Internal and External Labor Markets
and Declining Dynamism[*]

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Abstract

Over the last four decades, employment composition has shifted towards large firms in the US. This has occurred amidst a decline in employer-to-employer transitions. A natural question is, are workers in large firms climbing job ladders internally rather than externally? Using data from various supplements of the Current Population Survey, I find evidence of the prevalence of internal job ladders within large firms. I document that job stayers in large firms, relative to small ones, realize a larger annual pay growth and a higher probability of internal job switching. Accounting for internal job ladders amplifies labor market dynamism and offsets part of the decline in external employer-to-employer switching rates. At the same time, there has been a decreasing trend in the rate of internal job switching, suggesting that the forces affecting declining external dynamism could have also had implications on internal job ladders. I hypothesize that the decline in internal dynamism could be driven by the firm's endogenous response to decreasing labor market competition.
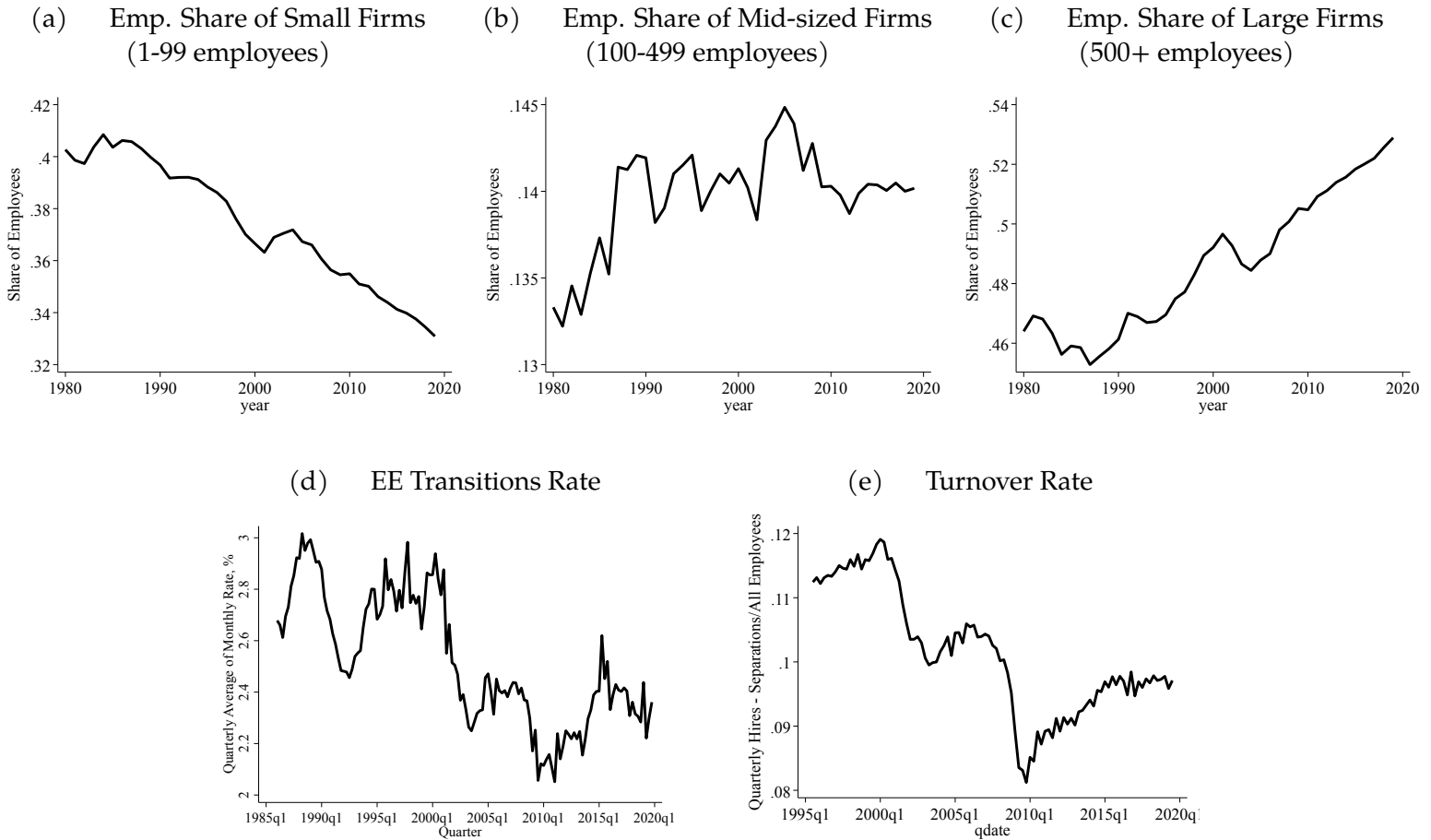
1 Introduction

The US labor markets have undergone a fundamental transformation over the last four decades. Employment composition has shifted from small to large firms (Figure 1, panels (a) - (c)). This has occurred amidst a decline in employer-to-employer transitions and measures of worker turnover - a phenomenon often termed as declining dynamism in US labor markets (Figure 1, panels (d) and (e)). A natural question arises that is pertinent to the measurement of dynamism: Are workers in large firms increasingly climbing job ladders *internally*, within firms rather than *externally*, across firms? This paper aims to understand the extent to which accounting for internal labor market transitions can offset or amplify the secular decline in external labor market dynamism.

Using microdata from the Job Tenure Supplement, Basic Monthly Survey, and Annual Social Economic Supplement of Current Population Survey for the years 1996-2020, I find evidence of the prevalence of internal job ladders within large firms. I document that job stayers in large firms, relative to small ones, report a higher probability of internal job switching over the course of a year. To understand whether these internal job-to-job moves are horizontal or vertical, I focus on annual pay changes of job stayers. I document that workers in large firms realize a larger annual pay growth and are more likely to report a pay increase relative to their small firm counterparts. These results are amplified for job stayers in large firms when the sample is conditioned on workers making internal job-to-job moves. Thus, job stayers in large firms, relative to small firms, realize a higher pay growth conditional on making internal job-to-job transitions, suggesting that these transitions could be ones on an internal job ladder. These patterns are robust to controlling for several worker- and job-level observable characteristics, occupations, and industries of workers, and different measures of pay.

Next, I attempt to understand the extent to which the internal job ladder contributes to overall labor market dynamism. Using a simple decomposition framework to disentangle changes in true dynamism emanating from job-to-job moves within firms and employer-

Figure 1: Employment share by firm size, EE transitions rate and Employee turnover rate

(a)   Emp. Share of Small Firms (1-99 employees)

(b)   Emp. Share of Mid-sized Firms (100-499 employees)

(c)   Emp. Share of Large Firms (500+ employees)

(d)   EE Transitions Rate

(e)   Turnover Rate

Notes: Business Dynamics Statistics, Current Population Survey, and Quarterly Workforce Indicators. Employment share is the annual stock of the number of employees in a particular size class expressed as a fraction of total employment. Post-1995 Employer-to-employer transitions rates are quarterly averages of monthly flows from Fujita et al. (2020) who use the Current Population Survey and correct for missing observations after a survey methodology change in 2007. Pre-1995 Employer-to-employer transitions rates are quarterly flows expressed as monthly rates (Diamond & Şahin 2015). Turn over rates is the sum of hires and separations rate.

to-employer moves across firms, I show that accounting for internal job ladders partially amplifies labor market dynamism and offsets part of the decline in external employer-to-employer switching rates. This result arises purely due to composition changes in employment towards large firms and treats internal job ladders within large and small firms as fixed. At the same time, on relaxing the latter assumption, I observe a secular decline in the rate of internal job switching rate across all firm sizes, but more so for large firms than small firms. Accounting for declining dynamism within internal job ladders,

therefore, amplifies the decline in overall labor market dynamism from the 1990s to 2010s.

The empirical findings of this paper can be interpreted through models of search in the labor market that generate employer-to-employer transitions as a result of workers searching on the job amongst firms that are heterogeneous in productivity and firms poaching employed workers from each other (Burdett & Mortensen 1998, Postel-Vinay & Robin 2002). A decrease in inter-firm competition, resulting from an increase in the market power of firms, can deteriorate workers' outside options. Evidence of this has been documented in the form of lower outside offers among workers in more concentrated labor markets (Caldwell & Danieli 2021, Schubert, Stansbury & Taska 2021) and increasing instances of anti-competitive practices, such as non-compete covenants and no-poaching agreements, being enforced by firms (Krueger & Ashenfelter 2018, Starr, Prescott & Bishara 2020). Through the lens of the model, as markets become dominated by a small set of large firms with a concentrated share of employment and vacancies, employees of these firms face a lower job-finding probability outside of their firms. At the same time, these employees could face a higher job finding probability within their firms. This could explain why internal job ladders are more prevalent within large firms than small firms. What explains the decrease in the frequency of climbing internal job ladders over time? I argue that this could be a consequence of the firm's endogenous response to decreasing competition in the labor market. As large firms internalize their employees' lack of better outside opportunities and a diminished ability to make employer-to-employer quits, they may respond by restricting their inside opportunities and reducing the frequency of promotions. This could explain the decrease in job-to-job mobility within firms, which co-exists with declining employer-to-employer mobility across firms, as well as the decrease in large firm pay premiums that have been observed in the US from the 1980s (Bloom, Guvenen, Smith, Song & von Wachter 2018).

The empirical findings of this paper relate to two broad strands of the literature that study within-firm worker mobility. The first strand investigates the source of large firm pay premiums and postulates that it could arise due to differences between small and large

firms' internal labor markets. Papageorgiou (2018) uses data from the Survey of Income and Program Participation (SIPP, 1996-2000 panel) and matched-employer-employee data from Denmark to document that occupational switching is higher among workers in large firms and that large firms have a higher number of occupations. They then develop a model to demonstrate that the higher number of occupations within large firms explains the large firm pay premium and lower separations risk observed in the data. Fox (2009) uses data from Sweden to document that firm-size pay premium increases with job responsibility. This is shown by the rise in firm-size pay gap by the age for white-collar, but the same patterns do not hold for blue-collar workers. Relative to these studies, I investigate the changes in within-firm worker mobility over time and attempt to understand its relation to the decrease in overall labor market dynamism and the decline in large firm pay premiums. I also consider annual changes in a self-reported measure of task switching that is available from the 1990s in the Job Tenure supplement of the CPS rather than on occupational codes that are generated through dependent interviewing. Finally, I identify worker mobility up the internal job ladder by associating them with increases in wage growth rather than wage levels and document new evidence on wage growth in small and large firms.

The second strand of the literature is related to understanding the role of internal labor markets in driving the life-cycle labor market outcomes of workers. Huitfeldt, Kostøl, Nimczik & Weber (2022) measure the internal career structures of firms using observed worker flows between detailed occupations within firms using data from Norway. They find that about a third of all job title changes occur within firms, and the number of internal labor markets and length of hierarchies within-firm job ladders is increasing in firm size. Bayer & Kuhn (2019) use data from Germany to find that changes in job level, or task execution within occupations, are an important driver of lifecycle wage dynamics in terms of wage growth and wage dispersion. I view this strand of the literature, using rich administrative data on internal labor markets and documenting its prevalence in large firms, as complementary to my analysis and a valuable source of deepening our understanding of the hierarchical structures and internal hiring patterns that exist within

firms in the labor market.

Doeringer & Piore (1985) were pioneers in studying internal labor markets, and early work by Baker, Gibbs & Holmstrom (1994*a*,*b*) and Lazear (1995) provided more evidence of the hierarchical structure and internal labor market within one firm. Other papers investigating within-firm labor mobility and wage growth develop frameworks to interpret the facts related to career growth within the firm: these include models of firm-specific on-the-job training opportunities (Idson 1993), learning by doing and human capital formation (Novos 1992, Pastorino 2015), and promotions (McCue 1996).

The rest of the paper is organized as follows. Section 2 provides evidence of internal labor markets within large and small firms. It begins by describing the measurement of internal mobility from the CPS and then presents the main results. Section 3 describes the evolution of job ladders within large and small firms. Section 4 discusses the decomposition framework that disentangles true dynamism into one from within firms and one from across firms. Section 5 concludes.

2 Evidence on Internal Job Ladders within Large and Small Firms

I use data from three supplements of the Current Population Survey: Job Tenure Supplement, Annual Social Economic Supplement, and Basic Monthly Survey, to find evidence of internal job ladders in large firms. I document the following stylized facts: First, job stayers report a higher probability of switching occupations over the year in large firms relative to small firms. Second, job stayers realize a higher annual wage and earnings growth in large firms relative to small firms. Third, among workers who reportedly switch occupations, those in large firms realize a higher wage and earnings growth. Collectively, I interpret these findings as evidence that workers climb within-firm job ladders at a higher frequency in large firms than in small firms.

2.1 Measuring Within-Firm Job Mobility of Job Stayers

All the above stylized facts pertain to job stayers who report an employer size and an annual measure of wage or earnings growth. To arrive at such a sample, I utilize the Current Population Survey (CPS). The CPS is a monthly household survey that follows a 4-8-4 sampling design reflecting the Interview Months (IMs) of the respondents. Households are interviewed consecutively for four months (IM 1-4), then left out of the survey for the following eight months, and interviewed again for the subsequent four months (IM 5-8). This structure is demonstrated in Figure 2, where the dashed part of the line represents the months with no information about the respondent.

In each interview in months 2-4 and 6-8, individuals are asked whether they work with the same employer as they did last month, enabling the identification of the respondent as a job stayer or job switcher. The key challenge lies in determining the respondent's job status over the course of eight months when they were not followed by the CPS. The survey does not contain additional information on the labor force status in the missing eight months, and I propose a novel measure to determine the job status of individuals between IM 4 and 8.

I utilize the Job Tenure Supplement (JTS) of the CPS that is administered biennially in January or February. The JTS contains information on the job tenure of the respondent's current employer. An individual who answers the JTS in IM 8 and reports an employer tenure of at least one year can be identified as a job stayer in IM 4. Furthermore, an individual who answers the JTS in IM 7 (IM 6) and reports an employer tenure of at least 11 months (10 months) and reports being with the same employer as last month in IM 8 (IM 7 and 8) can be identified as a job stayer between IMs 4 and 8. This is demonstrated in figure 2. Thus, utilizing the individual tenure in the JTS observed between IMs 5-8 and information from the monthly same-employer question of the CPS enables the identification of job stayers between IMs 4 and 8.

Fujita, Moscarini & Postel-Vinay (2020) have flagged the limitation of using the same-employer question in the monthly CPS in accounting for job-to-job flows, pointing to an

increasing trend in missing answers reported to this question from 2007-09.[1] They argue that correcting for this measurement error is important for computing EE rates because the monthly rates are small (around 2-3 percent of all employed make employer-to-employer transitions in a month), and small changes in EE rate caused by measurement errors could amplify their overall decline by a large percentage. The same argument applies as to why this is not a big problem when used in the context of job stayers. Job stayers constitute 97-98 percent of all employed, and overcounting them due to missing information on same-employer-status would constitute a nearly negligible change in terms of percentage terms. Second, Daly, Hobijn & Wiles (2012) compute the wage growth of job stayers and job switchers from the CPS but use a different mechanism for identifying job stayers. They define a job stayer as an individual who was employed in IMs 4 and 5-8, with the same detailed industry and occupation, reporting the same employer, the same job description, and duties. I find that over 90 percent of individuals are classified as job stayers using both definitions.

Next, for the sample of job stayers, I compute measures of annual wage and earnings growth from the outgoing rotation groups, IMs 4 and 8, of the monthly survey. Finally, I utilize the Annual Social and Economic Supplement (ASEC) to arrive at the measure of firm size for identified job stayers. The ASEC is a supplement of the CPS conducted annually in March and includes additional labor market information, including the respondent's employer size. The latter is expressed in terms of the total number of employees who worked for the respondent's employer (including employees from all locations of the employer) during the previous year. I arrive at the job stayer's firm size by utilizing this information from the ASEC answered in any month in IMs 6-8. Thus, linking the ASEC,

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[1]They show that this emanated from a change in the interview protocol of the CPS in 2008, allowing respondents to maintain the confidentiality of their answers should they not be available for any subsequent interview. As the question concerning the same employer as last month requires knowledge of the employer last month, if the respondent wishes to maintain the confidentiality of their employer information, a subsequent different respondent will not be asked this question. They show that many respondents chose to maintain confidentiality of answers after 2008, which led to an undercounting of job switching rates. Imputing data from the set of single-person households not affected by this change in survey methodology, they show that the cyclical drop in EE transitions after the Great Recession was considerably less than what was documented earlier.

Figure 2: Measuring wage growth and within-firm occupational transitions of job stayers in large and small firms in the CPS
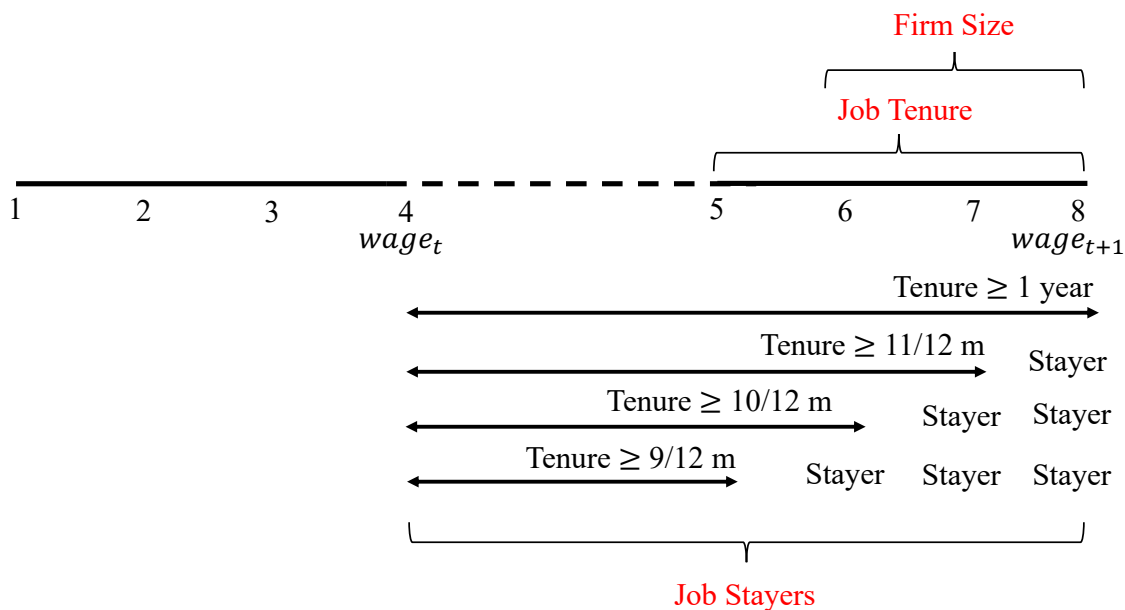
Notes: This schematic illustrates the construction of the sample from the CPS. The sample consists of an intersection of job stayers who report an annual measure of wage growth, within firm occupational transitions and firm size.

JTS, and the outgoing rotation groups of the Basic Monthly Survey make it possible to identify job stayers, their annual wage growth, and firm size. Finally, the variable to identify worker mobility within firms is also provided in the JTS, which gives information about whether the job stayer has been doing the same type of work within the firm over the last year. I use this variable as a self-reported measure of workers' internal mobility over different occupations.

2.2 Empirical Results

2.2.1 Likelihood of switching occupations within firms is higher for workers in large firms than small firms.

I first report the probability of switching occupations over the year among job stayers in large and small firms. The sample consists of full-time workers in private jobs who report

Table 1: Job stayers switch jobs more frequently in large firms

	Dependent Variable: Whether the job stayer switched occupations over the year		
	(1)	(2)	(3)
Firm Size: 100+ employees	0.0192***	0.0173***	0.0148***
	(0.001)	(0.001)	(0.001)
Constant	0.0302***	0.0368***	0.0677***
	(0.003)	(0.004)	(0.006)
Controls	Y	Y	Y
2-digit industry FE	N	Y	Y
2-digit occupation FE	N	Y	N
4-digit occupation FE	N	N	Y
N	120565	120565	120565

Notes: Controls include log tenure, hours worked, whether paid hourly, age, squared age, married, male, married-male, no. of children below 5 years, three education categories, three race categories, whether Hispanic, state, unemployment rate and a linear time trend. All continuous variables are normalized to mean zero. Robust standard errors in parenthesis. Data: CPS Job Tenure Supplement and Annual Social and Economic Supplement, 1996-2020. CPS person weights used. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

a job tenure of at least one year with their current employer in the JTS. The sample of workers also reports an employer size measure in the ASEC.

In Table (1) Column (1), I estimate a linear probability model of the event of the worker doing a different kind of work at the time of observation compared to a year ago on a constant, a dummy variable indicating their employer size, and controls variables, including worker demographics and job characteristics.[2]. The baseline group consists of white, married males who are paid non-hourly, have a bachelor's degree, and reside in Texas. Columns (2)-(3) estimate specifications further controlling for two-digit industries, two-digit occupations, and four-digit occupations, respectively. All occupation and industry codes pertain to ones at the time of observation and are time consistent. The baseline group further includes those employed in the information, financial, or professional services sector and in sales- and related occupations. All other control variables are normalized by

[2]Control variables include worker age, squared age, state of residence, number of children below five years, marital status, gender and the interaction of marital status and gender, education categories, race, and whether Hispanic. The regressions also control for log tenure, whether the worker is paid hourly, the hours worked, a linear time trend, and the unemployment rate of the state.

Table 2: Higher Earnings Growth in Large Firms

	Dep Var: Growth in Real Weekly Earnings			Dep Var: Prob of Positive Weekly Earnings Growth		
	(1)	(2)	(3)	(4)	(5)	(6)
Firm Size: 100+ employees	0.0160***	0.0158***	0.0148**	0.0318***	0.0312***	0.0303***
	(0.005)	(0.006)	(0.006)	(0.008)	(0.008)	(0.008)
Constant	0.0445***	0.0673***	0.0638***	0.5167***	0.5180***	0.5007***
	(0.014)	(0.018)	(0.022)	(0.018)	(0.023)	(0.029)
Controls	Y	Y	Y	Y	Y	Y
2-digit industry FE	N	Y	Y	N	Y	N
2-digit occupation FE	N	Y	N	N	Y	Y
4-digit occupation FE	N	N	Y	N	N	Y
N	25623	25623	25623	25623	25623	25623

Notes: Controls include log tenure, hours worked, whether paid hourly, age, squared age, married, male, married-male, no. of children below 5 years, three education categories, three race categories, whether Hispanic, state, unemployment rate and a linear time trend for the year. All job level characteristics correspond to the prior year. All continuous variables are normalized to mean zero. Robust standard errors in parenthesis. Data: CPS Outgoing Rotation Group, Job Tenure Supplement, and Annual Social and Economic Supplement, 1996-2020. CPS person weights used. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

their sample averages. The sample is weighted using CPS final weights.

The results show that job stayers in large firms are 1.5-1.9 percentage points more likely than their small firm counterparts to report doing a different kind of work (in terms of occupation) a year ago than the occupation they reported at the time of observation. These results hold for workers within broadly defined sectors and occupations (column 2), as well as narrowly defined occupations (column 3).

These results imply that workers in large firms appear to churn through more jobs than workers in small firms. In terms of occupational switching, this could be interpreted as climbing the internal job ladder if workers in large firms realize a larger average wage growth and if the occupational switches are associated with a pay increase. In the next section, I explore the pay dynamics of job stayers in large and small firms.

2.2.2 Pay growth is higher for workers in large firms relative to small firms.

I document that workers in large firms observe a higher annual pay growth and are more likely to realize a pay increase. The sample consists of full-time workers with at least one year of tenure with their current employer, who report their wages or salaries in outgoing rotation groups of the CPS and their employer size in the ASEC.

In Table (2), I regress the growth in real weekly earnings (panel A) and the probability of reporting a positive weekly earnings growth over the last year (panel B) on firm size and the same set of controls as the previous section. The industry and occupation fixed effects correspond to the ones reported for the previous year. The constant can be interpreted as the average growth in real weekly earnings, or the probability of realizing an increase in real weekly earnings, over the last year among job stayers in small firms in the baseline group, while the coefficient on firm size indicates the additional response of workers in large firms. I deflate the measure of nominal earnings with CPI-urban.

The regressions show that the residual earnings growth of workers in large firms is 1.5-1.6 percentage points higher, and the likelihood of receiving an increase in earnings is 3-3.2 percentage points higher for workers in large relative to small firms. These results hold for workers in broad sectors and occupations (columns 2 and 5), as well as narrowly defined occupations (columns 3 and 6). The Appendix shows that these results also hold for hourly wages.

2.2.3 Occupational Switchers in large firms realize a higher pay growth than occupational switchers in small firms.

I consider whether workers doing a different kind of work over the year are more likely to realize pay increases and how that differs by firm size. Table (3) estimates the average pay growth and the likelihood of earning a pay increase among the sample of workers who report doing a different kind of work from one year to the next. The sample consists of an intersection of workers in the last two sections. The constant represents the annual average growth in real weekly earnings and the average fraction of occupational switchers

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reporting an increase in real weekly earnings over the last year among job stayers in small firms who report switching occupations over the year. The coefficient on firm size represents the additional earnings growth and probability of earnings increasing among job stayers in large firms who switched occupations. All regressions control for the worker's demographic and job characteristics as before. Columns (2) and (4) additionally include 2-digit industry and occupation fixed effects.

Table (3) shows that the average growth rate of earnings among workers reporting a job change in large firms is 5.6 – 6.3 percentage points higher than their small firm counterparts. Among small firms, there appears to be no significant earnings growth among workers switching jobs. These results mirror the ones in Appendix table (A2), which reports the same regressions for hourly wages instead of monthly earnings. Next, the share of workers reporting an increase in earnings is also higher by 8.6 - 9.2 percentage points among occupational-switching job stayers in large firms relative to small ones.

These results imply that, on average, workers appear to realize a pay increase associated with making within-firm job switches. I interpret this evidence as being indicative of internal job switches documented in the JTS reflecting upward mobility in the internal job ladder rather than horizontal mobility at the same level of the ladder.

2.2.4 Average Tenure is higher for workers in large firms than small firms.

A potential implication of workers climbing job ladders within large firms would be that employee tenure would be higher in large firms. To establish this, I consider the sample of workers who report their job tenure in the JTS and firm size in the ASEC.

In Table (4), I regress the worker's tenure (in log years) in a job on their firm size and the same set of controls that are used in the previous sections. The second and third columns include controls for industry and a broad and narrow definition of occupation. The estimates show that an average employee stays about 1.1-1.2 years longer in large firms relative to small firms.

Table 3: Earnings Growth and Likelihood of Annual Earnings Increase | Switching occupations over the year

	Dep Var: Growth in Real Weekly Earnings		Dep Var: Prob of Positive Weekly Earnings Growth	
	(1)	(2)	(3)	(4)
Firm Size: 100+ employees	0.0598**	0.0631**	0.0863**	0.0924**
	(0.030)	(0.030)	(0.038)	(0.040)
Constant	0.0181	0.1091*	0.5213***	0.5057***
	(0.041)	(0.060)	(0.054)	(0.081)
Controls	Y	Y	Y	Y
2-digit Ind, Occ FE	N	Y	N	Y
N	1198	1198	1198	1198

Notes: Controls include log tenure, hours worked, whether paid hourly, age, squared age, married, male, married-male, no. of children below 5 years, three education categories, three race categories, whether Hispanic, unemployment rate and a linear time trend for the year. All job level characteristics correspond to the prior year. All continuous variables are normalized to mean zero. Robust standard errors in parenthesis. Data: CPS Outgoing Rotation Group, Job Tenure Supplement, and Annual Social and Economic Supplement, 1996-2020. CPS person weights used. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Job stayers have a higher tenure in large firms

	Dependent Variable: Tenure (in log years)		
	(1)	(2)	(3)
Firm Size: 100+ employees	0.152***	0.132***	0.123***
	(0.005)	(0.005)	(0.005)
Constant	0.532***	0.434***	0.571***
	(0.012)	(0.015)	(0.018)
Controls	Y	Y	Y
2-digit industry FE	N	Y	Y
2-digit occupation FE	N	Y	N
4-digit occupation FE	N	N	Y
N	136172	136172	136172

Notes: Controls include log tenure, hours worked, whether paid hourly, age, squared age, married, male, married-male, no. of children below 5 years, three education categories, three race categories, whether Hispanic, state, unemployment rate, and a linear time trend. All continuous variables are normalized to mean zero. Robust standard errors in parenthesis. Data: CPS Job Tenure Supplement and Annual Social and Economic Supplement, 1996-2020. CPS person weights used. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Probability of Within-Firm Job Switching has declined over time

|	Dependent Variable: Whether the job stayer switched occupations over the year			
	2000-2004		2014-18	
	(1)	(2)	(3)	(4)
Firm Size: 100+ employees	0.0205***	0.0183***	0.0148***	0.0138***
	(0.002)	(0.002)	(0.002)	(0.002)
Constant	0.0208***	0.0332***	0.0263***	0.0315***
	(0.006)	(0.008)	(0.006)	(0.008)
Controls	Y	Y	Y	Y
2-digit Ind, Occ FE	N	Y	N	Y
N	36833	36833	25386	25386

Notes: Controls include log tenure, hours worked, whether paid hourly, age, squared age, married, male, married-male, no. of children below 5 years, three education categories, three race categories, whether Hispanic, state, unemployment rate and indicator variables for the year. All continuous variables are normalized to mean zero. Robust standard errors in parenthesis. Data: CPS Job Tenure Supplement and Annual Social and Economic Supplement, 2000-2018. CPS person weights used. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

3 Evolution of Internal Job Ladders within Large and Small Firms

The results shown in the previous section demonstrate that job stayers within large firms switch their occupations more frequently, realize a higher pay growth, and observe a higher pay growth conditional on occupation switching. In this section, I explore the long-run trends in these patterns. I establish that, much like other measures of labor market dynamism and churn that have declined in recent decades, the measure of within-firm occupational switching has also mirrored these external patterns.

To document long-run trends in internal dynamism, I first divide the sample into two time periods: 2000-04 and 2014-18, and run the regressions reported in Table (1) separately for the two time periods. Table (5), columns (2), and (4) show that the likelihood of switching occupations decreased within both large and small firms. This decrease was about 0.62 percentage points for large firms and 0.17 percentage points for small firms.

Figure 3: Probability of Within-Firm Job Switching has declined over time
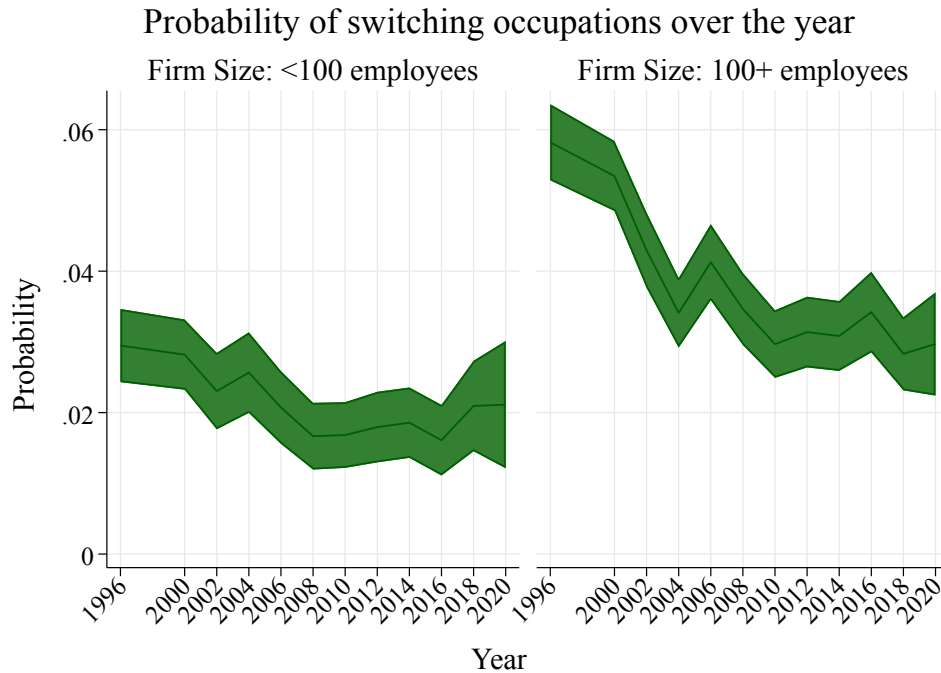
Probability of switching occupations over the year

Notes: Controls include log tenure, hours worked, whether paid hourly, age, squared age, married, male, married-male, no. of children below 5 years, three education categories, three race categories, whether Hispanic, state, unemployment rate and indicator variables for the year. All continuous variables are normalized to mean zero. Robust standard errors in parenthesis. Data: CPS Job Tenure Supplement and Annual Social and Economic Supplement, 1996-2020. CPS person weights used. 95% Confidence intervals reported.

Figure (3) shows the coefficients from the same regression corresponding to columns (2) and (4) on a year-on-year basis starting from the earliest the sample year of 1996. The decline of worker mobility within large firms appears to be even starker from 1996 to 2020. Worker mobility in small firms also declined over the sample period but by a much lower magnitude relative to the large firms.

Turning to changes in pay growth over time, Table (6) regresses the probability of reporting annual wage and earnings increases on firm size and the same set of controls that are used in Table (3). The regressions are run for the samples in 2000-04 and 2014-18. Columns (1) and (3) show that the probability of realizing a pay increase in large firms was higher than in small firms in 2000-04, but this probability became insignificant in 2014-18. In other words, the job stayers in large firms did not report a significantly higher

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Table 6: Large firm premium of probability of realizing a positive pay growth has declined over time

	Prob of Positive Earnings Growth		Prob of Positive Wage Growth	
	2000-04 (1)	2014-18 (2)	2000-04 (3)	2014-18 (4)
Firm Size: 100+ employees	0.0273*	0.0242	0.0532***	0.0277
	(0.014)	(0.017)	(0.014)	(0.017)
Constant	0.4058***	0.8686***	0.3924***	0.9473***
	(0.048)	(0.214)	(0.048)	(0.215)
Controls	Y	Y	Y	Y
2-digit Ind, Occ FE	Y	Y	Y	Y
N	7674	5349	7674	5349

Notes: Controls include log tenure, hours worked, whether paid hourly, age, squared age, married, male, married-male, no. of children below 5 years, three education categories, three race categories, whether Hispanic, unemployment rate and indicator variables for the year. All continuous variables are normalized to mean zero. Robust standard errors in parenthesis. Data: CPS Job Tenure Supplement and Annual Social and Economic Supplement, 2000-2018. CPS person weights used. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

probability of realizing pay increases than their small firm counterparts in 2014-18. In the Appendix, I also show regressions of earnings and wage growth for the two-time periods and do not find significant results in the 2000-04 period. Even though results related to pay changes in the CPS over these periods suffer from a small sample, they align with the work of Bloom et al. (2018) who have used the data from the US Social Security Administration and documented a decrease in large firm pay-level premiums relative to small firms by seven percentage points between 2000-2013.

4 Decomposing True Dynamism into Internal and External Job Moves

The previous section documented a decline in the rate of internal job switching, which was observed to a greater extent in large firms than in small ones. In this section, I propose a decomposition framework to compute the true measure of dynamism that would result from combining internal job-to-job with external employer-to-employer switches.

Let firm types be $j \in \{s, l\}$, and employment share of small firms be ω. Let p_j^k be the probability of making a k-type of job switch, where $k \in \{i, x\}$ denotes an internal (i) or external (x) job switch by an employee of a given firm type j. Let the true measure of dynamism, jj^*, be the sum of all internal (jj^i) and external (jj^x) job moves.

Then at each time period, t, the true measure of dynamism captures *all* job switches, within and across firms. This is given by:

$$jj_t^* = \omega_t(p_s^i + p_s^x) + (1 - \omega_t)(p_l^i + p_l^x)$$

$$= \underbrace{\omega_t p_s^i + (1 - \omega_t)p_l^i}_{=jj_t^i} + \underbrace{\omega_t p_s^x + (1 - \omega_t)p_l^x}_{=jj_t^x}$$

Consider first, a static decomposition which assumes the probabilities of job switching for each firm size class, and each type of job move is fixed. Then the change in the true measure of dynamism will only be driven by changes in the composition of the employed:

$$\frac{djj_t^*}{dt} = \frac{djj_t^i}{dt} + \frac{djj_t^x}{dt}$$

$$= \frac{d\omega_t}{dt}(p_s^i - p_l^i) + \frac{djj_t^x}{dt}$$

Between 2000-04 and 2014-18, the employment share of small firms declined by 3 pp. The difference in probabilities of making internal job switches within large relative to small firms ranged between 1.5-2 pp. The change in annual employer-to-employer transitions averaged 1.45 pp. Thus, accounting for within-firm job switching offsets the decline in external job switching by 0.06 pp.

Next, consider a dynamic decomposition that allows the probabilities of internal job switching for each firm size to vary over time. Then the change in the true measure of decomposition can be expressed as:

$$\frac{djj_t^*}{dt} = \frac{d\omega_t}{dt}(p_{st}^i - p_{lt}^i) + \omega_t \frac{dp_{st}^i}{dt} + (1 - \omega_t)\frac{dp_{lt}^i}{dt} + \frac{djj_t^x}{dt}$$

In 2014-18, the employment share of small firms was 0.34. Further, between 2000-04 and 2014-18, the average probability of making internal transitions in small firms declined by 0.17 pp while that in large firms decreased by 0.62 pp. Accounting for the decrease in within-firm job switching probabilities over time amplifies the decline in external job switching by 0.5 pp or 28 percent.

5 Conclusion

This paper has documented evidence of the prevalence of internal job ladders within large firms. Data from various supplements of the CPS reveals that job stayers in large firms realize larger wage growth and a higher likelihood of switching occupations over a year. They further report a larger wage growth conditional on internal job switching. This result may lead us to conclude that as employment composition shifts towards large firms, employees of those firms could climb job ladders internally rather than externally. This could explain the decline in labor market dynamism. However, I show that the probability of switching occupations within large firms has also decreased over time, amplifying the overall decline in labor market dynamism.

In ongoing work, I develop an equilibrium model of the labor market to explain the simultaneous decline in internal and external job mobility. I hypothesize that as labor markets become more concentrated and less competitive, with a few large firms dominating the market, the worker's job-finding probability outside the firm decreases, leading to a decrease in external dynamism. At the same time, as firms increasingly internalize that their employees face scarce outside options, they respond by reducing their opportunities of climbing job ladders internally, which could lead to a decrease in internal dynamism.

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A   Appendix Tables

Table A1: Higher Wage Growth in Large Firms

	Dep Var: Growth in Real Hourly Wages			Dep Var: Prob of Positive Hourly Wage Growth		
	(1)	(2)	(3)	(4)	(5)	(6)
Firm Size: 100+ employees	0.0125**	0.0138**	0.0130**	0.0378***	0.0378***	0.0351***
	(0.005)	(0.005)	(0.006)	(0.008)	(0.008)	(0.008)
Constant	0.0369***	0.0554***	0.0512**	0.5062***	0.4953***	0.4940***
	(0.013)	(0.018)	(0.021)	(0.018)	(0.023)	(0.029)
Controls	Y	Y	Y	Y	Y	Y
2-digit industry FE	N	Y	N	N	Y	N
2-digit occupation FE	N	Y	Y	N	Y	Y
4-digit occupation FE	N	N	Y	N	N	Y
N	25623	25623	25623	25623	25623	25623

Notes: Controls include log tenure, hours worked, whether paid hourly, age, squared age, married, male, married-male, no. of children below 5 years, three education categories, three race categories, whether Hispanic, state, unemployment rate and a linear time trend for the year. All job level characteristics correspond to the prior year. All continuous variables are normalized to mean zero. Robust standard errors in parenthesis. Data: CPS Outgoing Rotation Group, Job Tenure Supplement, and Annual Social and Economic Supplement, 1996-2020. CPS person weights used. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A2: Hourly Wage Growth and Likelihood of Hourly Wage Increase | Switching occupations over the year

	Dep Var: Growth in Real Hourly Wages		Dep Var: Prob of Positive Wage Growth	
	(1)	(2)	(3)	(4)
Firm Size: 100+ employees	0.0494*	0.0574*	0.0929**	0.1028**
	(0.029)	(0.029)	(0.039)	(0.041)
Constant	-0.0200	0.0315	0.4755***	0.4109***
	(0.040)	(0.062)	(0.054)	(0.080)
Controls	Y	Y	Y	Y
2-digit Ind, Occ FE	N	Y	N	Y
N	1196	1196	1196	1196

Notes: Controls include log tenure, hours worked, whether paid hourly, age, squared age, married, male, married-male, no. of children below 5 years, three education categories, three race categories, whether Hispanic, unemployment rate and a linear time trend for the year. All job level characteristics correspond to the prior year. All continuous variables are normalized to mean zero. Robust standard errors in parenthesis. Data: CPS Outgoing Rotation Group, Job Tenure Supplement, and Annual Social and Economic Supplement, 1996-2020. CPS person weights used. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A3: Changes in large firm pay growth premium

	Dep Var: Growth in Real Weekly Earnings		Dep Var: Growth in Real Hourly Wages Growth	
	2000-04	2014-18	2000-04	2014-18
	(1)	(2)	(3)	(4)
Firm Size: 100+ employees	0.0103	0.0121	0.0179*	0.0056
	(0.010)	(0.013)	(0.010)	(0.013)
Constant	0.0228	0.3444**	0.0009	0.3862**
	(0.036)	(0.167)	(0.035)	(0.162)
N	7674	5349	7674	5349

Notes: Controls include log tenure, hours worked, whether paid hourly, age, squared age, married, male, married-male, no. of children below 5 years, three education categories, three race categories, whether Hispanic, unemployment rate and indicator variables for the year. All continuous variables are normalized to mean zero. Robust standard errors in parenthesis. Data: CPS Job Tenure Supplement and Annual Social and Economic Supplement, 2000-2018. CPS person weights used. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$