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ABSTRACT

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Like many transition economies, Slovenia is undergoing profound changes in the workings of the labor market with potentially greater flexibility in terms of both wage and employment adjustment. We investigate the impact of the changing labor market for Slovenia using unique longitudinal matched employer-employee data that permits measurement of employment transitions and wages for workers and links of the workers to the firms with whom they are employed. We can thus measure worker flows and job flows in a comprehensive and integrated manner. We find a high pace of job flows in Slovenia especially for young, small, private and foreign owned firms and for young, less educated workers. While job flows have approached the rates observed in developed market economies, the excess of worker flows above job flows is lower than that observed in market economies. A key factor in the patterns of the worker and job flows is the determination of wages in Slovenia. A base wage schedule provides strict guidelines for minimum wages for different skill categories. However, firms are permitted to offer higher wages to an individual based upon the success of the worker and/or the firm. Our analysis shows that firms deviate from the base wage schedule significantly and that the idiosyncratic wage policies of firms are closely related to the observed pattern of worker and job flows at the firm. Firms with more flexible wages (measured as less compression of wages within the firm) have less employment instability and also are able to improve the match quality of its workers.

JEL Classification: J23, J31, J41, J61, P23, P31

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1. INTRODUCTION

Market economies exhibit tremendous flows of jobs and workers, substantial differences in

wages across workers and a continuously changing structure of wages.[1] Of course, the

magnitude and the structure of wage and employment dynamics varies across market economies

in systematic but complex ways. While there has been a burgeoning literature on these topics

(partly due to the emergence of longitudinal firm level datasets that permit the calculation of job

and worker flows), our understanding of these issues is still at a very early stage.

The role of market institutions in shaping the observed patterns of job flows, worker

flows and wage structures is still under considerable debate on both conceptual and empirical

grounds. This debate is not surprising given the nature of the fundamental policy tradeoffs that

all countries must address. On the one hand, to promote economic growth, market institutions

need to be sufficiently flexible to allow resources to be allocated to their highest valued use.

With rapidly changing technology, ever-changing economic conditions and the inherent trial

and error process of adopting new technologies and ways of doing business, the implied

reallocation rates of outputs and inputs needed on a continuing basis are high. On the other

hand, a highly flexible environment can imply lower job security for workers and also greater

inequality in wages.

The shift to a market economy for a transition country implies profound changes for the

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[1] In the U.S., roughly 1 in 10 jobs is created every year and 1 in 10 jobs is destroyed every year.
Amidst these large job flows are even larger worker flows in the U.S. with more than 2 in 10
positions being subject to an accession every year and more than 2 in 10 positions being subject
to a separation every year. The U.S. also exhibits substantial (and rising) wage inequality. As
noted in the text, there is considerable variation across countries in the patterns of job and
worker flows and the structure of wages. See Davis and Haltiwanger (1999) for a survey of job
and worker flows and Autor and Katz (1999) for a discussion of cross country differences in the
structure of wages.

workings of the labor market. While an oversimplification, one could say that transition economies can choose between a "U.S.-style" environment that promotes flexibility of both jobs and wages and a "Western European-style" environment that limits job and worker flows and also compresses wages. As such, European labor markets are characterized by both greater quantity (e.g., labor adjustment) and greater price (e.g., wage compression) restrictions. As Bertola and Rogerson (1997) and Nickell (1998) have pointed out, these different policies can have offsetting effects on the observed labor market dynamics. In a simple theoretical model, Bertola and Rogerson show that labor adjustment restrictions inherently dampen job flows while wage compression enhances job flows. The intuition for these differentiated effects is simple: by reducing the adjustment margin in the price side, wage compression increases adjustment in the quantity side. Both Nickell and Bertola and Rogerson use these arguments to try to account for the somewhat surprising empirical finding that the pace of job reallocation is not dramatically different between the U.S. and European countries. For a transition economy, these issues loom large because the mix of policies may have offsetting effects and, moreover, the mix of policies may have differential effects on different types of firms.

In this paper, we explore these issues empirically for one of transition economies: Slovenia. As a part of comprehensive reforms, Slovenia removed one of the key characteristics of the socialist system – job security, as the state gave up its role as a guardian and provider of jobs, and workers were allowed to be laid off, and enterprises to fail. Moreover, the reforms changed its previous wage determination system that was based on administrative constraints and collective decision-making, and introduced a market-based system, with an important role of collective bargaining. But like some other transition economies, Slovenia is changing its structure of markets gradually. It retains some restrictions on employment adjustment and also retains some restrictions on the differences of wages across workers. In particular, there are

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wage guidelines that determine the base wage of workers based upon the qualifications of the worker and the nature of the job.   However, firms are permitted some idiosyncratic flexibility in the determination of wages based upon the "success of the worker" and the "success of the firm". Our results show that different firms pursue different wage policies – some businesses exhibit much greater compression of wages than do others even after controlling for worker characteristics like education and experience. While the sources of these differences across firms in wage policies are not fully understood, presumably they derive in part from differences in the choices and constraints that firms face about their wage policy. The purpose of this paper is to exploit differences in the wage policies of Slovenian firms to explore how wage policies affect job and worker flows, and thus to shed more light on the above-mentioned tradeoff between labor market flexibility and rigidity. Our results indicate that wage compression is associated with higher job flows (higher job destruction and creation), as well as with *lower* excess worker flows (where excess worker flows are defined as worker flows over and above the job flows). The first finding is consistent with the Bertola and Rogerson argument that wage compression will lead to greater employment volatility.   As for the second finding, underlying this result is the finding that businesses with more compressed wages have less excess turnover of low quality workers but actually greater excess turnover for high quality workers.   The above findings have potentially important welfare implications. They suggest that wage compression creates excessive instability of jobs and thus imposes additional worker dislocation costs, as well as reduces firms' ability to achieve quality firm-worker matches. .

The data analyzed in the paper are longitudinal matched employer-employee data for the universe of workers in Slovenia in the late 1990s. Using these data we can measure both job and worker flows by both employer and employee characteristics. Thus, a key contribution of this paper is the measurement and analysis of worker and job flows in an internally consistent

fashion and relating them to employer and employee characteristics (measuring both simultaneously in an internally consistent fashion has not been previously done for a transition economy). While the worker and job flows are the starting point of this paper, the focus of the paper is in relating firm wage policies to the observed job and worker flows. We are able to explore these issues since we know individual worker wage outcomes and individual worker characteristics and also can place all workers inside their employers.

The paper proceeds as follows. Section 2 provides a brief discussion of the theoretical literature that motivates our empirical analysis. Section 3 presents institutional background for Slovenia on both labor adjustment restrictions and the determination of wages. Section 4 describes the data. Section 5 presents our empirical analysis. Section 6 provides concluding remarks.

2. JOB FLOWS, WORKER FLOWS AND WAGES – CONCEPTUAL ISSUES

Market economies experience high rates of job creation and job destruction in almost every time period and sector. Each year, many businesses expand and many others contract. New businesses constantly enter, while others abruptly exit or gradually disappear. Amidst the turbulence of business growth and decline, jobs, workers and capital are continually reallocated among competing activities, organizations and locations. 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

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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.

Much of the reallocation process, and much of our interest in it, centers on the labor market. The creation and destruction of jobs require workers to switch employers and to shuffle between employment and joblessness. Along the way, some workers suffer long unemployment spells or sharp declines in earnings; some retire early or temporarily leave the labor force to work at home or upgrade skills; some switch occupation or industry; some change residence to secure a new job, migrating short or long distances, often with considerable disruption to the lives and jobs of family members.

The workers who participate in this process differ greatly in the bundle of skills, capabilities and career goals that they bring to the labor market; likewise, jobs differ greatly in the skill requirements, effort and diligence that they demand from workers. The diversity of workers and jobs underscores the truly breathtaking scale and complexity of the search, assignment and reallocation processes carried out by the labor market and supporting institutions. The ongoing matching and sorting processes imply that worker flows (accessions and separations) exceed job flows. That is, sometimes a worker separates because the job is terminated (job destruction) but sometimes because of poor match quality or other factors such as life cycle events (e.g., leaving the labor force).[2]

Many factors may interfere in the efficiency of the worker and job flows. As Caballero and Hammour (2000) emphasize, distortions in product, factor and credit markets can distort the timing and the efficiency of the flows. As noted in the introduction, some of these market distortions are associated with policies and market institutions. In particular, quantity

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[2] Models of this flow characterization of the labor market have been recently surveyed in Mortensen and Pissarides

restrictions on labor market adjustment can impact the flows. Moreover, wage policies (i.e., national determination of wages and/or national guidelines for wage schedules) can impact the reallocation process. As Bertola and Rogerson (1997) have shown, wage policies that compress the wage distribution will tend to increase job flows as quantities will absorb shocks that wages might otherwise have absorbed.

In transition economies, the market institutions are evolving and, in turn, some businesses are potentially able to adapt to the changes in the institutions better than others. It is this latter idea that we explore in depth in the empirical analysis that follows. For example, some firms may be more able (or willing) to use flexible wage policies. These potential differences across firms suggest that some of the factors that Bertola and Rogerson (1997) emphasized may be relevant for between firm differences in outcomes. That is, firms that use a more flexible wage policy should exhibit less employment volatility. Note that while the latter is a clear empirical prediction that we test in the empirical analysis that follows, there are a number of interesting complicating factors. For one, the same type of offsetting effects that Bertola and Rogerson emphasized may be present in between firm differences. For example, it may be that new, private firms (perhaps especially with non-internal owners) are the most market-oriented and have the corporate culture to be the most flexible on both the quantity and the price dimensions. Thus, as in much of the literature on job flows in transition economies (see, e.g., Acquisti and Lehmann (2000) and Bilsen and Konings (1998)), we will be exploring whether ownership structure and other firm characteristics play a role in accounting for the patterns of the flows.

Another interesting complicating factor is that the idiosyncratic wage policies of a firm may impact not only its employment volatility (and thus its job flows) but also the "excess"

(1999) and Davis and Haltiwanger (1999).

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worker flows (i.e., worker flows that are above and beyond the worker flows needed to accommodate the job flows). In a matching and sorting environment, where firms learn about match quality through experience, wage policies may be very important for such excess worker turnover. A firm that chooses a less compressed wage policy may be able to retain the workers it learns are the best matches by increasing the wage of the well matched workers. Alternatively, a firm with a more flexible wage structure will be better able to encourage the workers it learns are poor matches to separate through paying a lower wage. In what follows, we also investigate these "matching" hypotheses that relate the idiosyncratic wage policies of firms to excess worker turnover.

3. EMPLOYMENT ADJUSTMENT RESTRICTIONS AND WAGE SETTING IN THE 1990S

Profound changes in the political and economic system, some of which started already when Slovenia was still part of Yugoslavia, heavily influenced outcomes in the Slovenian labor market in the 1990s. Above all, the 1988 Yugoslav Law on Enterprises transferred decision-making rights from workers to equity owners, thus formally ending the era of self-management. Important changes occurred both in employment and wage policies. The major novelty in the area of employment was the right of the employer to lay off a worker (although this option was extremely costly for the employer). On the wage setting front, the self-managed mechanism was replaced by a system with three components: the Labor Code, collective bargaining, and incomes policy. In this section we describe the employment adjustment restrictions and wage setting framework that were in place after the demolition of the self-managed system.

Employment protection legislation

In the former Yugoslavia, layoffs were not permitted except on disciplinary grounds. Slovenian transition reforms crossed the Rubicon of job security and allowed employers to lay off workers, but imposed large costs for doing so. In comparison to other transition economies, Slovenian employment protection legislation has been among the most restrictive (see Ribaud et al, 2001).

In case of a layoff "for economic reasons," the Labor Code of February 1991 (which has been with minor modifications in power till now) calls for an advance notification period of 6 months for all workers, and a severance payment of one half of monthly earnings for each year of employment with the current employer. [3] Moreover, before being able to layoff a worker, employers have to explore whether there is a possibility to: (i) reassign the worker within the firm (including to a job that requires fewer skills, with the worker's consent); (ii) retrain a worker within a 6 month period; and (iii) keep the worker under a reduced number of hours (36 hours a week). Slovenian employers have also faced significant procedural inconveniences associated with layoffs, including notification of the third party (trade unions) and a one month delay of the effective day of notification. Moreover, in the case of mass layoffs, firms have to prepare restructuring programs. Criteria for identifying workers to be laid off are spelled out in general collective agreements and include: work quality (productivity), qualifications, work experience, seniority, health, and social considerations (such as number of dependents).

More liberal, however, have been the regulations about the use of fixed-term employment. Although fixed-term contracts have been permitted only in "objective" cases defined by the law, Slovenian legislation does not limit the number of successive contracts nor maximum cumulated duration of fixed-term contracts. In addition, there are other ways the firm may be able to avoid the high costs of formal layoffs. For one, there are provisions for firms to declare a form of bankruptcy

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[3] In May 2002, Slovenia accepted a new Labor Code (which will come into force starting 2003) that introduces

that enables them to avoid some of the high costs of layoffs. For another, it may be that a firm is able to achieve employment reductions through inducing workers to leave – partly through normal attrition but also partly via the wage setting mechanism itself. We turn to the nature of the latter now.

Wage setting mechanism

Under the pre-transition, self-management system, the absence of explicit property rights dictated a specific wage setting mechanism. Both government and workers had clearly delineated roles. The government set the firm's wage bill (called a "socially warranted" wage bill), with the objective to even out differences in pay among firms -- the objective achieved by massive inter-firm income redistribution.[4] Within the government determined boundaries, the workers' role was to set individual wages within the firm. The wage scale was determined by a referendum of employees. Not surprisingly, in comparison to capitalist firms Yugoslav firms had extremely compressed wage scales. For example, in an enterprise with several thousand workers, the pay of the highest paid manager was 4.54 times that of the lowest paid worker (see further details on wage determination in Vodopivec, 1993).

The Labor Code of 1991 removed administrative constraints and collective decision-making, leaving wages to be determined by employers within the framework set by collective bargaining. The outcomes of collective bargaining have been binding for all employers (regardless of their participation in the bargaining process). The first general collective agreement for Slovenia was ratified in August 1990, and was followed by several other general, as well as numerous industry collective agreements. The latter ones tend to follow the then-prevailing general collective agreement, but may specify more detailed conditions of pay, as deemed appropriate for their specific areas.

more flexibility in employment protection regulation.

General collective agreements, among others, prescribe the components of the wage and determine fringe benefits (such as duration of vacation, reimbursement of transportation to work, meals, etc). According to these agreements, the components of wages are: (a) the basic wage, the floor of which is determined by collective and industry agreements; (b) wage supplements, for example, for difficult working conditions and for seniority; (c) supplement for individual success, and (d) an "income sharing" component, paid on the basis of the business success of the firm.

The largest component of a worker's pay is the basic wage (usually determined as a multiple, say 1.35, of the minimum basic wage as determined by collective agreements). To determine the basic wage, collective agreements classify workers into nine categories, prescribing for each category its own minimum, basic wage (precise inflation escalation clauses determine the basic wage for each category, for each month). The classification of workers is based on the level of their education. The basic wage for the highest category has been repeatedly set at three times that of the lowest category (some industry agreements set slightly higher ratios). Until 1997, firms in bad financial standing (the term not precisely defined) had the right to reduce the basic wage levels (by up to 20 percent till 1995, and by 10 percent during 1995-97). For illustration, below we present the basic wage scale mandated by the supplement to the 1997 general collective agreement (Official Gazette of the Republic of Slovenia, No.40, June 1997):

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[4] For quantification of redistributive flows for Slovenian firms in 1986, see Vodopivec (1993).

	Class	Coefficient	Basic monthly gross wage for full time work (in SIT)
1	Simple work (no training, unfinished elementary education)	1	47,978
2	Less demanding work (short training, completed elementary education)	1.1	52,776
3	Medium demanding work (up to two year professional/vocational education)	1.23	59,013
4	Demanding work (up to two-and-a-half- year professional/vocational education)	1.37	65,730
5	More demanding work (3 year of professional/vocational education, with a foreman exam, or 4-5 year of such education)	1.55	74,366
6	Very demanding work (2 years of college level education)	1.85	88,759
7	Extremely demanding work (4-5 years of college level education)	2.10	100,745
8	Most demanding work (master degree)	2.50	119,945
9	Exceptionally important and most demanding work (doctorate)	3.00	143,934

Bargaining agreements also specify many other conditions of pay. One of the most important ones is a seniority supplement, determining the minimum rate of returns to seniority (work experience). For example, Art. 47 of the 1997 general collective agreement (Official Gazette of the Republic of Slovenia, No.40) prescribes that a worker's pay is increased by at least 0.5 percent of his/her basic wage per each year of work experience (the same stipulation has been in effect throughout the 1990s).

In parallel to the structure of basic wages imposed by collective agreements, a 1995 social agreement introduced also inflation adjusted minimum wage (Official Gazette of Slovenia NO.22/95). The minimum wage exceeds the basic wage of the least paid workers as stipulated by collective agreements which is valid for the same period, because the minimum

wage provision relates to the total payment received by the worker (including various supplements), and the basic wage is only one -- albeit the main -- component of the pay. Until 1997, incomes policies (which were the staple in the self-management system) continued to be an important component of the wage-setting system. The government repeatedly accepted laws, which all limited the growth of the overall wage bill of the enterprise. Since 1997, there has been no income policy general limit on the overall wage bill, and the only limitation on the wage growth has been the requirement that the annual growth of managerial pay (the pay of highly-paid workers under the so-called individual contracts) should be matched by the growth of the payroll of the workers covered by collective agreements.

One key feature of the system is that it does permit firm-specific and worker-specific deviations from the wage guidelines due to the success of the firm and/or the success of the worker. Permitting such idiosyncratic deviations is new to the Slovenian system and it may be that some firms are more able or willing to allow for such deviations. In the following analysis, we explore this aspect of the system in greater detail.

In short, it is clear that the Slovenian wage setting traditionally has been a very structured, formally determined system but that the system is evolving. Basic wage, minimum wages, and indexation clauses all provide constraints on the wage determination process. However, allowance for idiosyncratic deviations on a firm-specific and even worker-specific basis offer the opportunity for the system (for at least some firms) to be responsive to market forces.   As emphasized in section 2, there is potentially a tradeoff between wages being responsive to market forces and employment volatility and excess worker turnover. Before analyzing the nature of these tradeoffs, we turn to a description of the data.

4. DATA SOURCES

Our analysis of job flows, worker flows, and wages during the transition of the Slovenian economy rests on four unusually rich administrative data bases covering all Slovenian workforce participants and all business subjects. Two of these are data bases on workers, containing employment history and earnings information, and two are data bases on firms, containing accounting and business registry information. Common identifiers allowed us to combine the records from different data bases. In the present analysis, we used data for 1997-99, the period for which all four data bases were available.[5] In what follows, we describe the data bases.

Description of data bases

1. *Work history data base* (maintained by the Statistical Office of Slovenia). This data base was established by the census of workers in 1987 and initially included information on all formal sector jobs that were in progress as of December 31, 1986. Information collected about the individuals incumbent in these jobs included age, educational attainment, gender, years of labor market experience counted towards eligibility for the state-sponsored pension plan, and years with the current employer. The data base also included information on the type of appointment held (fixed term versus permanent) and on certain other aspects of the terms of employment. The data base has been updated to include information on job terminations and job commencements, as well as some information on changes in the terms of employment. All of the information used to update the base was derived from forms that employers were required to file in connection with maintenance of social insurance records (the so-called M1, M2, and M3 forms). It contains the information on the starting and ending date of an employment

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[5] The authors are currently expanding the coverage of data bases, but needless to say, the preparation of such

spell, the type of appointment, occupation, employer identification code, and personal

characteristics (gender, age, education).

2. *Workers' earnings data base* (maintained by the Pension and Disability Fund*).* The data

    base contains information on earnings associated with each employment spell of

    workers employed in the formal sector. For each year (or part of the employment spell

    within a year) the information collected includes, among others, the amount of earnings,

    the number of hours worked in regular time and overtime, and starting and ending date

    of earnings period.

3. *Accounting data on enterprises* (maintained by the Agency for Payments). Data consist

    of yearly profit and loss statements and balance sheets, for all incorporated businesses in

    Slovenia.

4. *Business registry of firms* (maintained by the Statistical Office of Slovenia). The

    registry contains records, among others, about the following information for each firm:

    the starting date (and, if exists, the ending date), organizational type, ownership type,

    whether the firm has domestic or foreign owners, and what is the size of the firm.

A few further notes about the use of the data in this study are warranted. For the

purpose of this analysis, the business entity that we refer to as the firm is actually at the

establishment level. We have the information that enables us to aggregate up the establishment

level data to the enterprise level.   We have found that the results reported below largely hold at

the enterprise level.

The worker history database is comprehensive covering virtually all workers. The

number of workers in our micro data in any given year is roughly 750,000 consistent with the

published statistics on total employment. The aggregated micro data also yield aggregate

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inclusive, matched employer-employee data set is an extremely complex and slow process.

employment growth rates consistent with published statistics. For all of the job and worker

flow statistics, we use the worker employment history data for 1997-99. The worker earnings

database available for this study only provided wage data for the years 1997 and 1998. While in

principle all workers are should be included in this database, we only have roughly 500,000

workers in this database in a given year. The reason for this is that the underlying

administrative data on businesses with the earnings data did not include all businesses.

However, conditional on data being available for one worker in a business, we typically had all

of the workers in the business. Moreover, the non-reporting businesses appear to be

approximately random. One check of this is that we re-computed the gross worker and job flow

businesses for only those businesses with reported earnings data and compared those to the

comprehensive worker and job flow statistics we generated (and report below) from the worker

history database. The comparison of the job and worker flows across the comprehensive and

the more restrictive database yielded virtually identical results. In the reported results that

follow, the reported job and worker flow statistics are from the comprehensive database but the

wage distribution statistics and analysis is based on the businesses with reported earnings data.

5. *MEASUREMENT METHODOLOGY FOR JOB AND WORKER FLOWS*

The empirical analysis focuses on job flows, worker flows and wages. The concepts for job and

worker flows are defined as follows. First, for a business j and for workers of type k, define the

growth rate of employment as:

$$g_{jkt} = (E_{jkt} - E_{jkt-1}) / X_{jkt}$$

where E_{jkt} is employment for business j for workers of type k at time t and $X_{jkt} = .5(E_{jkt} + E_{jkt-1})$.

As discussed in detail in Davis, Haltiwanger and Schuh (1996), this growth rate measure has

several advantageous properties: (i) it accommodates entry and exit; (ii) it is symmetric for

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employment gains and losses; (iii) it is a second order approximation of the log first difference. Using this growth rate measure, job creation and destruction rates for workers of type k aggregated to employer characteristics s are defined as:

$$POS_{skt} = \sum_{g_{jkt} \geq 0, j \in s} (X_{jkt} / X_{skt}) g_{jkt}$$

$$NEG_{skt} = \sum_{g_{jkt} < 0, j \in s} (X_{jkt} / X_{skt}) | g_{jkt} |$$

where

$$X_{skt} = \sum_{j \in s} X_{jkt}$$

Job creation (POS) thus measures the gross employment gains from all expanding businesses (including contribution from entry) while job destruction (NEG) measures the gross employment gains from all contracting businesses for employers of type s. By construction, the net growth rate (NET) for sector s is given by the difference between creation and destruction. That is,

$$NET_{skt} = POS_{skt} - NEG_{skt}$$

Summary measures of the total amount of job reallocation are given by:

$$SUM_{skt} = POS_{skt} + NEG_{skt}$$

$$EXCESSJ_{skt} = SUM_{skt} - | NET_{skt} |$$

The total job reallocation rate (SUM) is a measure of the total rate of all jobs reallocated in a period. The excess job reallocation rate (EXCESSJ) is a measure of the reallocation of jobs over and above that necessary to accommodate the net employment changes at the sectoral level.

Worker flows are defined as follows. Let a_{jkt} be the number of accessions of workers of type k by firm j between t-1 and t. Let s_{jkt} be the number of separations of workers of type k by

firm j between t-1 and t. The rate of accessions (ACC) and separations (SEP) at the firm level

are given by:

$$ACC_{jkt} = a_{jkt} / X_{jkt}$$

$$SEP_{jkt} = s_{jkt} / X_{jkt}$$

It is useful to introduce a measure of excess worker reallocation at the firm level (EXCESSW)

that can be defined as:

$$EXCESSW_{jkt} = ACC_{jkt} + SEP_{jkt} - | g_{jkt} |$$

In a related fashion, excess accession (EXCACC) and separation (EXCSEP) rates can be

defined at the firm level given by:

$$EXCACC_{jkt} = ACC_{jkt} - | \max(g_{jkt}, 0) |$$

$$EXCSEP_{jkt} = SEP_{jkt} - | \min(g_{jkt}, 0) |$$

That is, excess accessions are accessions over and above any job creation that is occurring at the

business, while excess separations are separations over and above any job destruction that is

occurring at the business. At the sectoral level the accession, separation and excess worker

reallocation rates are given by:

$$ACC_{skt} = \sum_{j \in s} (X_{jkt} / X_{skt}) ACC_{jkt}$$

$$SEP_{skt} = \sum_{j \in s} (X_{jkt} / X_{skt}) SEP_{jkt}$$

$$EXCESSW_{skt} = \sum_{j \in s} (X_{jkt} / X_{skt}) EXCESSW_{jkt}$$

6. Worker and Job Flows: Basic Facts by Employer and Employee Characteristics

The job and worker flow rates presented here are based upon the 1997-99 period. The focus in this analysis is on the cross-sectional variation across employer and employee characteristics. As such, in the results that follow all rates are based upon time series averages of the annual rates for 1997-1999. Figures 1-8 present worker and job flow rates by industry, firm size, firm age, firm ownership type, foreign/domestic ownership status, educational attainment of the workforce, worker age, and worker gender.[6] Several patterns stand out. From Figure 1, the annual overall rate of job creation and destruction are both roughly 10 percent and the annual overall rate of accessions and separations are both roughly 15 percent. These rates are comparable to rates observed in Western economy countries (see, e.g., Davis and Haltiwanger (1999)). It is a bit surprising that job flows account for such a large fraction of worker flows (approximately 2/3). This ratio is large in comparison to Western Economies (where the ratio typically ranges between 1/3 and ½).[7]

In terms of employer and employee characteristics we find that the job flows as well as the rate of excess job reallocation are higher for construction, trade and hotel and restaurant industries, for private sector, small, foreign and young firms and for young, and less educated workers. The differences in the magnitudes of the flows across these groups are often substantial. For example, businesses one year old have creation rates that are more than twice the creation rates of businesses that are five years or older.   Net employment growth varies systematically across many of these same categories as well. Net job growth is higher for small, young, private, foreign owned firms and also for more educated and younger workers. For

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[6] Note that the results presented are all for "one-way" classifications so that for example the results by firm size class show the patterns across firm size classes for all types of workers.

these one-way tabulations, there are less systematic relationships between the pace of worker flows (especially the excess worker reallocation component) and the characteristics of employers and employees. We do find that excess worker reallocation is higher for private, older firms and for firms in the construction, trade and hotel and restaurant industries. Also, not surprisingly and consistent with matching theories of the labor market, younger workers exhibit higher excess worker turnover rates.

One issue these rich data permit analyzing is the role of between vs. within firm job reallocation. Between firm job reallocation is defined as the job reallocation resulting from the net expansion or contraction of the total employment at the firm. Within firm job reallocation can be defined and measured here in terms of changes in the mix of workers at the business. Thus, if the firm is expanding its net employment of say, educated, workers and contracting its net employment of less-educated workers, then this is a form of within firm job reallocation. For employers of type s and job reallocation for worker groups indexed by k we can define a *total* excess job reallocation adding together the between business excess job reallocation and the within business excess job reallocation across the workers indexed by k. This decomposition is given as:

$$EXCESSJ(k)_{st} = (SUM_{st} - |NET_{st}|) + (\sum_{j \in s}(X_{jt}/X_{st})(\sum_{k}(X_{jkt}/X_{jt})|g_{jkt}|) - |g_{jt}|)$$

where recall that j indexes businesses, k indexes worker types and s indexes employer types. The first term on the RHS of this decomposition is the between plant job excess reallocation for all worker types and the second term is the excess job reallocation across workers indexed by type k within businesses. This second term represents the reallocation within businesses over

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[7] See Davis and Haltiwanger (1999).

groups indexed by k over and above the changes required to accommodate the net change of overall employment at the business. Figure 9 presents the results of applying this decomposition using worker types first defined separately by worker age, worker education and worker gender and then worker types defined fully interacted across all these three categories. Interestingly, using these definitions of worker types, much of the job reallocation is a between firm phenomenon – that is, the within business reallocation rates are relatively small. For example, when all 3 worker types are considered interactively, the total excess job reallocation rate is about 25 percent, the excess between business job reallocation rate is about 19 percent and the within business job reallocation rate is about 6 percent.

These basic facts are interesting in their own right but our focus in this paper is to relate the patterns of worker and job flows to firm's wage policies. In the next section, we first explore the nature of firm wage policies. Following that analysis, we analyze the relationship between firm wage policies and worker and job flows.

7. The Distribution of Wages Between and Within Firms

The linked employer-employee data has information on earnings, hours and worker characteristics. We can measure the hourly wage a worker earns in any given year and match that worker with the firm. For workers that transit between one firm and another in a year, we can measure the hourly wage in each of the firms and allocate the hours with each firm appropriately. We also know the months of the year that the hours and earnings are affiliated so that the hourly wage measure we use is a real hourly wage adjusted for monthly variation in the general price level. For our analysis of wages, we only have information for the years 1997 and

1998. As such, the analysis of the connection between wage policies and job and worker flows

refer only to those years.

We begin our analysis of the distribution of wages by examining the (hours weighted)

total dispersion of log real hourly wages and decomposing the total variation into between and

within firm components for employers of type s. The latter decomposition is given by:

$$V_{st} = \sum_{j \in s} h_{jt} (w_{jt} - w_t)^2 + \sum_{j \in s} h_{jt} \sum_i h_{ijt} (w_{ijt} - w_{jt})^2$$

where V is the total variance, h_{jt} is the share of total hours for sector s accounted for by firm j,

w_{jt} is the (hours weighted) average wage at the firm, w_t is the overall (hours weighted) average

wage, h_{ijt} is the share of firm total hours accounted for by worker i in firm j, and w_{ijt} is the

average hourly wage for worker i at firm j. The first term on the RHS of this decomposition is

the between firm component and the second term is the within firm component.

Figure 10a presents the time series averages of this decomposition for the overall

economy and by industrial sector.[8] Overall, roughly half of the variation is within firm and half

is between firm. Thus, different firms pay on average different wages, while workers within

firms are also paid different wages. The nature of this decomposition varies by sector. In the

government sector, all of the variation is within firms. In trade, services and manufacturing, the

between firm component is larger than the within.

The differences between and within firms may simply capture differences in the

observable characteristics of the workers. Indeed, in section 3, the wage guidelines are such

that workers with different observable qualifications are to be paid different wages. In many

ways, our interest in firm's wage policies is in the idiosyncratic component to wages after

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[8] We calculate the wage decomposition for each year separately (1997 and 1998) and then take simple averages of
the by-year decompositions.

controlling for observable worker characteristics. To be able to characterize this idiosyncratic component, we proceed as follows. First, we estimate a standard wage equation using individual worker level information. That is we regress log real hourly wages on education categories, a quadratic in general labor market experience and a quadratic in firm specific experience (denoted tenure). The results of this standard regression are reported in Table 1. The results are quite sensible. Wages rise with education, general experience and firm specific experience. The relationship between wages and both forms of experience is concave consistent with much of the literature. Of course, in Slovenia with the detailed wage guidelines, some of this variation reflects the national policies determining wages. Indeed, the relatively high R-squared in this regression (around 0.5) presumably reflects the fact that a substantial amount of the wage variation follows the guidelines. However, there is still substantial residual wage variation after controlling for the worker characteristics. We now turn to investigating the degree to which that residual variation varies systematically across firms.[9]

Figure 10b depicts the dispersion of the residual component of wages (after controlling for worker characteristics) again decomposing the variation into between firm and within firm components. Interestingly, about half of the dispersion in the residual component is associated with within firm effects and half with between firm effects. The magnitude of the overall dispersion and the components varies substantially across industries. Comparing Figure 10b to Figure 10a we see more cross industry variation in the dispersion of residual wages as opposed to raw wages.

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[9] There are a number of issues and, as such, a number of alternatives that could be explored in determining the residual distribution. We could in principle include a firm effect in the wage equation related wages to worker characteristics. Alternatively, with a longer panel of data we could estimate both person and firm effects and decompose the person effects into the contribution of observable time-invariant characteristics (e.g., education) and unobserved characteristics using the methodology in Abowd, Creecy and Kramarz (2002). We leave the exploration of these alternatives to future work when a longer time series panel becomes available.

Figure 11 shows the decompositions of the residual wage distribution into between and within firm components by firm size, firm age, foreign/domestic and ownership type. Several patterns emerge. Overall residual dispersion is higher for older firms, foreign firms and private firms. There is a slight u-shaped pattern between overall dispersion of the residual wage distribution and firm size. Within firm residual wage dispersion increases in firm size and firm age. Between firm residual wage dispersion is especially high for private and foreign firms.

8. *The Relationship Between Firm Wage Policies, Job Flows and Worker Flows*

We now turn to exploring the relationship between firm wage policies and job and worker flows. Our approach here is exploratory since this is a relatively novel area of inquiry in the literature. We seek to understand the relationship between wage differentials and worker and job flows. Our focus is on the residual wage differentials since much of the wage differentials associated with worker characteristics reflects the regulation of wage determination. The residual component of wages presumably reflects, amongst other things, the differentials that firms pay individual workers based upon the "success of the worker" and/or the success of the firm.

Our core empirical specifications here are parsimonious and reflect the simple hypotheses discussed in section 2. First, we explore the hypothesis that a firm with a more flexible wage policy will have less employment volatility. We examine this hypothesis with a simple regression relating the average job reallocation rate of the firm (measured as the absolute value of the firm's growth rate) to the within firm dispersion in wages. The prediction is that average job reallocation should be inversely related to the within firm dispersion in wages. For the latter, our focus is on the residual component but we also consider the within firm dispersion in actual wages as a form of sensitivity and robustness analysis.

We also explore the relationship between the wage policies of a firm and worker reallocation. Since worker reallocation includes both job reallocation and *excess* worker reallocation, the focus here is on the latter. Excess worker reallocation is a measure of the reallocation due to match effects. The hypothesis here is that wage flexibility will yield greater excess separations for workers that are poor matches but less excess worker separations that are good matches. Thus, the overall relationship between wage flexibility and excess worker reallocation is unclear. In what follows, we first explore the overall relationship and then the hypotheses on the components of excess worker separations. While we do not have direct information about the quality of matches, we do have information about the wages that an individual worker receives. After exploring the overall relationship, we use the information about the average (residual) wage that a worker receives as a rough proxy of the many factors that reflect the quality of workers not captured by observable components.

In our baseline specifications, we include industry effects and we also include the average firm wage. We also consider all specifications on an unweighted (all firms get equal weight) and employment weighted basis. Tables 2a and 2b provide summary statistics for the variables used in the regressions.[10]

Table 3 presents the results of the regressions of job reallocation, worker reallocation and excess job reallocation on firm wage policies using the residual wage distribution. Table 3a presents the unweighted results. Table 3b presents the weighted results. Strikingly, businesses with greater within business dispersion in residual wages have lower job reallocation, lower worker reallocation but higher excess worker reallocation.

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[10] We do not include other employer characteristics in these regressions (e.g., size or ownership type) as these characteristics may be (and indeed section 7 shows they are in fact) related to the firm wage policies that we investigate. Note that the number of observations in Table 2 is the same as the number of observations used in the regressions reported in Table 3.

The finding that greater within business residual wage dispersion is associated with lower job reallocation is consistent with the hypothesis that firms with greater wage flexibility will have lower employment volatility. The finding that excess worker reallocation is positively related to within business residual wage dispersion is interesting and potentially reflects the matching effects hypotheses discussed in section 2. However, the matching effects hypothesis requires further analysis to which we turn to below.

Before exploring the matching hypothesis directly, we note one other aspect of our results. We find that firms with higher average wages (either residual or actual) have lower job reallocation, worker reallocation and excess worker reallocation (the only exception are unweighted regressions when using residual wages). This finding of an inverse relationship between the average wage of a firm and turnover is potentially consistent with the incentive based theories of wage determination (e.g., Akerlof and Yellen (1986)). While this is not a focus of the current analysis, this aspect of the findings is of interest and deserves further attention in future related work.

Recall that the matching effects hypothesis is a two-part hypothesis. Firms would like to encourage separations for workers who are bad matches but would like to encourage retention for workers that are good matches. As such, we are interested in knowing whether the increase in excess worker reallocation associated with greater wage flexibility is driven by excess separations of good or bad matches. While the latter are not observable, we can measure the residual wage for each individual worker in each year. As a proxy for worker quality not accounted for by observable characteristics we use the residual wage. Our hypothesis is that the higher excess worker reallocation at firms with greater dispersion should be disproportionately from workers in the lower part of the residual wage distribution. More specifically, we should observe greater excess separations in businesses with more flexible

wages for workers in the lower part of the residual wage distribution but less excess separations for workers in the upper part of the residual wage distribution.

To investigate this hypothesis, we rank workers by their residual wage in two ways. First, we rank workers in the overall distribution of wages for all workers and categorize workers in terms of which quartile of the overall wage distribution they are in. Second, using the workers in a particular business, we rank workers in the firm level distribution and categorize workers in terms of the quartile of the firm-level distribution. For all separations at an individual business, we categorize the separation based upon the wage quartile of the worker separating (first based upon all worker quartiles and then firm-specific quartiles). We then compute the separation rate for each wage quartile group so that for each firm we have potentially four separation rates (one for each quartile group).[11] Pooling the separation rates by quartile groups for all firms we examine the relationship between the separation rate by quartile group with the firm residual wage dispersion. To do this, we create a dummy variable for each quartile group and interact the dummy with the firm level measure of residual wage dispersion. Since we are interested in excess separations (i.e., separations over and above those necessary to accommodate any net changes at the business), we include on the RHS a measure of the overall firm net growth rate. In addition, we control for the average firm wage as well as for industries.

The results of this analysis are reported in Tables 5 (unweighted) and 6 (weighted). In each table, we report results using wage quartiles defined across all workers as well as firm-specific quartiles. The findings differ quantitatively but not qualitatively across the results

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[11] Note that it is only potentially four groups since a firm may not have any workers in a particular quartile group when the overall wage distribution is used. It turns out for either definition of quartiles, some firms do not have any workers in that quartile group. This implies amongst other things that the number of observations in the regression analysis is different depending on the quartile definition. Note as well that our wage coverage is not 100 percent for all workers. Thus, there is a fifth category for workers with missing wages. We include that fifth category as a control. Note that workers in this fifth category have about the average coefficient across the quartile groups consistent with the view that the workers with missing wages are randomly drawn from the distribution.

estimated using the different definitions of quartiles. As such, we discuss the results of these two specifications simultaneously.

The baseline (omitted) group is the lowest quartile. Separations from the lowest quartile are increasing in the standard deviation of the firm residual wage distribution while separations from the highest quartile are often decreasing in the standard deviation of the firm residual wage distribution. The impact for the highest quartile can be measured by adding the coefficients from the omitted group (lowest quartile) and the interaction coefficient. In all cases, the addition of the coefficients yields a negative coefficient and in all cases this negative coefficient is statistically different from zero. However, note that the absolute magnitude of the effect of rising wage dispersion is greater for those in the lowest quartile than those in the highest quartile. This pattern of magnitudes explains (at least in an empirical sense) the finding that rising wage dispersion yields greater excess worker reallocation.

In terms of other aspects of the results reported in Tables 5 and 6, a few points are worth noting. First, separations are strongly decreasing in the net growth rate – recall this is almost by construction so this is not surprising but helps emphasize that (i) controlling for net growth is important and (ii) more importantly, the results can be interpreted as characterizing excess separations. In unreported results we estimated a closely related specification where we measured the LHS as separations for the quartile less the overall net growth rate for the firm. The results are very similar to those reported here. A second point worth noting is that even with all of the other controls and the use of the residual wage distribution, firms with higher average residual wages tend to have lower excess separation rates consistent with the findings reported in Tables 3 and 4.

9. CONCLUDING REMARKS

The main results are summarized as follows:

- Post transition Slovenia has high pace of excess job reallocation (almost 20% per year) and job flows account for about two thirds of total worker reallocation.

- Rates of job and worker flows vary systematically by firm and worker characteristic. Job Flows (and Excess Job Reallocation) are higher for small, private sector, young firms, for firms in the construction, trade, hotel and restaurant industries. Job flows are higher for young, less educated workers.

- There are somewhat less systematic relationships between excess worker reallocation and firm and worker characteristics. Excess worker reallocation is higher for private, older firms, and firms in the construction, trade, hotel and restaurant industries. Excess worker reallocation is also higher for younger workers.

- Most job reallocation is between firms. There is modest within firm job reallocation by worker type. This contrasts somewhat with results for other countries and provides a potentially interesting area to explore in future research.

- The distribution of real hourly wages exhibits interesting patterns in the post-transition Slovenia economy. A decomposition of the total variance of wages indicates that between firm and within firm effects each account for roughly half of variation. Interestingly, this holds true for the actual wage distribution as well as the residual wage distribution after controlling for observable worker characteristics.

- The overall as well as the between and within firm contributions to the residual wage distribution vary considerably by sector and firm type. For example, the private sector has more overall dispersion that is primarily driven by between firm dispersion. Within firm dispersion of the residual wage distribution rises by firm size and firm age.

- Using either actual or residual wages, firms with more wage dispersion have lower job reallocation. This finding is consistent with the hypothesis from the Bertola and Rogerson

(1997) model that fewer restrictions on the distribution of wages dampen employment volatility (i.e., yields less job reallocation).

- Using actual or residual wages, firms with more wage dispersion have higher excess worker reallocation. To investigate what is driving this interesting finding, we explore the nature of the separations associated with the higher excess worker reallocation. We find that the excess separations induced by higher firm wage dispersion are disproportionately from workers with low residual wages. For workers with high residual wages, excess separations are actually lower in firms with high wage dispersion. These findings are consistent with a matching view of the labor market. Firms with higher residual wage dispersion are able to induce separations for its low wage workers and retain its higher wage workers.

- Firms with higher average wages (using either actual or residual wages) have lower job turnover, worker turnover and excess worker turnover using actual wages and residual wages. This finding is consistent with the hypothesis that firm wage policies may be used as an incentive device to reduce turnover.

Overall, we have found that idiosyncratic firm wage policies are related to the patterns of job and worker flows in striking ways. Businesses with more flexible wage structures have lower employment volatility and higher excess worker reallocation. The latter "excess" appears to be desirable in that firms with more flexible wage structures are apparently able to encourage poor matches to separate and good matches to stay.

While these are striking findings, they should be interpreted with caution. The patterns we have detected are primarily just cross sectional correlations. An obvious area for future work is to explore these relationships to detect causal relationships. In a related manner, it would be useful to explore the time series dimension of wage flexibility. In this paper, wage flexibility has been characterized in terms of dispersion of wages across workers within the firm. An

alternative interesting view of flexibility is more dynamic – that is, the responsiveness of individual wages to changes in economic conditions.   To explore issues of causality as well as to explore the dynamic notion of flexible wages requires the time series dimension. In this paper, we have very rich matched employer-employee data but for only a few years. In future work, we hope to extend the data to cover much of the 1990s and then to explore these and related issues.

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Figure 1a: Worker and Job Flows By Industry

Figure 1b: Excess Job Turnover and Excess Worker Turnover Rates

Figure 2a: Worker and Job Flows by Firm Size Class

Figure 2b: Excess Job Turnover and Excess Worker Turnover Rates
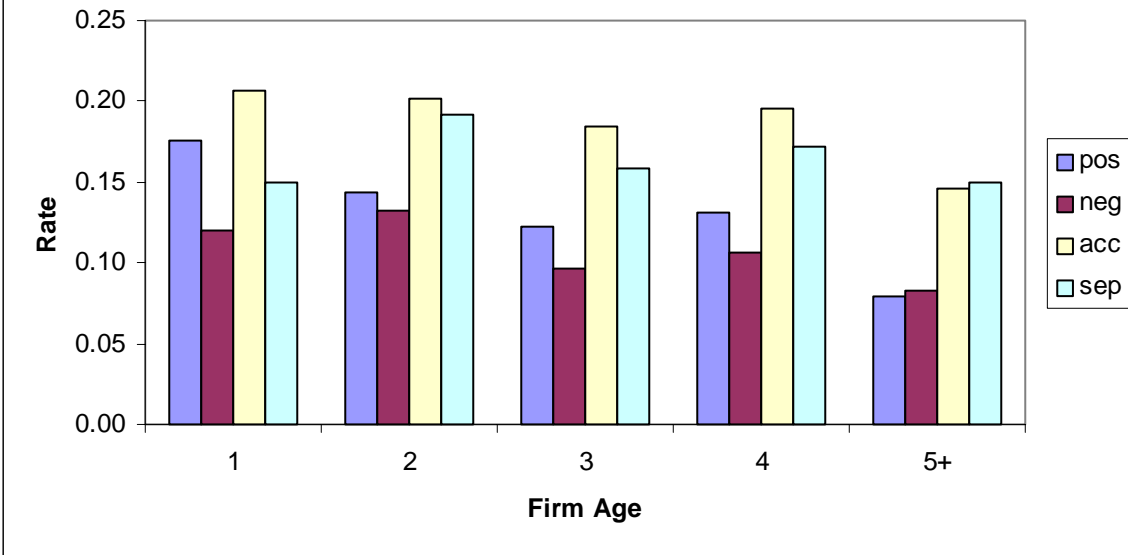
Figure 3a: Worker and Job Flows By Firm Age

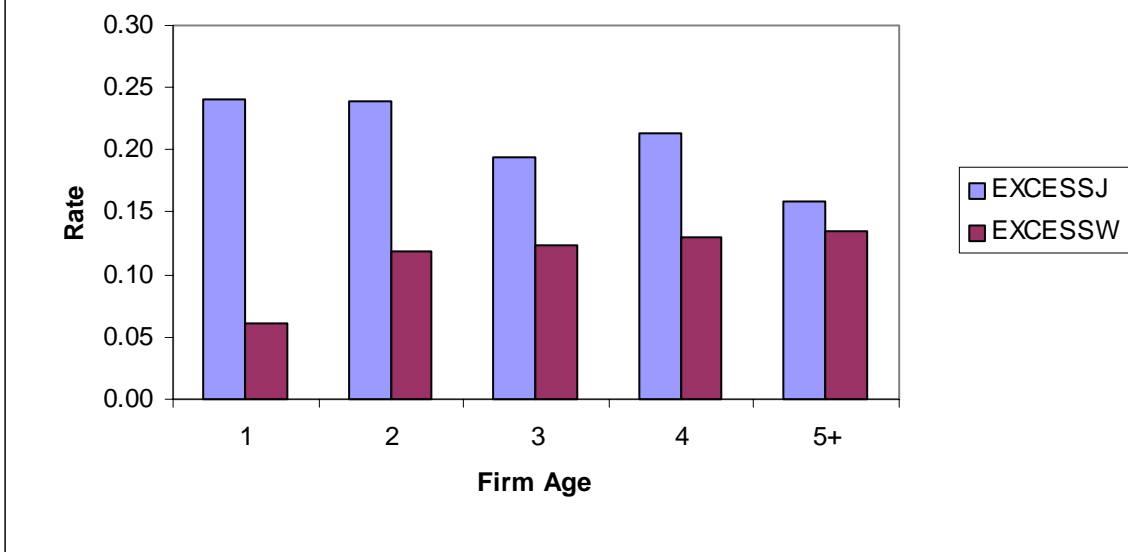Figure 3b: Excess Job and Excess Worker Turnover Rates

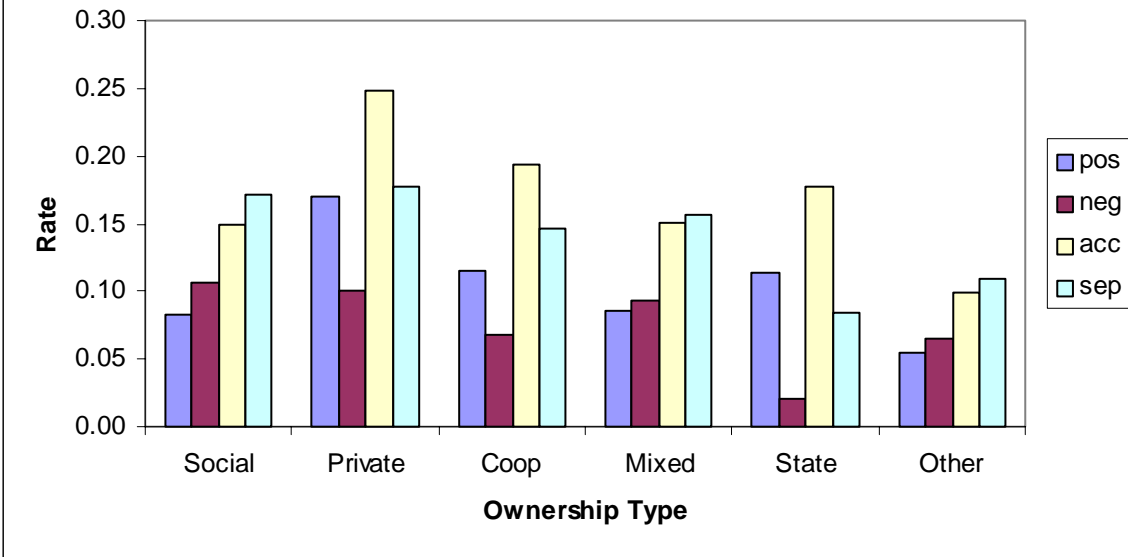**Figure 4a: Worker and Job Flows By Ownership Type**

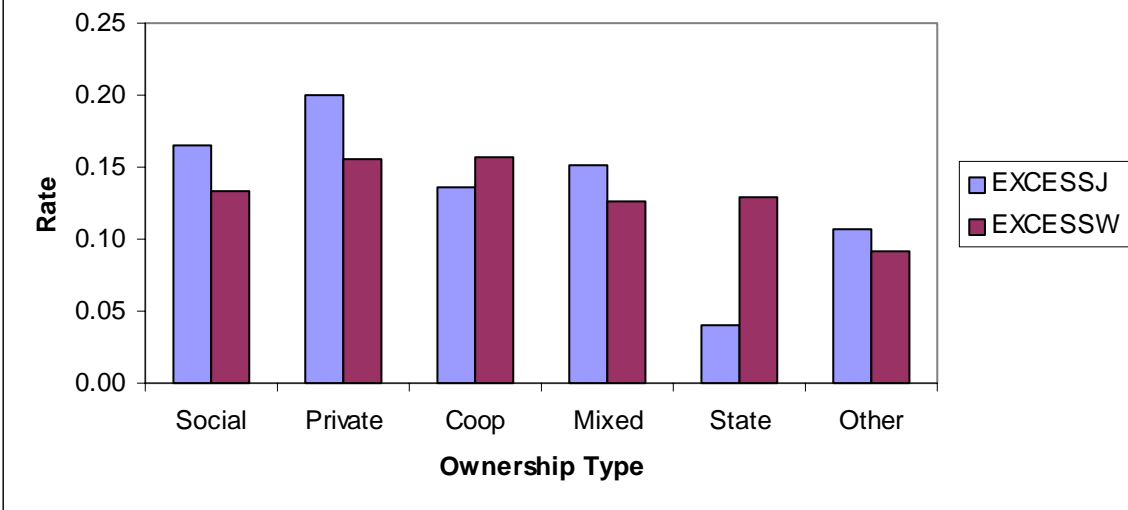**Figure 4b: Excess Job Turnover and Excess Worker Turnover Rates**
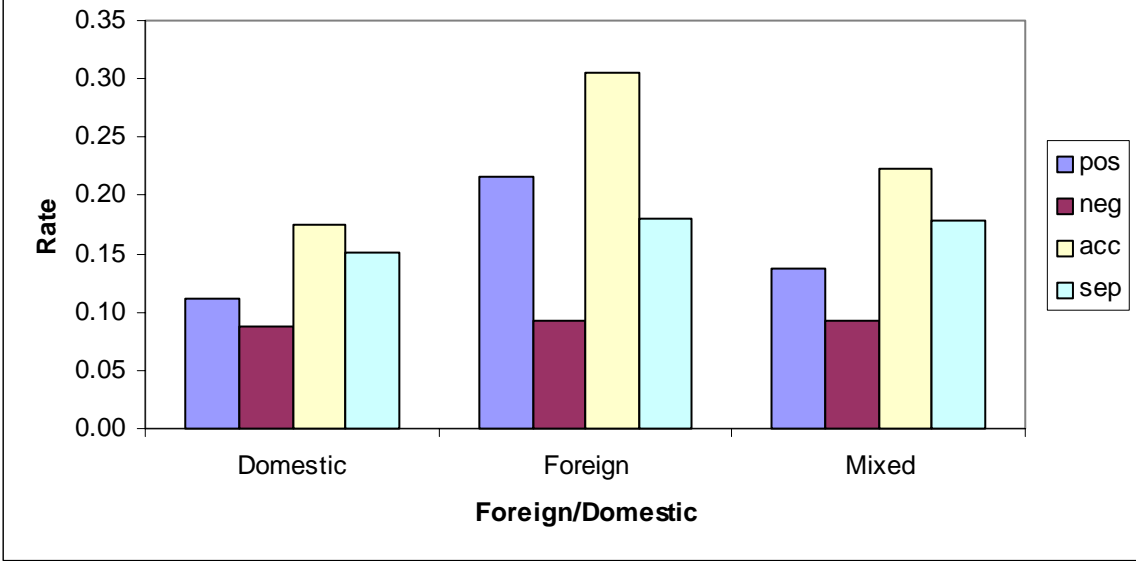
Figure 5a: Worker and Job Flows By Foreign/Domestic

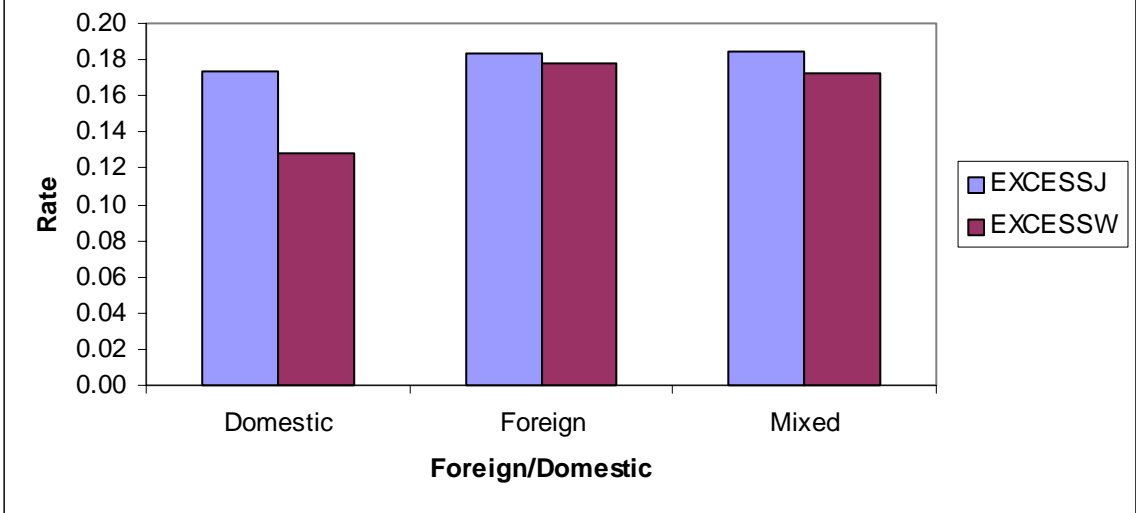**Figure 5b: Excess Job Turnover and Excess Worker Turnover Rates**

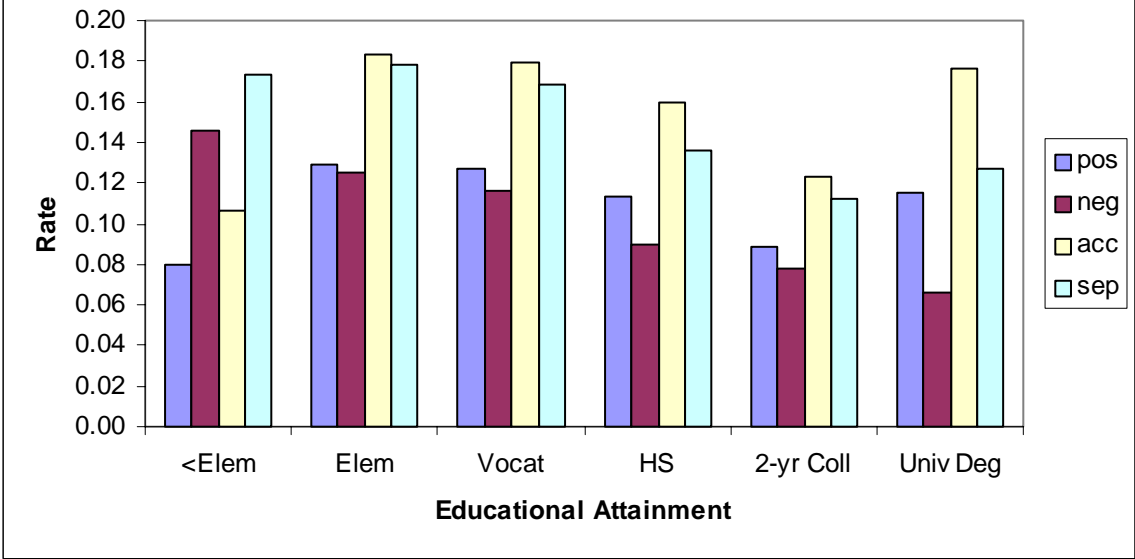**Figure 6a: Worker and Job Flows By Education**

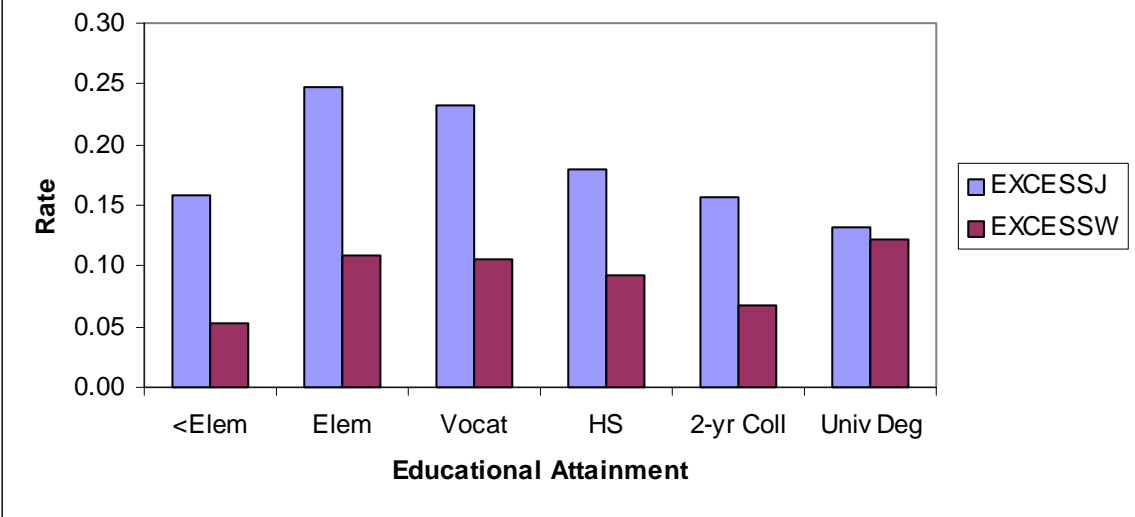**Figure 6b: Excess Job Turnover and Excess Worker Turnover Rates**
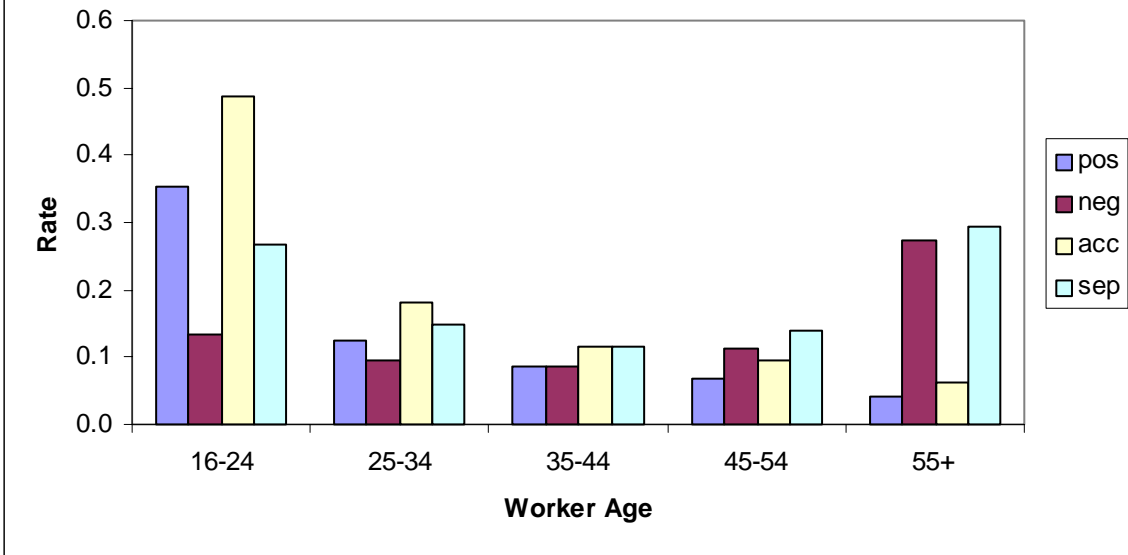
Figure 7a: Worker and Job Flows by Worker Age

Figure 7b: Excess Job Turnover and Excess Worker Turnover Rates
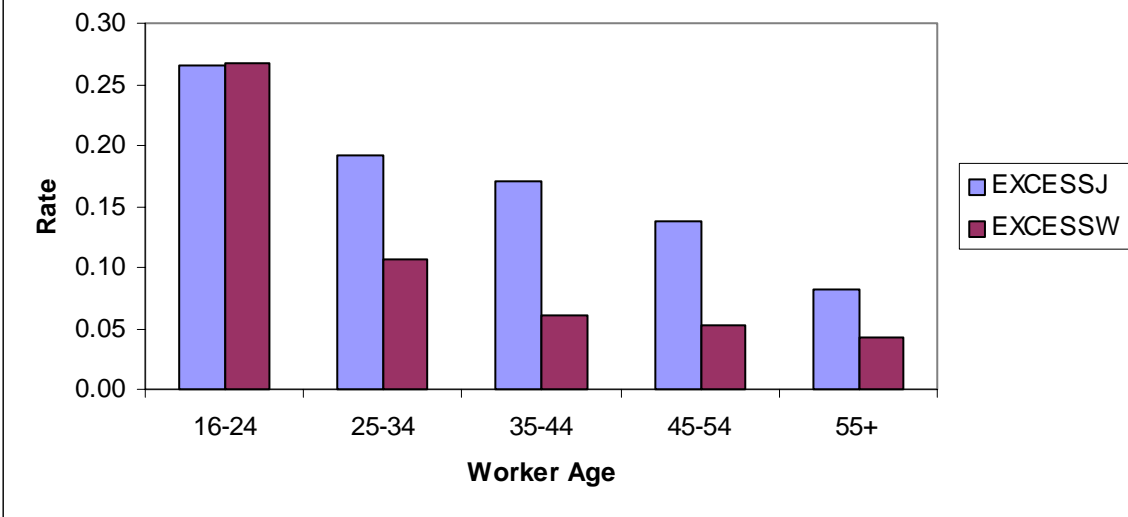
Figure 8a: Worker and Job Flows By Gender

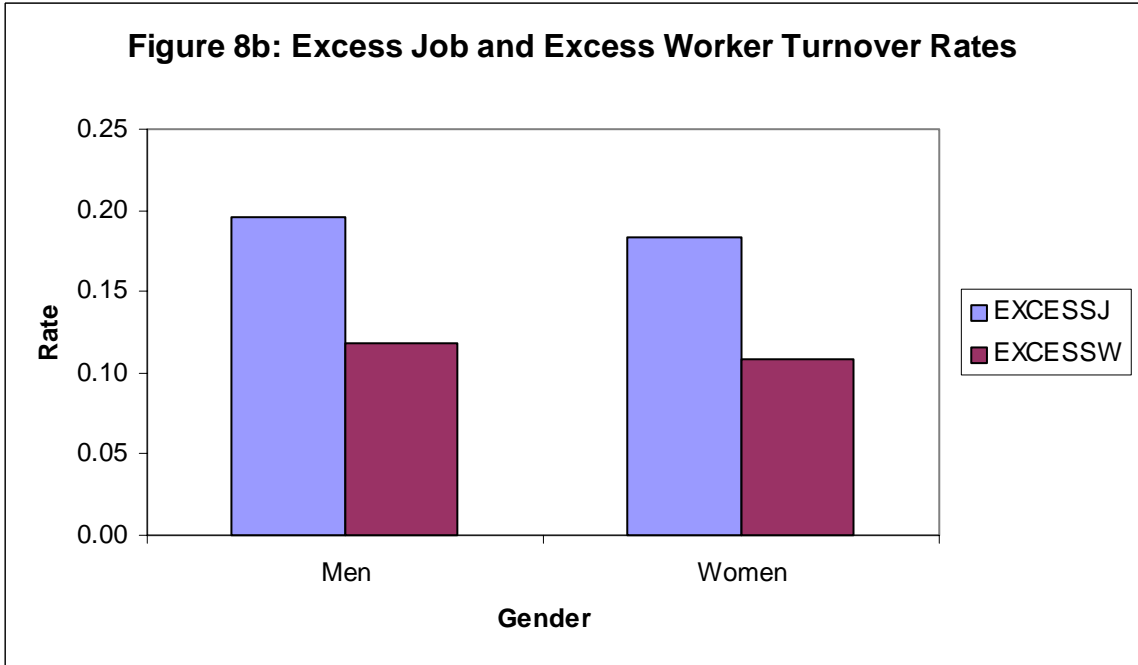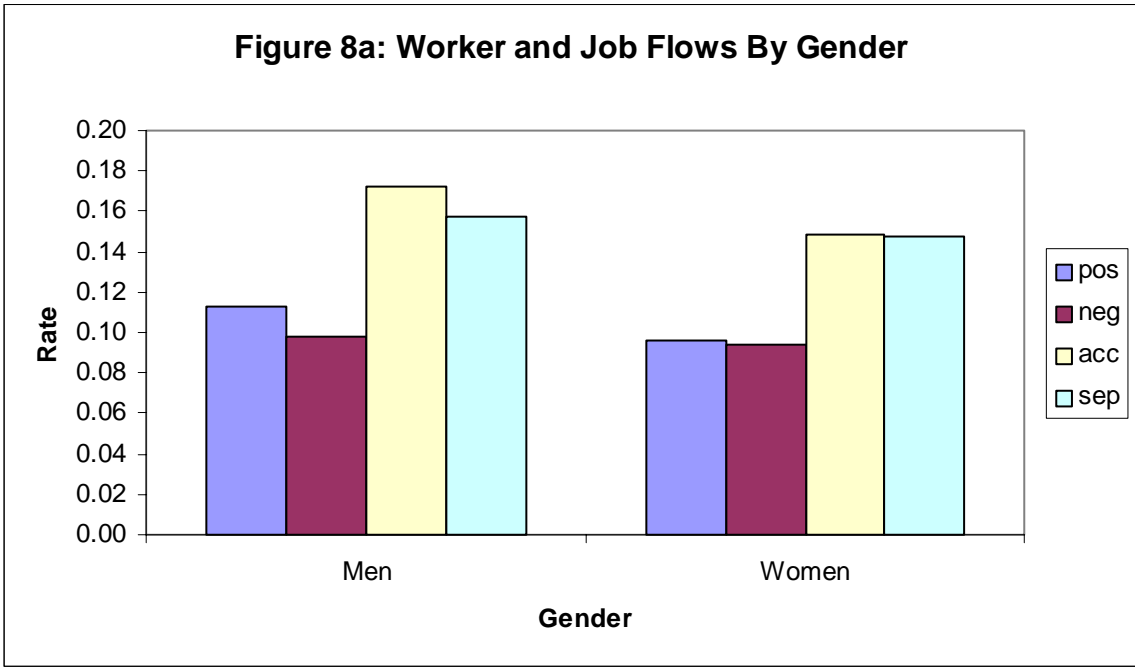**Figure 8b: Excess Job and Excess Worker Turnover Rates**

Figure 9: Total, Within Firm and Between Firm Job Reallocation (By Worker Type)

Figure 10a: Total, Between, Within Firm Dispersion of Wages -- Raw Distribution

Figure 10b: Total, Between, Within Firm Dispersion of Wages -- Residual Distribution

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Figure 11a: Total, Between, Within Firm Dispersion of Wages -- Residual Distribution

Figure 11b: Total, Between Plant, Within Firm Dispersion of Wages -- Residual Distribution
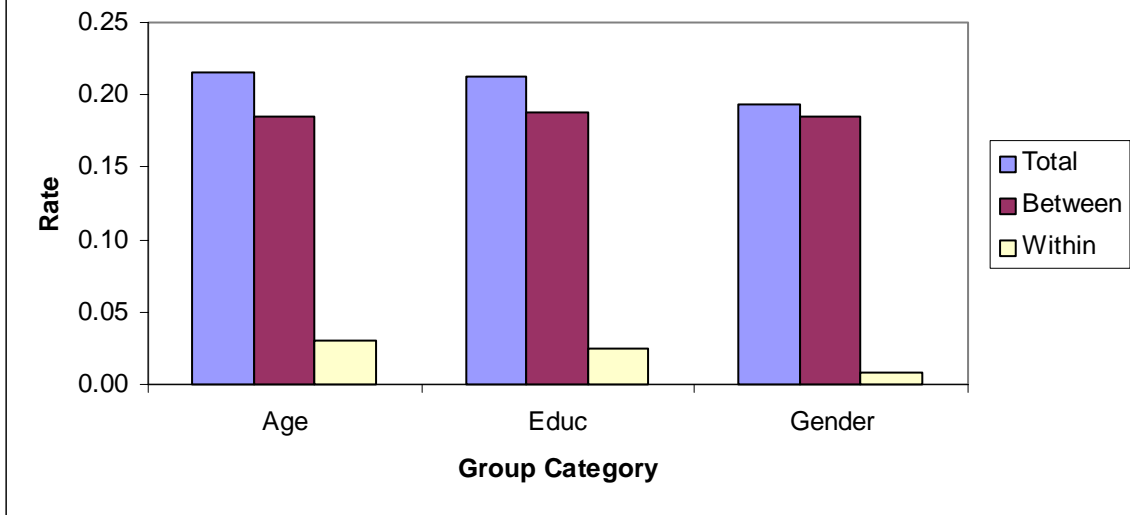

Figure 11c: Total, Between, Within Firm Dispersion in Wages -- Residual Distribution
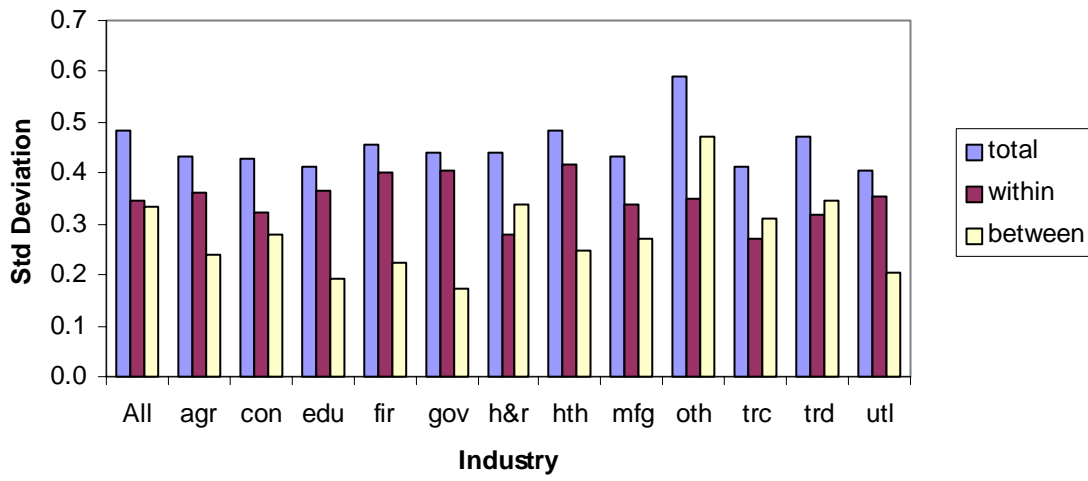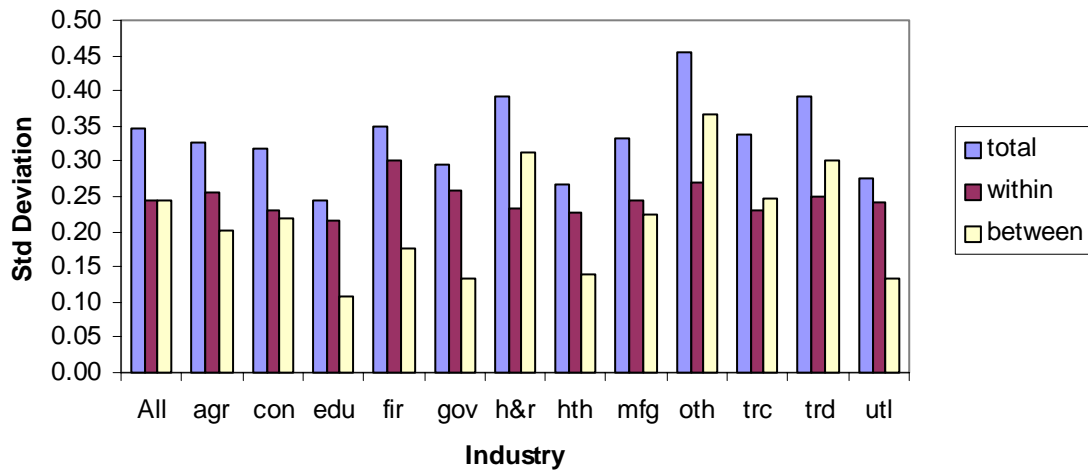

Figure 11d: Total, Between, Within Firm Dispersion of Wages -- Residual Distribution
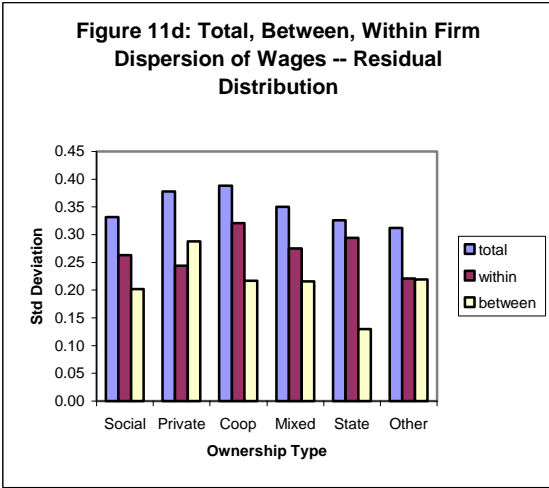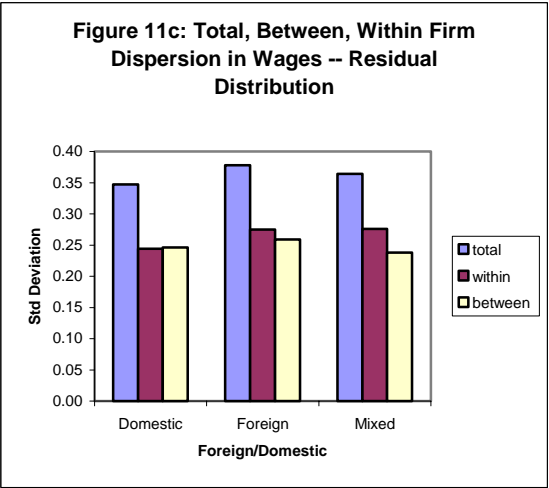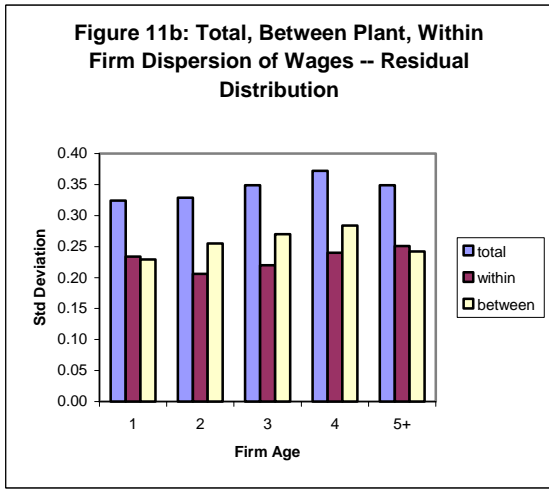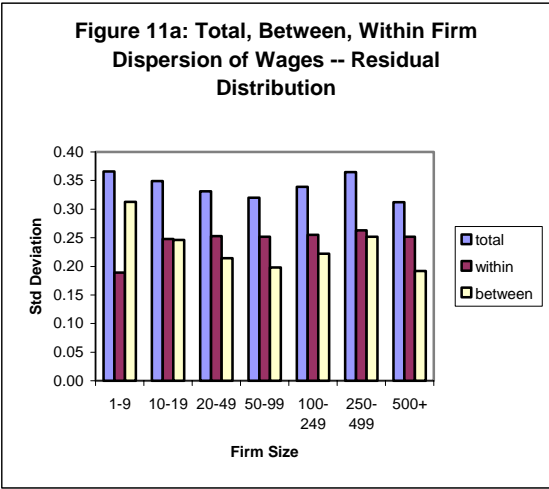
Table 1. The Relationship Between Wages and Individual Characteristics (Dependent Variable: log real hourly wage)

Explanatory Variable	Coefficient	Standard Error
Intercept	12.0984	0.0017
<Elementary	-1.1583	0.0018
Elementary	-1.0943	0.0015
Vocational	-0.9134	0.0013
High School	-0.6391	0.0014
2-year College	-0.3231	0.0017
Experience	0.0207	0.0002
Experience -squared	-0.0002	0.0000
Tenure	0.0247	0.0004
Tenure*squared	-0.0004	0.0000
R-squared	0.49	

Note: Omitted category for education is University Degree. Number of observations is 946971

Table 2a. Summary Statistics for Wage and Reallocation Regressions (Unweighted)

Variable	Mean	Std Deviation
Firm level Job Reallocation	0.42177	0.60241
Firm level Worker Reallocation	0.50115	0.61645
Firm level Excess Worker Reallocation	0.07938	0.19587
Firm level Average (Log) Wage – Actual Wages	11.49237	0.35860
Firm level (Log) Wage Dispersion – Actual Wages	0.10648	0.15175
Firm level (Log) Average Wage – Residual Wages	-0.18123	0.32234
Firm level (Log) Wage Dispersion – Residual Wages	0.09308	0.12197

Table 2b. Summary Statistics for Wage and Reallocation Regressions (Employment Weighted)

Variable	Mean	Std Deviation
Firm level Job Reallocation	0.1968	0.3500
Firm level Worker Reallocation	0.3199	0.3787
Firm level Excess Worker Reallocation	0.1230	0.1688
Firm level Average (Log) Wage – Actual Wages	11.6961	0.3556
Firm level (Log) Wage Dispersion – Actual Wages	0.2932	0.1506
Firm level (Log) Average Wage – Residual Wages	-0.03	0.2675
Firm level (Log) Wage Dispersion – Residual Wages	0.2185	0.1063

Table 3a. The Relationship Between Firm Wage Policies and Reallocation (Using Residual Wages)

Explanatory Variable	Firm Job Reallocation	Firm Worker Reallocation	Firm Excess Worker Reallocation
	Dependent Variable		
Firm Wage Dispersion	-0.61989 (0.0223)	-0.2658 (0.0230)	0.3541 (0.0074)
Average Firm Wage	0.01246 (0.0085)	0.0031 (0.0087)	-0.00933 0.0028
Industry controls?	Yes	Yes	Yes
R-squared	0.027	0.017	0.048
Number of Observations	51709	51709	51709

Table 3b. The Relationship Between Firm Wage Policies and Reallocation (Using Residual Wages and Employment Weighted)

Explanatory Variable	Firm Job Reallocation	Firm Worker Reallocation	Firm Excess Worker Reallocation
	Dependent Variable		
Firm Wage Dispersion	-0.2668 (0.0154)	-0.0859 (0.0168)	0.1809 (0.0077)
Average Firm Wage	-0.0853 (0.0061)	-0.1153 (0.0066)	-0.02998 (0.0030)
Industry controls?	Yes	Yes	Yes
R-squared	0.039	0.044	0.032
Number of Observations	51709	51709	51709

Table 4a. The Relationship Between Firm Wage Policies and Reallocation (Using Actual Wages)

Explanatory Variable	*Dependent Variable*		
	Firm Job Reallocation	*Firm Worker Reallocation*	*Firm Excess Worker Reallocation*
Firm Wage Dispersion	-0.4788 (0.0197)	-0.1594 (0.0203)	0.3194 (0.0065)
Average Firm Wage	-0.0802 (0.0086)	-0.1622 (0.0090)	-.08196 (0.0029)
Industry controls?	Yes	Yes	Yes
R-squared	0.030	0.025	0.051
Number of Observations	51709	51709	51709

Table 4b. The Relationship Between Firm Wage Policies and Reallocation (Using Actual Wages and Employment Weighted)

Explanatory Variable	**Dependent Variable**		
	Firm Job *Reallocation*	*Firm Worker Reallocation*	*Firm Excess Worker Reallocation*
Firm Wage Dispersion	-0.1943 (0.0110)	-0.0819 (0.0119)	0.1125 (0.0056)
Average Firm Wage	-0.1325 (0.0051)	-0.1748 (0.0055)	-0.0423 (0.0026)
Industry controls?	Yes	Yes	Yes
R-squared	0.055	0.062	0.031
Number of Observations	51709	51709	51709

Table 5. The Relationship Between Firm Wage Policies and Separation Rates by Wage Quartile – Using Quartiles of Residual Wage Distribution

Explanatory Variable	Dependent Variable: Firm Separation Rate by Wage Quartile Groups	
	Economy-Wide Quartiles	Firm-Based Quartiles
Firm Wage Dispersion	0.2179 (0.0149)	0.3495 (0.0168)
Firm Wage Dispersion Interacted with:		
2nd quartile dummy	-.12899 (0.0200)	-.3843 (0.0200)
3rd quartile dummy	-.3158 (0.0205)	-.4235 (0.0203)
4th quartile (highest wages) dummy	-.3119 (0.0202)	-.4529 (0.0196)
Average Firm Wage	0.01258 (0.0043)	-.03774 (0.0038)
Firm Net Growth Rate	-.4714 (0.0017)	-.4715 (0.0017)
Industry controls?	Yes	Yes
R-squared	0.365	0.349
Number of Observations	131114	149271

Table 6. The Relationship Between Firm Wage Policies and Separation Rates by Wage Quartiles –

Using Quartiles of Residual Wage Distribution – Employment Weighted

Explanatory Variable	Dependent Variable: Firm Separation Rate by Wage Quartile Groups	
	Economy-Wide *Quartiles*	*Firm-Based Quartiles*
Firm Wage Dispersion	0.1338 (0.0092)	0.1417 (0.0092)
Firm Wage Dispersion Interacted with:		
2nd quartile dummy	-.1360 (0.0102)	-.1640 (0.0095)
3rd quartile dummy	-.1897 (0.0104)	-.1878 (0.0096)
4th quartile (highest wages) dummy	-.1763 (0.0104)	-.1794 (0.0094)
Average Firm Wage	-.04038 (0.0030)	-.0605115847 0.00265817
Firm Net Growth Rate	-.4212 (0.0017	-.4222 (0.0016)
Industry controls?	Yes	Yes
R-squared	0.335	0.328
Number of Observations	131114	149271

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