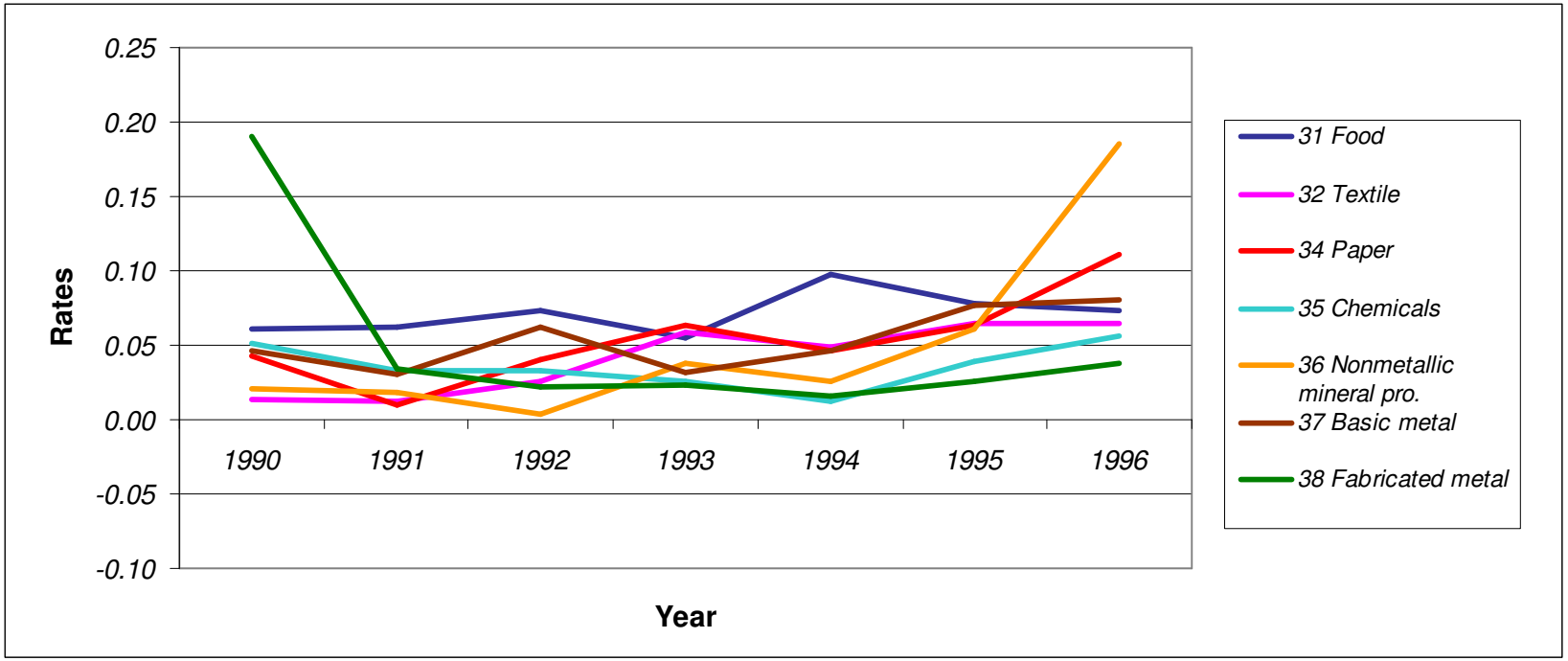
2-Digit Name	Year	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
Manufacture of food, beverages and tobacco (31)	**1990**	1514	636	0.0609	0.0256	0.0864	0.0353	0.0609	0.0511
	1991	1612	2046	0.0626	0.0795	0.1421	-0.0169	0.0795	0.1252
	1992	1852	1563	0.0732	0.0617	0.1349	0.0114	0.0732	0.1235
	1993	1410	2217	0.0551	0.0866	0.1416	-0.0315	0.0866	0.1101
	1994	2424	1678	0.0977	0.0677	0.1654	0.0301	0.0977	0.1353
	1995	1980	1362	0.0775	0.0533	0.1308	0.0242	0.0775	0.1066
	1996	1925	1499	0.0736	0.0573	0.1309	0.0163	0.0736	0.1146
	Mean	1817	1572	0.0715	0.0617	0.1332	0.0098	0.0784	0.1095
	Std Deviation	343	513	0.0141	0.0199	0.0238	0.0249	0.0116	0.0275
Textile, wearing apparel and leather industries 32	**1990**	945	6306	0.0133	0.0887	0.1020	-0.0754	0.0887	0.0266
	1991	820	8124	0.0125	0.1236	0.1361	-0.1111	0.1236	0.0250
	1992	1465	4006	0.0251	0.0686	0.0936	-0.0435	0.0686	0.0502
	1993	3296	3595	0.0590	0.0643	0.1233	-0.0054	0.0643	0.1180
	1994	2706	3437	0.0487	0.0618	0.1105	-0.0132	0.0618	0.0974
	1995	3535	945	0.0644	0.0172	0.0817	0.0472	0.0644	0.0345
	1996	3710	1642	0.0646	0.0286	0.0932	0.0360	0.0646	0.0572
	Mean	2354	4008	0.0411	0.0647	0.1058	-0.0236	0.0766	0.0584
	Std Deviation	1250	2507	0.0235	0.0357	0.0189	0.0574	0.0227	0.0361
Manufacture of paper and paper products; printing and publishing (34)	**1990**	243	402	0.0426	0.0705	0.1132	-0.0279	0.0705	0.0853
	1991	55	574	0.0099	0.1036	0.1135	-0.0937	0.1036	0.0199
	1992	205	202	0.0408	0.0402	0.0810	0.0006	0.0408	0.0804

2-Digit Name	Year	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
	1993	317	173	0.0631	0.0344	0.0975	0.0287	0.0631	0.0689
	1994	238	562	0.0460	0.1087	0.1548	-0.0627	0.1087	0.0921
	1995	310	520	0.0640	0.1073	0.1713	-0.0433	0.1073	0.1280
	1996	515	74	0.1111	0.0160	0.1271	0.0951	0.1111	0.0319
	Mean	269	358	0.0539	0.0687	0.1226	-0.0147	0.0865	0.0723
	Std Deviation	139	206	0.0310	0.0389	0.0315	0.0629	0.0280	0.0368
Manufacture of chemicals and chemical petroleum, coal, rubber and plastic products (35)	**1990**	1143	1940	0.0514	0.0872	0.1386	-0.0358	0.0872	0.1028
	1991	719	1636	0.0335	0.0763	0.1098	-0.0427	0.0763	0.0670
	1992	664	900	0.0323	0.0438	0.0762	-0.0115	0.0438	0.0647
	1993	522	643	0.0257	0.0317	0.0574	-0.0060	0.0317	0.0514
	1994	235	1122	0.0116	0.0556	0.0673	-0.0440	0.0556	0.0233
	1995	748	355	0.0388	0.0184	0.0572	0.0204	0.0388	0.0368
	1996	1105	220	0.0561	0.0112	0.0673	0.0450	0.0561	0.0224
	Mean	734	974	0.0356	0.0463	0.0820	-0.0107	0.0556	0.0526
	Std Deviation	317	640	0.0151	0.0285	0.0307	0.0338	0.0201	0.0286
Manufacture of non-metallic mineral products, except products of petroleum and coal (36)	**1990**	592	3135	0.0211	0.1120	0.1331	-0.0908	0.1120	0.0423
	1991	453	3329	0.0178	0.1308	0.1486	-0.1130	0.1308	0.0356
	1992	84	3158	0.0037	0.1399	0.1436	-0.1362	0.1399	0.0074
	1993	729	924	0.0374	0.0474	0.0848	-0.0100	0.0474	0.0748
	1994	494	1411	0.0256	0.0731	0.0987	-0.0475	0.0731	0.0512
	1995	1119	684	0.0608	0.0372	0.0980	0.0237	0.0608	0.0744
	1996	3500	398	0.1859	0.0211	0.2071	0.1648	0.1859	0.0423
	Mean	996	1863	0.0503	0.0802	0.1306	-0.0299	0.1071	0.0468

2-Digit Name	Year	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
	Std Deviation	1147	1295	0.0624	0.0476	0.0419	0.1028	0.0496	0.0234
Basic metal industries (37)	**1990**	367	188	0.0462	0.0237	0.0699	0.0225	0.0462	0.0473
	1991	246	1262	0.0303	0.1554	0.1857	-0.1251	0.1554	0.0606
	1992	443	528	0.0623	0.0743	0.1366	-0.0120	0.0743	0.1247
	1993	219	446	0.0312	0.0635	0.0947	-0.0323	0.0635	0.0624
	1994	314	608	0.0462	0.0895	0.1357	-0.0433	0.0895	0.0924
	1995	500	95	0.0769	0.0146	0.0915	0.0623	0.0769	0.0292
	1996	553	52	0.0801	0.0075	0.0876	0.0726	0.0801	0.0151
	Mean	377	454	0.0533	0.0612	0.1145	-0.0079	0.0837	0.0617
	Std Deviation	127	417	0.0203	0.0521	0.0401	0.0682	0.0345	0.0373
Manufacture of fabricated metal products, machinery and equipment, transport equipment, professional and scientific and measuring and controlling equipment (38)	**1990**	7150	1028	0.1901	0.0273	0.2174	0.1627	0.1901	0.0547
	1991	1497	2875	0.0342	0.0657	0.1000	-0.0315	0.0657	0.0685
	1992	926	4457	0.0219	0.1052	0.1271	-0.0834	0.1052	0.0437
	1993	898	4826	0.0231	0.1243	0.1474	-0.1012	0.1243	0.0463
	1994	569	4444	0.0163	0.1273	0.1436	-0.1110	0.1273	0.0326
	1995	793	1748	0.0256	0.0563	0.0819	-0.0308	0.0563	0.0511
	1996	1133	623	0.0377	0.0207	0.0584	0.0170	0.0377	0.0414
	Mean	1852	2857	0.0498	0.0753	0.1251	-0.0255	0.1010	0.0483
	Std Deviation	2354	1757	0.0623	0.0442	0.0521	0.0946	0.0523	0.0114

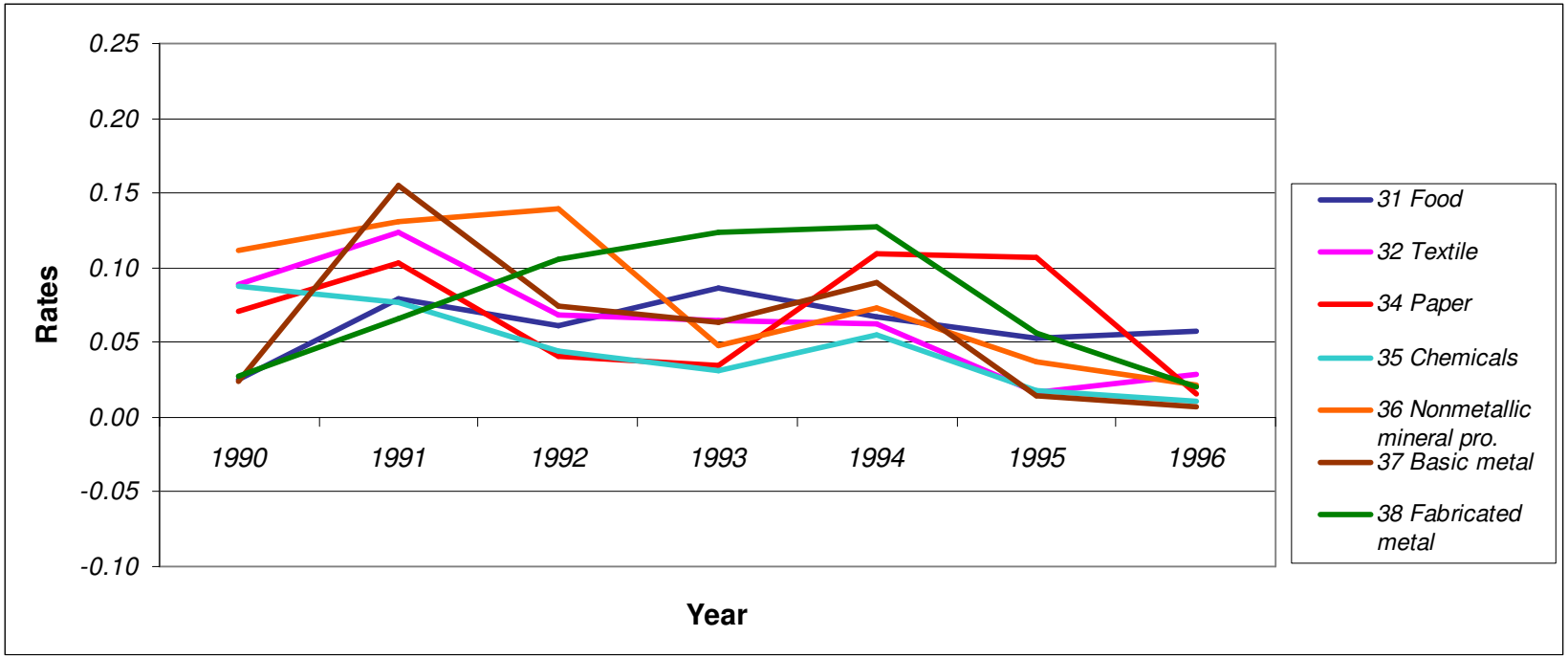
Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Figure A4. 14 Job Creation Rates of the Continuing Private Industrial Firms by Sectors (1990–1996)



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Figure A4. 15 Job Destruction Rates of the Continuing Private Industrial Firms by Sectors (1990–1996)



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Table A4. 22 Job Flow Rates of the Largest Private Industrial Firms by Sectors (1997–2006)

2-Digit Name	Year	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
Manufacture of food, beverages and tobacco (31)	**1997**	2679	1585	0.0943	0.0558	0.1501	0.0385	0.0943	0.1116
	1998	1712	2092	0.0580	0.0709	0.1290	-0.0129	0.0709	0.1161
	1999	2781	1528	0.0955	0.0525	0.1480	0.0430	0.0955	0.1049
	2000	3010	2055	0.0991	0.0677	0.1668	0.0314	0.0991	0.1353
	2001	1474	3293	0.0471	0.1051	0.1522	-0.0581	0.1051	0.0941
	2002	2218	1582	0.0752	0.0536	0.1288	0.0216	0.0752	0.1072
	2003	3530	3297	0.1171	0.1094	0.2265	0.0077	0.1171	0.2188
	2004	3062	1604	0.1008	0.0528	0.1536	0.0480	0.1008	0.1056
	2005	1620	1081	0.0509	0.0340	0.0848	0.0169	0.0509	0.0679
	2006	1849	1563	0.0571	0.0483	0.1054	0.0088	0.0571	0.0966
	Mean	2394	1968	0.0795	0.0650	0.1445	0.0145	0.0866	0.1158
	Std Deviation	714	754	0.0249	0.0245	0.0380	0.0315	0.0218	0.0400
Textile, wearing apparel and leather industries 32	**1997**	5909	1397	0.0940	0.0222	0.1163	0.0718	0.0940	0.0445
	1998	3597	3789	0.0534	0.0563	0.1097	-0.0029	0.0563	0.1068
	1999	4541	6302	0.0676	0.0939	0.1615	-0.0262	0.0939	0.1353
	2000	5145	2401	0.0787	0.0367	0.1154	0.0420	0.0787	0.0734
	2001	2905	3922	0.0426	0.0576	0.1002	-0.0149	0.0576	0.0853
	2002	5057	1058	0.0753	0.0158	0.0911	0.0596	0.0753	0.0315
	2003	5102	2676	0.0717	0.0376	0.1094	0.0341	0.0717	0.0753
	2004	5013	3293	0.0682	0.0448	0.1129	0.0234	0.0682	0.0896
	2005	3659	6304	0.0486	0.0838	0.1324	-0.0351	0.0838	0.0972
	2006	2999	5438	0.0413	0.0749	0.1162	-0.0336	0.0749	0.0826
	Mean	4393	3658	0.0642	0.0523	0.1165	0.0118	0.0754	0.0821
	Std Deviation	1030	1880	0.0172	0.0259	0.0191	0.0395	0.0130	0.0295
Manufacture of wood and	**1997**	695	74	0.1919	0.0204	0.2123	0.1715	0.1919	0.0409

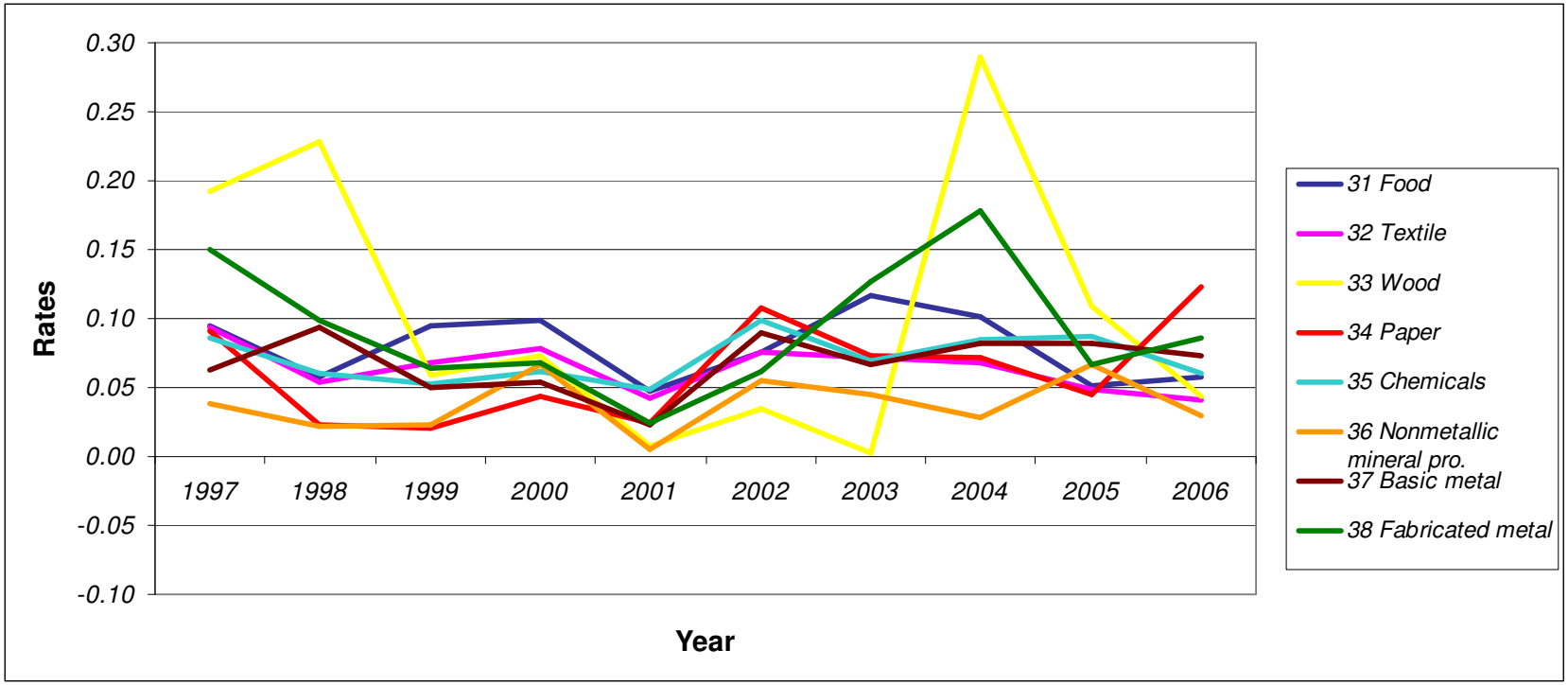
2-Digit Name	Year	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
wood products including furniture 33									
	1998	967	61	0.2279	0.0144	0.2423	0.2135	0.2279	0.0288
	1999	303	16	0.0588	0.0031	0.0620	0.0557	0.0588	0.0062
	2000	397	74	0.0730	0.0136	0.0866	0.0594	0.0730	0.0272
	2001	46	293	0.0080	0.0509	0.0589	-0.0429	0.0509	0.0160
	2002	188	782	0.0341	0.1419	0.1760	-0.1078	0.1419	0.0682
	2003	15	199	0.0031	0.0405	0.0435	-0.0374	0.0405	0.0061
	2004	1373	2	0.2900	0.0004	0.2905	0.2896	0.2900	0.0008
	2005	668	11	0.1094	0.0018	0.1112	0.1076	0.1094	0.0036
	2006	292	24	0.0432	0.0035	0.0467	0.0396	0.0432	0.0071
	Mean	494	154	0.1039	0.0291	0.1330	0.0749	0.1228	0.0205
	Std Deviation	432	240	0.0993	0.0431	0.0904	0.1236	0.0877	0.0213
Manufacture of paper and paper products; printing and publishing (34)	**1997**	408	120	0.0904	0.0266	0.1170	0.0638	0.0904	0.0532
	1998	111	334	0.0231	0.0696	0.0927	-0.0464	0.0696	0.0462
	1999	91	390	0.0199	0.0852	0.1051	-0.0653	0.0852	0.0398
	2000	184	347	0.0430	0.0811	0.1241	-0.0381	0.0811	0.0860
	2001	100	518	0.0243	0.1259	0.1501	-0.1016	0.1259	0.0486
	2002	396	21	0.1071	0.0057	0.1128	0.1014	0.1071	0.0114
	2003	297	47	0.0729	0.0115	0.0845	0.0614	0.0729	0.0231
	2004	310	74	0.0717	0.0171	0.0888	0.0546	0.0717	0.0342
	2005	207	365	0.0454	0.0801	0.1255	-0.0347	0.0801	0.0908
	2006	540	20	0.1227	0.0045	0.1272	0.1182	0.1227	0.0091
	Mean	264	224	0.0621	0.0507	0.1128	0.0113	0.0907	0.0442
	Std Deviation	152	185	0.0366	0.0427	0.0204	0.0769	0.0208	0.0277
Manufacture of chemicals and chemical petroleum,	**1997**	1928	473	0.0864	0.0212	0.1076	0.0652	0.0864	0.0424

2-Digit Name	Year	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
coal, rubber and plastic products (35)									
	1998	1439	393	0.0605	0.0165	0.0771	0.0440	0.0605	0.0331
	1999	1312	1161	0.0529	0.0468	0.0996	0.0061	0.0529	0.0935
	2000	1531	1022	0.0613	0.0409	0.1022	0.0204	0.0613	0.0818
	2001	1252	2491	0.0491	0.0978	0.1469	-0.0486	0.0978	0.0983
	2002	2389	752	0.0985	0.0310	0.1296	0.0675	0.0985	0.0620
	2003	1790	574	0.0692	0.0222	0.0913	0.0470	0.0692	0.0444
	2004	2277	745	0.0840	0.0275	0.1115	0.0565	0.0840	0.0550
	2005	2487	549	0.0869	0.0192	0.1061	0.0677	0.0869	0.0384
	2006	1826	1003	0.0597	0.0328	0.0926	0.0269	0.0597	0.0656
	Mean	1823	916	0.0709	0.0356	0.1064	0.0353	0.0757	0.0614
	Std Deviation	447	609	0.0169	0.0239	0.0199	0.0363	0.0169	0.0232
Manufacture of non-metallic mineral products, except products of petroleum and coal (36)	**1997**	709	519	0.0381	0.0279	0.0659	0.0102	0.0381	0.0557
	1998	419	330	0.0223	0.0175	0.0398	0.0047	0.0223	0.0351
	1999	433	1508	0.0229	0.0798	0.1027	-0.0569	0.0798	0.0458
	2000	1185	612	0.0665	0.0343	0.1008	0.0321	0.0665	0.0686
	2001	99	910	0.0054	0.0494	0.0548	-0.0441	0.0494	0.0108
	2002	964	1828	0.0548	0.1039	0.1587	-0.0491	0.1039	0.1096
	2003	754	631	0.0451	0.0377	0.0828	0.0074	0.0451	0.0754
	2004	472	595	0.0280	0.0353	0.0633	-0.0073	0.0353	0.0560
	2005	1106	61	0.0661	0.0036	0.0698	0.0625	0.0661	0.0073
	2006	522	374	0.0294	0.0210	0.0504	0.0083	0.0294	0.0421
	Mean	666	737	0.0378	0.0411	0.0789	-0.0032	0.0536	0.0506
	Std Deviation	343	544	0.0201	0.0301	0.0347	0.0376	0.0253	0.0303
Basic metal industries (37)	**1997**	1115	97	0.0628	0.0055	0.0683	0.0573	0.0628	0.0109

2-Digit Name	Year	Gross Job Creation	Gross Job Destruction	JCR	JDR	SUM	NET	MAX	EXS
	1998	1749	213	0.0932	0.0113	0.1045	0.0818	0.0932	0.0227
	1999	1003	421	0.0494	0.0207	0.0701	0.0287	0.0494	0.0415
	2000	1124	1051	0.0538	0.0503	0.1041	0.0035	0.0538	0.1006
	2001	487	2015	0.0232	0.0961	0.1194	-0.0729	0.0961	0.0465
	2002	1742	931	0.0896	0.0479	0.1375	0.0417	0.0896	0.0958
	2003	1350	597	0.0667	0.0295	0.0962	0.0372	0.0667	0.0590
	2004	1716	334	0.0817	0.0159	0.0976	0.0658	0.0817	0.0318
	2005	1832	126	0.0819	0.0056	0.0875	0.0762	0.0819	0.0113
	2006	1760	348	0.0731	0.0144	0.0875	0.0586	0.0731	0.0289
	Mean	1388	613	0.0675	0.0297	0.0973	0.0378	0.0748	0.0449
	Std Deviation	448	588	0.0213	0.0282	0.0210	0.0454	0.0164	0.0318
Manufacture of fabricated metal products, machinery and equipment, transport equipment, professional and scientific and measuring and controlling equipment (38)	**1997**	8808	1379	0.1495	0.0234	0.1729	0.1261	0.1495	0.0468
	1998	6583	2176	0.0992	0.0328	0.1320	0.0664	0.0992	0.0656
	1999	4557	6822	0.0644	0.0964	0.1608	-0.0320	0.0964	0.1288
	2000	4665	1923	0.0681	0.0281	0.0962	0.0400	0.0681	0.0562
	2001	1716	6671	0.0241	0.0937	0.1178	-0.0696	0.0937	0.0482
	2002	4043	5730	0.0610	0.0865	0.1475	-0.0255	0.0865	0.1220
	2003	8228	1190	0.1274	0.0184	0.1458	0.1090	0.1274	0.0369
	2004	12749	351	0.1780	0.0049	0.1829	0.1731	0.1780	0.0098
	2005	5580	1928	0.0664	0.0229	0.0894	0.0435	0.0664	0.0459
	2006	7478	962	0.0853	0.0110	0.0963	0.0743	0.0853	0.0219
	Mean	6441	2913	0.0923	0.0418	0.1342	0.0505	0.1050	0.0582
	Std Deviation	3077	2484	0.0467	0.0357	0.0334	0.0761	0.0359	0.0389

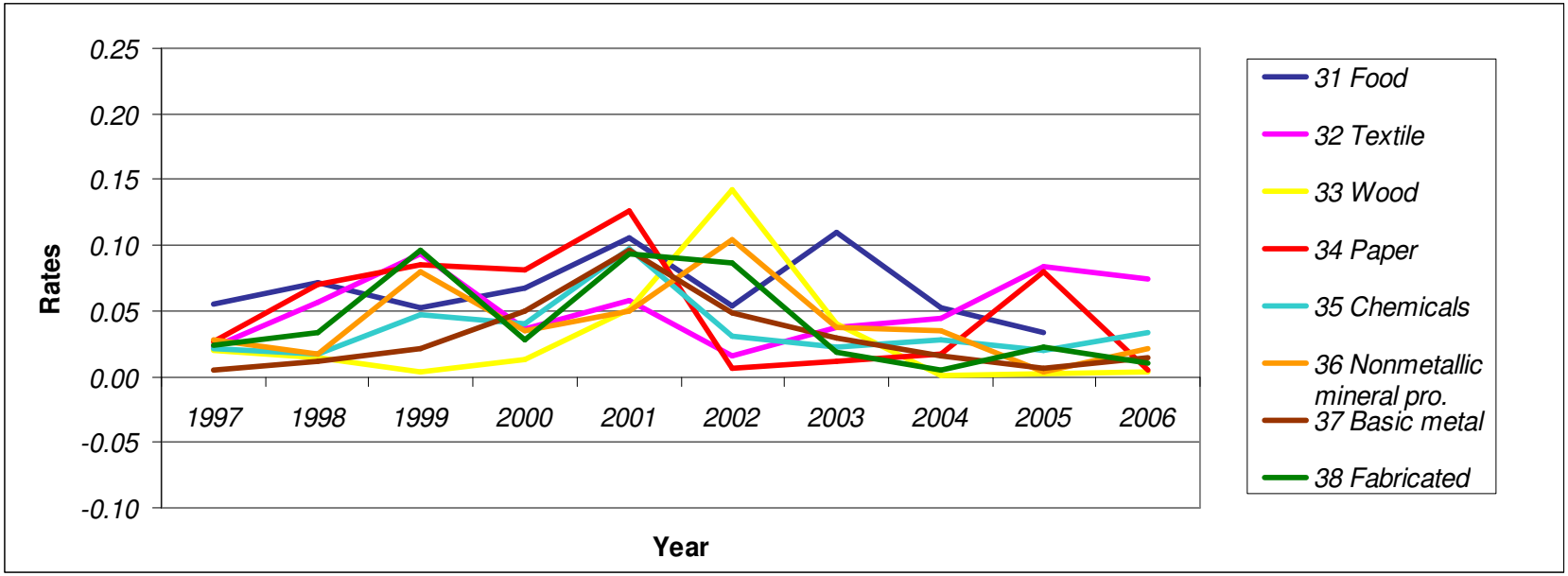
Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Figure A4. 16 Job Creation Rates of the Continuing Private Industrial Firms by Sectors (1997–2006)



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

Figure A4. 17 Job Destruction Rates of the Continuing Private Industrial Firms by Sectors (1997–2006)



Source: Calculated by the author using data from ISO (Istanbul Chamber of Industry).

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