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Resumen

En una economía de mercado, las empresas están continuamente expuestas a shocks que afectan a su rendimiento y resultados. En respuesta, las empresas reaccionan reasignando sus factores productivos, como el capital y la mano de obra, a usos más productivos. En este trabajo estimamos los flujos de trabajo a lo largo de un período de veinte años en Uruguay, explorando las características de las empresas y los trabajadores. Para ello, utilizamos datos de panel procedentes de registros administrativos de la seguridad social que emparejan a empleadores y empleados en empresas formales entre 1996 y 2015. Los niveles de flujo de trabajo y sus ciclos son consistentes con la evidencia internacional. La entrada y la salida de empresas del mercado desempeñan un papel importante, explicando alrededor del 30% del número total de puestos de trabajo creados y destruidos para todo el período, con una gran heterogeneidad entre sectores, la edad y el tamaño de las empresas. En particular, las empresas más pequeñas no son tan relevantes para explicar el crecimiento neto como sugieren las creencias políticas y populares, y son las empresas de nueva creación las que desempeñan el principal papel en la creación de empleo en Uruguay. A pesar de representar sólo el 5% del empleo total, éstas empresas crearon más de una cuarta parte de los nuevos puestos de trabajo y mantienen este papel en una regresión totalmente saturada. Entre características de los trabajadores, no encontramos diferencias en los flujos de trabajo por género, pero las trabajadoras ganan de participación en el período; hay mayores tasas de flujo entre los trabajadores menores de 25 años y los trabajadores en trabajadores del primer y tercer tercil salarial.

Palabras clave: flujos de empleo; empresas y trabajadores macheados; empleo formal; Uruguay

Código JEL: J23, J63, L25

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Abstract

In a market economy, firms are continuously exposed to economic shocks that affect their performance and results. In response to these shocks, firms react by reallocating their productive factors, such as capital and labor, to more productive uses. We estimate the job flows over a twenty-year period in Uruguay, exploring firm and worker characteristics. We use panel data from social security administrative records that match employers and employees in formal firms between 1996 and 2015. Job flow levels and their cycles are consistent with international evidence. Entry and exit of firms from the market play an important role, explaining about 30% of the total number of jobs created and destroyed for the whole period with high heterogeneity across industries, firm age, and firm size. In particular, the smallest firms are not as relevant in explaining net growth as political and popular beliefs would suggest, and it is start-ups that have the main role in job creation in Uruguay. Despite representing only 5% of total employment, they created more than one-quarter of new jobs and maintained this role in a fully saturated regression. Among worker characteristics, we found no differences in job flows by gender, but female workers gain participation in the period; there are bigger flow rates among workers under 25 and workers in the first and third wage terciles.

Keywords: job flows; employer employee match data; formal jobs; Uruguay

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1 Introduction

In the past decade, economic literature has documented the central role of young and start-up firms in job creation, in contrast with the traditional conception of small businesses as the main drivers of employment dynamics. The seminal paper [Birch \(1981\)](#) showed that small firms create two-thirds of net new jobs, a finding supporting the prior beliefs of policymakers who have promoted this idea with a wide variety of financial and regulatory measures. Although [Davis and Haltiwanger \(1992\)](#); [Davis et al. \(1996\)](#) criticize Birch's methodology and identify firm age as the primary predictor of net job creation, [Neumark et al. \(2011\)](#) following the same methodology still documents the great importance of small firms. But as more recently [Haltiwanger et al. \(2013\)](#); [Decker et al. \(2014\)](#) document, start-up firms are typically small; once they control for this fact, size is no longer significant in explaining job creation. Because most of this evidence comes from the US, the role of firm age and size in employment growth must continue to be analyzed to determine what types of firms create jobs and with which characteristics, especially in developing countries where firms are more vulnerable to shocks.

This paper analyzes the formal job dynamics in a developing country, exploiting the characteristics of both the firms and the workers. We use a sample from a linked employer-employee administrative record data set for Uruguay's formal labor market from 1996 to 2015. We first analyze the role of firm size and age in job creation and job destruction in Uruguay. Secondly, we explore the relationship between firm size and age and job characteristics in the persistence of creation and destruction, and along the firm's life-cycle. Finally, we examine creation and destruction by demographic characteristics such as gender and age of those who occupied these jobs.

Firms usually face uncertainty through idiosyncratic and aggregate shocks, and they have to decide how to adjust their labor utilization conditional on their sector characteristics, age, and size ([Hopenhayn, 1992](#); [Luttmer, 2007](#); [Arkolakis, 2016](#)). In developing economies, firms also deal with more and recurrent shocks, uncertainty, and constraints ([Ayyagari et al., 2013](#)). Firms also have to decide whether to produce in the informal or formal sector, or in some situations hire a share of workers with informal contracts. Meanwhile, governments decide the level of enforcement of employment laws ([Jales and Yu, 2020](#); [Kanbur and Ronconi, 2018](#); [Ulyssea, 2018](#); [Ceni, 2014](#)). Then, in economies with high informality rates, formal jobs are more vulnerable in recessions, and firms are more cautious about creating new jobs during the expansions. The pattern of firms entering and exiting in the market provides insights into the whole economy and its productivity trends ([Asturias et al., 2017](#); [Foster et al., 2008, 2001](#)). In this context, we analyze Uruguayan firms behavior in the context of a middle income country with formal employment expansion during the period (Figures 1 to 2), and with strong labor market institutions ([De Wit and De Kok, 2014](#); [Voulgaris et al., 2005](#)).

Our data consists of 115,587 formal firms that existed between 1996 and 2015 in practically all economic sectors, excluding the public and construction sectors.¹ We can follow these firms monthly, computing their size, age, and sector. We match 99% of these firms with their employees, allowing us to compute job flows by worker characteristics such as gender, age, and wage. [Alves et al. \(2016\)](#), uses a database from the same administrative records to compare the dynamic of worker-managed firms with similar conventional firms, and [Casacuberta et al. \(2004\)](#) analyze the impact of trade liberalization on job dynamics in the manufacturing sector. We analyze job flows over twenty years, during which the Uruguayan economy experienced a deep recession in 2001-2002, a moderate recession during one quarter of 2009, and many new labor market regulations after 2005, such as collective bargaining agreements, barriers to firing workers, and the expansion of the right to strike.

Our central findings are, first, that firms create 13% and destroy 10% of jobs annually, with considerable heterogeneity among firms' age and size. Size and age differentiate firms' behavior; smaller and younger firms present the highest rate of net creation but if we control jointly for both characteristics, the role of size disappears in net job growth but it remains in reallocation. Secondly, in terms of growth rates, inequality decreases in the period when we consider all firms, but if we exclude those that create and destroy all their jobs there is a rise in inequality. Finally, when we match firms and employees to compute job flow by worker characteristics, we find that during the period, female workers gain four percentage points in total participation. Job flow cycles are similar between genders, but males present low levels in all the rates. Jobs occupied by young workers feature higher levels of creation and destruction, and during the recession are the first jobs to be lost with the deepest contraction.

We contribute to the literature in three ways. First, we analyze firms' creation and destruction dynamics and the role of firm size and age within the context of a developing country. Recent incipient evidence on job flows from developing countries shows greater heterogeneity within developing economies, providing a contrast with previous evidence drawn primarily from the US and Europe and highlighting the need for more attention on different national experiences ([Brummund and Connolly, 2019](#); [Eslava et al., 2019](#); [Ayyagari et al., 2014](#)). Our second contribution is to utilize a rich database of firm administrative records, which allows us to follow firms across almost two decades to document employment dynamics in three stages of the business cycle: a deep recession, rapid growth, and moderate growth. Finally, exploiting the ability to match firms with their employees, our third contribution is to explore employment flows by some of the characteristics of those who occupied those jobs, such as gender, age, and wage features, which have not been previously analyzed in this literature.

¹We exclude the public sector given that its job flows respond to different incentives than those in the private sector, and construction is excluded because in the administrative records, workers appear by the construction site code.

2 Data and Descriptive Statistics

We construct an unbalanced panel of Uruguayan firms from the Social Security Agency's social security administrative records (in Spanish Banco de Previsión Social, BPS). The panel consists of a random sample of 20% of firms that had activity in at least one month between April 1996 and April 2015. In total, we have information for roughly 50,000 firms on average per year. These records are at the firm level; therefore, each unit can have one or more establishments with the same owner. This implies the drawback that it is not possible to capture movements of jobs between plants of the same firm or between occupations within the same plant.

We clean this database, excluding firms that did not operate in market conditions, as well as firms in sectors with particular hiring rules or massive regulatory changes during the period. We exclude firms in the public sector because the hiring process is regulated by the government and not by the market. We screen out rural and domestic service firms since there were significant regulatory changes during the period to encourage the formalization of firms and their workers. Finally, construction is not considered in this paper because firms in this sector are defined as individual construction sites.

Our final database has approximately 5.96 million observations and information for a total of 115,587 firms, roughly an average of 30,000 firms per year. The cleaned data represents 60% of the total observations available in the complete database. Table 1 reports summary statistics for our panel before and after cleaning. The distribution of firms in our panel in terms of size, employment, and age is similar to that of US firms [Criscuolo et al. \(2014\)](#). We compute that about 75% of firms have fewer than ten employees and 20% have between 20 and 50 employees; in terms of employment with about 20% of employment in firms below 50 employees and 50% in big firms with more than 250 employees. Uruguayan firms are more similar than the Americans, European firms large firms accumulate a lower employment share (from 20% to 40%), and micro firms account for 80% to 90% ([Hallak and Harasztosi \(2019\)](#)). Finally, we observe that 17% are start-up firms and 50% of firms have more than ten years in the market.

We compare these characteristics before and after cleaning; firms in our database are located in a larger proportion in the capital city than those in the whole sample. In terms of distribution by size, firms after cleaning are larger. In particular, there is a reduction of 12 points in micro-firms' (1-4 employees) participation and an increase in all other size categories. We do not observe any change in the employment participation of micro firms, but the share of small and medium-sized firms increased to large firms' detriment. This difference is mainly explained by public sector firms in which a significant proportion of employment is concentrated. Firms in both samples are similar

in terms of age and sector, but there is some difference in the number of plants, gaining participation of firms with two or more plants. We match this monthly database of firms with their employees, allowing us to construct the number of jobs by employee gender, age, and wage. We match the 99% of firms, working with 109,487 firms, which have mainly the same characteristics as our clean database. Finally, in this database we can measure only formal employment flows. So when a firm creates (destroys) a job, we cannot be sure that it is a creation (destruction), or if it reflects the (in)formalization of a previously informal (formal) worker. It cannot be determined whether that position was effectively destroyed or occupied by an informal worker. As is observed in Figures 1 and 2, informal workers were between 30% and 50% of all workers during the period, but this percentage is much higher (between 50% and 70%) among micro firms and practically irrelevant among those with ten or more employees. Informality is higher among commerce workers than in services or industry (see the right panel of the Figure 2). Second, the most accurate way to measure the process of creation and destruction is to combine information at the plant and firm level. The use of data at the firm level may reflect changes in firms' structure (e.g., mergers and acquisitions) that are not genuine job creation and, therefore, cannot be detected with the available data.

3 Methodology

In this section, we first introduce job flow measures based on [Davis et al. \(1996\)](#). We define the employment growth rate for firm i in period t as:

$$g_{it} = (E_{it} - E_{it-1}) / X_{it} \quad (1)$$

where g is the employment growth rate, $E_{it} - E_{it-1}$ is the change in the number of formal workers from period $t - 1$ and t , and X is the current average size, defined as:

$$X_{it} = 0,5(X_{it} + X_{i,t-1}) \quad (2)$$

The other two important measures at firm level that we use are derived directly from equation 1. We define job creation (c) and destruction (d) rates in period t for firm i as:

$$c_{it} = \max(g_{it}, 0) \quad (3)$$

$$d_{it} = \max(-g_{it}, 0) \quad (4)$$

Aggregating 1 by different categories (that we will refer to with the letter s) such as firm size, age or sector, we obtain the net growth rate for a given category in period t , as expressed in the following

expression:

$$net_{st} = \sum_{i \in s} (X_{it} / X_{st}) g_{it} \quad (5)$$

which is simply the employment-weighted sum of growth rates from all firms in category s . In the same manner, we calculate aggregate job creation and destruction as the weighted sum of equations 3 and 4 respectively.

$$c_{st} = \sum_{i \in s} (X_{it} / X_{st}) \max(g_{it}, 0) \quad (6)$$

$$d_{st} = \sum_{i \in s} (X_{it} / X_{st}) \max(-g_{it}, 0) \quad (7)$$

Finally, we compute flow measures with the number of jobs with the employee characteristic j : gender, age, and wage. E_{it}^j is the number of jobs in firm i , in period t , and with the characteristic j .

4 Results

In this section, we show in detail the job creation anatomy of firms in Uruguay. First, we present the general patterns of job creation, job destruction, and net growth distribution by firm characteristics. Secondly, we analyze the role of these characteristics in job flows. Then, we explore the persistence of those changes and the firms' life-cycle pattern. Finally, we analyze firms' patterns in terms of the characteristics of those who occupied these jobs.

4.1 General patterns

In Table 2, we show aggregate job creation, job destruction, net creation, and reallocation for the entire economy, in both quarterly and yearly frequencies. On average, during the two decades, firms created 13.4% of jobs annually and destroyed 10.2%. These average percentages are consistent with international evidence related to job creation and destruction if we consider a long period, and only the share of formal jobs. Figure 3 shows annual and quarterly performance during the period. Net creation has three periods: positive but declining between 1996 and 1999, negative between 1999 and 2003, and finally, consistently positive between 2004 and 2014. This cyclical behavior is due to both the cyclical behavior of job creation and countercyclical job destruction. During the whole period, job reallocation was relatively stable, between 20% and 25% annually. Note the quarterly net rates have negative figures in some quarters: before the 2002 recession, and in the fourth quarter of 2008 because of the global financial crisis, although in this case, net job destruction has no impact on the overall year.

In Tables 3 to 7, we compute the average rates of flows and shares by firm age, size, and sector. In Table 3 we observe that start-up firms create drastically more jobs than older firms; in particular, those that are ten or more years old have null net creation during the period. However, start-up firms represent only 5% of total employment and one-quarter of jobs created annually. Despite their null net creation, old firms account for more than 70% of employment and 40% of creation. If net growth decreases and the share of employment increases with age, the share of creation has a U-shape, and destruction a hump-shape. Creation and destruction have an overall cyclical trend, although start-up firms show positive growth throughout the whole period. Older firms show negative rates during the early 2000s recession and a deceleration at the end of the period (Figure 4).

Micro firms create and destroy jobs at the same rate and represent about 7% of total employment. Firms with more than 20 employees have a net creation close to 4%, representing 70% of total employment and 60% of job creation, as shown in Table 4. Net growth and share of employment increase with firm size, and both the share of creation and destruction have a hump-shape. Figure 5 shows trends for all size categories; smaller firms lose employment share during the whole period, which is gained by the bigger firms. All sizes of firm show cyclical with similar patterns as the general trends. In Table 5 we analyze creation and destruction by both size and age. We find that start-up firms have higher net growth rates, even among big firms. There is a positive correlation between size and net growth, and between age and the total employment share for all other age groups. Those firms with more than ten years in the market and more than 20 employees account for 36% of total employment and more than one-quarter of job creation and job destruction.

In Table 6 and in Figure we analyze job flows by sector. Net average rates are positive in all three main sectors, but we find a more dynamic performance in commerce and services. In the manufacturing industries, job creation participation is smaller than destruction and share of employment, which confirms the more than five percentage points of participation lost over the whole period. Services account for more than half of employment creation and destruction and gain almost eight percentage points in employment over the period. In each sector, creation and destruction decrease with firm size, but the behavior has different patterns, as is shown in Table 7. Service firms with more than 20 employees account for more than 40% of employment, one-third of job creation, and one-quarter of job destruction.

The first main result of the paper is that overall flows of formal jobs in Uruguay are similar to those presented by Haltiwanger et al. (2014); Criscuolo et al. (2014); Haltiwanger et al. (2013) for industrialized countries and for the US in particular. Small firms have no relevance in employment as in some European countries and, despite stringent regulations, firms have lively flows of jobs across the cycle. Casacuberta et al. (2004) described the dynamic in manufacturing up to 1995, showing how

this sector loses significance during a massive trade opening in the eighties and nineties. Our paper computes that in this sector there is a stagnant trend during the following twenty years in a context of economic growth, leading to decreased labor market share.

Figure 7 presents the growth rate distribution unweighted and weighted by firm size in the left and right panels, respectively. In the unweighted growth distribution, almost 30% of firms create or destroy all their jobs; this figure becomes only 5% in the weighted distribution. Table 8 shows that these changes represent 30% and 35% of the total job creation and destruction, respectively. Furthermore, firms with no changes in employment are 25% in the unweighted but rise to almost 40% in the weighted one. Therefore, as the distribution varies by size, smaller firms create and destroy all their jobs more often than bigger ones, and bigger firms remain with no changes in their jobs more often than smaller ones (Figure 8). Figure 9 shows changes in the distribution by age. The main difference is between start-ups and old firms, with more firms in the extremes for start-ups and more unchanged jobs for old firms.

In Figure 10, we construct the growth rate percentile and compute three ratios: 90-10, 90-50, and 50-10, first for all firms, and then for only the continuing firms (excluding those firms with total creation or destruction). If we consider all firms, the ratios decrease during the period; then there is a decrease in inequality over the whole distribution and the left and right tails of the distribution. But when we consider only the continuing firms, the ratios rise and are mainly in the right tail; note the trend in 90-50 is steeper than that in 50-10.

Finally, in Figure 11 we present changes in the growth distribution along the firm's life-cycle. The ninth decile of growth is about 120% in the first year, but it is below 20% at the age of 16. The median goes from about 40% to close to null growth at the age of 16. As the first decile is about -10% during the whole life-cycle, there is a clear contraction in the distribution of growth during the life-cycle.

4.2 Up or out dynamics

This section introduces a regression analysis to assess the role of size and age in firm growth performance. On average, younger firms create and destroy more jobs than the older ones, but if the analysis becomes more complex, this relationship is called into question (Brummund and Connolly, 2019; Haltiwanger et al., 2013; Neumark et al., 2011). We perform a regression analysis, considering only job flows computed in the denominator of the average because this specification is more restrictive when confirming the hypothesis about the role of size in net growth. We first regress job flow rates on nine dummies for age (seven dummies for size), 21 industry dummies, and a dummy for each calendar year in the sample, first with the whole sample and then considering only those firms which do not create or destroy all their jobs. We then introduce age (size) controls

and age-size interactions in a more saturated regression, and we compute the marginal coefficient on the average of all other variables. Then, we use this set of specifications with the firm's entrance, the firm's exit, and job reallocation.

In Figure 12, we show the results of net growth on size and age. The effect of size on net growth is constant when we do not consider age and becomes increasing when we introduce the age control. These trends are similar to those described by Haltiwanger et al. (2013) for the US, when the negative coefficient for small firms becomes almost zero when we consider only those firms that continue. In the right panel of Figure 12, there is a clear relationship between a firm's age and net growth, wherein in all the specifications, younger firms have higher growth rates. In Figure 13, we show that the entrance and exit of firms has a negative relationship with firm size, both when considering age controls and not. For the exit of firms in relation to age, there is also a negative trend. All these Figures show that the up-or-out pattern also holds for Uruguayan firms.

Finally, in Figure 14 we show the regression of job reallocation rates on size and age. We observe a similar pattern in the two cases, with decreasing trends which become less steep when we introduce controls and only include continuing firms.

4.3 Persistence and growth rates

In this section, we present measures of persistence and concentration. In particular, we analyze the persistence of newly created and newly destroyed jobs and how they are distributed among new firms (or exited firms) and continuing firms. Figures 15 and 16 depict more persistence of newly created jobs than newly destroyed ones. A year later, 80% of jobs created remained active and only 60% of those destroyed stayed in that condition. Job destruction persistence falls sharply in the second year, while the fall in creation is smooth.

Job instability depends directly on firm size. Those jobs created (and destroyed) in big firms stay in that situation longer than in the smaller ones, and there is an order by size. Our persistence rates are not monotonically decreasing in creation and destruction and, in particular, there is a U shape for job destruction among big firms.²

Both creation and destruction persistence increase with firm size. Figure 16 shows that a job created in a big firm has 15 percentage points more of chance to remain one year later than a job created in a small firm. This gap is 40 percentage points in the case of a job destroyed. As firms become bigger, job flows are smoother, and they do not respond immediately to idiosyncratic shocks.

²By definition, these rates are monotonically decreasing functions; however, when averaging persistence rates across years, this property does not necessarily hold.

We find higher persistence in creation than in destruction, which is consistent with the fact that during most of our period of analysis, the labor market was in the positive part of the cycle. Papers that explore the flows in manufacturing feature findings that are identical (Albak and Sørensen, 1998) or the opposite (Hijzen et al., 2010; Davis and Haltiwanger, 1992).

Firm size life-cycle is similar in the three samples: all sample firms, only those firms that have more than five employees, and only considering a longitudinal sample. The ratio of average employment at age 10+ compared with that at birth is 3.6 for all firms; it decreases to 2.8 among those with more than five employees and to 2 for the longitudinal sample, see Figure 17. Even when we exclude micro firms that have a shorter and more convulsive life, or we consider those firms that are more than ten years old, selection is reduced. These figures are bigger than those found by Eslava et al. (2019) in manufacturing plants in Colombia and the US, which were 2.3 and 1.7, respectively. Longitudinal growth is slower than the cross-sectional data; the average size at 10+ years is two times that observed at birth, but in Colombia, longitudinal growth is faster than in the cross-section but lower than in Uruguayan firms.

4.4 Jobs characteristics

Finally, we compute for each firm the number of jobs by gender and age group in the job, and by wage tercile. In Figures 18 to 20 we present the main annual and quarterly job flows. This analysis is one of the central contributions of the paper; as far as our knowledge it has not been presented in any paper before.

First, the panels of Figure 18 show that the job share participation of females increased four percentage points in the period, and cyclical behavior is observed in each gender as in the population as a whole. The cycles have a greater effect on those jobs occupied by males, despite female workers having higher unemployment and informality rates in the Uruguayan economy.

In the analysis of age in Figure 19, all the groups present cyclical behavior, but it is more pronounced in the case of those under 25 years of age, and practically imperceptible in those above 45. The jobs occupied by those under 25 had a net destruction of around of 20% in the 2002 recession; this pattern of net destruction started in the late nineties when there were the last years of a positive cycle. Negative net growth return during the global financial crisis between 2009 and 2012. Those jobs occupied by workers between 26 and 45 years of age are similar to those in the whole population, and those jobs whose occupants are above 45 do not show net destruction in the whole period, even in the 2002 recession.

Finally, we consider job flows by the wage paid. We compute the percentiles for the whole economy,

and compute how many jobs there are in any firm that belong to each wage tercile. In Figure 20, we present job flows by wage tercile, and firstly we observe that the cyclicalities are similar in the three groups. In the whole period in Table 10, on average there are higher rates of creation and destruction in the first tercile, but net creation is higher in the third tercile. There were more jobs destroyed in the 2002 recession in the third tercile, but then growth was constant, and in the 2009 global financial crisis and after, the first and second tercile were the ones that responded more negatively.

5 Discussion

In this paper we did not analyze the effect of particular labor market policies, but it is noteworthy that since 2005, the Uruguayan government has introduced first a collective bargaining agreement scheme to create around 90 sectoral minimum wages, then new barriers to firing workers in the private sector in 2006, and finally the expansion of the right to strike in 2009. Theoretically, these new regulations should increase firms' costs and slow down the flow of job creation. However, this is not the dynamic that we observe, and formal labor firms follow the same general patterns of creation and destruction as the labor markets in industrialized countries. Firms create new jobs constantly in the period after 2005 and observe cyclical but dynamic new firms and higher weight of firms with higher net growth rates. Moreover, the persistence of destroyed jobs is smaller than that of created jobs, then firms destroy jobs, but 40% (60%) of them are again created a (two) year after.

As was documented by Haltiwanger et al. (2013), small firms are not as relevant in explaining net growth as the figures initially appear to show, and it is young firms that have the main role of net creation. These firms have relevance also in explaining gains in productivity and economic growth Foster et al. (2001); Asturias et al. (2017). We find the up-or-out dynamic whereby young firms grow more, but those firms also exit more; start-ups have the same pattern: either create and grow dynamically or fail and exit. Life-cycle analysis shows an average firm that survives ten years in the market has at least double the number of employees than in their first four years.

Growth rate distribution has three modes (complete destruction, no changes, and all creation) in all the cases that we study, but if we exclude those firms that destroy or create all of their jobs, we find that there is an increasing inequality during the twenty year period. But in this case, it seems to be a positive result, as the slope of the 90/50 trend is steeper than the 50/10 one. Inequality occurs because there are bigger positive rates and the same negative ones.

6 Conclusion

The aim of this paper is to analyze in detail the flow of jobs in Uruguayan firms during an almost twenty year period. We use a novel database of firms and match them with their employees to analyze not only the flow of jobs by firm characteristics but also by the characteristics of those workers that occupied the jobs.

We compute an annual net average job creation in the period of about 3%, which is more concentrated in small and young firms. But size is not as relevant when we consider both effects jointly. Manufacturing firms are stagnant during the period after the big contraction during the trade liberalization of the early nineties, and the job dynamics observed in the period are pushed mainly by services firms. Growth rate patterns are quite different by firm size and age, showing a reduction in the inequality of rates by the ratios 90/10, 90/50, and 50/10; but when we exclude those firms that enter or exit in that year, the result is the opposite.

This paper contributes to understanding the job flow dynamics in a middle-income country with increasing labor regulations such as collective bargaining agreements and firing barriers. In a context of dynamic GDP, regulation enforcement, and formalization, firms present similar dynamics as those in industrialized countries. Further research should extend the analysis to a consideration of specific regulations and productivity measures.

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Tables

Table 1: Descriptive statistics

	Before cleaning	After cleaning	Matched
Observations	9,650,191	5,957,324	5,908,235
Number of firms	212,392	115,587	109,489
<i>Geographical distribution</i>			
Capital city	45.9	59.8	59.8
<i>Employment distribution</i>			
Mean	19.4	19.1	19.2
Median	4.0	5.0	5.0
Standard deviation	290.8	111.3	111.8
<i>Firm participation by size (%)</i>			
1 to 4	55.2	44.5	44.3
5 to 19	32.3	38.7	38.8
20 to 99	10.5	14.2	14.3
more than 100	2.0	2.6	2.6
<i>Employment participation by firm size (%)</i>			
1 to 4	5.8	5.2	5.1
5 to 19	15.6	19.3	19.3
20 to 99	21.0	29.3	29.3
more than 100	57.6	46.2	46.3
<i>Firm distribution by age</i>			
Mean	13.5	16.1	16.2
Standard deviation	14.1	17.5	17.5
<i>Firm participation by age (%)</i>			
Start-up (0-2 years)	17.3	16.0	15.6
Young (3-5 years)	14.7	15.1	15.2
Mature (6-10 years)	18.1	18.6	18.6
Old (+10 years)	49.9	50.3	50.6
<i>Employment participation by firm age (%)</i>			
1 to 4		6.0	5.9
5 to 19		9.3	9.3
20 to 99		13.9	13.9
more than 100		70.8	70.9
<i>Number of plants (%)</i>			
1 plant	89.0	84.2	84.1
2 plants	7.0	9.6	9.7
3 plants	1.8	2.8	2.8
4 plants or more	2.2	3.4	3.4
<i>Firm participation by sector (%)</i>			
Industry	12.8	13.5	13.6
Commerce	33.3	35.3	35.3
Services	53.9	51.2	51.1

Note: In this table size is considered in the usual way, that is, total employment instead of the current size measure z proposed in section 3. All calculations are obtained using the panel as a pool.

Table 2: Average job flow rates

	<i>Annual flows (%): 1997-2014</i>				
	<i>Mean</i>	<i>Median</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Creation	13.4	13.5	2.5	8.9	17.1
Destruction	10.2	9.2	2.2	7.6	14.9
Reallocation	23.6	23.5	1.5	19.9	25.4
Net growth	3.2	3.6	4.4	-5.4	9.5
Excess reallocation	18.9	17.9	2.3	15.1	22.9

	<i>Quarterly flows (%): 1996q3-2015q2</i>				
	<i>Mean</i>	<i>Median</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Creation	6.0	6.1	1.0	2.8	7.8
Destruction	5.2	5.0	0.9	3.4	7.2
Reallocation	11.1	11.1	1.2	8.6	13.9
Net growth	0.8	0.9	1.5	-2.9	3.6
Excess reallocation	9.7	9.5	1.6	5.7	13.0

Note: We compute all the flow rates considering the average size in the the denominator. Job creation is the rate of the total average jobs of those firms which create jobs, and jobs destruction is the total average jobs of those firms which destroy jobs. Net job creation is the simple difference between job creation and job destruction. Job reallocations is the simple sum of job creation and job destruction. Excess reallocations is the difference between the reallocation and the net growth. Source: BPS administrative records.

Table 3: Job flow rates by aggregate age, 1997-2014

<i>Age</i>	<i>Job creation</i>	<i>Job destruction</i>	<i>Net growth</i>	<i>Job reallocation</i>	<i>Share in total employment</i>	<i>Share in job creation</i>	<i>Share in job destruction</i>
Start-up	71,8	19,2	52,6	91,0	5,1	26,4	9,6
Young	22,8	17,5	5,3	40,4	9,3	15,8	15,8
Mature	15,5	14,5	1,0	30,0	14,0	16,6	20,1
Old	7,7	7,7	0,0	15,4	71,8	41,1	54,4

Note: We compute all the flow rates considering the average size in the the denominator. Job creation is the rate of the total average jobs of those firms which create jobs, and jobs destruction is the total average jobs of those firms which destroy jobs. Net job creation is the simple difference between job creation and job destruction. Job reallocations is the simple sum of job creation and job destruction. Excess reallocations is the difference between the reallocation and the net growth. The share of employment is computed with respect to the total employment in the economy, the share of job creation with respect to the total job creation, and the share of job destruction with respect to the total job destruction. We define a firm with two years or less in the market as a Start-up Firm, a Young Firm with between three and five years, a Mature Firm between six and ten years, and an Old Firm with more than ten years. Source: BPS administrative records.

Table 4: Job flow rates by aggregate size, 1997-2014

<i>Size</i>	<i>Job creation</i>	<i>Job destruction</i>	<i>Net growth</i>	<i>Job reallocation</i>	<i>Share in total employment</i>	<i>Share in job creation</i>	<i>Share in job destruction</i>
Micro	25,3	25,4	-0,1	50,7	6,7	12,5	16,6
Small	21,7	19,2	2,5	40,9	21,5	35,1	41,1
Midsize	13,3	9,4	3,9	22,6	28,9	28,7	26,6
Big	7,5	3,8	3,7	11,2	43,1	23,6	15,6

Note: We compute all the flow rates considering the average size in the denominator. Job creation is the rate of the total average jobs of those firms which create jobs, and jobs destruction is the total average jobs of those firms which destroy jobs. Net job creation is the simple difference between job creation and job destruction. Job reallocations is the simple sum of job creation and job destruction. Excess reallocations is the difference between the reallocation and the net growth. The share of employment is computed with respect to the total employment in the economy, the share of job creation with respect to the total job creation, and the share of job destruction with respect to the total job destruction. Size categories are defined as the number of employees using current size measure (Z). Micro (1-4), small (5-19), midsize (20-99) and big (100+ employees). Source: BPS administrative

Table 5: Job flow rates by sector and firm size, 1997-2014

Sector	Size	Job creation	Job destruction	Net growth	Job reallocation	Share in total employment ^d	Share in age group employment ^b	Share in job creation ^c	Share in job destruction ^d
Start-up	Micro	70,3	27,9	42,4	98,2	1,2	23,0	6,2	3,4
	Small	77,7	22,3	55,4	100,0	1,8	33,9	10,2	4,0
	Midsize	76,4	14,4	62,0	90,8	1,3	23,8	6,9	1,7
	Big	53,9	6,7	47,2	60,6	1,1	19,2	3,1	0,6
Young	Micro	19,2	29,8	-10,6	49,0	1,2	12,7	1,7	3,5
	Small	26,5	24,0	2,5	50,5	3,1	33,1	6,2	7,3
	Midsize	22,5	14,1	8,4	36,6	2,9	30,6	4,9	3,9
	Big	19,8	5,5	14,3	25,3	2,3	23,6	3,0	1,1
Mature	Micro	16,3	26,5	-10,3	42,8	1,4	9,6	1,6	3,4
	Small	19,2	20,8	-1,7	40,0	4,4	31,0	6,4	9,1
	Midsize	13,8	11,9	2,0	25,7	4,7	32,8	5,0	5,5
	Big	12,9	6,0	6,9	18,9	3,8	26,6	3,7	2,2
Old	Micro	13,5	22,0	-8,5	35,5	3,0	4,1	3,0	6,3
	Small	13,4	16,9	-3,6	30,3	12,3	17,1	12,4	20,8
	Midsize	8,0	7,8	0,2	15,8	20,2	28,0	12,0	15,5
	Big	5,2	3,4	1,9	8,6	36,5	50,7	13,8	11,8

Note: We compute all the flow rates considering the average size in the denominator. Job creation is the rate of the total average jobs of those firms which create jobs, and jobs destruction is the total average jobs of those firms which destroy jobs. Net job creation is the simple difference between job creation and job destruction. Job reallocations is the simple sum of job creation and job destruction. Excess reallocations is the difference between the reallocation and the net growth. The share of employment is computed with respect to the total employment in the economy, the share of job creation with respect to the total job creation, and the share of job destruction with respect to the total job destruction. We define a firm with two years or less in the market as a Start-up Firm, a Young Firm with between three and five years, a Mature Firm between six and ten years, and an Old Firm with more than ten years. Size categories are defined as the number of employees using current size measure (Z). Micro (1-4), small (5-19), midsize (20-99) and big (100+ employees). Source: BPS administrative

Table 6: Job flow rates by aggregate sector, 1997-2014

<i>Sector</i>	<i>Job creation</i>	<i>Job destruction</i>	<i>Net growth</i>	<i>Job reallocation</i>	<i>Share in total employment</i>	<i>Share in job creation</i>	<i>Share in job destruction</i>
Industry	10.7	9.9	0.8	20.6	22.7	17.5	21.4
Services	14.1	9.9	4.2	24.1	54.4	57.2	53.4
Commerce	14.9	11.4	3.5	26.3	23.0	25.3	25.2

Note: We compute all the flow rates considering the average size in the denominator. Job creation is the rate of the total average jobs of those firms which create jobs, and jobs destruction is the total average jobs of those firms which destroy jobs. Net job creation is the simple difference between job creation and job destruction. Job reallocations is the simple sum of job creation and job destruction. Excess reallocations is the difference between the reallocation and the net growth. The share of employment is computed with respect to the total employment in the economy, the share of job creation with respect to the total job creation, and the share of job destruction with respect to the total job destruction. Source: BPS administrative

Table 7: Job flow rates by sector and firm size, 1997-2014

Sector	Size	Job creation	Job destruction	Net growth	Job reallocation	Share in total employment ^a	Share in sector employment ^b	Share in job creation ^c	Share in job destruction ^d
<i>Industry</i>	Micro	45.4	47.4	-2.0	92.7	1.1	4.7	3.7	5.0
	Small	16.2	16.1	0.0	32.3	4.0	17.7	4.9	6.4
	Midsize	8.4	8.2	0.2	16.6	6.9	30.7	4.3	5.5
	Big	6.1	4.5	1.7	10.6	10.4	46.9	4.7	4.4
<i>Services</i>	Micro	41.5	34.6	7.0	76.1	4.4	8.1	14.0	15.5
	Small	20.6	15.4	5.2	36.1	8.7	16.0	13.8	13.6
	Midsize	13.6	9.1	4.5	22.7	13.2	24.1	13.5	11.9
	Big	7.6	4.5	3.1	12.1	28.2	51.7	16.0	12.4
<i>Commerce</i>	Micro	39.0	35.8	3.2	74.8	3.1	13.7	9.3	11.2
	Small	16.1	12.6	3.4	28.7	6.5	28.4	7.9	8.2
	Midsize	9.3	6.1	3.2	15.3	6.9	30.0	4.7	3.9
	Big	7.2	3.3	3.8	10.5	6.4	27.9	3.4	1.9

Note: We compute all the flow rates considering the average size in the denominator. Job creation is the rate of the total average jobs of those firms which create jobs, and jobs destruction is the total average jobs of those firms which destroy jobs. Net job creation is the simple difference between job creation and job destruction. Job reallocations is the simple sum of job creation and job destruction. Excess reallocations is the difference between the reallocation and the net growth. The share of employment is computed with respect to the total employment in the economy, the share of job creation with respect to the total job creation, and the share of job destruction with respect to the total job destruction. Size categories are defined as the number of employees using current size measure (Z). Micro (1-4), small (5-19), midsize (20-99) and big (100+ employees). Source: BFS administrative

Table 8: Job creation and destruction share by growth rates

<i>Growth rate</i>	<i>Share of job creation</i>	<i>Share of job destruction</i>
0 - 10%	11.6	9.5
10 - 25%	15.2	11.4
25 - 100%	27.3	24.1
100%-200%	17.0	19.5
200%	28.8	35.4

Note: Growth rates expressed in absolute value.

Table 9: Persistence rates (%)

	<i>Annual rates, 1997-2013</i>	
	<i>One year</i>	<i>Two years</i>
Job creation	78.7	62.0
Job destruction	62.7	30.6

	<i>Quarterly rates, 1996q3-2015q1</i>			
	<i>One quarter</i>	<i>Two quarters</i>	<i>Four quarters</i>	<i>Eight quarters</i>
Job creation	76.6	59.7	45.6	33.5
Job destruction	60.2	34.9	20.9	12.6

Note: In the first panel, we compute the probability that a job created (destroyed) survive in the first and the second year after the creation computed with the annual database. In the second panel, we compute the probability of a job created (destroyed) survive in the first and second quarter

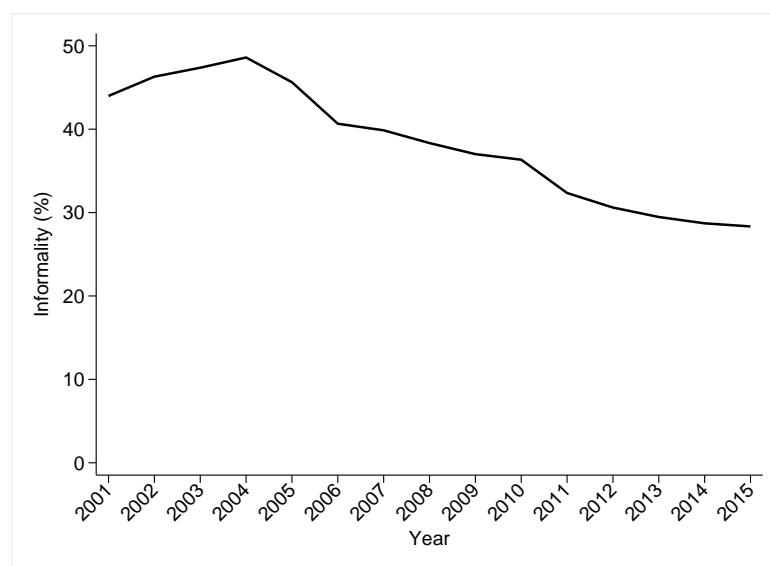
Table 10: Job flow rates by employee characteristic, 1997-2014

	Creation	Destruction	Net growth	Employment share
<i>Gender</i>				
Women	10.3	7.3	3.0	43.8
Men	8.6	7.5	1.2	56.2
<i>Age</i>				
14 to 25 years	17.7	19.8	-2.1	17.1
26 to 45 years	10.0	8.3	1.7	53.0
More than 45 years	12.6	6.7	5.8	29.9
<i>Wages</i>				
First Tercile	17.5	16.0	1.5	34.5
Second Tercile	16.6	13.5	3.1	33.3
Third Tercile	15.3	10.6	4.7	32.2

Note:

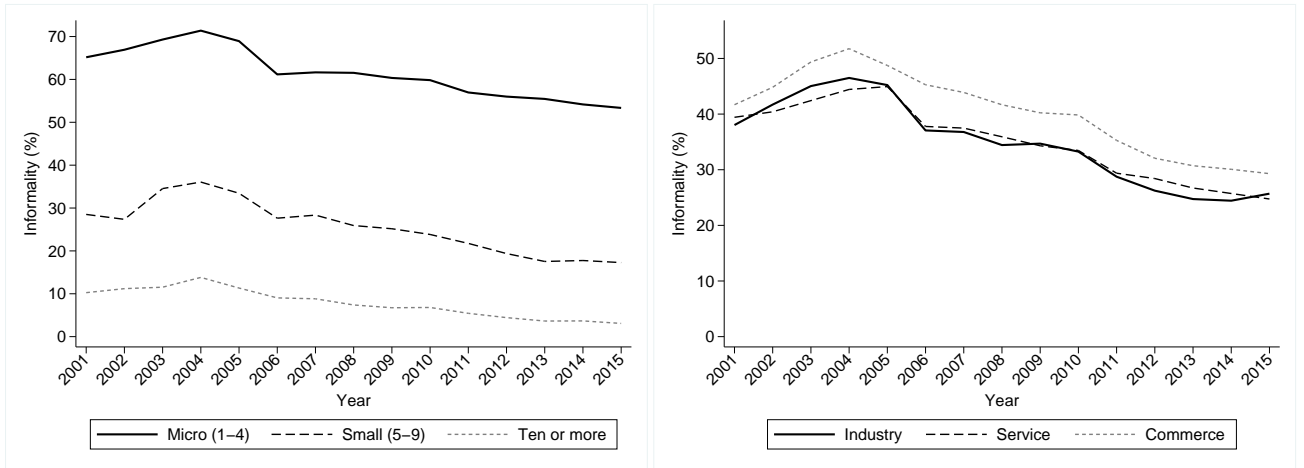
Figures

Figure 1: ANNUAL INFORMALITY RATES, 2001-2015



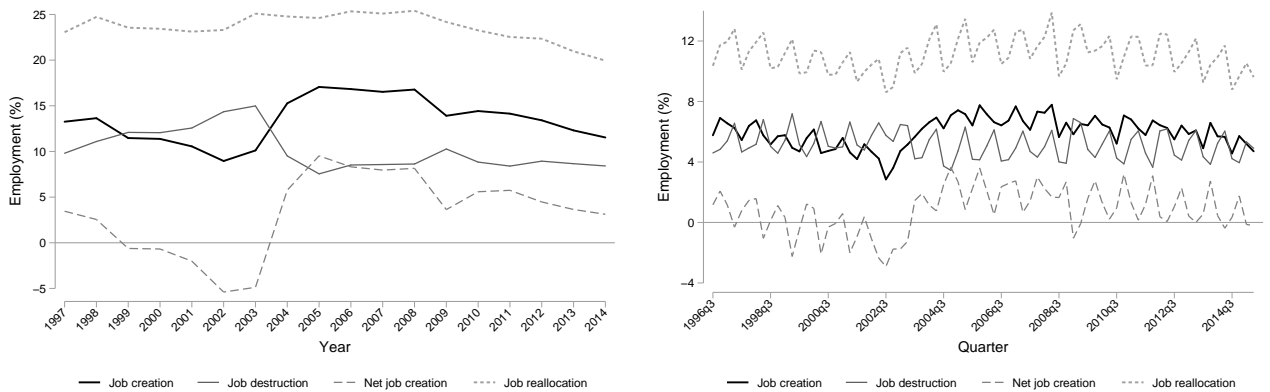
Note: We compute the share of workers who declare that they have no right to social security protection for the elderly. This information is available since 2001. Source ECH household surveys, INE.

Figure 2: ANNUAL INFORMALITY RATES BY SIZE AND INDUSTRY, 2001-2015



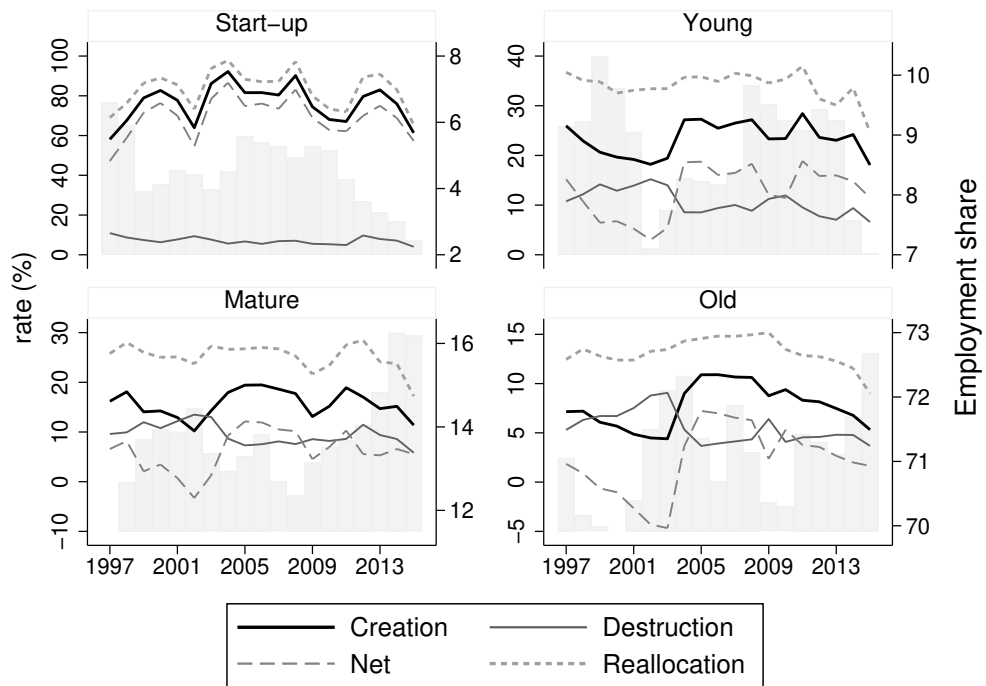
Note: We compute the share of workers who declare that they have no right to social security protection for the elderly. Firm size is available in three categories: one to four employees, five to nine employees and ten or more employees. Informality information is available since 2001. Source ECH household surveys, INE.

Figure 3: ANNUAL AND QUARTERLY JOB FLOW RATES, 1997-2014



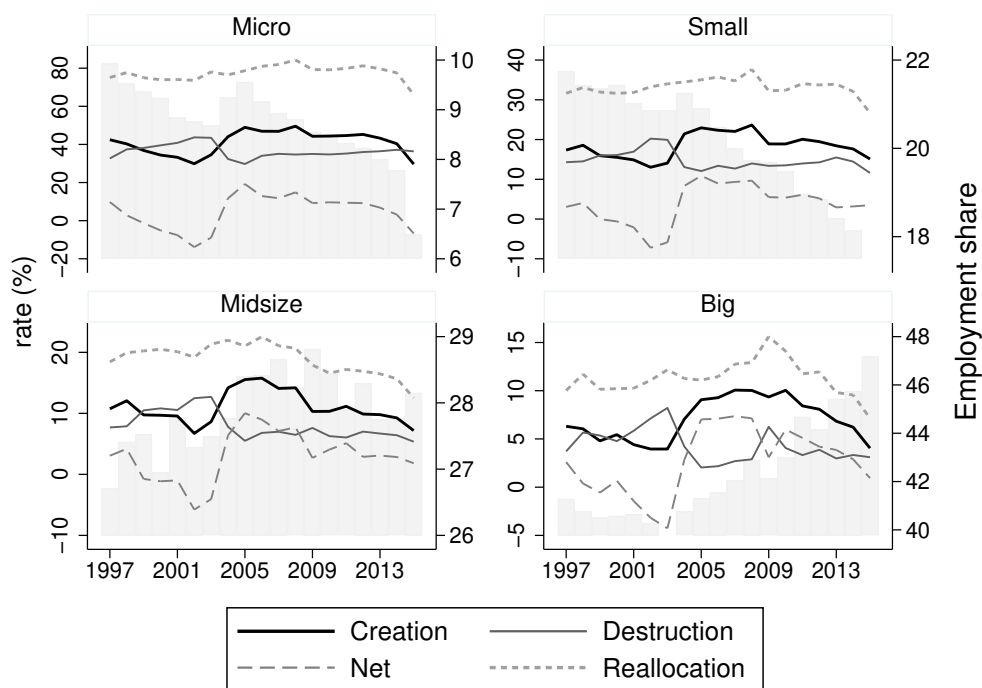
Note: We compute annual all flow rates considering the average size in the denominator. Job creation is the rate of the annual average jobs of those firms that created jobs, and job destruction is the annual average jobs of those firms which destroyed jobs. Net job creation is the simple difference between job creation and job destruction. Job reallocations is the simple sum of job creation and job destruction. We compute quarterly all flow rates considering the average size in the denominator between 1996q3 and 2015q2. Job creation is the rate of the quarterly average jobs that firms create in the year and job destruction is the quarterly average jobs that firms destroy. Net job creation is the simple difference between job creation and job destruction. Job reallocations is the simple sum of job creation and job destruction. Source: BPS administrative records.

Figure 4: JOB FLOW RATES BY THE FIRMS' AGE GROUP



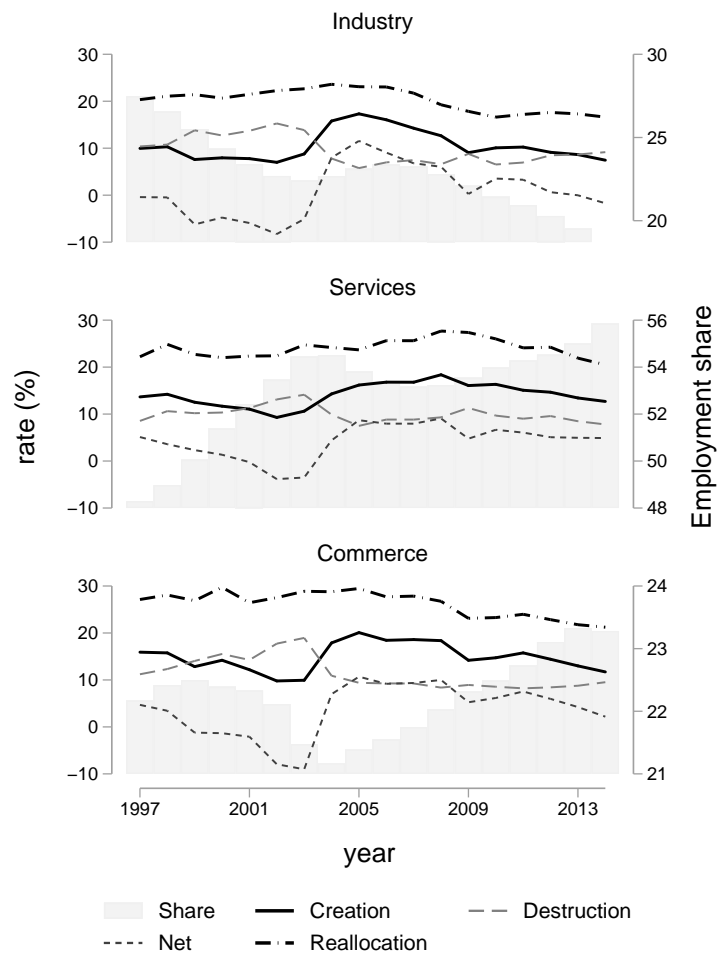
Note: We compute annual all flow rates considering the average size in the denominator. Job creation is the rate of annual average jobs of those firms which created jobs, and job destruction is the annual average jobs of those firms which destroyed jobs. Net job creation is the simple difference between job creation and job destruction. Job reallocations is the simple sum of job creation and job destruction. Employment share is defined as the rate of the annual average number of jobs in each firm's age group with respect to the annual average number of jobs. We define a firm with two years or less in the market as a Start-up Firm, a Young Firm as one with between three and five years, a Mature Firm with between six and ten years, and an Old Firm with more than ten years. Source: BPS administrative records.

Figure 5: JOB FLOW RATES BY FIRM SIZE GROUP



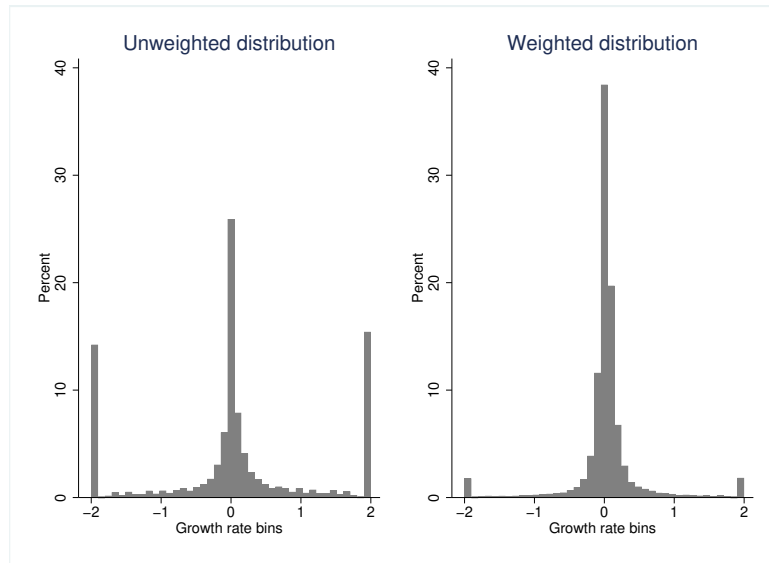
Note: We compute annual all flow rates considering the average size in the denominator. Job creation is the rate of annual average jobs of those firms which created jobs, and job destruction is the annual average jobs of those firms which destroyed jobs. Net job creation is the simple difference between job creation and job destruction. Job reallocations is the simple sum of job creation and job destruction. Employment share is defined as the rate of the annual average number of jobs in each firm's size group with respect to the annual average number of jobs. We define a Micro firm as one with less than four employees, a Small firm with between five and 19 employees, a Midsize firm with between 20 and 99 employees, and a Big Firm with more than 100 employees. Source: BPS administrative records.

Figure 6: JOB FLOW RATES BY SECTOR



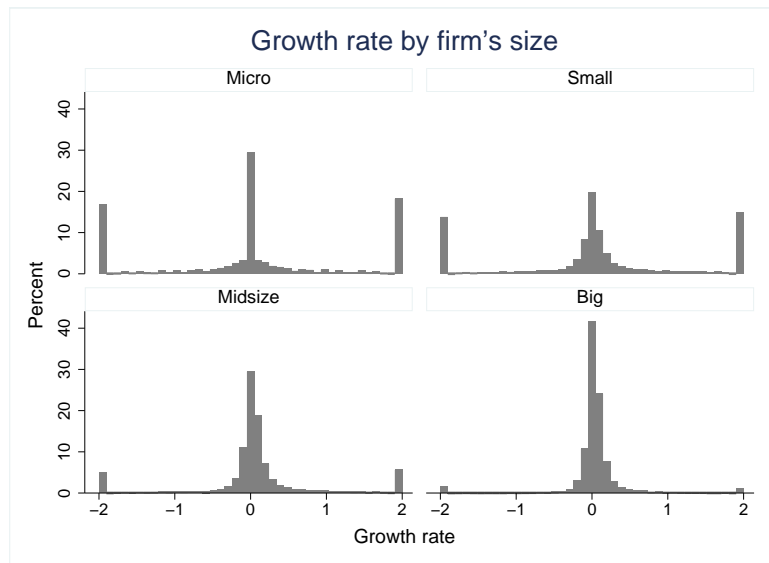
Note: We compute annual all flow rates considering the average size in the denominator. Job creation is the rate of annual average jobs of those firms which created jobs, and job destruction is the annual average jobs of those firms which destroyed jobs. Net job creation is the simple difference between job creation and job destruction. Job reallocations is the simple sum of job creation and job destruction. Employment share is defined as the rate of the annual average number of jobs in each firm's size group with respect to the annual average number of jobs. Source: BPS administrative records.

Figure 7: FIRMS GROWTH RATE DISTRIBUTIONS, 1997-2014



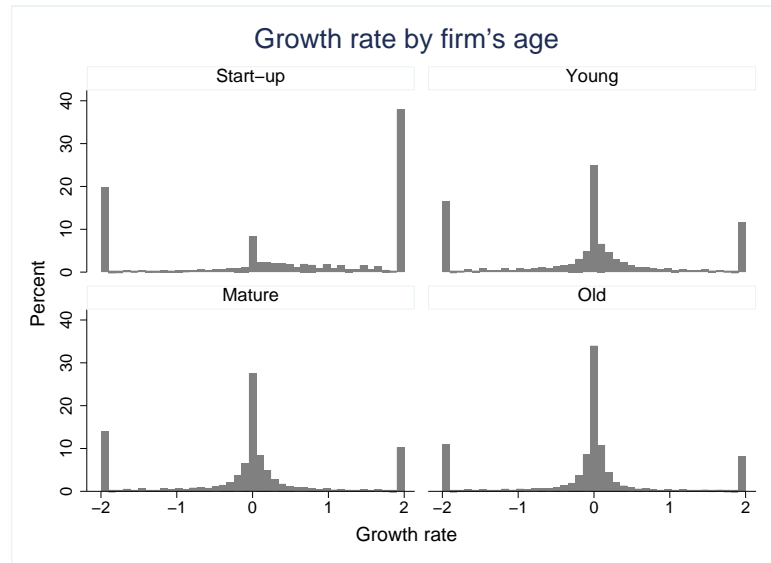
Note: We compute the growth rate as net job creation. The net job creation is the simple difference between job creation and job destruction. Job creation is the rate of annual average jobs of those firms which created jobs, and job destruction is the annual average jobs of those firms which destroyed jobs. In the left panel, we graph the growth rate bins distribution, -2 is full job destruction (exiting firms) and 2 is full job creation (entering firms). In the right panel is the weighted distribution by firm size. Source: BPS administrative records.

Figure 8: FIRMS GROWTH RATE DISTRIBUTIONS BY FIRM SIZE, 1997-2014



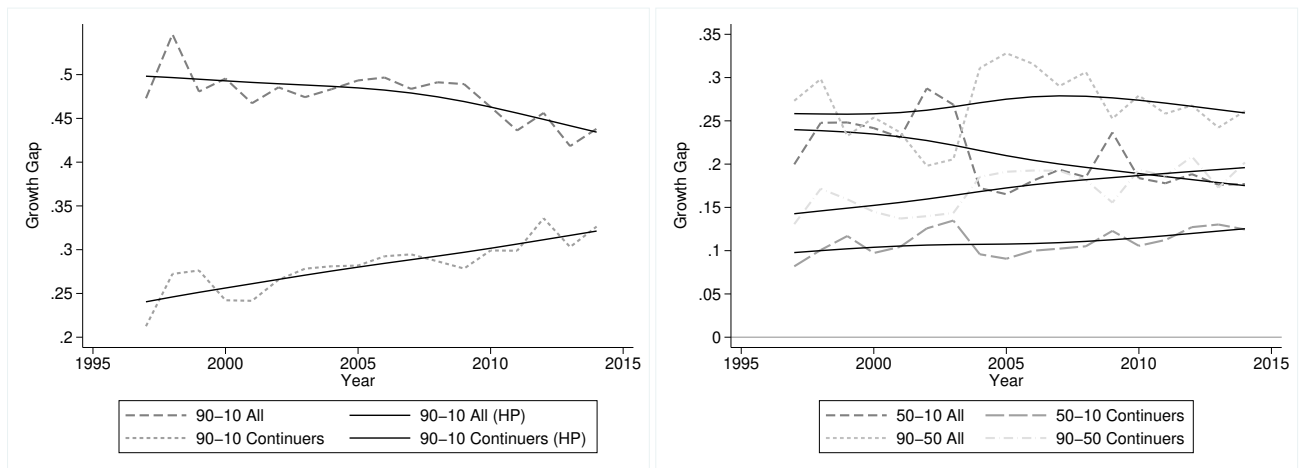
Note: We compute the growth rate as net job creation. The net job creation is the simple difference between job creation and job destruction. Job creation is the rate of annual average jobs of those firms which created jobs, and job destruction is the annual average jobs of those firms which destroyed jobs. We graph the unweighted growth rate bins distribution, -2 is full job destruction (exiting firms) and 2 is full job creation (entering firms). We define a Micro firm as one with less than four employees, a Small firm with between five and 19 employees, a Midsize firm with between 20 and 99 employees, and a Big Firm with more than 100 employees. Source: BPS administrative records.

Figure 9: FIRMS GROWTH RATE DISTRIBUTIONS BY FIRM AGE, 1997-2014



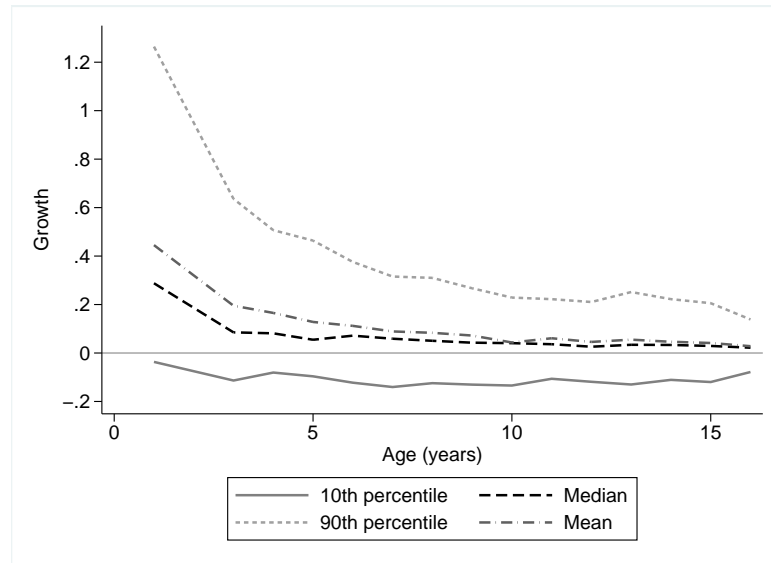
Note: We compute the growth rate as net job creation. The net job creation is the simple difference between job creation and job destruction. Job creation is the rate of annual average jobs of those firms which created jobs, and job destruction is the annual average jobs of those firms which destroyed jobs. We graph the unweighted growth rate bins distribution, -2 is full job destruction (exiting firms) and 2 is full job creation (entering firms). We define a firm with two years or less in the market as a Start-up Firm, a Young Firm as one with between three and five years, a Mature Firm with between six and ten years, and an Old Firm with more than ten years. Source: BPS administrative records.

Figure 10: GROWTH RATE GAP



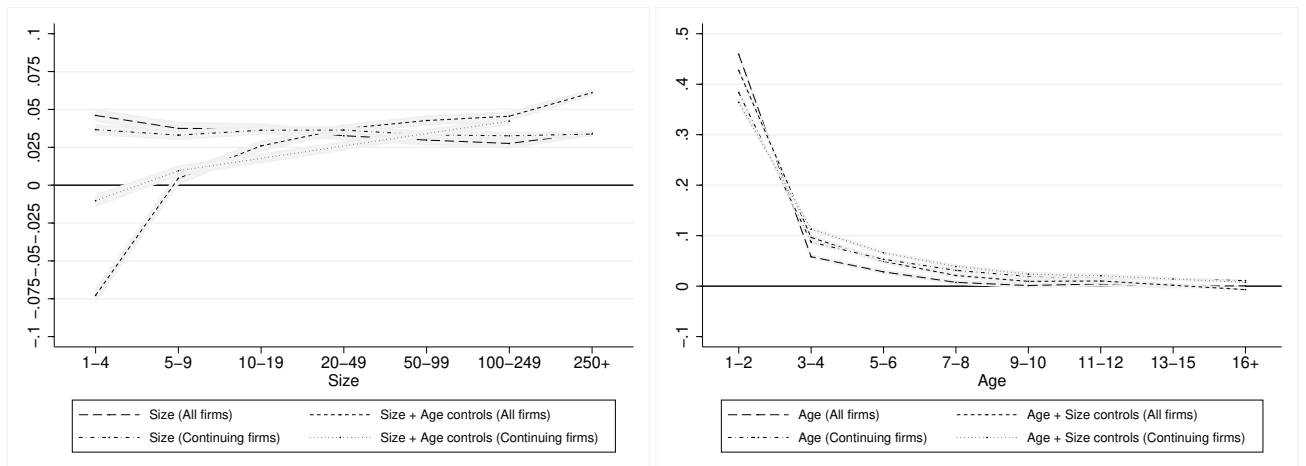
Note: We compute the growth rate as net job creation for all firms and for continuing firms. The continuing firms are define excluding those with a net creation of -1 and 2. The net job creation is the simple difference between job creation and job destruction. Job creation is the rate of annual average jobs of those firms which created jobs, and job destruction is the annual average jobs of those firms which destroyed jobs. We compute the growth rate percentile by firms' age and the gap between percentile 90 and 10 for all firms and for those that do not destroy all their jobs in that period. We compute the growth rate percentile by firms' age and the gap between percentile 90 and 50, and between percentile 50 and 10 for all firms and for those that do not destroy all their jobs in that period. We show also the Hodrick -Precott with a smooth parameter of 100. Source: BPS administrative records.

Figure 11: GROWTH DISTRIBUTION BY FIRM AGE 1997-2014



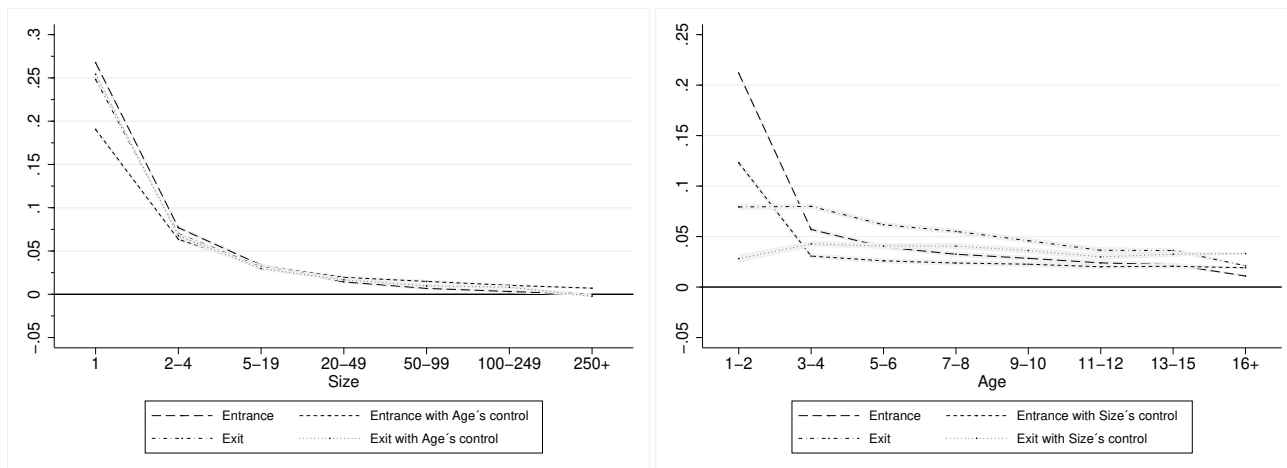
Note: We compute the growth rate as net job creation. Net job creation is the simple difference between job creation and job destruction. Job creation is the rate of annual average jobs of those firms which created jobs, and job destruction is the annual average jobs of those firms which destroyed jobs. We compute the growth rate percentile by firm age. Source: BPS administrative records.

Figure 12: EFFECT OF FIRM SIZE AND AGE ON NET GROWTH WITHOUT AND WITH CONTROLS.



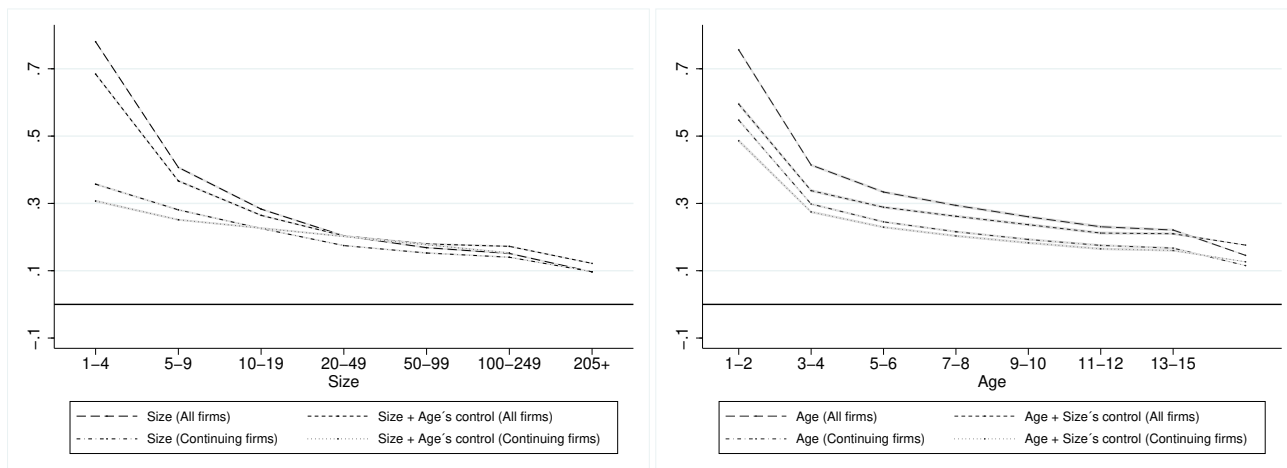
Note: In the left panel, we regress the net job growth rate on firm size with and without firm age controls. In the right panel, we regress the net job growth rate on firm age with and without firm size controls. In both, we show the marginal effect on the average of all other variables. We use seven size classes (0-5, 5-9, 10-19, 20-49, 50-99, 100, 249 and 500 and more), and nine age classes (0,1-2, 3-4,5-6,7-8,9-10,11-12,13-15 and 16 and up). We also control for specification by year, geographical area, and sector using the ISIC Revision 4 broad structure. We perform the regression first for all firms and then for only continuing firms. The gray shaded area is the 95% confidence interval. Source: BPS administrative records.

Figure 13: EFFECT OF FIRM SIZE AND AGE ON ENTRANCE AND EXIT WITHOUT AND WITH CONTROLS



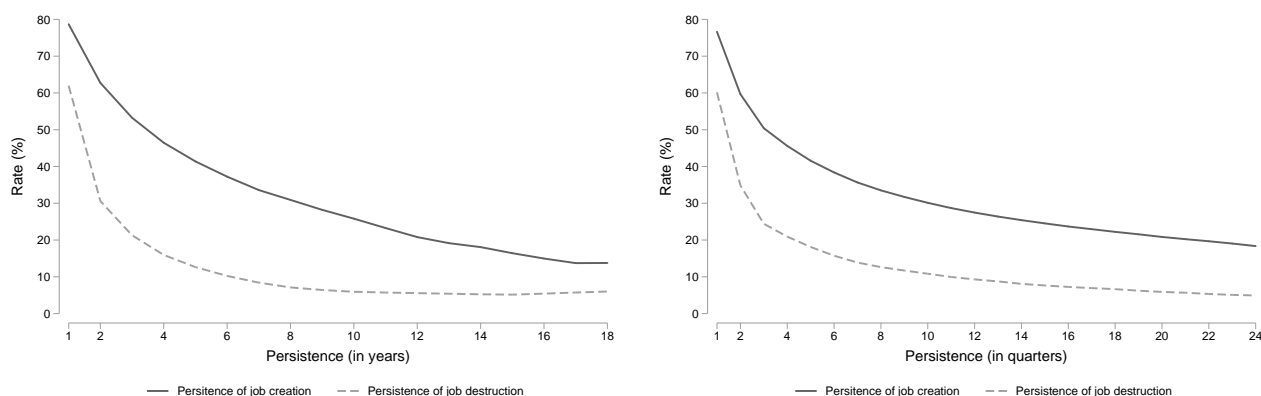
Note: In the left panel, we regress the net job growth rate on firm size with and without firm age controls. In the right panel, we regress the net job growth rate on firm age with and without firm size controls. In both, we show the marginal effect on the average of all other variables. We use seven size classes (0-5, 5-9, 10-19, 20-49, 50-99, 100, 249 and 500 and more), and nine age classes (0,1-2, 3-4,5-6,7-8,9-10,11-12,13-15 and 16 and up). We also control for specification by year, geographical area, and sector using the ISIC Revision 4 broad structure. We perform the regression first for all firms and then for only continuing firms. The gray shaded area is the 95% confidence interval. Source: BPS administrative records.

Figure 14: EFFECT OF FIRM SIZE AND AGE ON JOB REALLOCATION WITHOUT AND WITH CONTROLS



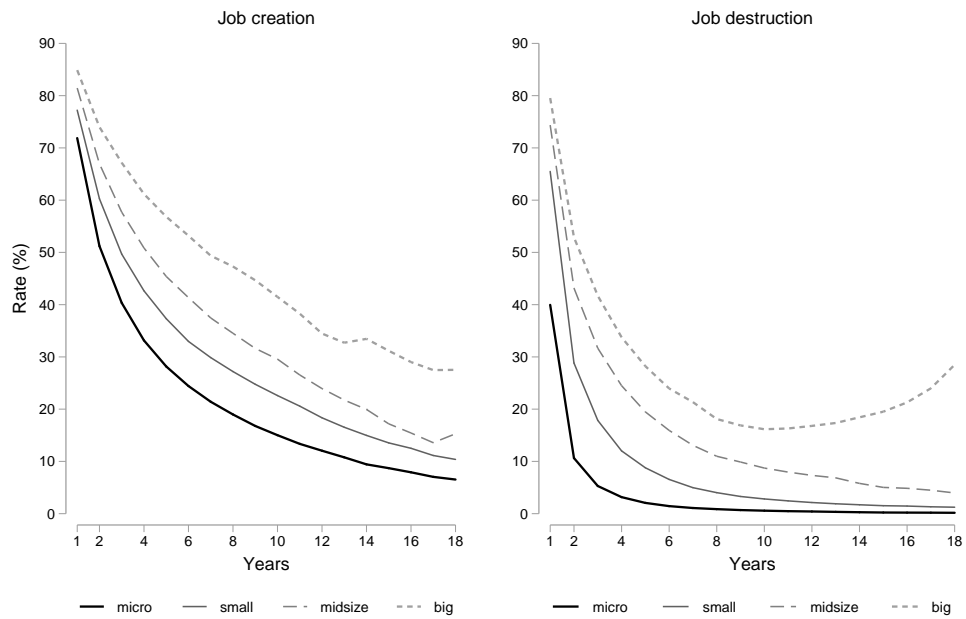
Note: In the left panel, we regress the job reallocation on firm size with and without firm age controls. In the right panel, we regress the job reallocation on firm age with and without firm size controls. In both, we show the marginal effect on the average of all other variables. We use seven size classes (0-5, 5-9, 10-19, 20-49, 50-99, 100, 249 and 500 and more), and nine age classes (0,1-2, 3-4,5-6,7-8,9-10,11-12,13-15 and 16 and up). We also control for specification by year, geographical area, and sector using the ISIC Revision 4 broad structure. We perform the regression first for all firms and then for only continuing firms. The gray shaded area is the 95% confidence interval. Source: BPS administrative records.

Figure 15: YEARLY PERSISTENCE OF JOB CREATION AND JOB DESTRUCTION



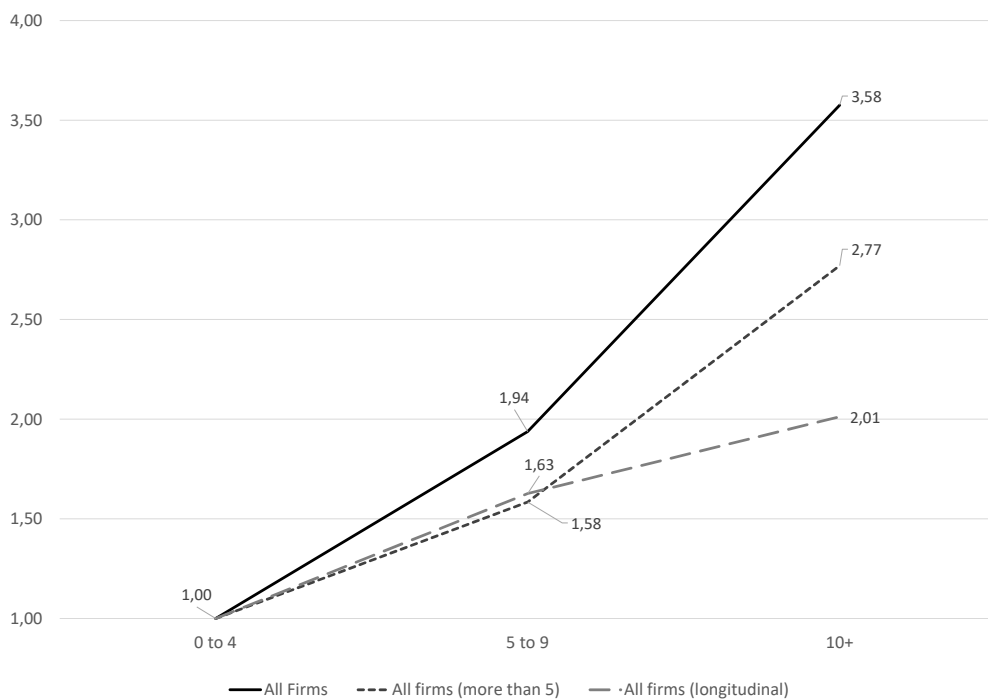
Note: By definition, these rates are monotonically decreasing functions. However, destruction persistence rates for the 16th, 17th, and 18th years violate this property. This behavior only happens when averaging persistence rates across years. In the aforementioned cases, only three, two and one calendar years respectively are being used for calculating their means (e.g. persistence of destroyed jobs after 18 years only comprises newly destroyed jobs in 1997 that remain destroyed in 2015).

Figure 16: YEARLY PERSISTENCE OF JOB CREATION AND JOB DESTRUCTION BY FIRM SIZE



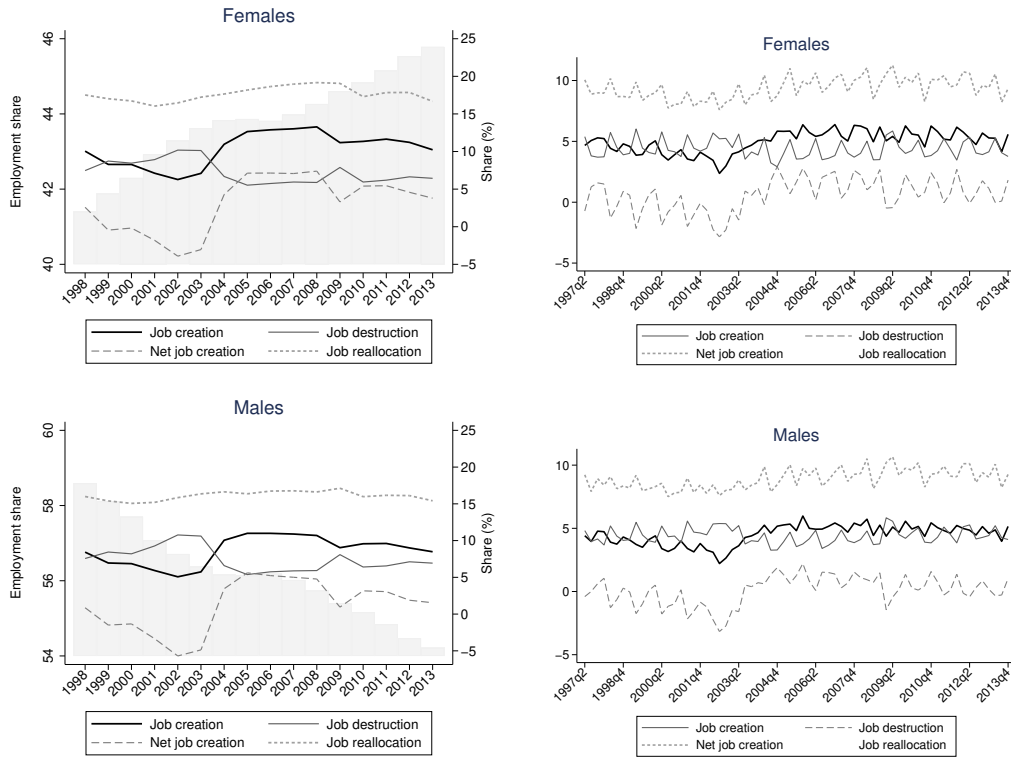
Note: By definition, these rates are monotonically decreasing functions. However, when averaging persistence rates across years this property does not necessary hold.

Figure 17: LYFE-CYCLE



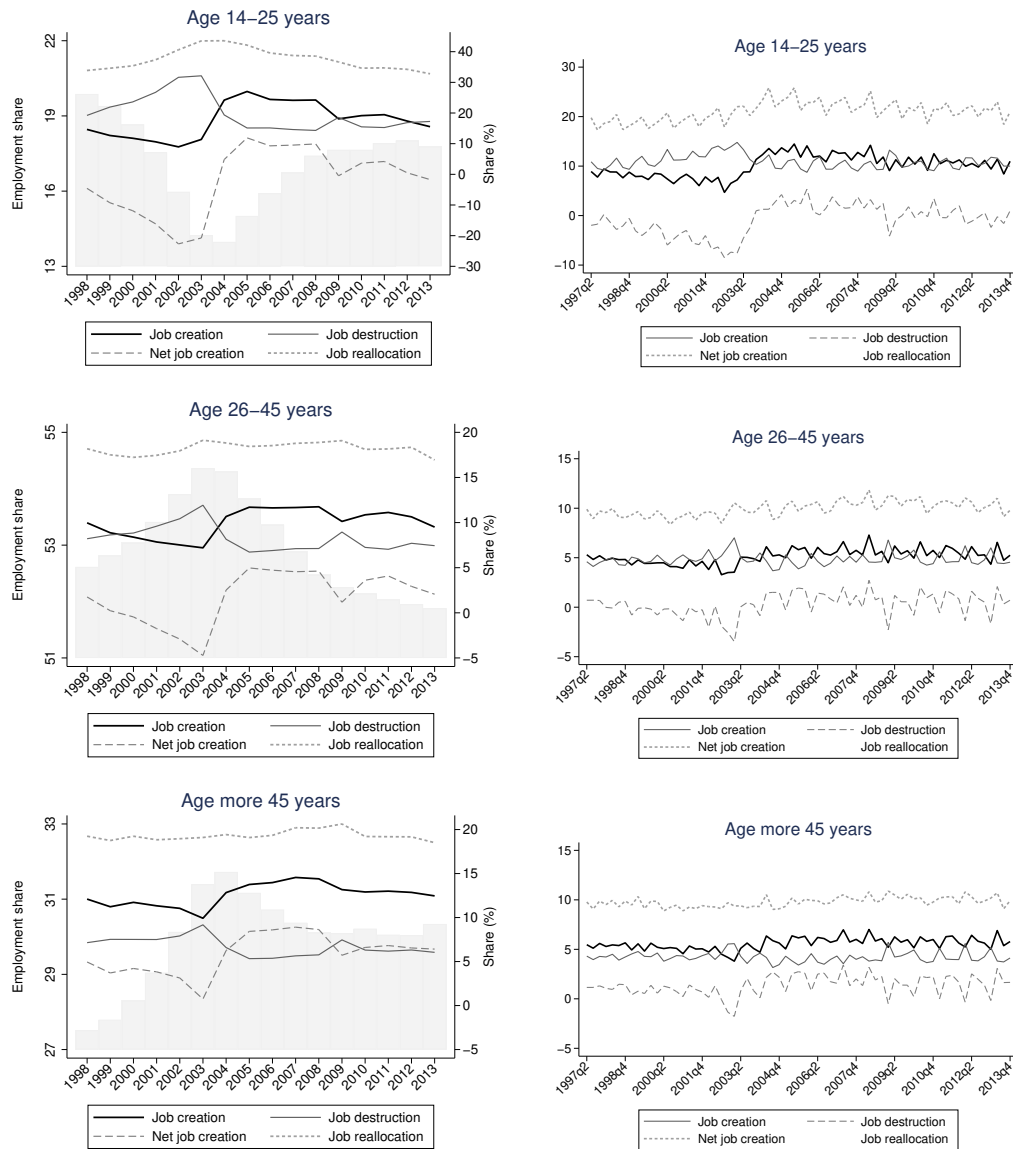
Note: The figure presents the ratio between average employment at age category and the average for those firms below five years of age. we consider three groups: All firms, those firms with more than five employees, and those firms that were born during the period and lasted at least ten years.

Figure 18: JOB FLOW RATES BY WORKER'S GENDER



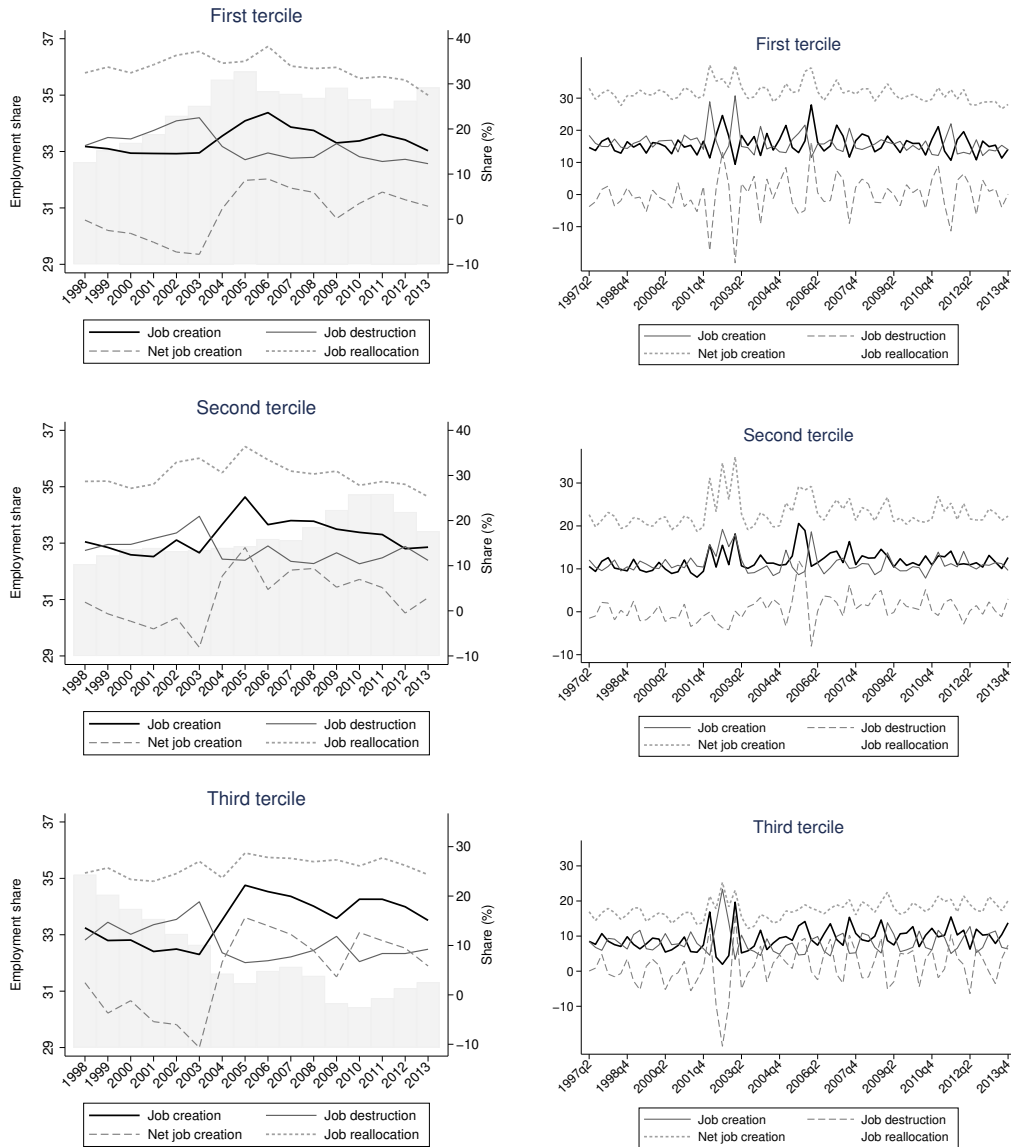
Note: We first compute the number of jobs in each firm that are occupied by each gender. We compute annual all flow rates considering the average size by gender in the denominator. Job creation is the rate of the annual average jobs of those firms which created jobs, and job destruction is the annual average jobs of those firms which destroyed jobs. Net job creation is the simple difference between job creation and job destruction. Job reallocations is the simple sum of job creation and job destruction. Source: BPS administrative records.

Figure 19: JOB FLOW RATES BY WORKER'S AGE



Note: We first compute the number of jobs in each firm that are occupied by each age group. We compute annual all flow rates considering the average size by each age group in the denominator. Job creation is the rate of the annual average jobs of those firms which created jobs, and job destruction is the annual average jobs of those firms which destroyed jobs. Net job creation is the simple difference between job creation and job destruction. Job reallocations is the simple sum of job creation and job destruction. Source: BPS administrative records.

Figure 20: JOB FLOW RATES BY WORKER'S WAGES



Note: We first compute the number of jobs in each firm that are occupied by each overall wage tertile. We compute annual all flow rates considering the average size by wage tertile in the denominator. Job creation is the rate of the annual average jobs of those firms which created jobs, and job destruction is the annual average jobs of those firms which destroyed jobs. Net job creation is the simple difference between job creation and job destruction. Job reallocations is the simple sum of job creation and job destruction. Source: BPS administrative records.