Subcontracting and Employment Instability

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Abstract

Work in the twenty-first century has become short-term, precarious, and unstable. To explain this phenomenon, this article considers the firm-to-firm contracts that have come to make up modern economies – a transformation known to affect pay, but with unknown implications for the stability of work. Combining recent insights about the reasons for subcontracting with older organizational theories of dependence and diversification, I argue that the subcontractor's position carries with it both increased exposure to risk and the inability to absorb that risk. These compound to destabilize work for its employees. I draw on unique French data that identifies subcontractor establishments to show that their employment is substantially more unstable than it is elsewhere. Occupational homogeneity, high labor shares, and unprofitability can account for about 40% of subcontractors' excess employment instability. Finally, I trace out a mechanism behind these findings: following a drop in firm revenue, the employees of subcontractor workplaces are more likely to exit than are those of non-subcontractor workplaces. These findings demand a richer view of employment instability, entailing not only the demise of conventional employment – the focus of much recent research – but also the constraints that lead establishments to amplify and concentrate instability.

1   Introduction

Across industrialized countries, work has become unsteady and short-term (Bidwell 2013; Kalleberg 2018). Explanations focus on the rise of non-standard employment, fixed-length jobs, and other practices that have replaced traditional employment relations (Kalleberg 2009; Osterman 2023). Yet it is unclear which types of employers turn to unstable work, and why. To answer this question, I turn to the dramatic "fissuring" of the economy into webs of contracting organizations, in which products and services are increasingly sold from firm to firm rather than made in-house (Weil

2017). Subcontracting – where one organization contracts with another to buy goods or services instead of producing them itself – is a key piece of this transformation (Bernhardt et al. 2016). Are firms that provide subcontracted goods and services more unstable workplaces?

Despite its rapid spread, we know little about the relation between subcontracting and unstable employment (Davis-Blake and Broschak 2009). I theorize the steps by which firms that sell subcontracted goods and services become hot-spots of turnover and instability. Due to the type of functions that are outsourced (Williamson 1981; Kalleberg and Marsden 2005), if subcontracting makes up a greater share of an organization's sales then it will typically be exposed to greater revenue volatility. It will also tend to be more labor intensive, unprofitable, and occupationally specialized (Handwerker 2023; Appelbaum 2017). I argue that these attributes limit the subcontractor's margins for adjustment in the face of revenue fluctuations. Thus firms that primarily perform subcontracted work are more likely to face revenue swings *and* more likely to transmit those swings to payroll. As a result, employment lasts for less time.

To explore these predictions, I examine subcontracting in France – a country with relatively high labor-market protections, where effects on employment instability ought to be more muted than in other countries. I combine three sources of French economic data: establishment-level surveys from 2004, 2010, and 2016 identify subcontracted employers; longitudinal employer-employee administrative data keep track of earnings, occupations, and demographics; and firm-level financial data records firms' sales. This combination of data lets me follow subcontractors' employees over time, overcoming the limitations that have confined past research to buyer firms – not subcontractors – and to point-in-time pay penalties alone (Davis-Blake and Broschak 2009). I use this data to compare exit rates among the employees of subcontractor and non-subcontractor firms. I then incorporate measures of occupational specialization, labor costs, and profitability. Finally, I compare the effect of revenue swings on subcontractors and non-subcontractors.

I find that establishments for which subcontracts comprise over half of sales exhibit greater fluctuations in employment. Employees are more likely to exit even net of occupation and personal characteristics. Exiting employees also experience a loss of income and turn to unemployment insurance, suggesting that such turnover is not entirely voluntary. Second, I find that subcontractors have higher labor shares, more occupational homogeneity, and lower profit margins. Incorporating these measures shrinks the gap in turnover between subcontractor and non-subcontractor firms by about two fifths. Finally, I explore the transmission of revenue swings to payroll. Employees are more likely to exit subcontractors than non-subcontractors in the years after a drop in revenue. These findings reflect the predictions developed in this paper.

This paper establishes that subcontracting is a motor of employment instability

and reveals how this instability arises. In doing so, it traces the roots of unstable or short-term work past the well-documented employment practices that enable it (as in Cappelli and Neumark 2004; Kalleberg 2009; Osterman 2024) to the position of the establishment itself. This approach echoes recent work showing that pay inequality arises not just from a given firm's wage-setting practices, but from the market and network positions that constrain the firm (Benton and Kim 2022; Wilmers 2018; Tomaskovic-Devey et al. 2020). The rise of the networked economy yields not only pay penalties but also instability, erasing the buffer between workers and product markets.

2   Employment instability and fissuring

The twenty-first century has seen the rise of short-term, unstable work throughout the post-industrial West (Bidwell 2013; Lübke and Erlinghagen 2014). This has fueled a widespread sense of insecurity and precarity (Kalleberg 2018). The effects of employment instability run the gamut, ranging from mental health to family formation rates and making it a threat to the social fabric (Vergauwen et al. 2017; László et al. 2010).

To understand dropping tenure and rising precarity, research has focused on the changing relations between employees and employers. Employers have switched to non-standard and fixed-term employment contracts; done away with traditional promotion systems; and made workers face labor-market competition to keep or advance their careers (Vallas and Prener 2012; Kalleberg 2009; Cappelli and Neumark 2004; Osterman 2023; Cappelli 1999). The rise of alternative and informal work arrangements has rightly received a great deal of attention, and platforms like Uber famously take this dynamic to the extreme (Gaboriau 2019; Katz and Krueger 2019; Vallas and Schor 2020). Many employers have, simply, opted into low-road practices (Kalleberg and Vallas 2017).

Missing from these accounts of instability are the constraints upon the organizations where it is produced – beyond the employment practices that transmit it. At the same time that work has become less stable, pay has come to depend more on where one works and the position of this workplace vis-à-vis other organizations (Tomaskovic-Devey et al. 2020; Benton and Kim 2022). Outsourcing, franchising, contracting, and other forms of "fissuring" have torn apart organizations into webs of firms (Weil 2018). The employees of subordinate firms are cut off from the economic rents formerly available, leading to lower wages (Drenik et al. 2023; Wilmers 2018; Dube and Kaplan 2010; Zwysen 2023) but with unknown effects on instability and precarity (Davis-Blake and Broschak 2009). Has this transformation fed the rise of unstable work?

This paper focuses on one hallmark of this transformation: subcontracting. Subcontracting is a practice where a buyer firm establishes a contract with another – which I call the subcontractor – in order to purchase inputs or services that might otherwise be produced in-house (Perraudin et al. 2014). Contracts can be durable and span years, or much shorter-term; the purchased goods or services may be specialties that the buying firm cannot produce on its own, or they may be intended to supplement or replace the buying firm's capacity.[1] Domestic contracting networks are widespread and play an ever-growing role in Western economies (Davis, Diekmann, and Tinsley 1994; OECD 2021; Davis-Blake and Broschak 2009), meaning that their effect on employment stability would be widely felt.

What type of work do subcontractors perform? A large literature has documented that managers hire subcontractors in order to avoid long-term commitments – especially towards labor – and remain flexible (Cappelli and Keller 2013; Peck and Theodore 2006; Abraham and Taylor 1996). Additionally, outsourced tasks are typically simpler and more readily separated from other functions in the organization (Hasan, Ferguson, and Koning 2015; Berlingieri, Pisch, and Steinwender 2021; Kalleberg and Marsden 2005). In the language of transaction costs, assets general enough to be easily obtained through market exchanges, or those for which future demand is highly uncertain, are more likely to be contracted out (Williamson 1981).

This has several implications for the structure of subcontractor organizations. Most importantly, subcontractors are likely exposed to volatile demand for their products or services, and face pressure to sell for as cheaply as possible (Wilmers 2018; Appelbaum 2017). Profit margins are thin and uncertain. They are also likely to be more specialized and occupationally homogeneous, doubling down on a small range of functions to achieve economies of scale (Wright and Kaine 2015; Handwerker 2023). Finally, subcontractors tend to be labor intensive, since they are often used to offload long-term commitments to labor and to shirk employment regulations (Bilal and Lhuillier 2025; Giannoni and Mertens 2019; Ha 2022).

3   The effect of subcontracting

How do subcontractors become hot-spots of instability? A common function of subcontracting – to offload long-term commitments for inputs that are not regularly needed – means that many subcontractors risk facing volatile demand from clients. This is further amplified by specialization. By focusing on a small range of tasks, subcontractors do not diversify in a way that would even out their exposure to product-market fluctuations (Pfeffer and Salancik 1978; Davis and Cobb 2010). They match

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1. Note that this is a more general definition than is sometimes used, for instance when construction contractors subcontract out particular trades (Bernhardt et al. 2016).

the descriptions of establishments in the "secondary" labor market: simple in form, occupationally narrow, and lacking control over their product markets, such establishments are buffeted by environmental volatility (Baron and Bielby 1984; Reich, Gordon, and Edwards 1973). Inasmuch as subcontractors respond to drops in sales by cutting labor, this demand volatility will yield greater employment instability.

Indeed, labor intensity, thin margins, and occupational specialization limit subcontractors' room for adjustment when faced with dropping sales. Most simply, if labor comprises a larger share of costs and the firm faces headwinds, then there are few other margins to cut. The cost structure funnels instability towards payroll. Primarily employing workers to service contracts (as in Weil 2018) means that, for many subcontractors, employment is largely a *variable* cost – not fixed or overhead. As Cornfield (1983) argued, these types of jobs are more likely to be cut when sales fall. Moreover, the narrowness of subcontractor firms means that there are few other lines or tasks to which to transfer workers when one line takes a hit. This contrasts with the classic multidivisional manufacturing firm of the last century, able to absorb slack in one line by "bumping" workers to another (Doeringer 1967). Subcontractors therefore have few ways to respond to revenue swings other than by adjusting payroll.

Of course, subcontractor organizations may stabilize demand by cultivating particular types of client relationships. Targeting more reliable clients, such as government agencies, can reduce uncertainty (Mascarenhas 1989; Somai 2019). A subcontractor may also develop a strong, "embedded" tie with a primary client, making itself less susceptible to volatility (Podolny 1994; Uzzi 1997). However, doing so could place it in an especially vulnerable position, dependent on the client and exposed to any shifts in the client's demand (Emerson 1962; Wilmers 2018). In this case, having several clients would lessen its dependence and smooth out fluctuations (Burt 1983; Porter 1980). Distinguishing these predictions would require information on the duration and type of relations between suppliers and clients; I unfortunately cannot test these predictions in this paper.

Even in the absence of extra revenue swings – for example, if a subcontractor sells to the public sector or obtains sufficient expertise to be in constant demand (Whitford 2005, 68–69) – subcontractors' specialization and labor intensity will transmit any shocks that do arise to payroll more sharply. Consider the contractor firms who, in the wake of USAID's unexpected defunding in March 2025, quickly laid off much of their workforce (Tanis 2025). In this way, the nature of subcontracting tends to heighten both the volatility facing subcontractor firms *and*, even lacking that, the rate with which such volatility is funneled to payroll. Instability compounds. Such employment instability also adds to any additional voluntary turnover arising from the worse conditions and lower pay at subcontractor establishments (as in Godechot and Salibekyan 2019).

Stinchcombe's (1959) work on construction subcontractors offered an early exam-

ple of this dynamic. Specialization allowed firms to easily contract and expand in response to their volatile seasonal markets. In Stinchcombe's case, employees were skilled craftsmen who – often using union channels – could jump to other construction jobs fairly easily. Thus, instability in organizational membership did not imply instability in individuals' earnings. But as fissuring spreads throughout modern economies, it has spilled into many industries without the protections enjoyed by skilled construction trades (Hammerling 2022). This spread makes the link between subcontracting and instability a much greater concern today. The instability it produces is no longer a sectoral idiosyncrasy that craft workers can opt into; instead, it becomes a feature many must encounter.

Predictions.   The dynamic theorized in this section has clear, testable implications. Most importantly, I expect that establishments for which subcontracts make up a larger share of sales will display more unstable employment. They should exhibit greater swings over time in total employment, and their employees should exit at higher rates. This exit rate should be elevated even when comparing individuals in the same occupation, since the excess turnover arises not from the task performed but from its organizational context. Second, these establishments should exhibit more specialization, greater labor share, and less profitability. Though these features have been used to describe or identify subcontractors (Handwerker 2023; Bilal and Lhuillier 2025), they have not been established with data on *known* subcontractors. These features should account for some of the employment instability at subcontractor establishments. Finally, one can explore whether subcontractors pass market shocks to payroll more readily: given a drop in their employer's revenue, are workers more likely to exit a subcontractor than a non-subcontractor? This would reflect the final step of the hypothesized process.

I study these predictions in France, noted for widespread perceptions of precarity among the workforce (Lübke and Erlinghagen 2014; Erlinghagen 2007). The history of subcontracting in France goes back decades (Bakis 1975), and recent technologies such as broadband internet have allowed firms to outsource even more tasks (Bergeaud et al. 2022). As revealed by the REPONSE survey of establishments introduced below, a growing share of French employees work for subcontractor establishments (Figure 1). As is the case elsewhere, subcontracting in France depresses earnings and also contributes to the rise of income segregation by workplace (Tinel et al. 2007; Godechot et al. 2024). Legal obligations of employers towards their employees may encourage them to outsource work (Ha 2022; Autor 2003), though the relatively strong minimum wage and employment protections in France create a floor below which subcontracted work is less likely fall (Bilal and Lhuillier 2025).
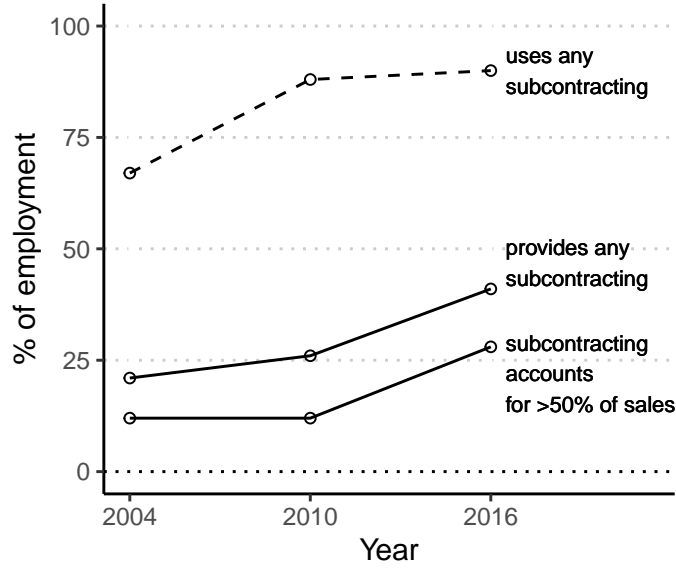
Figure 1: Rates of provision and use of subcontracting over the three REPONSE survey rounds from 2004 to 2016. Establishment responses are weighted by employment.

4   Data

I combine a set of firm surveys with employee register records and mandatory financial statements. The French government's employment statistics agency, DARES, has administered the REPONSE [2] survey to a sample of establishments every six years since 1992. The management (*direction*) portion of the REPONSE asks managers an array of questions about the business strategy and employment practices. Since 2004, the REPONSE survey has included questions about the use and provision of subcontracting; the first wave of which was used by Perraudin et al. (2014) to study subcontractors. The questions pertain specifically to subcontracting (*sous-traitance*), rather than externalization or fissuring more broadly. I also use a question, available in the 2004 and 2010 rounds, that asked whether respondents' firms were profitable.

To learn about employees and their earnings, I link in administrative records of each person-by-workplace (jobs). These are called the DADS prior to 2016, and the BTS afterwards.[3] They contain job-level annual pay (gross and net), full-time equivalence, and hours worked, as well as age, gender, and occupation. I link observations

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2. *Relations professionnelles et négociations d'entreprise*, Survey on labour relations and agreement negotiations.

3. *Déclaration annuelle des données sociales*, annual declaration of social data; and *Base tous salariés*, the all-employees database.

Table 1: Summary of principal workplace characteristics in the REPONSE sample. *a*: the questions about profitability and capacity to adjust prices were asked only in the 2004 and 2010 rounds of REPONSE, and not in 2016. *b*: 3-digit occupation was not reliably recorded in 2004, resulting in a smaller sample for the 3-digit HHI.

Variable	Average	SD	N. establishments
From establishment survey (REPONSE)			
Provides any subcontracting	0.29	0.46	8,200
Subcontracting accounts for over 50% of sales	0.18	0.39	8,200
Reports low profitability	0.16	0.37	4,400[a]
From job register (DADS/BTS)			
Jan 1st employment in FTE	366.00	518.00	7,300
Occup. concentration - HHI (2 digit)	0.42	0.22	7,300
Occup. concentration - HHI (3 digit)	0.35	0.24	5,400[b]
From firm financials (FICUS/FARE)			
Labor share	0.59	0.15	7,300

at a given REPONSE establishment from 2004 to the DADS/BTS records of its employees from 2004 through 2007, and similarly for the following REPONSE rounds. Finally, I link at the firm level to mandatory financial filings, called the FICUS prior to 2008 and the FARE afterwards. These documents include annual revenue for all French firms, and are assembled annually from a mix of administrative records, social security filings, and industrial surveys.

The resulting merged data contains about 3,000 linked establishments per REPONSE round for the three REPONSE rounds. As noted in Table 1, about 8,200 establishments have nonmissing responses about subcontracting. Of these, about 7,300 are successfully linked to the job register; 5,400 can be linked to observations with 3-digit occupation codes – available for the 2010 and 2016 rounds – and 4,400 can be linked to REPONSE surveys with nonmissing responses to the profitability question. Note that the sample sizes are rounded to the hundreds in order to avoid disclosing identifiable information.

In order to track employment outcomes for workers over time, I produce a second analysis sample at the person level. I use the longitudinal person identifiers in the French government's all-employees panel (*Panel Tous Salariés*).[4] This is a roughly

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4. Godechot, Palladino, and Babet (2023) create an alternative set of longitudinal person iden-

one-in-twelve sample of individuals from the main person-firm file (the DADS/BTS), for which longitudinal person links were created. It consists of individuals born in October of even-numbered years as well as those born on a few additional dates.[5] Some workers are employed at multiple establishments of the same firm; I keep only workers whose highest-paying establishment was among the REPONSE establishments. I accessed all of these datasets, which are held by the statistical agency INSEE, via the French government's CASD system. Please see Appendix A for more details about the data sets, the survey question wordings, and the construction of variables.

The merged data have several advantages over other types records often used to study fissuring. Many studies identify lead firms using abrupt decreases in a firm's support-service employment, and identify contracted firms only in certain support-service sectors (France: Bilal and Lhuillier 2025, Germany: Goldschmidt and Schmieder 2017, USA: Dorn, Schmieder, and Spletzer 2022). With direct responses about subcontracting, I can capture a much wider range of subcontractor establishments. This frees me from both sectoral limitations as well as the event-study approach to measuring outsourcing; I can measure the levels of use and provision across sector.

A first finding (Figures 1, 2) is that externalization is growing and prevalent across sectors, which studies of support-service outsourcing alone cannot capture. In many French sectors, more than one in five individuals work at establishments where the majority of sales come from subcontracts (Figure 2). The total share of the labor force at such employers has climbed steadily from about 12% in 2004 to over 25% in the 2016 (Figure 1). The service-and-social sector has lower levels in all years, likely because it includes large semi-public employers. Additionally, over 80% of employees work at establishments that use subcontracting or outsourcing. These rates reflect estimates based off of records of firms' subcontracting expenses (Perraudin, Thèvenot, and Valentin 2013).

5 Employment instability

The analysis in this paper proceeds in three parts, tracing out the explanation developed in Section 3. The first part, discussed in this section, measures the relationship between employment instability and a firm's provision of subcontracting. Subsequent

tifiers, covering more individuals. While well suited to studying income dynamics, their method of identifying workers may not capture exit rates as precisely as is needed for this study. Also note that the "all employees" refers to the underlying full-count dataset – the "All-employees database" – from which the 1-in-12 sample is drawn.

5. These are: 2-5 January, 1-4 April, 1-4 July, and 1-4 October, regardless of year. See `www.insee.fr/fr/metadonnees/source/serie/s1047`.
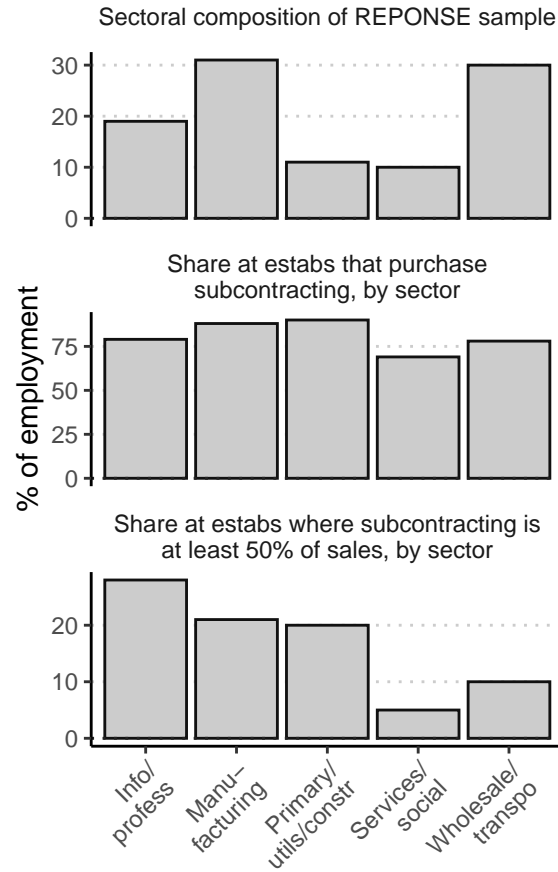
Figure 2: Distribution of surveyed establishments by sector (top row); share of establishments within each sector that report purchasing subcontracted products or services (middle row); share of establishments within each sector for which subcontracts make up majority of revenue (bottom row). All results are weighted by establishment employment, and calculated combining the 2004, 2010, and 2016 samples.

sections will explore the processes leading to instability.

Methods to study employment instability

To measure workers' experience of instability, I use the 1-in-12 sample of workers assembled by the French statistical agency. I first identify the sampled individuals who are employed at firms in the REPONSE survey by January 1st of the survey year, $t = 0$. I then follow these individuals over time and measure whether they are no longer employed at the original firm one, two, and three years later ($t = 1, 2, 3$). I require that individual panels be balanced – that each individual can indeed be followed over the three-year period even if they exit the firm. This approach allows me to compare the rates of exit among subcontractors and non-subcontractors. Among employees present in the survey year, are those employed at subcontractor establishments more likely to exit over subsequent years?

To adjust for establishment as well as individual characteristics, I fit a model of exit rates. I first create an indicator for whether person i is no longer employed at their initial workplace $w(i)$ one, two, and three years after the survey year, denoted by $\text{exit}_i^t = 1$. I then regress this indicator on dummies for the share of sales from subcontracts: no sales from subcontractors; 1-49% of sales; and 50% or more – as well as workplace and person controls:

$$\text{exit}_i^t = \beta_1^t \mathbf{1}\left\{\text{SC } 50+\%\right\} + \beta_2^t \mathbf{1}\left\{\text{SC } 1\text{-}49\%\right\} + \lambda^{t\top} x_{w(i)} + \theta^{t\top} z_i + u_i^t. \tag{1}$$

$x_{w(i)}$ contains indicators for industry-by-survey year, region-by-survey year, and whether the workplace is part of a multi-establishment firm. I also adjust for the individual's age, age squared, and gender, held in the vector z_i. I estimate a base version of (1), and a second version adding occupation indicators to z_i. In both cases, I fit this model separately for each additional year since the REPONSE survey ($t = 1, 2, 3$), yielding year-specific coefficients indexed by the superscript t.

I fit Eq 1 as a linear probability model using OLS, but also re-fit it with logistic regression to similar effect (see Appendix B). I cluster standard errors by establishment. The β_1^t capture the excess exit rates among employees of establishments where subcontracts make up the majority of sales, relative to workplaces that provide no subcontracting. The β_2^t captures excess exit rates among establishments receiving under half of sales from subcontracts, also relative to workplaces that provide no subcontracting. These comparisons are made adjusting for workplace, individual, and job characteristics.

It is known that the rate of turnover typically declines with one's tenure (Lachanski 2025). Thus, the excess exit rates calculated in Equation 1 may mix together a higher probability of exiting a subcontractor conditional on tenure with lower average

tenure among subcontractors' employees. While both of these would indicate that subcontractor establishments churn through employees, each suggests a somewhat different mechanism. I will address this distinction in two ways. First, I fit a logistic discrete-time survival analysis of turnover, where I pool all years ($t = 1$ through 3) and add fixed effects for years of tenure to Equation 1. Inclusion of these fixed effects – alongside the occupation fixed effects – is expected to decrease the power the of the analysis. Second, Appendix B Table 6 reports the results from Equation 1 fit among workers present for at least 2 years by January 1st of the survey year.

Finally, I examine fluctuations in total establishment employment. For each year I first obtain establishments' employment on January 1st (in full-time equivalence). I then log this quantity and calculate its standard deviation over the 4-year window beginning at REPONSE survey year $t = 0$ and ending in $t = 3$. This captures the variability of a given establishment's payroll over time. I regress this measurement on the same subcontracting indicators as in Equation 1 as well as dummies for 2-digit industry-by-year, region-by-year, and multi-establishment status. This approach measures expansions and contractions at the establishment level, regardless of whether individuals were included in the 1-in-12 worker subsample. It would fail to detect, for instance, a case where the workforce turns over but the number of employees remains constant. It therefore complements but does not replace the person-level analysis described above.

Results

This section presents the key descriptive findings of the paper: employment is more unstable at subcontractor establishments than it is at non-subcontractor establishments. I begin with simple average rates of exiting, before presenting the covariate-adjusted estimates from Equation 1. I then present additional results from the turnover survival analysis and establishment-level analysis. At the end of the section, I show that this turnover often results in lower earnings and an increased probability of using unemployment insurance.

Exit rates. Figure 3a reports the rate at which employees present at surveyed establishments in year 0 exit over the subsequent three years. 15% exit by the following year, and just over 30% by the three-year mark. Figure 3b breaks up the exit rates by the employer's subcontracting status. Among workplaces that provide no subcontracting, about 14% of employees present on January 1st of the survey year were no longer present by the next year, and 30% were no longer present three years later. These rates were higher among workplaces for which subcontracting constitutes the majority of sales: 18% and 37% exited by the one- and three-year marks, respectively.
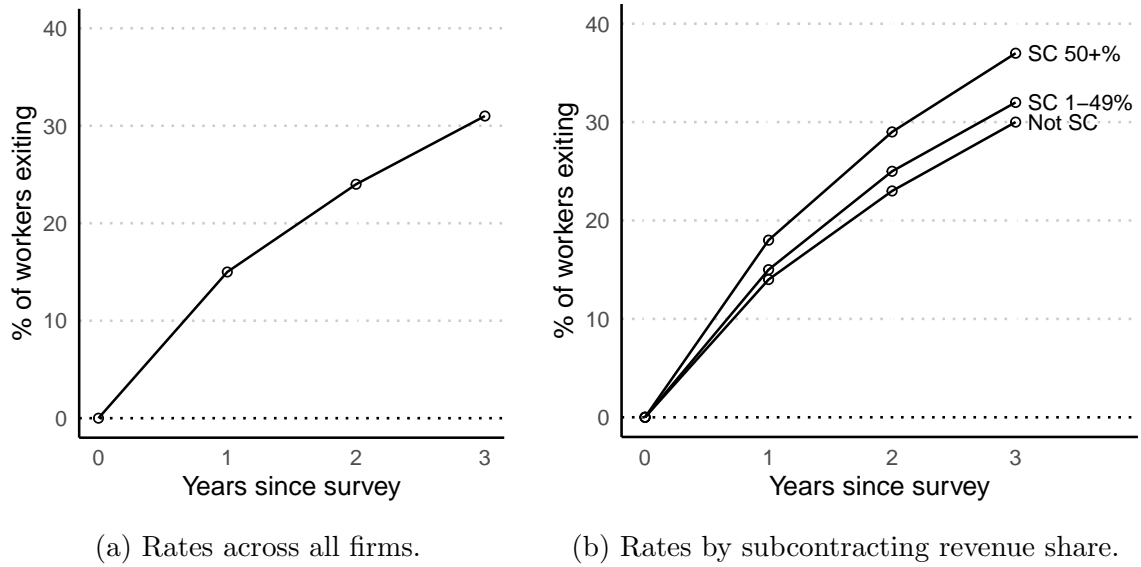
(a) Rates across all firms.

(b) Rates by subcontracting revenue share.

Figure 3: Rates at which employees present at a surveyed establishment in the survey year ($t = 0$) exit the surveyed establishment. Data: REPONSE and Panel Tous Salariés.

Exit rates were in between these two extremes at workplaces where subcontracts made up under half of revenue.

Figure 4 presents the excess exit rates among subcontracting establishments adjusting for workplace and personal characteristics (see Equation 1). Figure 4a adjusts for industry-year, region-year, multi-establishment status, and worker age and gender. Among individuals present at surveyed firms on January 1st of the REPONSE year, those working for employers highly reliant on subcontracts were 2.3 percentage-points more likely to exit by year 1 than those whose employers did not provide any subcontracting. This excess exit rate increases to 4.3 percentage-points by year 3. Employees of establishments that perform some subcontracted work, but for which this work does not make up the majority of revenue, appear to be slightly more likely to exit than are employees of non-subcontractors; but these differences are not statistically significant.

Figure 4b additionally adjusts for occupation. With this adjustment, those employed at firms highly reliant on subcontracts were even more likely to exit – an excess rate of 2.4 and 4.6 percentage-points in years 1 and 3, respectively. These differences are both statistically significant and substantial, equal to about 15% of the base turnover rates in Figure 3a. The excess exit rate among firms less reliant on subcontracts was not distinguishable from zero. This result is robust to alternative functional forms as well as alternative sample restrictions; see Figure 7 and Table 6

of Appendix B. In brief, these results show that subcontractor establishments churn through employees more quickly. This excess turnover is not explained by occupational composition.

Additional measures of instability. The excess exit rates measured in Figure 4 do not distinguish between elevated turnover conditional on tenure, and turnover due to the lower average levels of tenure among subcontractors' employees. I thus fit a logistic discrete-time survival analysis of turnover, adding in tenure-year fixed effects. The left column of Table 2 reports the resulting estimates: conditional on tenure, the probability of exiting increases by about 0.16 log-odds among employees of firms highly reliant on subcontracts compared to firms without subcontracts. This corresponds to an odds ratio of about 1.17. I do not find excess turnover among firms where subcontracts account for under half of revenue. This bolsters the findings of Figure 4 that increased reliance on subcontracting is associated with greater turnover.

The right column Table 2 reports the results of an establishment-level analysis. I measure establishment-level employment fluctuations with the standard deviation of logged January 1st employment over a four-year window to capture variability in employment as a proportion. I regress the log of this quantity – since it is positive and right-skewed – on the subcontracting indicators as well as establishment controls. Again, this yields a similar picture: firms more reliant on subcontracts for revenue display greater fluctuations in employment from year to year.

Exiting and economic wellbeing. The turnover described could be either involuntary or voluntary; the data do not allow me to differentiate between the two. However, an additional analysis of the outcomes of firm-exiting allows me to explore how economic wellbeing changes for exiters. I regress the change in logged annual pretax income from years 0 to 3 on an indicator for exiting, as well as industry, occupation, region, year, and demographic controls. I repeat this analysis separately for employees of firms receiving over half of revenue from subcontracts and for employees of firms fulfilling no subcontracts.

Figure 5a reports that exiting is associated with an almost 20% reduction in total pretax earnings among those formerly employed at non-subcontractors; this reduction is even greater – about 27% – for those formerly employed at firms reliant on subcontracts. I repeat this analysis to estimate the probability of receiving unemployment payments at year 3, shown in Figure 5b. Those exiting non-subcontractors are about 30 percentage-points more likely to receive unemployment payments by year 3; and those exiting subcontract-reliant firms are about 26 percentage-points more likely to receive unemployment payments.

The goal of this final analysis is not to compare the subcontracting and non-
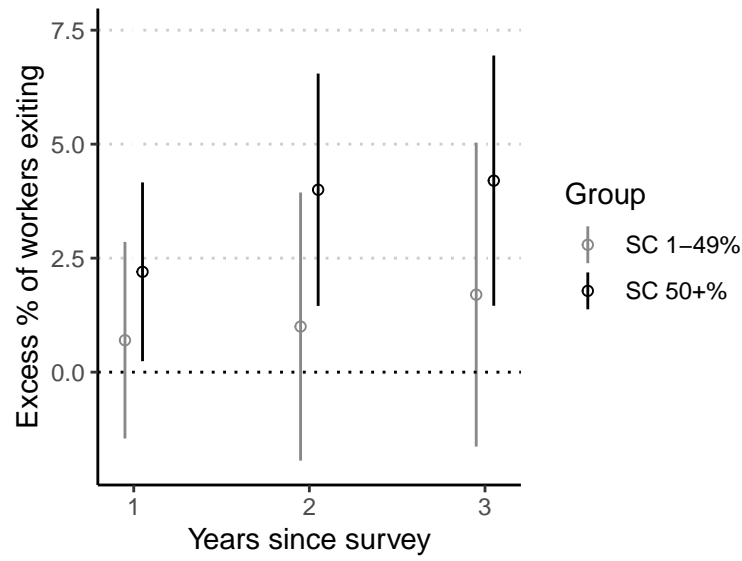
(a) Coefficients on subcontracting indicators from a model adjusting for establishment and personal characteristics. Reference group is non-subcontractor establishments.
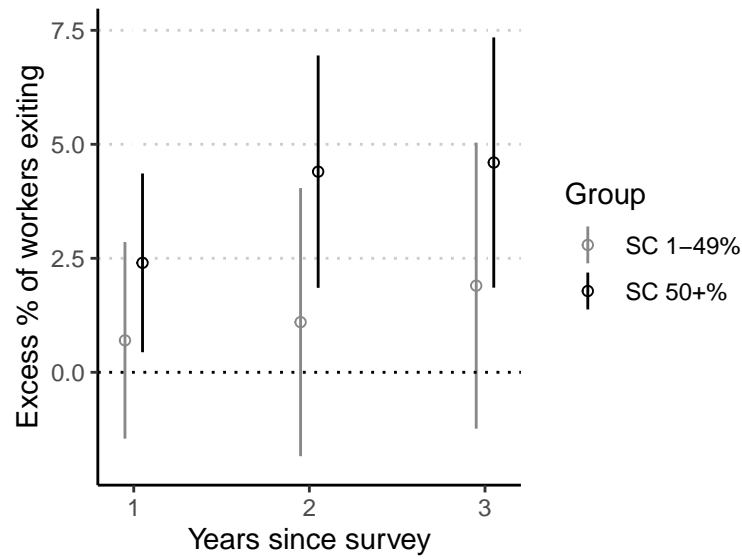
(b) Coefficients as in Figure 4a, additionally adjusting for workers' occupation code at focal firm in survey year.

Figure 4: Associations between an establishment's subcontracting status and the probability that an employee leaves over a 1-3 year period, based on Eq 1. Models are fit with OLS as a linear probability model. Standard errors are clustered by firm. Data: REPONSE and Panel Tous Salariés.

Table 2: Table reports two additional measurements of employment volatility: the coefficients on subcontracting indicators from a logit survival model (left column); and the coefficients on subcontracting indicators from an establishment-level regression of log standard deviation of yearly establishment employment over a three-year window (right column). SEs in the left column are clustered by firm. SEs in the right column are heteroskedasticity-robust (HC1). 95% CIs are shown in brackets. $^*p < 0.05,^{**}p < 0.01$.

Variable	Turnover from survival model (log-odds)	Estab-level employment fluctuations
Subcontracting indicator (reference: no subcontracting)		
Subcontracting accounts for over 50% of sales	0.161*	0.013*
	[0.024, 0.298]	[0.001, 0.025]
Subcontracting accounts for 1-49% of sales	0.034	0.008
	[-0.009, 0.05]	[-0.004, 0.020]
Industry-year and region-year fixed effects	✓	✓
Employee age, gender, and occupation fixed effects	✓	N/A
N	209,000 (individuals)	7,300 (establishments)
Adj. R2	0.128	0.1

(a) Change in log pre-tax income across all jobs.

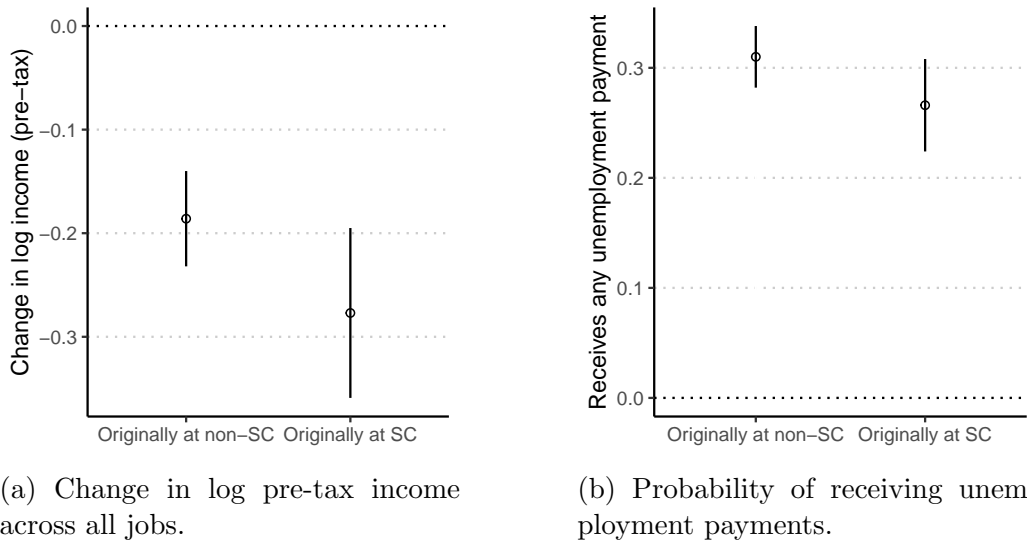(b) Probability of receiving unemployment payments.

Figure 5: Relation between exiting surveyed establishment and outcomes three years after the REPONSE survey, separately by whether surveyed establishment received majority of revenue from subcontracts ("originally at SC"). Models adjust for industry-year, region-year, and individuals' age, gender, and occupation. SEs are clustered by establishment.

subcontracting coefficients. Rather, Figure 5 shows that there are long-term, negative correlates of exiting firms for employees of both types of firms. It is entirely possible that departures are voluntary: one may opt into a subcontractor workplace with the intention of exiting soon, or one may leave after experiencing the poor conditions often associated with subcontracting (Appelbaum 2017). The analysis here simply documents that the excess turnover observed among subcontractors is, indeed, associated with large drops in workers' economic wellbeing.

6 Understanding subcontractor organizations

The last section determined that employment is more unstable at establishments reliant on subcontracting for revenue. This section examines the organizational features that expose subcontractors' employees to instability. I show that establishments where subcontracting makes up a greater share of sales are marked by occupational homogeneity, higher labor shares, and lower profitability. With the exception of profitability, these dimensions are strongly associated with employment instability. Incorporating them into the models of instability from the prior section greatly attenuates the gap between subcontractors and non-subcontractors. I interpret this as

evidence of the process hypothesized in this paper.

Methods to compare organizational features

I measure three aspects of surveyed organizations: occupation specialization, labor intensity, and profitability. I measure occupational specialization with an establishment's occupational concentration, based on the full-count linked employer-employee data (DADS or BTS). The main analysis will use the Herfindahl-Hirschmann Index (HHI) calculated on the basis of 2-digit occupational codes to capture occupational concentration.[6] While 3-digit occupations offer a finer level of occupational categorization, reliable 3-digit coding is only available after 2010; I therefore focus on 2-digit occupation in the main text. While occupational concentration has been used to *identify* subcontractor establishments (Handwerker 2023), it has not actually been documented as a feature of known subcontractors.

Labor intensity is measured as the labor share of value added: total salary and wages paid over the course of the year divided by the total value added in that same year, both measured at the firm level in the FARE/FICUS data. Labor share, a standard measure in the economic literature (Autor et al. 2017), captures the degree to which labor is a major cost relative to output. Finally, lacking good administrative data on profitability, I use a question from the REPONSE survey about self-assessed profitability. I recode this question so that 1 indicates high profitability and 0 indicates low profitability. This question was asked in only 2004 and 2010, and the translated wording can be found in Appendix A.

The mechanism hypothesized in this paper implies that firms more reliant on subcontracting will be more occupationally specialized, more labor-intensive, and less profitable. This can be tested by comparing firms that do not fulfill subcontracts to firms increasingly reliant on subcontracting. I make these comparisons by regressing each attribute on indicators for subcontracting – under and over 50% of sales – as well as dummies for region-by-year, industry-by-year, and multi-establishment status:

$$y_w = \beta_1 \mathbf{1}\{\text{SC } 50+\%\} + \beta_2 \mathbf{1}\{\text{SC } 1\text{-}49\%\} + \lambda^\top x_w + u_w, \tag{2}$$

where x_w is the vector of controls for workplace w. I anticipate that the coefficients on the subcontracting dummies increase with the share of sales from subcontracts.

Additionally, I hypothesized that subcontractors' specialization, labor intensity, and unprofitability all produce employment instability. To evaluate this prediction,

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6. For a workplace w with n_w total employees and n_{wo} in occupation o, this is

$$\text{HHI}_w := \sum_o \left(\frac{n_{wo}}{n_w}\right)^2.$$

I add these covariates to the exit-rate regression Equation 1. Because the question about profitability is absent from the 2016 survey, I fit models with specialization and labor share on all years, and an additional model with specialization, labor share, and profitability on years 2004 and 2010. I continue to include the same set of covariates as in the full specification of Equation 1: industry and region interacted with year, and individuals' age, gender, and 2-digit occupation. I also add specialization, labor share, and profitability to the survival analysis and the establishment level regression of employment fluctuations from Table 2. These further results are reported in Appendix B.

Results

I begin by comparing the occupational concentration, labor share, and profitability of subcontractor and nonsubcontractor establishments. Figure 6 reports the coefficients on the two subcontracting indicators – 1 to 49% of sales from subcontracts, and 50% or more of sales from subcontracts – from Equation 2. Figure 6 also reports these coefficients from two sets of regressions: the first weighting only by establishments' survey sample weights, and the second weighting by establishment employment. Note that the reference group is firms who perform no subcontracted work.

These estimates show that, even after adjusting for industry and region, increased reliance on subcontracts is associated with greater occupational concentration, higher labor share, and lower profitability. Establishments for whom subcontracts make up at least half of sales are about 6 percentage points more likely to report low profitability when compared to non-subcontractors. Their occupational HHI is about 0.03 higher for 2-digit occupations and 0.04 for 3-digit occupations. Finally, their labor share is 2.5 to 3.7 percentage-points higher, depending on the weighting scheme. Across all of these measures, establishments less reliant on subcontracting are more similar to those without any subcontracts. These results bolster the claim that dependence on subcontracting brings with it specialization, labor-intensity, and thinner margins.

Do the organizational features highlighted here – occupational narrowness, unprofitability, and labor share – account for subcontractors' excess employment instability? To answer this question, I add these measurements to the exit-rate regressions from Equation 1. Table 3 reports these results. Column 1 shows the coefficients on the subcontracting indicators from the base model (Equation 1) adjusting for industry, region, demographics, and occupation. These differ slightly from the estimates presented in Figure 4b since the sample is now restricted to establishments with non-missing labor share, HHI, and profitability information. Over three years, workers are 5.2 percentage points more likely to exit firms highly reliant on subcontracting than nonsubcontractor firms ($SE = 1.4$ percentage points). The exit rate among es-

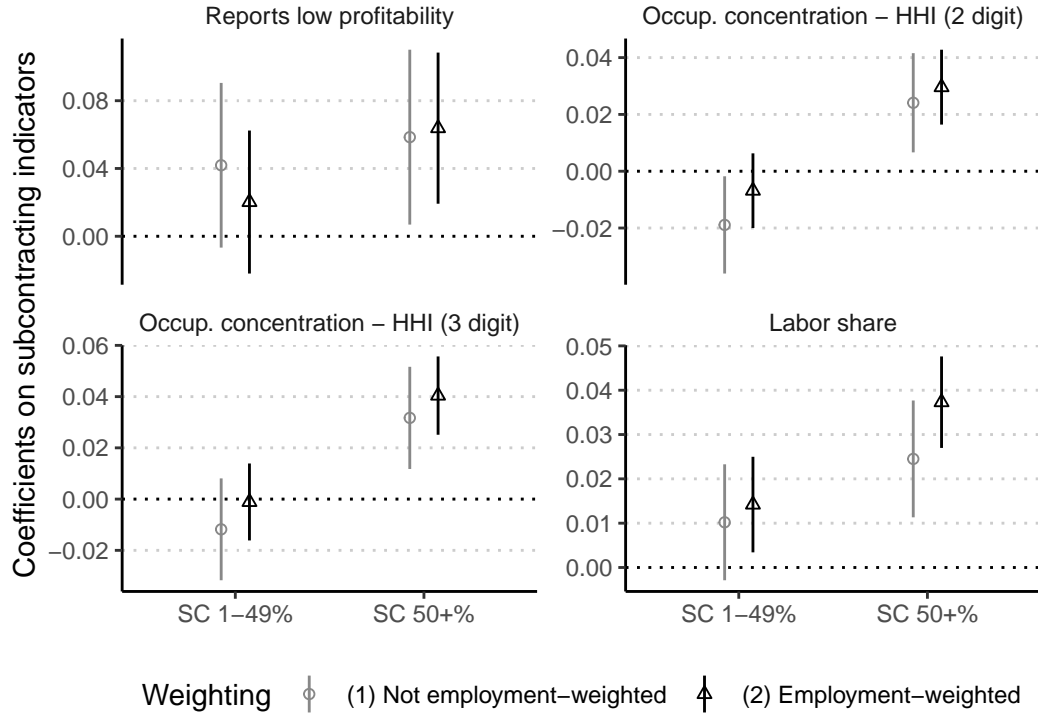Figure 6: Comparison of occupational concentration, self-reported profitability, and labor share to the reference group of non-subcontracting firms. Occupational concentration is measured by the Herfindahl-Hirschman Index (HHI) using 2-digit occupation (all years) and 3-digit occupation (2010 and 2016 only). Figure reports coefficients on subcontracting indicators from Equation 2. SEs are heteroskedasticity-robust (HC1).

tablishments less reliant on subcontracting cannot be distinguished from that among non-subcontractors.

Once labor share and occupational concentration are included, the excess exit rate among firms highly reliant on subcontracting drops from 5.2 to 3.5 percentage points ($SE = 1.4$). The excess exit rate among firms receiving under half of sales from subcontracts also attenuates somewhat, but is in all instances indistinguishable from zero. Labor share is strongly associated with turnover: a one-tenth increase in labor share corresponds to a 3.18 percentage-point boost in the exit rate ($SE = 0.52$). Occupational concentration is, as well: a one-tenth unit increase in occupational HHI is associated with a 1.21 percentage-points increase in the exit rate ($SE = 0.3$).

The role of profitability, on the other hand, is unclear. While subcontractors are less profitable (Figure 6), the coefficient on profitability is not quite statistically significant at the 5% level ($p < 10\%$, see column 4 of Table 3). This may reflect the imprecision of the measure used: a survey question assessing the establishment's profitability. Nonetheless, including HHI, labor share, *and* profitability does compress the excess exit rate among subcontractors by over two fifths: from 0.057 to 0.032.

I repeat this approach with the survival analysis – which includes tenure-year fixed effects – and with the establishment level of variability in log establishment size, extending the results in Table 2. I report these coefficients in Tables 7 and 8 of Appendix B. The results echo those presented in Table 3: first, occupational concentration and labor share are strongly associated with employment fluctuations; second, inclusion of these attenuates the gap in turnover between subcontractors and nonsubcontractors.

The results of this section reflect the theory of subcontracting and instability developed in this paper. Subcontractor organizations are more labor-intensive, more occupationally uniform, and less profitable. This reflects the idea that subcontracting begets constraint and specialization. Second, these attributes are strongly associated with turnover: workers at occupationally homogeneous or labor-intensive establishments are more likely to exit. Finally, adjusting for these attributes dramatically cuts – by about two-fifths – the excess exit rate among subcontractors' employees. These results reflect key predictions of the theory that subcontractors have limited room to absorb market shocks beyond adjusting payroll, and that this explains employment instability. The next section documents the final step of this mechanism.

7 Transmission

Here I examine one possible reason for subcontractors' elevated payroll instability: is their employment more responsive to fluctuations in revenue? Evidence of this mechanism would support the argument advanced in this paper. My approach draws

Table 3: Table reports coefficients on subcontracting indicators from regression of exiting by year 3. SEs clustered by establishment, with 95% CIs shown in brackets. $^\dagger p < 0.1,^* p < 0.05,^{**} p < 0.01,^{***} p < 0.001$.

Variable	All years		2004 and 2010	
	(1)	(2)	(3)	(4)
Subcontracting indicator (reference: no subcontracting)				
SC accounts for over 50% of sales	0.052***	0.035*	0.057**	0.032
	[0.025, 0.08]	[0.008, 0.06]	[0.022, 0.09]	[-0.003, 0.07]
SC accounts for under 50% of sales	0.022	0.017	0.023	0.014
	[-0.009, 0.05]	[-0.014, 0.05]	[-0.016, 0.06]	[-0.023, 0.05]
Labor share		0.318***		0.378***
		[0.216, 0.42]		[0.247, 0.51]
Occup. concentration - HHI (2 digit)		0.121***		0.106**
		[0.062, 0.18]		[0.033, 0.18]
Reports low profitability				0.027†
				[-0.006, 0.06]
Industry-year and region-year fixed effects	✓	✓	✓	✓
Employee age, gender, and occupation fixed effects	✓	✓	✓	✓
N	98000	98000	64000	64000
Adj. R2	0.165	0.174	0.134	0.148

on work in labor economics that tracks how employment transitions reflect evolutions in a firm's productivity, profitability, or revenue (Maibom and Vejlin 2021; see also Card et al. 2018). The goal, here, is to measure how workers' employment changes when their employer's revenue fluctuates. I do so by modeling the probability of exiting a firm in the 3 years after the REPONSE survey as a function of changes in revenue from years 0 to 1.

Methods

As in Equation 1, $w(i)$ denotes person i's workplace in the survey year. Let drop_w be an indicator variable equal to 1 if workplace w's revenue drops by more than 5% and 0 otherwise. I fit the following model,

$$\text{exit}_i^{t=3} = \alpha \, \text{drop}_{w(i)} + \gamma \, \text{drop}_{w(i)} \times \mathbf{1}\{\text{SC}_{w(i)} \geq 50\%\} + \lambda^\top x_{w(i)} + \theta^\top z_i + u_i. \quad (3)$$

This model adjusts for employer characteristics $x_{w(i)}$ – industry-by-calendar year, region-by-calendar year, and log size, all interacted by whether w receives more than half of sales from subcontracts. I also adjust for worker characteristics z_i – age, age squared, gender, and occupation, also interacted by subcontracting status.

The coefficient of interest in Equation 3 is γ. This coefficient captures the excess turnover at subcontractor establishments when revenue drops, as compared to non-subcontractor establishments. These comparisons are made conditional on sector, region, demographic attributes, and occupation. If γ is positive, then that means that employment among subcontractor establishments is more responsive to revenue swings. This would be consistent with the argument advanced in this paper, where firms that provide subcontracting are less able to insulate their employees from product-market volatility.

I fit Eq 3 as a linear probability model with the person-level records from the 1-in-12 employee panel, clustering standard errors by establishment and using the REPONSE establishment survey weights. I restrict the sample to only single-establishment firms, since revenue is measured at the firm level in the financial records (FARES/FICUS). I also restrict to firms where revenue changes by less than 20% in either direction, and to workers who were employed at the focal firms on January 1st of the survey year. To assess whether revenue fluctuations are associated with the displacement of longer-term employees, I also fit the model on the subset of workers who have been employed for at least 2 years at the focal workplace prior to the REPONSE survey.

Results

Following Equation 3 above, I estimate the excess responsiveness of employment at subcontractor establishments following a drop in revenue, as compared to non-

subcontractors. Table 4 reports the results. In the three years following a drop in revenue of at least 5%, the employees of subcontractor firms are about 8.3 percentage points more likely to exit the firm (SE 4.1 percentage-points). Note that this comparison is made conditional on workplace sector, region, and worker demographics, and occupation. The sample includes all workers employed at the focal establishments on January 1st of the reference year. For a sense of the magnitude, note that 8.3 percentage points is over one quarter of the 31% three-year exit rate from Figure 3.

These findings, from the first column of Table 4, could reflect the shorter tenure of workers who were hired for an intentionally temporary spell in the year of the revenue drop. To explore whether longer-term employees are also more likely to exit subcontractors than non-subcontractor establishments following revenue swings, I re-estimate Equation 3 among workers employed for at least two years by January 1st of the survey year. The excess turnover is even more pronounced: such workers are 9.7 percentage points more likely to leave subcontractor than non-subcontractor establishments.

Comparing three-year employment trends to single-year changes in revenue will limit the issue of reverse causality – where a drop in revenue concomitant with a drop in employment may actually be caused by the firm losing employment. There is another risk that an underlying factor affects the trends in both employment *and* revenue, thereby biasing the estimate γ. For this to be an issue, this unmeasured factor must be orthogonal to the sector-year, region-year, person, and occupation controls and it must affect subcontractors and non-subcontractors differently. An alternative approach, with instrumental variables for revenue, is less useful since the complier and noncomplier populations may differ between subcontractors and non-subcontractors.

Despite limitations to the identification strategy, this section helps to clarify the mechanism linking an establishment's provision of subcontracting to the precarity of its workforce. I find that, among establishments dependent on subcontracting for sales, employment is substantially more responsive to revenue swings. This reflects the argument that subcontracting erases the organizational boundary between workers and product market volatility.

8   Discussion

This paper asks whether and why subcontractors' employment is more unstable. The literature on outsourcing suggests that firms providing subcontracted work are likely to be specialized, labor intensive, and unprofitable. I theorize that these combine to both over-expose subcontractors to revenue volatility *and* to funnel any revenue volatility to payroll. This theory yields several clear, testable predictions: first and

Table 4: Excess responsiveness of subcontractor employment following a drop in revenue, coefficient γ in Equation 3. SEs clustered by establishment, with 95% CIs shown in brackets. $^*p < 0.05,^{**}p < 0.01$.

Variable	All workers	Workers with tenure ≥ 2 years	No adjustment for occupation
Excess responsiveness to revenue drop $(\hat{\gamma})$	0.083*	0.097*	0.101*
	[0.003, 0.164]	[0.001, 0.193]	[0.003, 0.199]
Industry-year and region-year fixed effects	✓	✓	✓
Employee age, age^2, gender	✓	✓	✓
Occupation fixed effects	✓	✓	
N. individuals	25000	15000	15000
R2	0.223	0.212	0.186

most importantly, that employment is more volatile at organizations more reliant on subcontracting for sales; second, that such organizations will be occupationally narrower, less profitable, and more labor intensive; third, that these attributes predict turnover and that they can account for some of the excess turnover among subcontractors' employees; and fourth, that subcontractor establishments are more likely to transmit a drop in revenue to payroll.

I evaluate these predictions with microdata from France, a country with strong labor-market protections where the destabilizing effect of subcontracting ought to be relatively muted. I begin by presenting descriptive evidence on the rate and distribution of subcontracting: establishments highly reliant on subcontracting employed about 12% of the French workforce in 2004 but over 25% twelve years later. The provision of subcontracting cuts across sectors; this exploration of subcontracting in sectors beyond support services is, itself, a significant addition to the research on subcontracting.

I then document the elevated rates of turnover among subcontractors. I find that employees of establishments receiving over half their sales from subcontracts are more than 4 percentage points more likely to exit over a three-year period; this is about 15% greater than the average exit rate. Excess exiting is not explained by differences in industry, region, employee demographics, or occupation. Additionally, the size of such establishments fluctuates considerably more from year to year as compared to non-subcontractor establishments. These findings establish that subcontractors are

key sites of labor churning in the modern economy.

The second part of the paper examines the steps linking subcontracting to employment instability. First, firms more reliant on subcontracting are substantially more occupationally uniform, have higher labor shares, and report lower profitability. These findings confirm predictions – previously untested – about subcontracting found throughout the literature (e.g. Handwerker 2023). Second, occupational homogeneity and the labor share are strongly associated with workers' turnover, and can account for about two fifths of the excess exit rate among subcontractors. Profitability is only associated with turnover at the 10% significance level, possibly due to its imprecise measurement. Third, I conduct a sharper test of the transmission mechanism. When revenue drops, the employees of subcontractors are about 8 percentage points more likely to exit than are those of non-subcontractors. These results reflect the argument that labor intensity and specialization limit subcontractors' ability to absorb market fluctuations.

Though robust to a series of check (Appendix B), these results have significant limitations. I cannot distinguish between voluntary and involuntary turnover: workers seeking short-term jobs may opt into subcontractor establishments, echoing the insight that not all part-time or flexible work can be assumed to be bad (Kaduk et al. 2019, Tilly 2010, 47–69). The lower wages and quality of employment at some subcontractor establishments may also drive turnover (as in Godechot and Salibekyan 2019). Three results limit this concern. First, the average exiter loses earnings and is more likely to use unemployment insurance (Figure 5). Second, the variability in establishment-level employment (second column of Table 2) is less likely to result from waves of workers choosing to exit at the same time. Third, the fact that dropping revenue is more strongly associated with subsequent departure, in Table 4, suggests that at least some of this excess turnover is involuntary.

This paper also cannot unpack the complex relation between subcontractor and client. On this question the literature yields mixed predictions. Long-term ties between two firms may improve stability (Uzzi 1997), but could also leave the subcontractor vulnerable to the lead firm's caprices (Wilmers 2018; Emerson 1962). Dyadic data, with records on both subcontractor and client as well as on the quality and duration of their tie, is necessary to tease these apart. The present study does not use such records. Nonetheless, in providing evidence about the subcontractor organizations – the oft overlooked party of the subcontractor-client dyad – it advances our understanding of the complex nature of fissuring.

9 Conclusion

Unstable employment is a hallmark of modern labor markets (Kalleberg 2018; Lübke and Erlinghagen 2014), with wide-ranging impacts on wellbeing (Griesbach 2025; Vergauwen et al. 2017). To explain its rise, scholars have sought answers in the transformation of employment relations – in the growth of "market-mediated" employment and in the demise of the internal labor markets that once insulated workers and ensured careers (Cappelli 1999; Kalleberg 2011; Cobb 2016; Osterman 2024; Schor et al. 2020). The findings of this paper broaden our view: from the employment practices that enable precarity to the organizational and inter-organizational setting that produces and amplifies it. This contributes to a nascent literature on the role of firms' network position and cost structures in shaping not only wages but also their employment patterns (Lin 2016; Benton and Kim 2022).

This reorientation highlights the need for policy to address employment instability, and shows that such policy must grapple with the fissured nature of modern work. Facilitating workers' ability to continue careers across new firms, much as in the construction industry, could reproduce the inter-departmental "bumping" of old manufacturing firms (Doeringer 1967; Weil 2019). Policies that provide a common floor regardless of one's direct employer – minimum wages or employment-standards enforcement, for instance – are essential, as is the legal recognition that subcontractors' employees often depend economically on lead firms (Rème-Harnay 2020; Crague et al. 2012). These policies could have an incidental benefit, too. By raising the floor and extending the liability of lead firms, they could limit the ability of subcontractors to undercut in-house production on labor cost alone. This may make domestic subcontracting a less attractive tool for sidestepping commitments towards workers (as in Autor 2003; Ha 2022).

Absent such policy, a picture emerges of an economy ever more populated by brittle and interconnected organizations, unable to pad their employees from environmental shifts. This raises the possibility that instability increases in the aggregate – and is not merely redistributed among unequal pieces. Such a description would reflect recent work showing that inter-firm production networks can actually amplify aggregate swings in output (Acemoglu, Akcigit, and Kerr 2016; Elliott, Golub, and Leduc 2022). What is distinctive about this description, however, is its emphasis on the organizational attributes that concentrate and translate environmental volatility into unstable employment. A glimpse at the business literature shows that lead firms often attempt to control their suppliers and limit their capacity to diversify (Arruñada and Vázquez 2006). Future work must grapple with this interplay of intra- and inter-organizational structure and the aggregate effects it produces.

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A Data appendix

I combine three sets of data collected by the French government: establishment surveys, firm financial records, and linked employer-employee records. The REPONSE survey, administered to a sample of establishments every six years since 1992, asks an array of questions about market position and employment practices. Since 2004, the REPONSE survey has included questions about the use and provision of subcontracting; since 2010, there have been additional questions about the type and scale of subcontracting. The questions pertain specifically to subcontracting (*sous-traitance*), rather than externalization more broadly.

   To learn about employee features and earnings, I link in the DADS and its successor post-2016, the BTS. These are administrative records of each person-by-workplace (jobs). This gives me job-level annual pay (gross and net), full-time equivalence, and hours worked, as well as some other features: age, gender, occupation, and whether the contract is fixed-term. This full-count data is what I use to calculate the occupational concentration in workplaces. I use an additional one-in-twelve sample of the the DADS/BTS in which longitudinal person identifiers are available; this is the *Panel tous salariés* (all-employees panel). I include more information about this panel below.

   Finally, I link at the firm level to mandatory financial filings: the FICUS for 1994 to 2007, and the FARE for 2008 to 2020. These documents include value-added, revenue, total wages, and expenses. These include all French firms, and are assembled annually from a mix of administrative records, social security filings, and industrial surveys. The resulting merged data contains roughly 3,000 linked establishments per REPONSE year, or 9,000 total.

   I restrict the REPONSE samples after 2004 in the following way. (*a*) I remove establishments classified as "*administration publique*" (public administration, NAF2 code 84). (*b*) I keep only private-sector commercial firms: those whose *code juridique* in FARE/FICUS (`CJ` in FICUS or `STAT_CJ` in FARE) is between 0 and 5 inclusive, other than code 4[7]. Note that I include all jobs, even those for whom the job is secondary or part-time. I deflate all euro denominated quantities to real 2014 euros, using the CPI calculated by French statistical agency INSEE.[8]

   The rest of this section provides more information about the key variables used in the analysis.

- **Job-level occupation (DADS).** I use the occupational codes `PCS` (*professions et catégories socioprofessionnelles*) available in DADS records starting in 2009.

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7. Code 4 is *Personne morale de droit public soumise au droit commercial.*
8. See `https://www.insee.fr/fr/statistiques/series/102342213` .

These are specific, four-digit/character codes, and INSEE has used an automatic coding system since 2009. Prior to 2009, 4-digit codes were less reliable. For my analysis, I primarily use the first two digits (known as CS, *catégories socioprofessionnelles*), which are reliably coded in all years.

- **Job-level earnings (DADS).** I use the gross (S_BRUT) annual pay. In my main analysis, I include all earnings as they appear in the DADS files.

- **Job-level hours worked (DADS).** I use the recorded number of hours worked in the year (NBHEUR).

- **Number of employees at establishment/year (DADS).** I use the mean yearly establishment employment, as given in the DADS establishment-level file.

- **Workplace industrial classification (REPONSE).** The REPONSE survey records include 3-digit industrial classification (*nomenclature d'activité française*, NAF, labeled as NAF_1 in 2004-5, APEN in 2010-11, and ape in 2016-7). The NAF coding scheme was revised in 2007. I recode observations to the post-2008 scheme at the 2-digit level using INSEE's 4-digit crosswalk as follows: for each 2-digit industry i from the 2003 scheme, I identify the 2-digit industry j of the 2008 scheme to which the plurality of the 4-digit industries within i are assigned in the crosswalk. I then recode all workplaces in i under the 2003 scheme as j under the 2008 scheme. There are 219 three-digit NAF codes, and 15 broader sectoral codes.

- **Workplace subcontracting (REPONSE).** This question translates as: "Does your establishment's activity usually consist of subcontracted work?"

  - Answers: $\geq 90\%$ of sales, $50 - 89\%, 25 - 49\%, 10 - 24\%, 1 - 9\%$, no.
  - Available 2004, 2010, 2016.

- **Use of subcontracting (REPONSE).** "Does your establishment make use of subcontracting? This includes all types of subcontracting (including custodial services, for example)." [Note that subcontracting is written "*sous-traitance*".]

- **Profitability.** "With respect to your competitors, is your profitability: much higher, somewhat higher, equivalent, somewhat lower, much lower."

  - Available 2004, 2010.

Table 5: Summary of principal characteristics of workers in the longitudinal 1-in-12 PTS sample who were linked to employers in the REPONSE sample. Note that calculation of averages and SDs are weighted by REPONSE establishment sample weights.

Variable	Average	SD	N. individuals
From establishment survey (REPONSE)			
Employer provides any subcontracting	0.28	0.20	108000
Employer SC accounts for over 50% of sales	0.16	0.35	108000
From 1-in-12 person panel (PTS)			
Age	38.90	9.28	108000
Male	0.64	0.47	108000
Tenure in years at Jan 1 of REPONSE year	6.11	6.85	108000
Hours worked in year 0	1740.00	407.00	108000
Total earnings pre tax (2022 Euros)	31000.00	27600.00	108000

- **Firm revenue (FICUS/FARE).** I use firm revenue (`CATOTAL` in FICUS; `Redi_r310` in FARE). I drop missing values – because the part of my analysis which uses these quantities looks at year-to-year changes in them, it does not make sense for me to impute missing values with adjacent years.

- **Region**. The job-level records (DADS) contains a code for the workplace's region. The classification of French regions changed in 2014. I recode pre-2014 regions to their post-2014 regions, of which there are 12 unique values.

All-employees panel. The *Panel Tous Salariés* contains roughly one in twelve individuals from the full person register (DADS/BTS, described above). The French statistical service adds longitudinal person identifiers to this panel, allowing me to follow individuals over time even when they switch firms. For individuals employed at multiple establishments of the same firm, the data identifies the establishment from which they receive the greatest pay as their principal workplace within that firm. I identify all workers who are employed at one of the establishments surveyed in the REPONSE surveys *in* the year of that survey (2005, 2011, and 2017). I further restrict to workers ages 15 to 55 who are employed at the focal surveyed workplace on January 1st of the survey year.

Table 5 reports key summary statistics regarding the set of workers in the PTS

panel who were employed at a REPONSE establishment in the survey year. About 28% of this linked sample are employed at establishments providing any subcontracting, and about 16% were employed at establishments for which subcontracts comprise the majority of sales. These are slightly lower than the respectives rates – 29% and 18% – in the full sample, per Table 1 in the main text. Note that the number of individuals reported in Table 5 (108,000) exceeds the numbers reported in tables with model outputs (e.g., Tables 2 and 3). This is because, when fitting models, I additionally require that individuals' employers have nonmissing data on occupational concentration, labor share, and other attributes.

To track turnover, I identify whether an individual working for a given employer on January 1st of the REPONSE year ($t = 0$) receives any pay from that same employer in each of the following three years ($t = 1, 2, 3$). If they do, I count this as *staying* at that firm; if they do not, I count this as exiting. Figure 3, in the main text, reports the overall rates of staying, weighted by REPONSE establishment survey weights.

B   Additional results and specifications

Sample restrictions for turnover analysis.   In the analysis underlying Figures 3 and 4, I restrict the sample of workers from the *Panel Tous Salariés* to all those employed at the surveyed establishment in the REPONSE year ($t = 0$). Specifically, I select those whose start date is no later than January 1st of that year, whose end date is no earlier than January 1st, and who earn at least one euro from that firm that year. I further restrict to a balanced panel: cases where I observe all individuals in all years beginning at the survey year and continuing for three years ($t = 0, ..., 3$) – whether or not they exit. This section assesses the robustness of the main results to alternative sample restrictions.

Table 6 reports the probability of exiting 3 years post-survey under different sample criteria. The first row reports the main results for $t = 3$. The second row selects only those who worked at least 800 hours at the focal workplace in the prior year. The third removes the balanced-panel restriction. The fourth focuses on workers for whom the REPONSE-affiliated job accounts for over half of personal annual earnings in the survey year. The fifth row requires individuals be employed at the REPONSE-affiliated job for at least 2 years at the beginning of the survey year. The sixth row uses an alternative explanatory variable: here, I measure subcontracting as a share of revenue, rather than two indicator variables (for 1-49% and 50+% of revenue).

In all cases, the results are similar to those presented in the main text: firms receiving over half of revenue from subcontracts have greater turnover. The final row expresses this differently: an 0 to 1 increase in the share of revenue coming from subcontracts is associated with a 6.6 percentage-point increase in the probability of workers exiting by $t = 3$. Note that all models adjust for the full set of covariates: industry-by-year, region-by-year, age and age-squared, gender, and occupation at year 0.

Alternative functional form.   The analysis of exit rates presented in Figure 4 relies on the linear probability model of exiting, Eq 1. Because the linear form may be ill-suited to this case, I repeat the analysis using logistic regression instead. Figure 7 reports the odds ratios on the subcontracting indicators – note that this scale differs from the percentage-points scale in Figure 4. The specification in Figure 7 adjusts for the same full set of covariates as in Figure 4b: industry and region interacted with year, as well as age, age squared, gender, and occupation. The results yield similar conclusions again: there is considerably more turnover at workplaces receiving over half of revenue from subcontracts.

Associations between turnover and concentration, labor share, and profitability.   Table 3 extends the analysis of exit rates – first reported in Table 4

and based on Equation 1 – to explore the relation between exiting and labor share, concentration using 2-digit HHI, and self-reported profitability. Here, I repeat this extension for two other approaches to measuring turnover: a survival analysis that includes tenure-year fixed effects, and the standard deviation of an establishment's log annual employment over a four-year period. Table 2 compared subcontractors and nonsubcontractors using these two approaches, without the addition of HHI, labor share, or profitability.

Here, I repeat the analyses reported in Table 2, adding measurements of concentration, labor share, and profitability. The survival analysis is reported in Table 7. Working at a firm for which subcontracts make up over half of sales was associated with 0.161 greater log-odds (1.17 as an odds ratio) of exiting from year-to-year, when compared to employees of non-subcontractors. This declines to 0.109 (1.115 as an odds ratio) after incorporating labor share and occupational concentration. A one-unit increase in labor share is associated with a 1.25 log-odds change in exiting, and a one-unit increase in occupational concentration is associated with a 0.524 change in log-odds. These are statistically significant at the 0.1% level. Thus, even when comparing workers with similar levels of tenure, labor share and occupational concentration are strongly associated with tenure; and incorporating them into the model of turnover greatly reduces the unexplained gap between subcontractors and nonsubcontractors.

Results based on the establishment-level measure of variability are reported in Table 8. Note that these models are run at the establishment level, so do not contain any worker- or job-specific covariates. As in the rightmost column of Table 2, the outcome is the standard deviation of the log of an establishment's January 1st employment over a four-year period beginning at the REPONSE surve year ($t = 0$ to $t = 3$). Establishments highly reliant on subcontracting see greater fluctuation in employment in the base model ($\beta = 0.013$); this drops to 0.008 once labor share and occupational concentration are included. Labor share is strongly associated with establishment-level fluctuations ($\beta = 0.110$), while the association with occupational concentrations (0.021) is only significant at the 10% level.

Table 6: Table reports coefficients on subcontracting indicators from LPM regressions of exit rate 3 years after survey on subcontracting, with alternative sample restrictions. First row shows the results for t=3 presented in the main text. SEs are clustered by establishment, with 95% CIs shown in brackets. $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

| Sample	SC 50+%	SC 1-49%	Continuous SC share	N	R2
Main sample (balanced panel)	4.6** [1.8, 7.4]	1.9 [-1.3, 5.1]		104000	0.156
Balanced panel, over 800 hours in survey year	3.9** [0.9, 6.9]	1.5 [-1.9, 4.9]		95000	0.127
Unbalanced panel	3.6* [0.8, 6.4]	1.4 [-1.8, 4.6]		109000	0.160
Balanced panel, REPONSE job accounts for % $\geq$ 1/2 of earnings in survey year	3.8** [1, 6.6]	1.4 [-2, 4.8]		94000	0.128
Balanced panel, tenure at least 2 years by survey year	3.6* [0.4, 6.8]	2 [-1.8, 5.8]		62000	0.129
Balanced panel, continuous measure of SC			6.6*** [2.8, 10.4]	104000	0.156
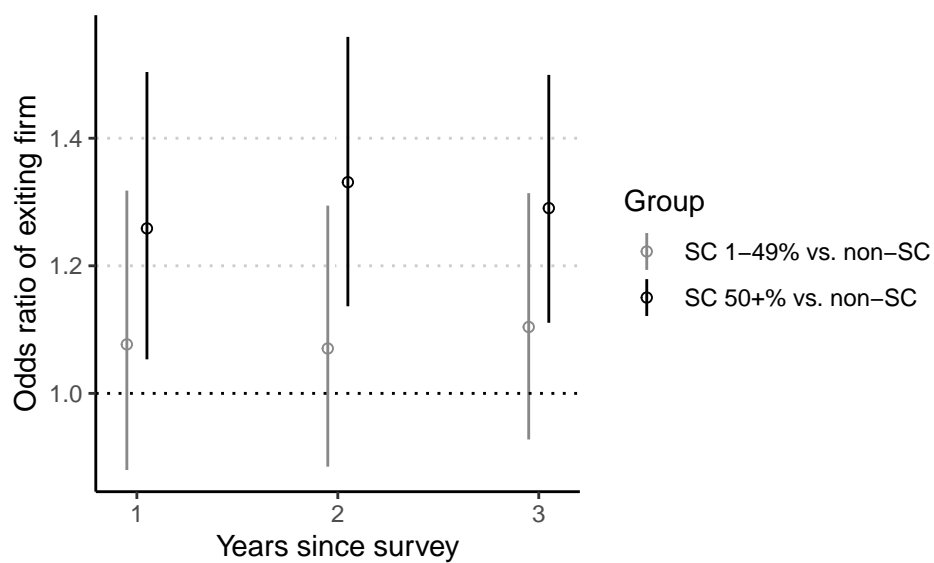
Figure 7: Association between share of revenue from subcontracting and probability of exit, adjutsing for industry, region, and personal characteristics. This differs from Figure 4b in its use of logistic regression instead of OLS. Units are odds ratios. Standard errors are clustered by firm. Data: REPONSE and Panel Tous Salariés.

Table 7: Table reports log-odds coefficients on subcontracting indicators from survival analysis of employee exit. SEs are clustered by establishment, with 95% CIs shown in brackets. $^*p < 0.05,^{**}p < 0.01,^{***}p < 0.001$.

Variable	(1)	(2)
Subcontracting indicator (reference: no subcontracting)		
Subcontracting accounts for over 50% of sales	0.161*	0.109
	[0.024, 0.3]	[-0.03, 0.25]
Subcontracting accounts for under 50% of sales	0.034	0.02
	[-0.123, 0.19]	[-0.135, 0.17]
Labor share		1.25***
		[0.754, 1.75]
Occup. concentration - HHI (2 digit)		0.524***
		[0.244, 0.8]
Industry-year and region-year fixed effects	✓	✓
Employee age, gender, and occupation fixed effects	✓	✓
N persons	209000	209000
Adj. R2	0.128	0.131
Log lik.	-797000	-794000

Table 8: Table reports coefficients on subcontracting indicators from *establishment-level* regression of logged standard deviation of yearly establishment employment over 4-year periods. SEs are heteroskedasticity-robust (HC1), with 95% CIs shown in brackets. $^{\dagger}p < 0.1,^{*} p < 0.05,^{**} p < 0.01,^{***} p < 0.001$.

Variable	(1)	(2)	(3)
Subcontracting indicator (reference: no subcontracting)			
Subcontracting accounts for over 50% of sales	0.013*	0.008	0.004
	[0.001,0.025]	[-.004, 0.020]	[-0.010, 0.018]
Subcontracting accounts for under 50% of sales	0.008	0.007	0.003
	[-0.003, 0.021]	[-0.005, 0.019]	[-0.011, 0.016]
Labor share		0.110***	0.072**
		[0.065,0.155]	[0.027, 0.118]
Occup. concentration - HHI (2 digit)		0.021†	
		[-0.004, 0.046]	
Occup. concentration - HHI (3 digit)			0.036**
			[0.009, 0.063]
Industry-year and region-year fixed effects	✓	✓	✓
Adj. R2	0.100	0.107	0.127
N establishments	7300	7300	5400