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**The Changing Nature of Work and Public Pension Coverage:
Evidence from the US and Europe**

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The Changing Nature of Work and Public Pension Coverage: Evidence from the US and Europe

Axel Börsch-Supan, Courtney Coile, Jonathan Cribb, Carl Emmerson, Yuri Pettinicchi

Abstract:

We examine non-standard work and its impact on pension coverage via a case study of the US, the UK, and Germany. We find that the share of workers engaged in non-standard work has changed only modestly over time in these three countries, despite the popular perception that a more significant transformation in the nature of work may be underway. We discuss how non-standard work may affect public pension coverage, as both the pension rules and the level of actual and reported earnings of workers engaged in non-standard work can differ from those of workers engaged in standard work. We find that workers who spent much of their career in self-employment (one type of non-standard work) have higher levels of financial distress in retirement and rely more on financial assets outside the public pension system.

Zusammenfassung:

Wir untersuchen atypische Beschäftigungsformen und ihre Auswirkung auf den späteren Rentenbezug anhand einer Fallstudie der USA, Großbritanniens und Deutschlands. Dabei stellen wir fest, dass sich der Anteil der Arbeitnehmer, die einer atypischen Beschäftigung nachgehen, in diesen drei Ländern im Lauf der Zeit nur geringfügig verändert hat, trotz der weit verbreiteten Auffassung, dass sich ein tiefgreifender Wandel in der Arbeitswelt vollziehe. Wir erörtern, wie sich atypische Beschäftigungen auf den Rentenbezug aus der staatlichen Rentenversicherung auswirken kann, da sowohl die Rentenversicherungspflicht als auch die Höhe der tatsächlichen und gemeldeten Verdienste von Arbeitnehmern in atypischen Beschäftigungsverhältnissen, von denen der Arbeitnehmer in Normalarbeitsverhältnissen, abweichen können. Wir stellen fest, dass Arbeitnehmer, die einen Großteil ihrer beruflichen Laufbahn in der Selbstständigkeit verbracht haben (definiert als eine Art atypischer Beschäftigung), im Ruhestand in höherem Maße in finanziellen Nöten sind und stärker auf finanzielle Vermögenswerte außerhalb des staatlichen Rentensystems angewiesen sind.

Keywords:

Social security, public pensions, alternative work, non-standard work, self-employment

JEL Classification:

I32, J23, H55

**“The Changing Nature of Work and Public Pension Coverage:
Evidence from the US and Europe”**

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Introduction

The concept of work conjures up the image of an employee heading to an office, factory floor, or retail establishment in exchange for a paycheck from their employer at routine intervals. The employee likely has a reasonable expectation of being in the same job for the foreseeable future, even if there is always some risk of being laid off or fired and some chance that the employee may leave for a better job or for personal reasons. In reality, work arrangements can be far more varied and volatile. Workers may be in alternative work arrangements, such as working as an independent contractor, on-call worker, or employee of a temporary help agency or contract firm. Work may be contingent, where workers have only a temporary contract or lack any formal or informal contract for ongoing employment. They may have low and/or irregular hours or work, making it difficult to plan their time and finances. Workers may be self-employed, reliant on their own ability to identify clients in order to sustain a flow of income.

The prevalence of non-standard work arrangements has risen in recent years. By one estimate, the share of US workers engaged in alternative work rose by 5 percentage points between 2005 and 2015, reaching nearly 16 percent of the workforce, although subsequent analysis suggests that the rise may have been more modest (Katz and Krueger, 2016, 2019). The online “gig” workforce, which includes high-profile companies like Uber and Task Rabbit, currently accounts for just 0.5 percent of the US workforce but is growing rapidly. In Europe, the use of temporary contracts is on the rise, with a 25 percent increase in temporary employees from 2001 to 2012 as compared to a 7 percent increase in permanent employees over the same period (EPSC, 2016). In the UK, the recent “Taylor Review” (commissioned by the UK government) found that permanent employment as an employee now only accounts for 60 percent of the total UK labor market, with the remainder split between self-employment, agency

work, temporary work, zero hours contracts and the gig economy (Taylor, 2017). Many factors have contributed to the rise in non-standard work, including technological change, demographic change, and union decline (Bidwell et al., 2013).

Non-standard work arrangements – a term we define broadly to include alternative work, contingent work, and self-employment – offer different advantages and disadvantages relative to standard employment. Employers may benefit from having enhanced ability to match staffing to changing needs, while workers may value having more flexibility in the scheduling and location of work (Hurst and Pugsley, 2011; Mas and Pallais, 2017; Spreitzer et al., 2017); indeed, DiNatale (2001) reports that a majority of workers in alternative work prefer this arrangement to traditional jobs. In some countries, including the UK, there are considerable tax and legal advantages for economic activity being organized as self-employment rather than as traditional employment (Adam et al., 2017; Adams et al., 2018). However, workers are also likely to face greater income instability and reduced eligibility for employer-provided benefits (Davis, 2016).

Importantly, eligibility for public pension benefits may also be affected by the type of employment relationship. In some cases, non-standard work may simply not accrue public pension entitlements, may shift the obligation of making pension contributions from employers and purchasers of services to workers, or may offer greater scope for low earnings or unreported income, reducing future pension entitlements. While there is the clear potential for the changing nature of work to affect public pension benefits, there has been little work exploring this relationship.

In this paper, we analyze how the rise of non-standard work may affect public pension coverage. We frame our analysis as a case study of three developed economies – the US, the UK, and Germany – in order to obtain a sense of how differences in pension rules affecting non-

standard work may shape the relationship between non-standard work and pension coverage. Our first task is to define non-standard work and to identify measures that can be collected in a comparable way across countries and over time. As we explain in more detail below, the latter is a challenging task, as the standard labor force surveys that are administered at an annual or greater frequency do not necessarily contain the information needed to calculate all desired measures of non-standard work. We review relevant country-specific studies and present time series data for our three countries for those measures that can be constructed in a comparable manner. We find that since 2000, the share of workers engaged in self-employment (as measured in household survey data) has declined by nearly 1.5 percentage points in the US, increased by about 2.5 percentage points in the UK, and remained roughly flat in Germany. There are large increases in the shares of atypical employment in Germany between the 1990s and 2007, followed by a surprising decline. The share of workers in a non-permanent job or working two or more jobs has declined in the UK, and the latter has also declined in the US.

Second, we examine those aspects of public pension rules that are relevant for pension coverage for workers engaged in non-standard work. These include, naturally, any eligibility requirements or contribution rates that are specific to those in non-standard work, but may also include rules that apply to all workers but might be expected to have special relevance for this group of workers. We discuss how the changing nature of work may affect public pension coverage.

Finally, we undertake a simple comparison of financial well-being in retirement of the employed vs. self-employed (one category of non-standard worker) in three parallel analyses for 27 European countries and Israel, the UK, and the US. We find that the self-employed have greater rates of financial distress and are at higher risk of poverty in retirement in Europe;

financial distress is also higher for the self-employed in the UK, while there is no such relationship in the US. We find that income inequality is consistently greater among the lifetime self-employed. Finally, we find that the self-employed accumulate greater financial assets relative to their current incomes than the employed, behavior that is consistent with reduced public pension coverage for this population and greater self-insurance. We caution that these findings should not be interpreted as causal due to the potential endogeneity of self-employment. We conclude with final thoughts about the implications of the changing nature of work.

I. Background and Previous Literature

Defining Non-Standard Work

While there is rising public interest in the changing nature of work, there is no widely-accepted definition that demarcates non-traditional work. At the broadest level, traditional work might be thought of as work conducted in the context of an employer-employee relationship that is expected to continue indefinitely, whereas non-traditional work may encompass work arrangements that are temporary, contingent, or involve the worker functioning as a vendor of their own labor services rather than as a standard employee.

In practice, the terms alternative work and contingent work have come to represent specific kinds of non-traditional work. As defined by the U.S. Bureau of Labor Statistics (BLS, 2018), alternative employment arrangements encompass the following groups: “1) independent contractors (workers who are identified as independent contractors, independent consultants, or freelance workers, regardless of whether they are self-employed or wage and salary workers); 2) on-call workers (workers who are called to work only as needed, although they can be scheduled

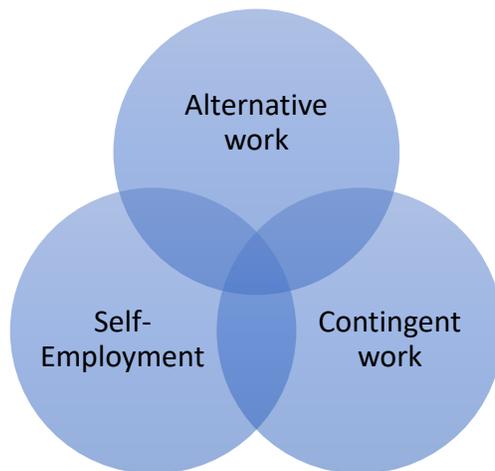
to work for several days or weeks in a row); 3) temporary help agency workers (workers who are paid by a temporary help agency, whether or not their job is temporary); and 4) workers provided by contract firms (workers who are employed by a company that provides them or their services to others under contract, are usually assigned to only one customer, and usually work at the customer's worksite)." The BLS defines contingent workers as "those who do not have an implicit or explicit contract for ongoing employment." Those who are expecting to leave their jobs for personal reasons, such as retirement or to return to school, are not included. The BLS provides several estimates of contingent work based on slightly different definitions – for example, requiring that the job be expected to last for less than one year vs. not expected to last but without a specific time frame given.

Another kind of work outside of traditional employment is self-employment. Those who are self-employed may choose to incorporate their business, a step that offers the "traditional benefits of the corporate structure, including limited liability, tax considerations, and enhanced opportunity to raise capital through the sale of stocks and bonds," or may remain unincorporated (Hipple and Hammond, 2016). The self-employed are also sometimes characterized by whether they have any paid employees (beyond the founder/owner).

It is worth noting that alternative work, contingent work, and self-employment are distinct terms with areas of overlap (when using the BLS definitions), as illustrated in a simple way in Figure 1 below. For example, those engaged in alternative work include both employed workers (e.g., those who work for a temporary help agency or for a company that provides their services to others under contract) and self-employed workers (e.g., independent contractors who say they are self-employed). Conversely, among the self-employed, only those who identify as independent contractors or on-call workers are deemed to be in alternative work. Similarly, the

contingent work force can include both employed and self-employed workers and workers in alternative and non-alternative work arrangements, depending on what these workers report about the expected duration of their jobs (and other aspects of the specific BLS definition of contingent work being used).¹

Figure 1: Overlap in Alternative Work, Contingent Work, and Self-Employment



In the remainder of the paper, we use the term “non-standard work” to encompass all kinds of non-traditional work arrangements, including alternative work, contingent work, and self-employment. At times, we also focus more narrowly on one or the other of the three types of non-standard work (alternative work, contingent work, or self-employment).

¹ See Table 1 in Abraham et al. (2018) for a useful categorization of non-standard work types and characteristics.

Previous Literature on Non-Standard Work

Past studies shed some light on trends in the prevalence of non-standard work, as well as the demographic characteristics of those engaged in this work and the implications of non-standard work for retirement security. In the US, however, this work has been made much more challenging by a gap in the collection of relevant data and by the apparent sensitivity of the estimates to various measurement issues.

The prevalence of alternative and contingent work in the US was fairly stable between 1995 and 2005, a period during which the relevant data was collected regularly by the BLS. The share of workers in alternative work rose slightly, from 10.0 in 1995 to 10.7 percent in 2005, while the share of workers in contingent work (using the broadest definition) declined modestly, from 4.9 to 4.1 percent (BLS 1995, 2005). Following a decade in which no data were collected, Katz and Krueger (2016) administered their own survey and estimated that the share of workers engaged in alternative work reached 15.8 percent of the workforce in 2015, a 5.1 percentage point increase from 2005. Subsequently, the BLS fielded its survey again in 2017 and found that 10.1 percent of workers were engaged in alternative work and 3.8 percent in contingent work, values similar to those in 1995 and 2005 (BLS, 2018). Katz and Krueger (2019) explore the discrepancy between the two recent sets of estimates and conclude that differences in labor market conditions and survey methods and sampling issues played a role. Accounting for these, they estimate that the share of workers engaged in alternative work rose by 1 to 2 percentage points between 2005 and 2015.

The “gig” economy is a subset of alternative work that has come to greater public prominence in recent years. The term gig is used in the music industry to refer to a one-time

opportunity to play or record music, but the term is now more broadly used to refer to any one-off job where the worker is paid for doing a specific task or working for a specified amount of time (Abraham et al., 2018). While there have long been day laborers performing this type of work, the growth of online platforms such as Uber, TaskRabbit, and Mechanical Turk has facilitated the matching of workers and employers.

Measuring the gig workforce is challenging with currently available data. As Abraham et al. (2018) note, questions on household survey data may not be sufficiently precise to identify gig workers from within larger groups (e.g., the unincorporated self-employed), and also may not probe deeply enough to identify gig work consistently, particularly when it constitutes a second job. Tax data (for example, 1099-MISC filings) also does not uniquely identify gig workers. Nonetheless, there are clear indications that the gig workforce is growing rapidly. Hall and Krueger (2018) report that the number of Uber drivers doubled ever six months from the middle of 2012 until the end of 2015.

Self-employment is a more well-established form of alternative work, yet previous studies estimating its prevalence have also identified measurement issues. Both Abraham et al. (2018) and Katz and Krueger (2016) show that the level of self-employment is lower as measured in household surveys than in tax data. In addition, while household survey data show a flat or declining trend in self-employment, tax records shows steady long-term growth.

The existing literature has explored the demographic characteristics of those involved in non-standard work. For alternative work, Katz and Krueger (2016) find a strong age gradient, with 24 percent of workers ages 55 to 75 engaged in alternative work, versus 14 percent and 6 percent of workers ages 25 to 54 and 16 to 24, respectively. Katz and Krueger (2016) find that male-female differences in alternative work are fairly small. While differences by race/ethnicity

and education in alternative work as a whole are small, sharper differences emerge by the type of alternative work – high school dropouts are substantially less likely to report that they are independent contractors or workers whose services are offered by contract firms and substantially more likely to report that they are on-call workers and temporary help agency workers, as compared to college graduates. There are also differences in satisfaction by type of alternative work, with 84 percent of independent contractors saying that they prefer to work for themselves, while only 55 percent of on-call workers prefer this arrangement to having regularly scheduled hours and only 23 percent of temporary help agency workers prefer their job to permanent employment. The probability of alternative work is highest in the industries of construction and professional and business services.

Previous studies suggest that economic factors may influence the decision to enter into alternative work. Katz and Krueger (2017) estimate that secular trends such as rising inequality and technological change contributed to a rise in alternative work, while cyclical factors are less important. Koustas (2019) finds that households have sharply declining income and assets in the period before initiating gig employment, suggesting that they may be experiencing financial stress.

The motivations for entering self-employment are likely to be heterogeneous. For some, self-employment allows for experimentation with innovative ideas, an experiment that can be continued in case of success or end in a return to traditional employment in case of failure (Kerr et al., 2014). For these workers, the potential for higher income growth offsets the risky income profile of self-employment. Others are more likely to be self-employed due to exogenous factors specific to the labor market. One factor is sector characteristics such as seasonality, which is important in industries like agriculture and fishery. A second factor is legal innovation aimed at

making the labor market more flexible, which may be exploited by employers to externalize labor cost, creating the figure of fake self-employment (self-employed with a one-to-one work relationship). A third example is technological innovation that it is fostering the gig economy and on-demand jobs. Unlike those in the first group, workers who are self-employed for these reasons are likely to experience lower labor income with little upside potential.

There is a growing literature that to date has assessed the retirement decisions of people in non-standard employment (mainly those in self-employment), and how non-standard work affects pensions and wellbeing in retirement. Self-employed workers have been found to be more likely to transition to part-time work later in working life, perhaps suggesting a smoother path to retirement (Zissimopoulos and Karoly, 2007), and they have been found to retire later, on average (Bartel and Sicherman, 1993). Ramnath et al. (2017) find that about 1 percent of older workers transition from employment to self-employment each year, with a reduction in hours and earnings that is consistent with workers using self-employment as a bridge to full retirement.

The rise of atypical employment in Germany has been described and analyzed in a series of studies that were written under the impression that normal employment is bound to decline. Sachverständigenrat (2008) finds that structural changes (especially in sectoral composition) do not explain much of this rise. Hoffmann and Walwei (2002), Dietz and Walwei (2006) and Schäfer and Seyda (2008) stress that atypical employment is a response to the inflexibility of the German labor market, especially its strict employment protection laws. However, in light of the decline of atypical employment after the 2008 financial crisis and the ensuing German “job miracle” (discussed below), this assessment appears to have been somewhat premature.

A specifically German form of atypical jobs are jobs provided by temp agencies based on a permanent contract with that agency but not with the purchaser of the service (Burda und

Kvasnicka, 2005). Antoni and Jahn (2006a, 2006b) document that such workers are typically male, often foreigners, younger than average and often low educated. Buscher (2007) argues that wage differentials do not explain the steep increase since overheads charged by the temp agency are large and largely offset the often lower wages of the workers. Germany introduced a law which requires companies to pay after 3 months equal salaries to workers in-house and workers loaned from a temp agency; many such workers are then hired by the company as documented by Ichino et al. (2006) and Bellmann and Kühl (2007).

The rise of atypical employment in the UK (and self-employment in particular) has been much commented upon – and increasingly studied – in recent years. There has been particular concern because, as is found in Cribb (2018), reported earnings of (unincorporated) self-employed workers are, on average, considerably lower than employees' earnings. Indeed, Tatomir (2015) finds that increases in self-employment in the UK have been concentrated among low paid workers. This has led to concerns that increased self-employment is reflection of increased “underemployment” or “disguised unemployment” (see Bell and Blanchflower, 2013) that may exist despite very low headline unemployment rates. However, Tatomir (2015) argues that the rise in self-employment between 2008 and 2014 was driven by structural trends that preceded the financial crisis. For example, the fact that older adults are more likely than younger adults to be self-employed, combined with an aging population, is identified as one of the key reasons for long term increases in self-employment in the UK.

In addition, there is increasing interest and concern regarding the preparedness for retirement of British self-employed workers. While data from the late 1980s and mid 1990s showed that the self-employed were a relatively wealthy group (Parker, 2003), UK government statistics show the proportion of the self-employed participating in a pension or retirement plan

fell from 30 percent to 14 percent from 2007 to 2016 (Department for Work and Pensions, 2018). This is in contrast to the trends for employees, for whom pension participation increased substantially as a result of the UK governments' policy of obliging employers to automatically enrol most of their employees in a workplace pension scheme (Cribb and Emmerson, 2016).

II. How Non-Standard Work Affects Pension Coverage

There is a growing concern that many self-employed workers deal with more precarious working conditions than their traditionally employed counterparts, lacking the safety net provided by job-related agreements between workers and employers. Over their working life, many earn less and bear more risk than employees (Hamilton 2000, Maskowitz and Vissing-Jorgensen, 2002). In many countries, they have also reduced access to public pension rights and often need to manage on an individual basis their risky financial decisions, such as pension plan participation and contributions (Möhring, 2014). Their pension adequacy is thus of great concern (EU Pension Adequacy Report, 2018). We now discuss this issue in more detail for each of our three countries.

US

In the US, Social Security retired worker benefits are available to those with ten years (or more precisely, forty quarters) of covered employment. Benefits are based on an individual's highest thirty-five years of (wage) indexed earnings, with a progressive formula applied to average earnings to generate the benefit amount and an actuarial adjustment for claiming before

or after the full retirement age.² The average monthly benefit for new retired worker recipients in 2016 was \$1,592 for men and \$1,217 for women (Social Security Administration, 2018; Table 6.B3). For recent cohorts of beneficiaries, the average replacement rate is 44 percent (Khan et al., 2018). The program is funded by a tax of 6.2 percent of earnings up to \$132,900 (in 2019) paid by employers and an additional 6.2 percent paid by employees.³ These contributions fund retired worker benefits, Disability Insurance (DI) benefits, and benefits to dependent spouses, children, and survivors of disabled and retired worker beneficiaries. Beneficiaries age 65 and above with very low income and assets may be eligible for Supplemental Security Income (SSI) benefits, which top up the monthly benefit to \$771 for an individual or \$1,157 for a couple.

² In 2019, the progressive benefit formula replaces the first \$926 of Average Indexed Monthly Earnings (AIME) at 90 percent, the next \$4,657 of AIME at 32 percent, and the remainder at 15 percent. The Full Retirement Age (FRA) depends on birth cohort and has been rising over time, from 65 for those born in or before 1937 to 67 for those born in or after 1960; for a worker turning 66 in 2019, the FRA is 66. A worker can claim benefits as early as age 62; for a worker with a FRA of 66, there is an actuarial reduction of 25 percent (relative to the FRA benefit) for claiming at age 62 and an actuarial increase of 32 percent (relative to the FRA benefit) for claiming at age 70.

³ There is an additional 1.45 percent tax on earnings, paid both by employers and employees (2.9 percent total), which funds Medicare. The Medicare tax applies to all earnings (there is no cap) and to self-employment earnings.

The self-employed are covered by Social Security. While not covered by the program at its inception in 1935, the self-employed were added to the rolls of covered workers between 1950 and 1965 (Social Security Administration, 2018; Table 2.A1).⁴ Self-employed workers pay the full 12.4 percent tax on their net earnings.⁵ Employed and self-employed workers earn eligibility for benefits in the same way (in 2019, each \$1,360 of annual earnings counts as a quarter of covered earnings, up to four per year), and a worker may combine periods of work in employment and self-employment to reach the minimum contribution period. If self-employed workers have annual net earnings under \$400, their earnings are not subject to payroll tax.⁶

Social Security provisions are thus essentially the same for those engaged in standard and non-standard work, since there are no major differences in the treatment of self-employed and employed workers (other non-standard employees – e.g., those working for a temp agency or on a short-term contract – also face the same rules as standard employees). The primary way in

⁴ Different groups of self-employed workers joined Social Security at different times: non-farm self-employed (except members of professional groups) joined in 1950, while farm workers and various groups of professionals joined in 1954, 1956, and 1965. Members of the clergy and religious orders were subject to different rules.

⁵ Net earnings reflect gross earnings minus one half of Social Security taxes. This adjustment maintains parity in the treatment of the employed and self-employed, as the employer's share of the tax is not considered part of the wage.

⁶ Note that there is an optional reporting method that can allow those with net earnings under \$400 to have their earnings count for Social Security (Social Security Administration, 2019).

which non-standard work can affect Social Security benefits in the US, then, is if non-standard earnings are lower, more volatile, or more subject to underreporting than standard earnings.

A large literature explores earnings in employment versus self-employment, with many studies pointing to lower earnings in self-employment. For example, Hamilton (2000) reports that median earnings of a self-employed worker over a ten-year period are 35 percent lower than earnings of a comparable employed worker; he also finds some evidence for the “superstar” hypothesis, as self-employment earnings exceed earnings from employment for the top quartile of the self-employment earnings distribution. Hurst and Pugsley (2011) emphasize that the non-pecuniary benefits of self-employment attract some people into self-employment despite lower earnings, while Dawson et al. (2014) point to overconfidence as a factor that may explain entry into self-employment and subsequent low earnings.

Levine and Rubinstein (2017) point to substantial differences between the incorporated and unincorporated self-employed that may help to explain earnings differences. The incorporated self-employed: 1) are more likely to engage in non-routine cognitive work; 2) are more educated and more likely to have had high self-esteem and engaged in illicit activities as teenagers; and 3) earn more than comparable workers while employed and also experience an increase in earnings upon switching to self-employment. By contrast, the unincorporated self-employed are more likely to be engaged in manual work, have less education, and experience a drop in earnings upon switching to self-employment. The relatively larger number of unincorporated than incorporated self-employed may thus explain why average earnings are lower for the self-employed than for the employed. A second theory is that lower earnings among the self-employed than the employed may reflect (greater) underreporting of self-employment income on household surveys. Hurst et al. (2014) concludes that the self-employed

underreport their income by about 25 percent based on finding much higher consumption relative to reported income for the self-employed, a finding that can potentially account for much of the earnings gap in previous studies. Pissarides and Weber (1989) have similar findings for the UK.

Whatever the gap in earnings between the self-employed and the employed, underreporting of self-employed income to tax authorities could reduce Social Security benefits for this group. There is ample of evidence of this behavior, as reviewed in Slemrod (2007). He reports a “tax gap” of 43 percent for business income, representing the unpaid tax liability as a share of total tax liability (paid and unpaid). Within this category, underreporting is highest for farm net income (72 percent of liability unpaid) and non-farm proprietor income (57 percent unpaid) and lower for partnership, S corporation, and other like arrangements (18 percent unpaid). Underreporting is only 1 percent for tax liability from wages and salaries. As Slemrod notes, “there is substantial evidence that the extent of evasion for sole proprietor income is high compared to such income sources as wages, salaries, interest, and dividends.”

These findings have implications for the pension coverage of those engaged in non-standard work. While it is not entirely clear whether the self-employed have lower average earnings than the employed, it is clear that a lower fraction of their earnings are reported to tax authorities, which will result in a lower Social Security benefit entitlement – perhaps dramatically so, based on data from Slemrod (2007), although that evidence does not allow us to distinguish whether there are a larger number of people who underreport their income more modestly or a smaller number who underreport more substantially. The progressive nature of the Social Security benefit formula ensures a higher replacement rate for those with lower (reported) earnings, but the benefit amount will be lower in absolute terms, leaving the worker exposed to a higher risk of financial insecurity in retirement. If a worker is engaged in non-standard work for

an employer (e.g., is on a temporary contract or working for a help agency), then the worker's earnings will typically be reported correctly to tax authorities. If the earnings for such work are lower than what could be earned in a comparable standard job, or if the non-standard worker's earnings trajectory is more subject to gaps between employment spells, then the benefit will be lower than that received by a standard worker.

UK

The UK currently has a flat rate state pension with entitlement depending on the number of years of contributions made, not the amount of these contributions. Employees and the self-employed accrue entitlements in broadly similar ways. The main way of building entitlements is by having enough income from employment or self-employment to pay payroll taxes called National Insurance Contributions (NICs). In addition, people can build entitlement through “credits” for the receipt of certain qualifying transfer payments such as child benefit for a child aged under 12. While the rules are broadly similar for employees and the self-employed, a lower proportion of the self-employed accrue entitlement to the state pension in a given year, as their earnings are less likely to exceed the threshold for build entitlement through NICs. This section sets out in more detail how the rules for state pension accrue vary by type of worker and provides estimates of accrual and how, and why, this has changed over the last decade.

Eligibility for a state pension in the UK is determined by the contributions that an individual has made – or the “credits” that they have received for other activities – during their working life. Since April 2016, the UK moved to a very simple state pension system. Individuals need to make 35 years of contributions (or to have credits made on their behalf) in order to

receive a full state pension, known as the Single Tier Pension (STP), which in 2019–20 will be worth £168.60 (\$219.18) per week. Those with between 10 and 35 years of contributions receive a proportionately lower award (for example 20/35ths for someone with 20 years of contributions) while those with fewer than 10 years of contributions are not eligible for any state pension. All that matters is the number of years in which contributions have been made: two individuals who both make contributions for 35 years will both get the same state pension even if the actual amounts contributed are very different.

Individuals can receive the state pension from the “state pension age” (which is rising from 65 in 2018 to 66 in 2020). There is also no work or earnings test: people can continue in paid work while receiving the state pension without penalty, though it is subject to income tax. Differences in state pension accrual between those in standard and non-standard employment only emerge from differences in contributions.

The most common form of contribution is through the payment of NICs, which is a tax on the earnings of employees and the self-employed. Employees build entitlement to a state pension through paying NICs if they earn more than £118 per week in 2019–20 (£6,136 – or \$7977 – per year). This regime also applies to “owner-managers” (who are employed by their own incorporated company). NICs are applied per job, so those with multiple jobs pay lower NICs than someone earning the same total amount in only one job, but if they do not earn more than £118 in at least one job, they will not accrue any state pension entitlement.

The self-employed pay NICs once their profits are above £6,365 per year in 2019–20. This is very similar to the earnings threshold for an employee, meaning these rules are broadly aligned across employees and the self-employed. Workers who do not earn enough to build state pension entitlement through NICs can build entitlement through receiving “credits” for certain

activities, including receiving unemployment or incapacity benefits. More importantly for workers, those receiving child benefit (CB; a transfer payment paid to over 80% of families with children) for a child aged under 12 are also credited as if they have made NICs contributions,⁷ as are those receiving Working Tax Credit (WTC; an in-work benefit for low income families similar to EITC in the United States). Reforms currently underway will extend coverage of these credits further.

Given all these rules, actual differences in state pension accrual between employees and the self-employed therefore depends on differences in the level and distribution of employment income and, for those who do not have sufficient employment income, whether they are in receipt of CB for a child aged under 12 or WTC. For those not getting credits lower employment income among the self-employed – or lower *reporting* of employment income by the self-employed – can translate into a lower state pension entitlement.

Table 1 shows the fraction of people with different economic activities that accrue entitlement to the state pension in 2016. It shows the fraction that accrue entitlement due to having sufficient earnings and the fraction who do not qualify through earnings but who do qualify via CB or the WTC. We look at people who are only employees, only self-employed, and those who are both employees and self-employed. Almost 93% of employees earn enough to pay NICs and therefore accrue state pension entitlement in that way, while just under 2% do not earn enough but qualify via receipt of CB/WTC. This leaves just over 5% of employees not accruing state pension rights in 2016.

⁷ Only one person within a family can receive child benefit, usually the mother.

Table 1: Percentage of workers potentially accruing state pension entitlement in 2016

	% of workforce	Qualify via earnings	Qualify via CB/WTC	Total not qualifying
Employees (only)	86.8%	92.9	1.7	5.4
Of which:				
Not owner-managers	85.4%	93.0	1.7	5.3
Owner-managers	1.3%	84.0	2.0	14.0
Self-employed (only)	11.8%	75.1	5.9	18.9
Employees and self-employed	1.5%	88.8	2.4	8.8
Total workforce	100%	90.7	2.2	7.1

Source: Authors' calculations using the UK Family Resources Survey.

On average, earnings among the self-employed are much lower than for employees. For this reason, only 75% of the self-employed have sufficient earnings to build entitlement through NICs. A further 6% of this group accrue entitlement through receipt of CB/WTC. This leaves almost 19% not accruing any state pension entitlement in that year: more than three times greater than the rate of non-accrual observed among employees. Owner managers are also less likely than average to accrue pension entitlement (14% do not qualify in 2016), due to a higher share with low earnings. 9% of those who are both employees and self-employed do not qualify in 2016.

Table 1 sets out that in 2016, 7.1% of workers did not accrue any entitlement towards the STP because their employment income was too low and they were not credited with NICs contributions due to receipt of a qualifying benefit. Table 2 produces equivalent figures for 2007 (chosen as it predates the global financial crisis) and finds that the proportion of workers not accruing state pension rights in that year was lower at 6.2%. The 0.9 percentage point increase in the proportion not accruing rights towards the state pension between 2007 and 2016 can be decomposed into: changes in the proportion of employees and self-employed who earn too little to pay NICs; a 2010 reform that restricted “credits” to those receiving child benefit for a child aged under 12 (rather than under 16); and the increase in the share of the workforce that is self-employed. The resulting decomposition is shown in Table 2. It shows that approximately one-third of the increase in the share of the workforce not accruing state pension rights is due to an increase in the proportion of employees not earning enough to pay NICs. One-third is due to the less generous child benefit crediting, and the remaining one-third is due to the rising share of the workforce that are self-employed rather than employed.

The figures in Tables 1 and 2 above relate to accrual in a single year. However, an individual only needs to contribute (or receive credits) for 35 years to get a full Single Tier Pension. Given that a full working life can be much longer than this, many people without contributions in any given year could still expect to receive a full STP. This might be particularly relevant to those who spend some years in self-employment (potentially with earnings too low to qualify) after having spent many more years as an employee. Indeed, analysis of the work histories of those aged 50 and over in 2006–07 in section IV shows that while 26% of men and women had spent some time in self-employment only 6% had spent more than half of their working-life in self-employment.

Table 2: Decomposing the recent rise in the share of the UK workforce not accruing state pension rights between 2007 and 2016.

Proportion of workers not accruing state pension in 2007	6.2%
Increase between 2007 and 2016 due to:	
Rise in proportion of employees earning too little	+0.3%
Rise in proportion of self-employed earning too little	−0.0%
Child benefit crediting for child under 12 rather than child under 16	+0.3%
Rise in share of workforce that is self-employed	+0.3%
Proportion of workers not accruing state pension in 2016	7.1%

Source: Authors' calculations using the UK Family Resources Survey.

Finally, the UK Single Tier Pension system was only introduced in 2016–17. Prior to that, the state pension system had two components: a flat rate Basic State Pension (BSP; worth only £115.95 per week in 2015–16) and an earnings-related State Second Pension (S2P). Under this system, both employees and the self-employed who paid NICs (or received credits through qualifying benefits) would accrue entitlement to the BSP in the same way. However, employees could also accrue entitlement for the earnings-related S2P either through NICs or through receiving child benefit for a child aged under 6. In contrast, the self-employed could not accrue entitlement through their earnings and could only do so if they received CB (for a child under 6) or WTC. This meant most self-employed workers only accrued entitlement to the BSP.

As a result, those who spent large proportions of their working life in self-employment and reached the state pension age prior to April 2016 will receive a much lower state pension than those retiring at the same time having spent a large proportion of their working life in standard employment. This difference could, in some cases, be considerable: someone receiving a full “State Second Pension” on top of the “Basic State Pension” would have a state pension around 2.5 times greater than someone receiving just a full “Basic State Pension” and no “State Second Pension”.

Since the new “Single Tier Pension” amount is much higher than the old “Basic State Pension” (but less generous than the “Basic State Pension” plus a full “State Second Pension”), the UK’s 2016 reform has made the state pension system considerably more generous for the self-employed for those reaching the state pension age from April 2016 onwards.

Germany

The German pension system is the oldest formal pension system in the world and was originally targeted to traditional blue-collar workers only. Many of these historical features are still in place and affect atypical jobs in particular ways. The German pension system began as a funded disability insurance scheme in 1889 but was quickly broadened into a social security system with disability and old-age pensions covering blue- and white-collar workers. After the catastrophes of two world wars, a hyperinflation and a great depression, the system was transformed into a pay-as-you-go (PAYG) system in 1957, with benefits designed to continue in retirement the living standard achieved during the working life. From the beginning, civil servants and the self-employed were not part of the system.

All traditionally employed workers must enroll in the main pillar of the German pension system. This covers about 85% of the labor force. Contributions are currently about 19% of gross wages, paid half by the employee and half by the employer. Individual pension benefits are proportional to the individual labor income averaged over the entire working career such that the relative income position of an individual during the working life is preserved during retirement. The key element of this mechanism is the “earnings point” (EP). For every year, a person with exactly the average earnings receives one EP. The number of EPs earned each year thus reflects both the hourly wage and the number of hours. A full-time employed individual who earns twice the average hourly wage will receive two EPs per year; an individual with the average hourly wage who works part-time, say a third of full-time hours, will receive only 0.33 EPs. There is no redistribution between high and low earners within the pension system, leading to very small pensions for interrupted careers and/or part-time jobs. There is, however, social assistance that acts as a kind of minimum pension. In turn, there is an upper earnings threshold up to which contributions are levied and earning covered, essentially defining a maximum pension.

The actual benefit per month is calculated as the number of EPs earned over the working career times the point value; this value has been reduced recently and is currently about 32 Euros. The average pensioner has earned about 38 EPs, thus receiving a monthly pension benefit of 1,216 Euros.⁸ Average monthly gross earnings are 3,091 Euros,⁹ hence the gross replacement

⁸ Deutsche Rentenversicherung Bund: Rentenversicherung in Zahlen 2018

⁹ Deutsche Rentenversicherung Bund: Rentenversicherungsbericht 2018

rate is about 40%. Since taxes and contributions are substantially lower during retirement, the net replacement is much higher at about 65%.

The self-employed are a heterogeneous group in terms of pensions. In general, they are not covered by the main public pillar. However, many professions have their own pension subsystems. Examples are frequent among well-paid professions such as medical doctors and lawyers. There is also a (heavily subsidized) subsystem for artists. These subsystems are self-contained and partially funded. In spite of government subsidies, pension subsystems for artists and similar gig-economy workers deliver very small benefits that are often below the poverty line. The self-employed may also voluntarily participate in the main public pillar. This was fairly common until the 1990s, but most of the self-employed are no longer in the public pillar, mainly due to the low expected return on contributions. Many of the self-employed preferred to invest in mutual funds, stocks, and bonds, but some are uncovered by any type of old-age provision (see below).

Workers employed in “mini jobs” – labor contracts with monthly earnings below 450 Euros – have historically lacked pension coverage. These jobs are an important feature in the German labor market with a share of about 7% in 2017 (as shown below). Many mini jobs are held by women in part-time; another big group consists of pensioners who want to increase their (often small) public pension and/or participate in some active occupation. Until 2013, mini jobs were exempt from the mandatory main public pillar. While these employees could voluntarily enroll, almost none did, similar to the self-employed. Since 2013, mini jobs have been covered by the main public pillar. Employers must pay a 15% contribution rate; employees are expected to add 3.6% of gross earnings but may opt out. In fact, most mini job workers do this since their

own contribution would earn them only about 0.15 earnings points annually which corresponds to about 4.50 Euro of their monthly pension.¹⁰

In order to prevent old-age poverty, Germany introduced “social assistance for older and disabled individuals” in 2001. This program serves as a minimum pension for individuals who are aged 65 and over or disabled. Benefits are computed by a complicated formula that is based on actual personal needs (for example, care if disabled) and complemented by housing allowances. The monthly “standard benefit” is 424 Euros for a single individual, but the actual amount varies considerably, with an average benefit of 786 Euros per month.¹¹ This benefit is strictly means tested both in terms of income and assets, with a 100% claw-back rate for pensions and other income sources. About 3.2% of individuals 65+ receive this kind of social assistance. Non-take-up is estimated to be between 50 and 70% but there is no reliable evidence due to the dearth of data on assets and other household income sources.¹²

There is much discussion these days that Germany may need to establish a subsidized pension pathway for individuals with atypical careers, who often end up with a pension not much

¹⁰ https://www.deutsche-rentenversicherung.de/Allgemein/de/Inhalt/2_Rente_Reha/01_rente/04_in_der_rente/04_grundsicherung_bei_kleinstrenten/00_01_grundsicherung_anspruch_und_hoehe.html

¹¹ Statistisches Bundesamt (zuletzt 2015), Fachserie 13, Reihe 2.2; ab 2016: Genesis Datenbank

¹² Kaltenborn, Bruno (2016). „Grundsicherung wegen Alters: Zugänge und Rentenbezug.”

Bericht für das Forschungsnetzwerk Alterssicherung der Deutschen Rentenversicherung Bund. Berlin.

(if at all) greater than the social assistance benefit. Proposals range from a more redistributive pension system (such as the concave schedule of the US social security system) to tax-financed add-ons to low pensions (for example, via upgrading of low EPs). There are also proposals to reduce the clawback rate for pensions and other income sources in the social assistance system, not the least in order to reduce the strong disincentives to work in this income range. Finally, there are plans to bring the self-employed into the main public pension system, as is the case in all EU countries except Germany. All these developments are likely to be part of a pension reform package that is expected to enter the Bundestag in the fall of 2019.

III. Trends in Non-Standard Work

US

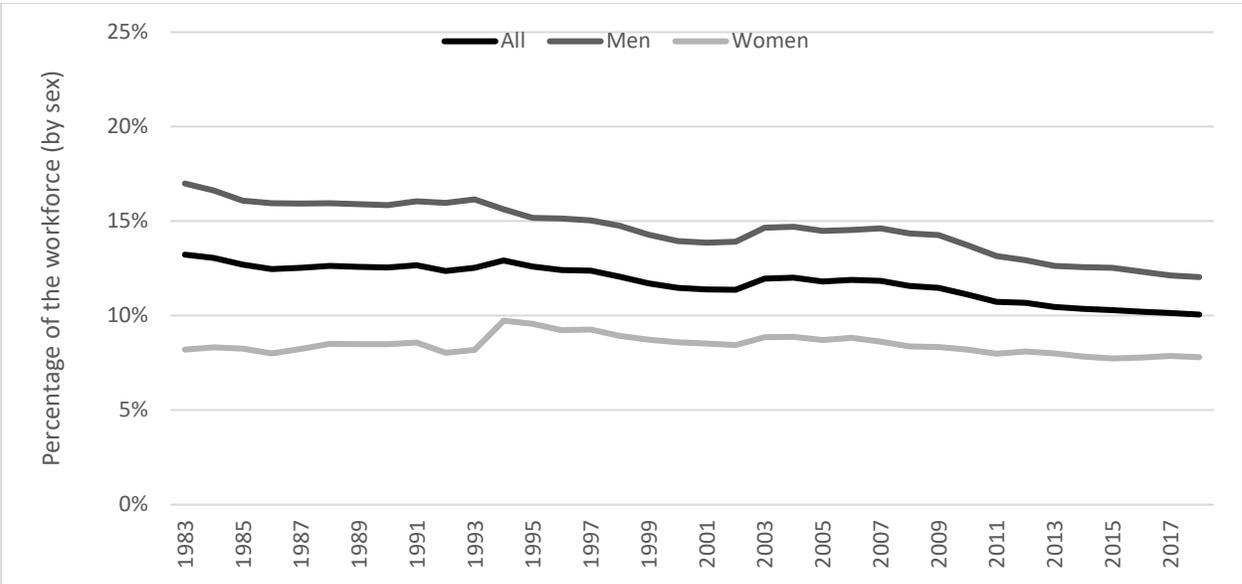
In the US, measuring trends in contingent and alternative work has been hampered by a lack of regular data, as mentioned above. The Current Population Survey (CPS) is the primary survey used to measure labor force trends. While self-employment status is a standard item in the CPS (and indeed, in most all labor force surveys), the sequence of questions that provides the information needed to calculate alternative and contingent work status is not part of the regular survey. Rather, this information is collected in the Contingent Worker Supplement (CWS), which was administered in 1995, 1997, 1999, 2001, 2005, and 2017. The lack of data between

2005 and 2017 makes it difficult to examine trends in alternative or contingent work (as defined by the BLS, see discussion above).¹³

Given this challenge, we focus on using the CPS to estimate those measures that may be estimated consistently over time, namely self-employment (total and by incorporation status) as well as whether workers have multiple jobs and are working part-time. Figure 2 presents the share of the workforce that is self-employed. This has been declining over time, from a peak of 13 percent in the mid-1990s to 10 percent in 2018. In interpreting this decline, one must be mindful of the evidence discussed above suggesting that self-employment as captured in tax data has been rising over this period. There is a distinct difference by gender, with 12 percent of male workers and 8 percent of female workers in self-employment in 2018.

¹³ GAO (2015) attempts to estimate the size of the contingent work force using the General Social Survey, Survey of Income and Program Participation, and various data sources from the Bureau of Labor Statistics. They find that employment by temporary help services has been relatively flat over time. Under their most expansive definition (which includes standard part-time employment), alternative work rose from 35.3 to 40.4 percent of the employed labor force between 2006 and 2010; however, all of the rise can be attributed to part-time work, which may have risen in part due to the Great Recession.

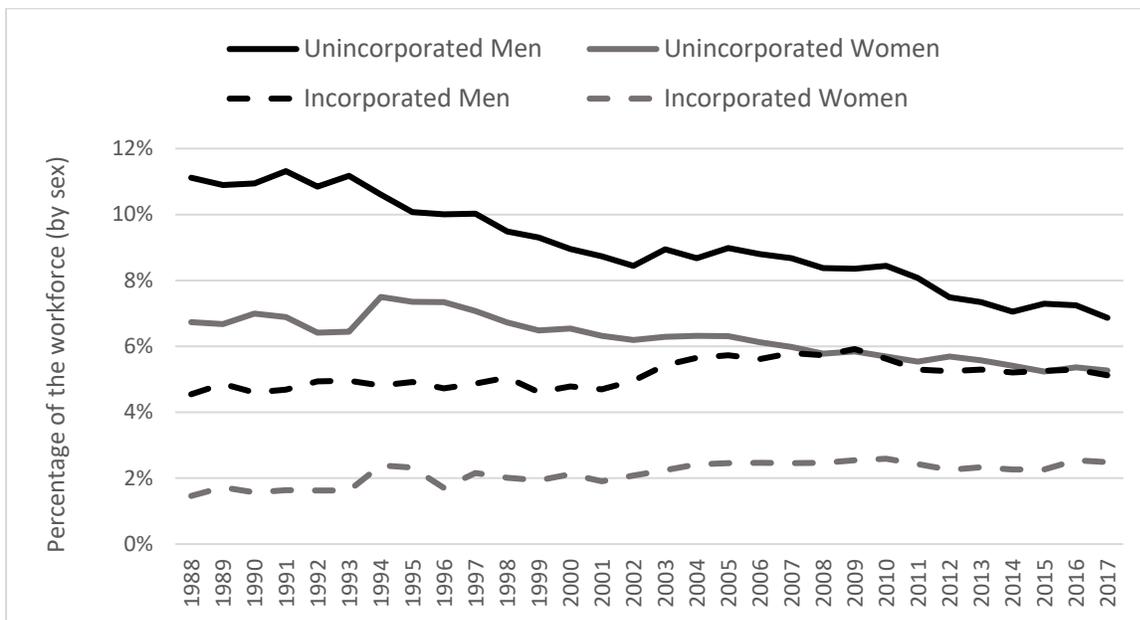
Figure 2: Proportion of workforce that are self-employed in the US, by sex, 1983-2018



Source: Current Population Survey. Ages 25-64 only.

Figure 3 displays self-employment as a share of the workforce, separating the self-employed by incorporation status. As Figure 3 makes evident, the decline in self-employment (as measured in the CPS) that was evident in Figure 2 is being driven by a decline in unincorporated self-employment. Incorporated self-employment has risen by about 1 percentage points for both men and women over the past three decades, although men’s incorporated self-employment has declined since the Great Recession.

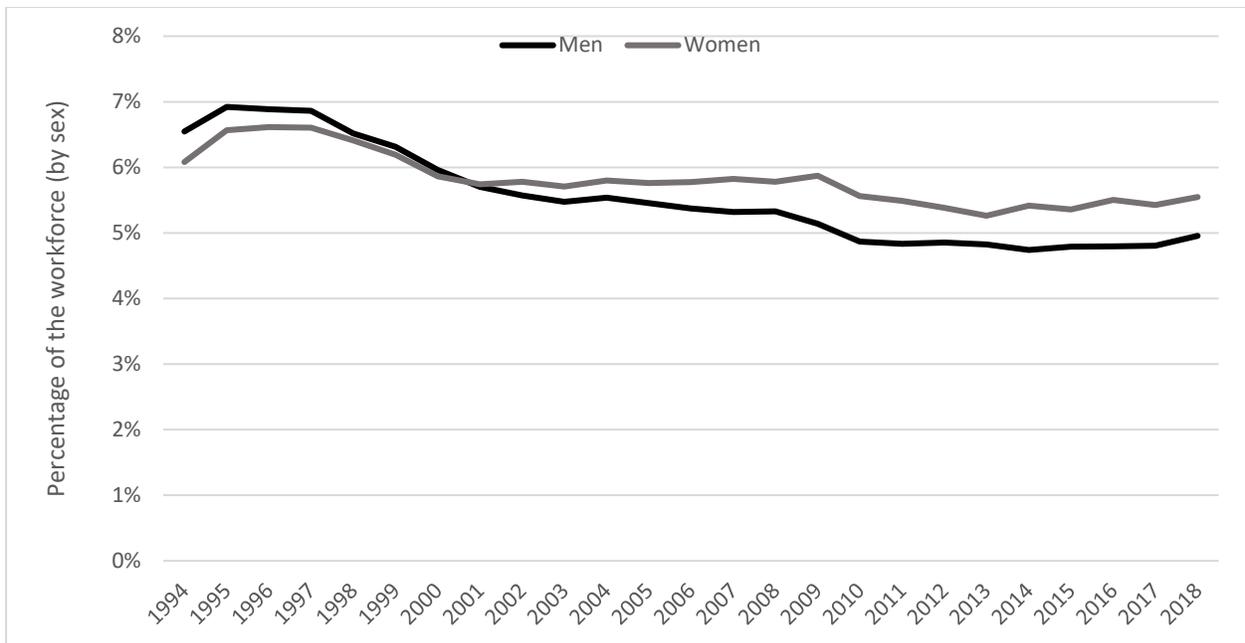
Figure 3: Proportion of workforce who are in incorporated and unincorporated self-employment in the US, by sex, 1988-2017



Source: Current Population Survey. Ages 25-64 only.

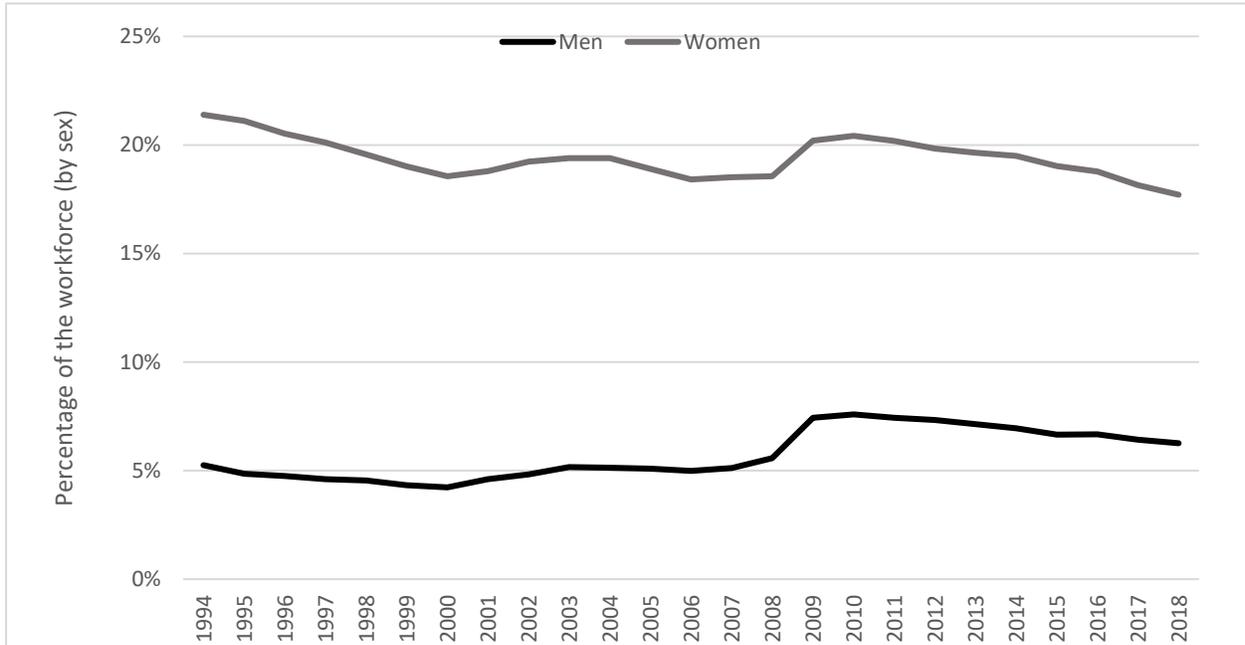
Figure 4 shows the share of the workforce that is working multiple jobs. This has declined over time by about 2 percentage points, with women slightly (by 0.5 percentage points) more likely to hold multiple jobs in 2018. Finally, Figure 5 shows the share of the workforce that is working part-time. Gender differences here are much more dramatic, with women about 3 times as likely to be working part time (18 percent of employed women are working part-time, compared to only 6 percent of employed men). The series for both men and women show an increase following the Great Recession, and the rate of part-time work for men has not yet returned to pre-recession levels. For women, there is a long-term decline in part-time work, likely connected the general rise in women’s participation in the work force over time.

Figure 4: Proportion of workforce who has multiple jobs in the US, by sex, 1994-2018



Source: Current Population Survey. Ages 25-64 only.

Figure 5: Proportion of workforce who is working part-time in the US, by sex, 1994-2018

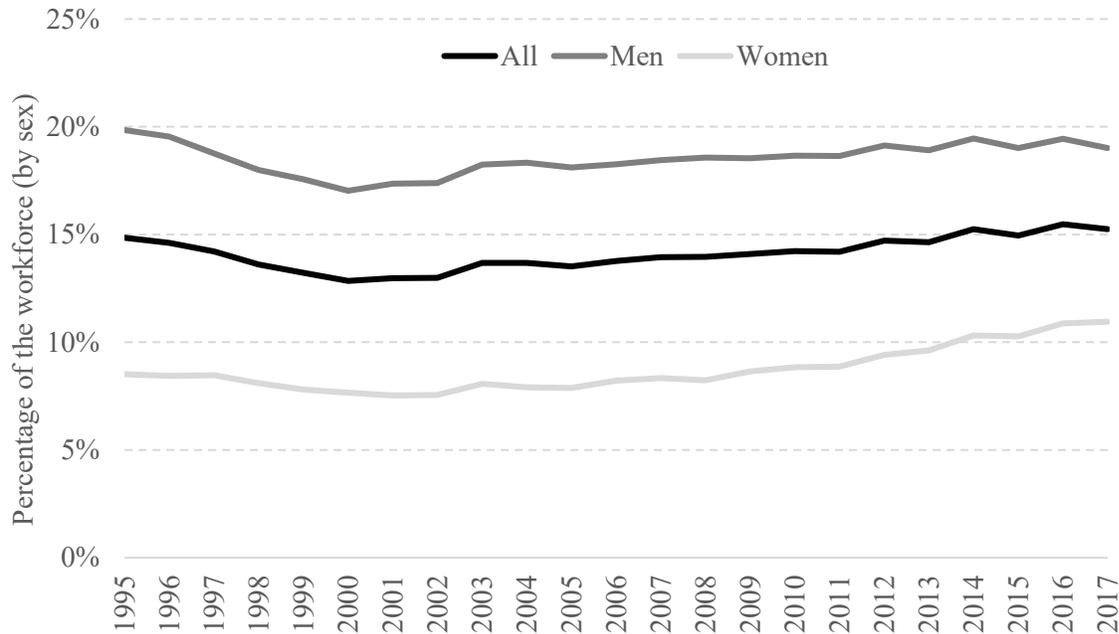


Source: Current Population Survey. Ages 25-64 only.

UK

Figure 6 shows the fraction of working 25 to 64 year olds in the UK for whom self-employment is their main economic activity. In 2017, 15.2% of workers were self-employed, close to the 20-year high of 15.5% seen in 2016. The fraction of workers that are self-employed fell throughout the late 1990s as employment rose rapidly, to a recent low of 12.8% in 2000, but has grown consistently since then. While self-employment is more common for men than women (19% vs 11% in 2017 respectively), it has grown more rapidly in recent years for women.

Figure 6: Proportion of workforce that are self-employed in the UK, by sex, 1995-2017



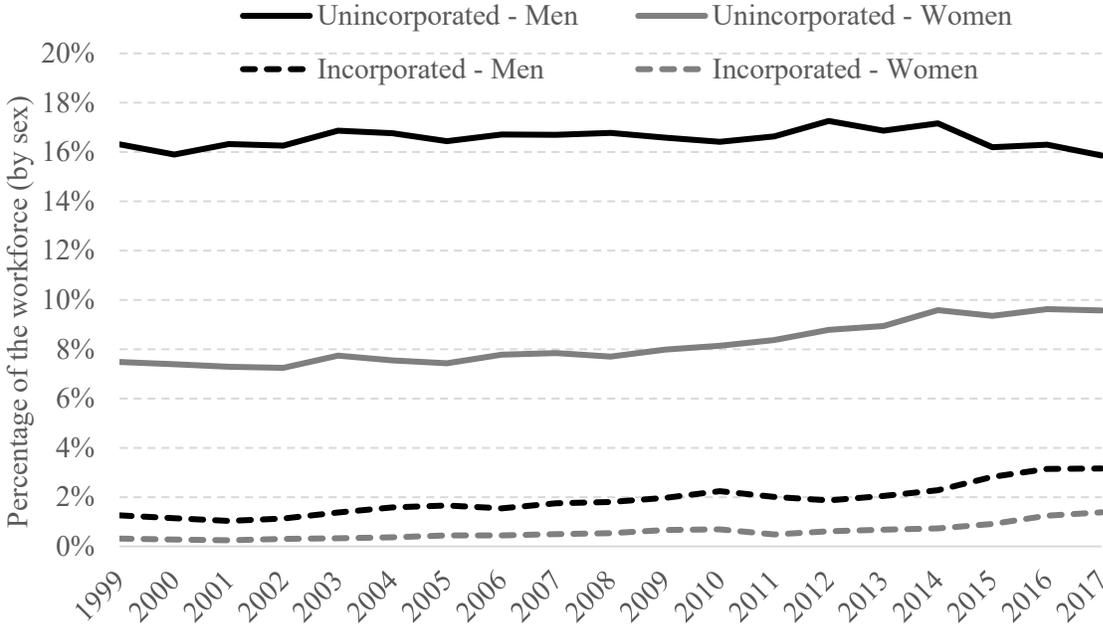
Source: Authors’ calculations using the UK Labour Force Survey Data. Notes: Age 25-64 only.

In the UK, people who are self-employed can either be “unincorporated” (those who are sole-traders or partners in a partnership) or “incorporated” (company owner-managers). While the tax and legal treatment of these two forms of self-employment are very different (see Adam et al., 2017), the key distinction is that for the unincorporated self-employed, profits of their business activity are taxed as earnings each year. For those who are incorporated, the owner-manager can pay themselves a taxable salary from the business that they own, and in addition, profits will be subject to corporation tax and can be paid out as dividends or retained within the business as desired by the business-owner.

Figure 7 shows, by sex, the change in unincorporated and incorporated self-employment since the data were first collected on it in 1999. Being unincorporated is far more common than incorporated (in 2017 16% of the workforce vs. 3% of the workforce for men, 10% vs. 1% for

women). However, much of the growth in self-employment over the last two decades has come from people working for their own incorporated business – all of the growth in male self-employment since 1999 has been in incorporated businesses, and a third of the growth in female self-employment.

Figure 7: Proportion of workforce who are in incorporated and unincorporated self-employment in the UK, by sex, 1999-2017

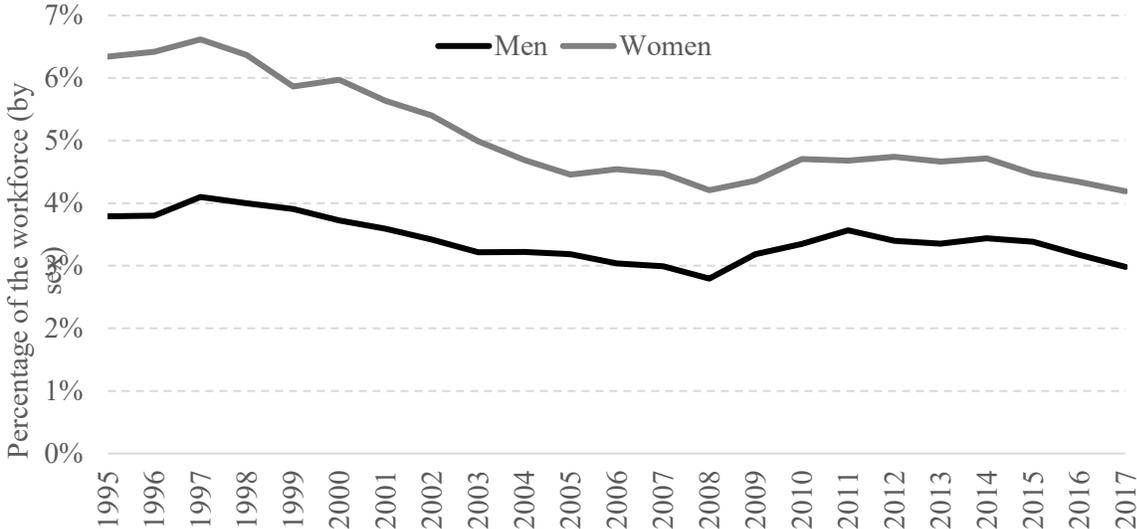


Source: Authors’ calculations using the UK Labour Force Survey Data. Notes: Age 25-64 only.

The gradual increases in self-employment in the UK are not mirrored by other long-run increases in non-standard work. Figure 8 shows that the proportion of workers who are working on a non-permanent (i.e. temporary) contract. Women are substantially more likely than men to work on a non-permanent contract, the reverse of the pattern by sex for self-employment. The

figure also shows that the last few years have seen a fall in the proportion working on non-permanent contracts, returning it to close to the levels seen at prior to the 2008-09 Recession. More strikingly, particularly for women, the levels of non-permanent contract work are substantially lower than they were in the mid-1990s. Since 1995, for women it has fallen from 6.3% to 4.2% of workers, and from 3.8% to 3.0% for men.

Figure 8: Proportion of workforce working in a non-permanent employee job in the UK, by sex, 1995-2017

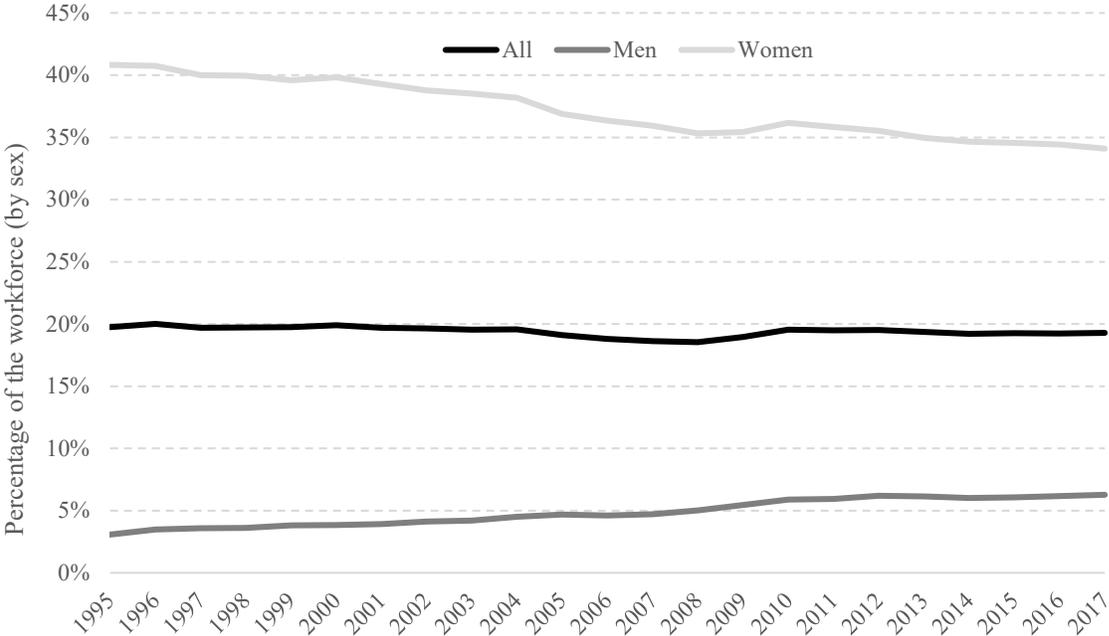


Source: Authors’ calculations using the UK Labour Force Survey Data. Notes: Age 25-64 only.

Part-time work, while not formally included in our definition of non-standard work, is also of interest. Figure 9 shows that the proportion of the workforce that works as a part-time employee is essentially unchanged over the last 20 years, despite an increase in the fraction of women in the workforce (who are more likely to work part-time). This is offset by a large fall in the fraction of the female workforce who work part-time (from 41% to 34%), although there is a

smaller increase in the proportion of men working part-time (from 3% to 6%). Belfield et al. (2017) showed that this increase in part-time work for men entirely occurred for low-paid men, for whom there was around a 15 percentage point increase in the fraction working part-time.

Figure 9: Proportion of workforce that are part time employees, by sex, 1995-2017

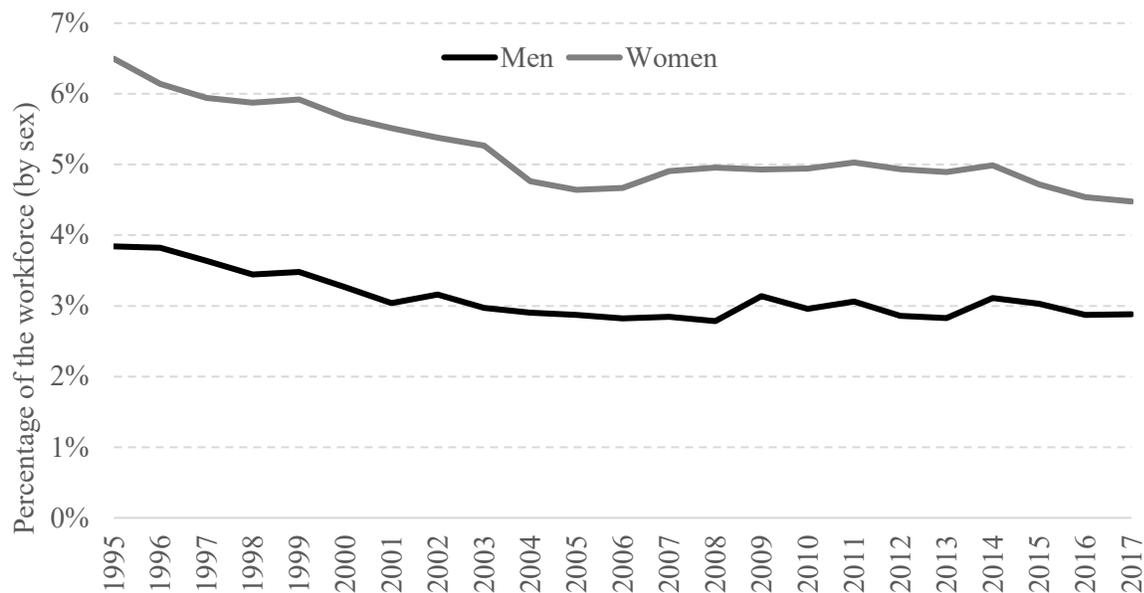


Source: Authors’ calculations using the UK Labour Force Survey Data. Notes: Age 25-64 only.

Women in paid work in the UK are also much more likely than men in paid work to have two or more paid jobs. The levels and trends in this measure are fairly similar to what was seen for the proportion working on a temporary contract. Figure 10 shows that between 1995 and 2017, the proportion of female workers who are working two or more jobs fell from 6.5% to 4.5%, slightly larger than the fall for men, which was from 3.8% to 2.9%.

Figure 10: Proportion of workforce with two or more paid jobs in the UK,

by sex, 1995-2017



Source: Authors' calculations using the UK Labour Force Survey Data. Notes: Age 25-64 only.

One aspect of non-standard work that is often discussed is the prevalence of “zero hours contracts.” We do not provide data on these contracts as there is considerable difficulty measuring trends in this form of work, as the term “zero hours contract” has become increasingly salient in recent years, leading to concerns of increased reporting of such contracts, rather than a genuine increase in their prevalence.

Germany

The German statistical system distinguishes “normal” and “atypical” employment. Dietz and Walwei (2006) define normal employment as a full-time, permanent occupation subject to social security contributions and characterized by a fixed contract between employer and

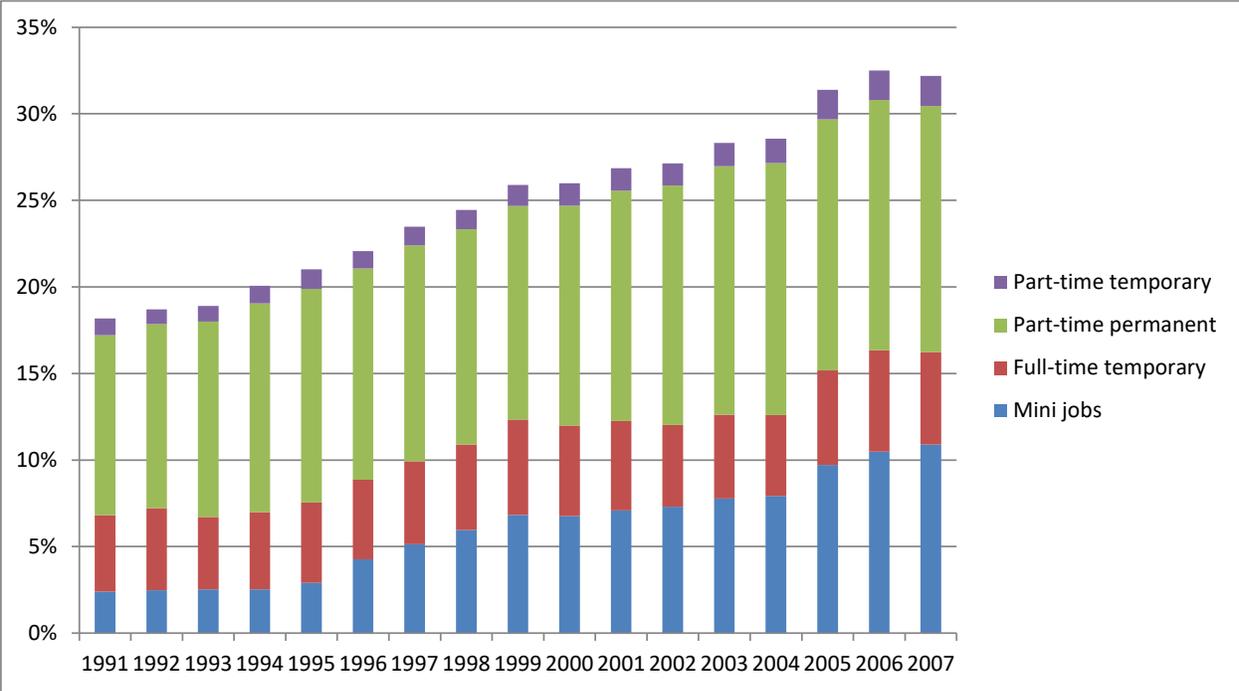
employee (“dependent employment”). Some authors (e.g. Schäfer und Seyda, 2008; Hoffmann und Walwei, 2002) add to this definition that the salary is determined by the social partners in the respective branch.

The German statistical system does not count self-employment as atypical. It distinguishes four types of atypical employment: (a) jobs with a temporary contract, (b) part-time jobs, (c) so called “mini jobs” in which employees earn less than currently 450 Euro per month and are not due to make social security contributions (but their employers are, see above), and (d) jobs provided by temp agencies. Note that (a) and (b) are not mutually exclusive, while (c) and (d) are regarded as dominating categories independent of hours worked. Mini jobs always have temporary contracts.

Figures 11 and 12, based on Sachverständigenrat (2008), show the development of atypical jobs between 1991 and 2007, especially the six-fold increase in the share of mini jobs (green bars in Figure 11) and a sevenfold increase in jobs provided by temp agencies (Figure 12). The share of mini jobs in dependent employment rose from about 2% in 1991 to almost 12% in 2007. According to the definition of the German statistical system, the largest category of atypical employment in Germany is part-time jobs with a permanent contract. Together with the other atypical employment categories, their share also rose but much less dramatically than mini jobs and jobs provided by temp agencies – the latter reached 750,000 in 2007, corresponding to about 2% of all dependently employed workers.

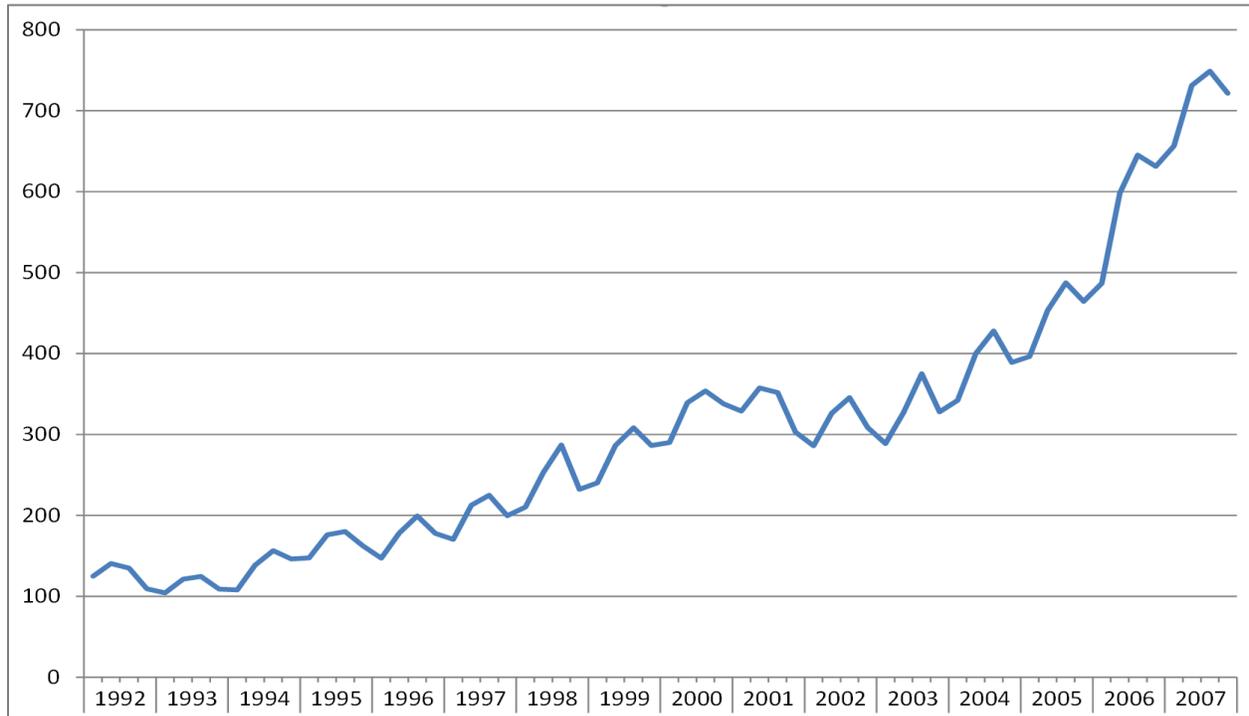
Figure 11: Atypical employment in Germany (share of total dependent employment),

1991-2007



Source: Sachverständigenrat (2008), p.433.

Figure 12: Employees of temp agencies in Germany, 1991-2007, in thousands.

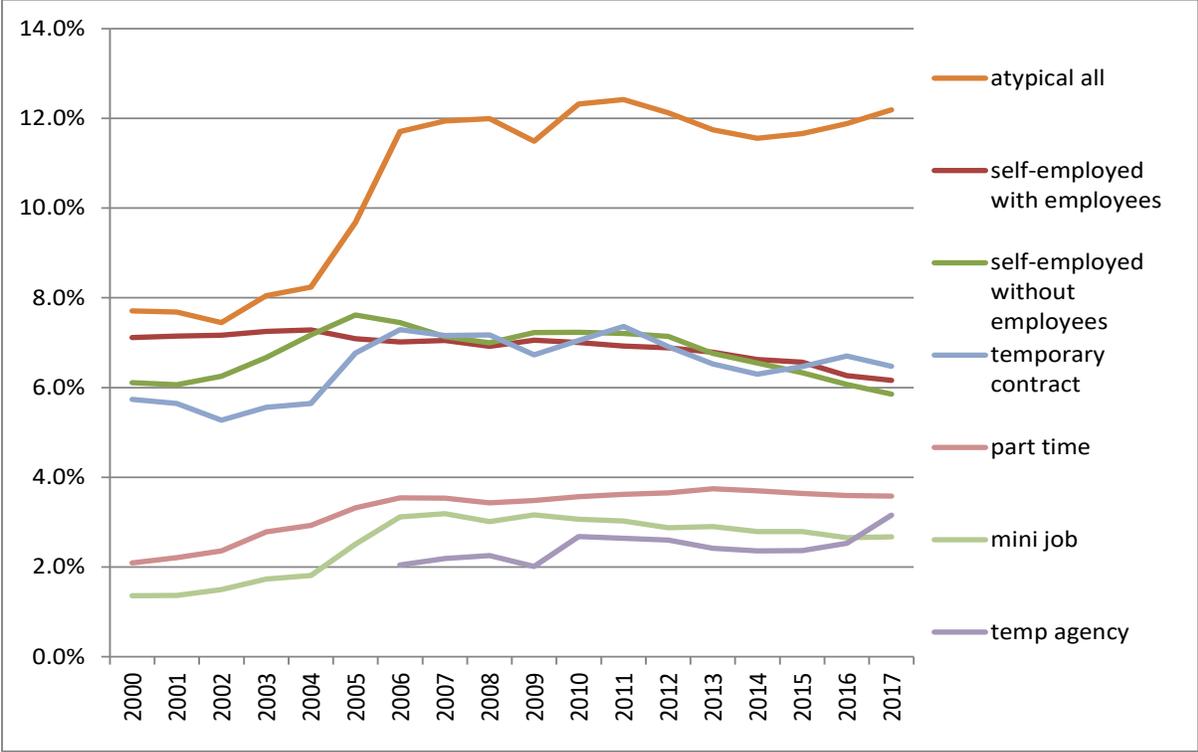


Source: Sachverständigenrat (2008), p.443.

This strong trend did not continue, as is shown in Figures 13 and 14, based on numbers provided the German Statistical Agency (Statistisches Jahrbuch, 2012, 2016 and 2018). After 2006, the steep increase of atypical employment suddenly stopped. Its share remained roughly constant for men but declined for women in all categories except for jobs provided by temp agencies. Ex ante, this trend reversal was a big surprise. It has to be seen in the context of the unprecedented overall job growth since the implementation of labor market reforms between 2002 and 2007 and the unexpected strong recovery of the German economy after the 2008 financial crisis. As a result, the effects of the 2008 crisis are hardly detectable in Figure 15 (right axis). This German “job miracle” increased “normal” employment as defined above – that is,

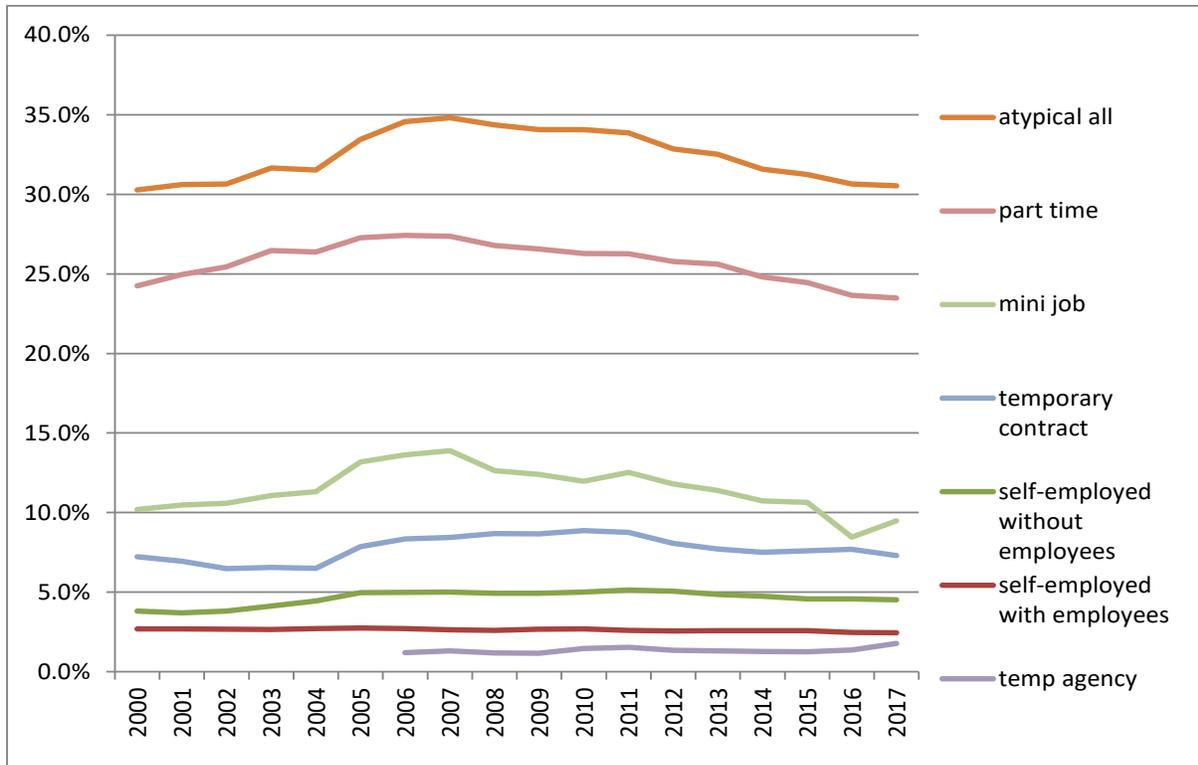
full-time permanent contracts covered by the German social security branches – both in absolute and relative terms (Figure 15, left axis). Women were particularly likely to change from atypical to normal jobs after 2007.

Figure 13: Atypical employment in Germany, Men, 2000-2017



Source: Authors' calculations using Statistisches Jahrbuch (2012, 2016, 2018).

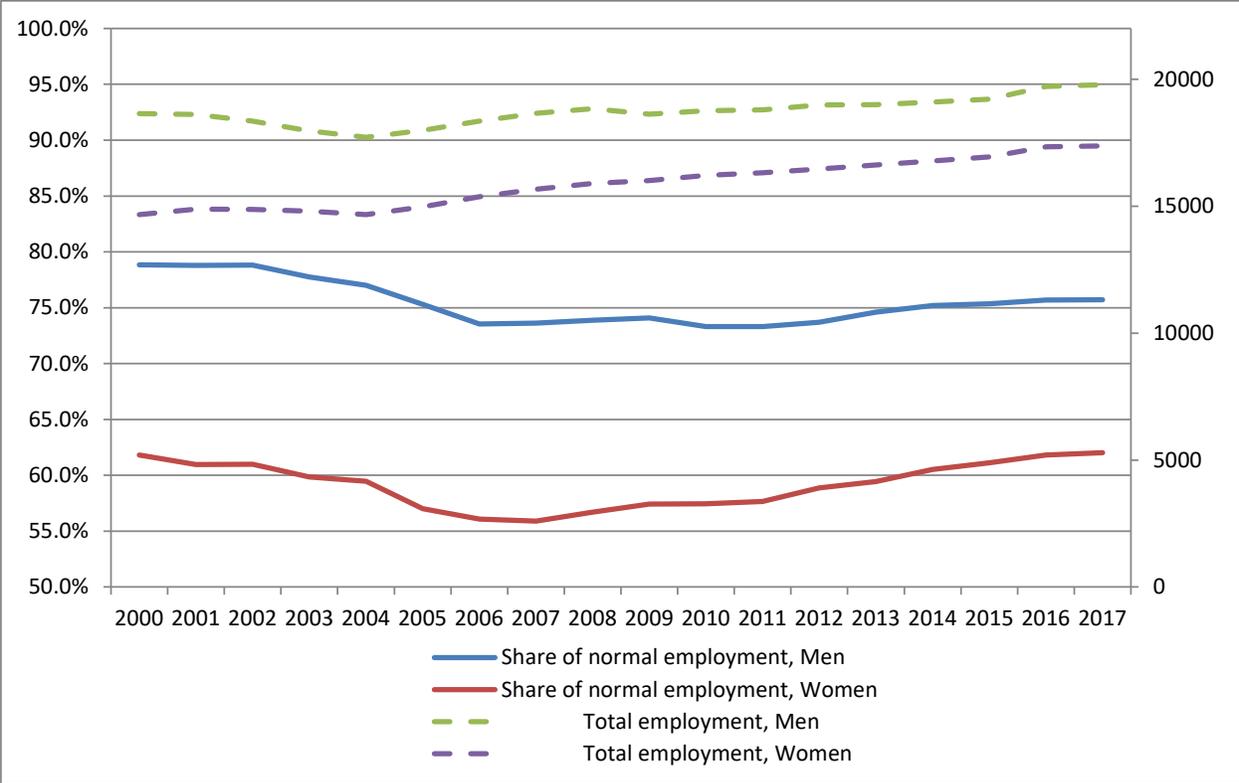
Figure 14: Atypical employment in Germany, Women, 2000-2017



Source: Authors' calculations using Statistisches Jahrbuch (2012, 2016, 2018).

Figures 13 and 14 also show that atypical employment has a strong gender pattern. In particular, part-time and mini jobs are much more frequent for women than for men, while normal employment is more frequent for males. It is noteworthy that the share of mini jobs in 2017 is lower than in 2000: many women have changed to jobs with more hours and higher salaries since 2005.

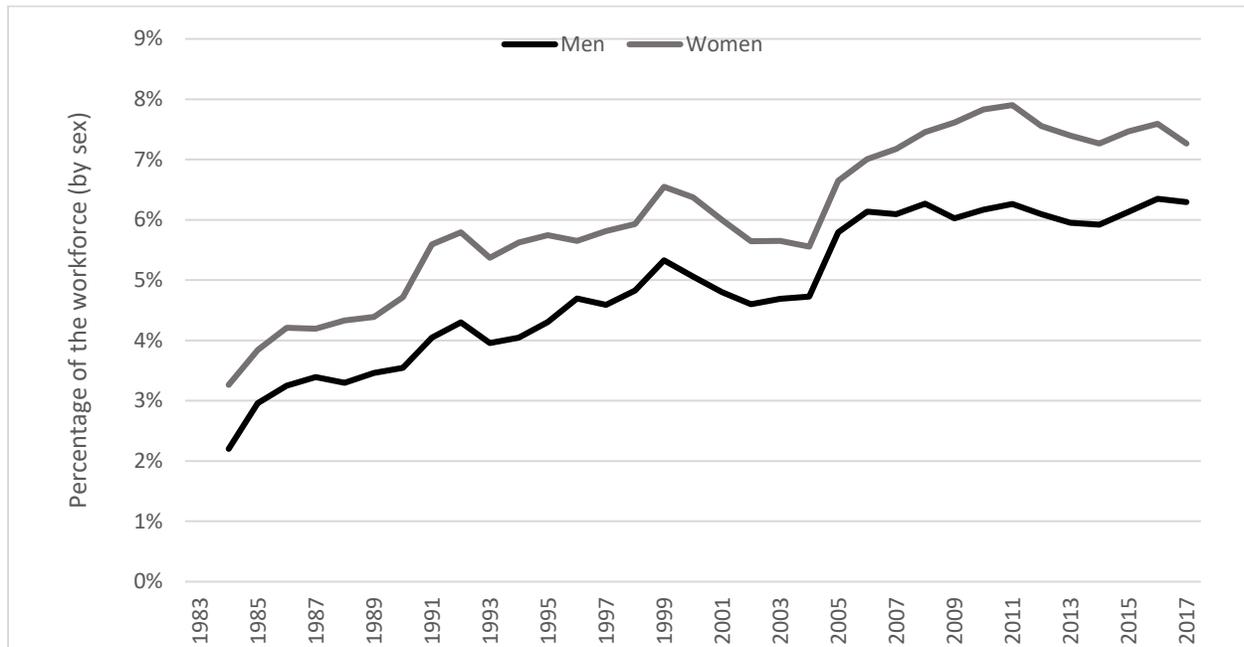
Figure 15: Total employment and share of normal employment in Germany, 2000-2017



This strong gender pattern is particularly visible in the share of jobs with a temporary contract (Figure 16). The share of women without a permanent contract is about 1 to 1.5 percentage points higher than that of men. The trend is similar to the other categories of atypical employment: strongly increasing until after the financial crisis, then flattening for men and decreasing for women.

Figure 16: Proportion of workforce working in a non-permanent employee job

in Germany, by sex, 1983-2017

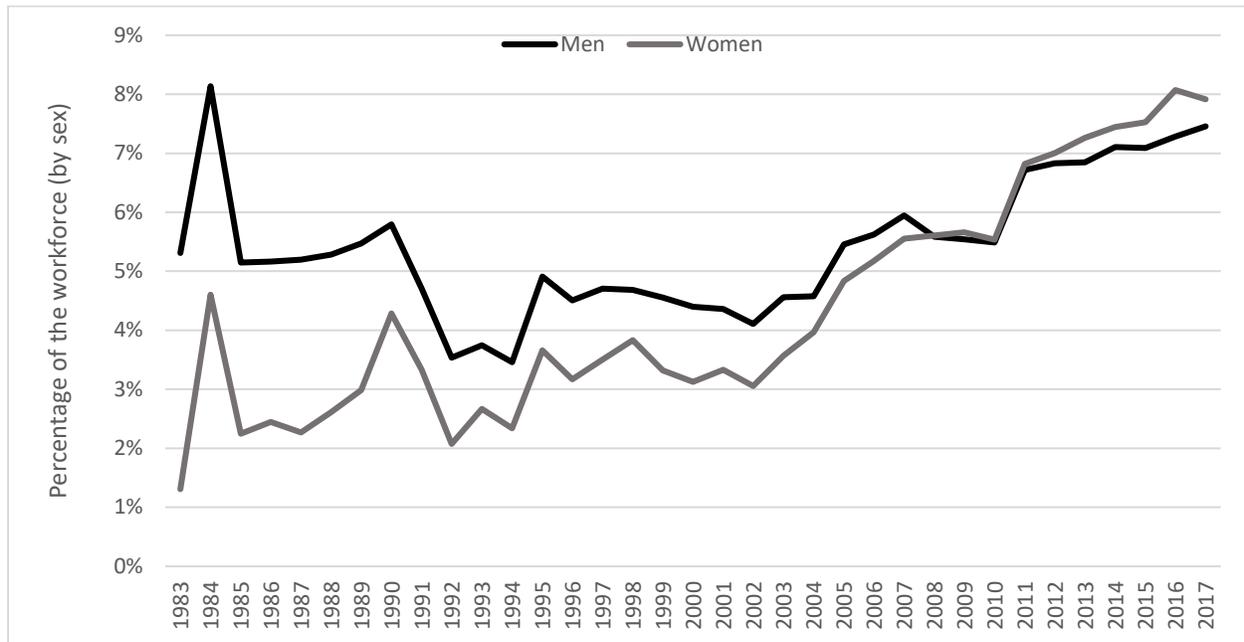


Source: Authors' calculations using the Labour Force Survey Data (EUROSTAT). Notes: Age 25-64 only.

A reversal of the gender pattern is shown in Figure 17. Atypical employment conditions may sometimes imply that workers have to work in more than a single job to make ends meet. In the 1980 and 1990s, this was far more frequent for men than for women. This difference became smaller after 2000; since 2010, there have been more women than men holding two or more jobs.

Figure 17: Proportion of workforce with two or more paid jobs in Germany,

by sex, 1983-2017

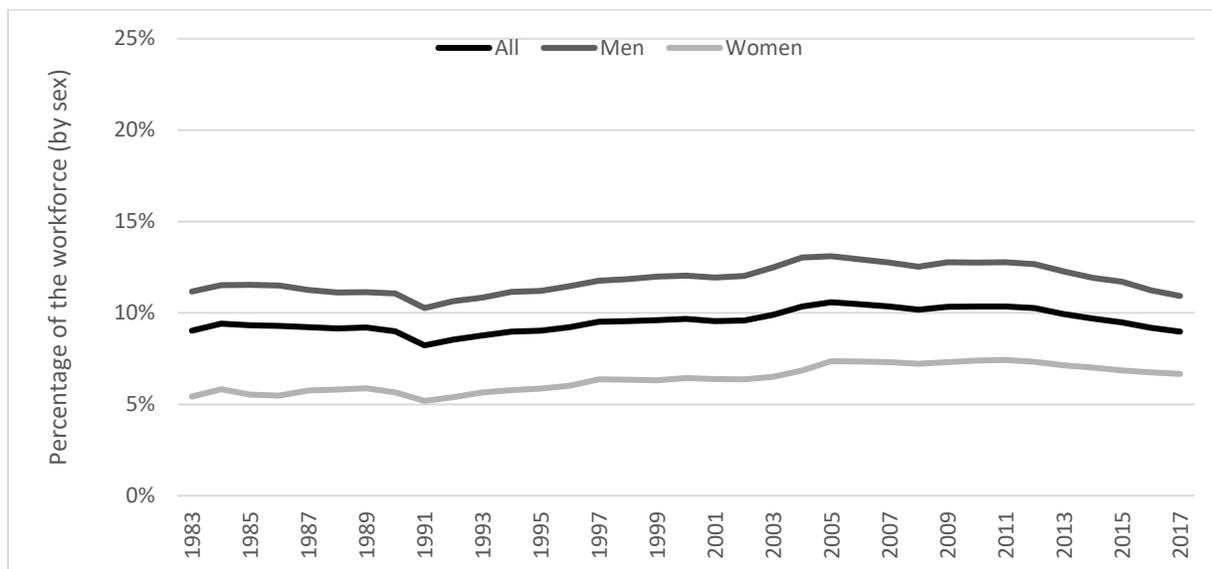


Source: Authors' calculations using the Labour Force Survey Data (EUROSTAT). Notes: Age 25-64 only.

Germany does not count self-employment as atypical. On first sight, self-employment appears rather stable, as seen in Figure 18. However, it is important to distinguish between those self-employed who run a business with and without employees. Figure 19 shows that the former category stayed more or less constant while the latter category steeply increased between 1991 and 2005, corresponding to the steep increase in mini jobs and jobs provided by temp agencies. It is then followed by an equally similar decline. We speculate that the same explanation holds: between 1991 and 2005, self-employment was one form of escaping unemployment, which was still high in Germany during the 1990s. After the job miracle following the financial crisis of

2008, many of these self-employed individuals managed to obtain a normal employment contract.

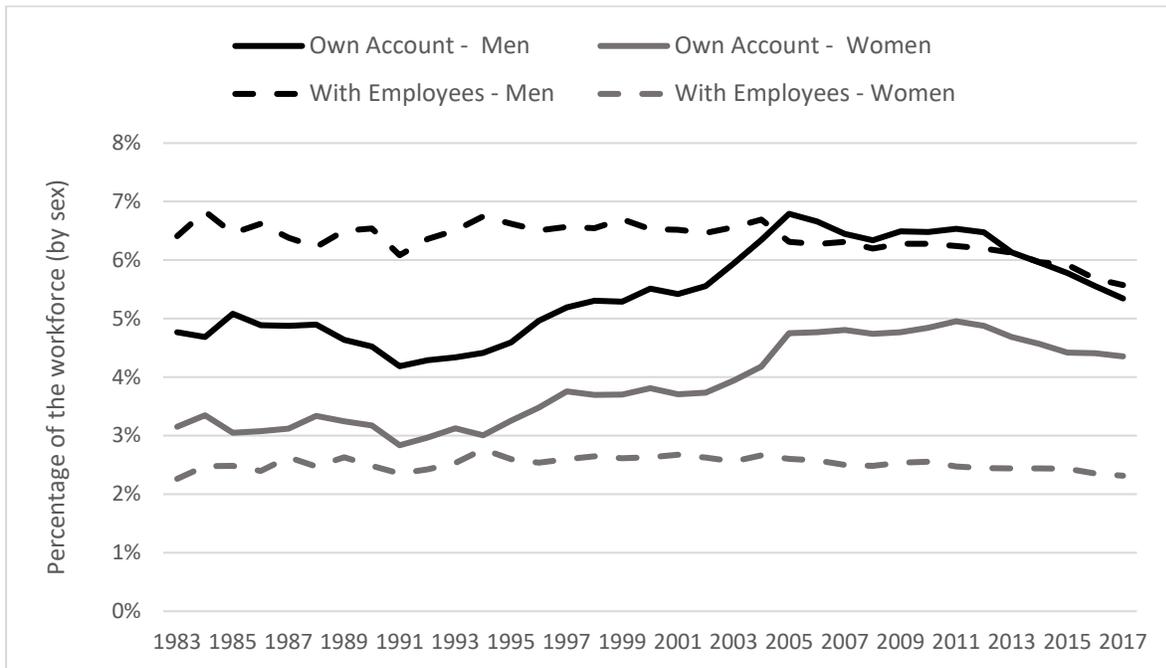
Figure 18: Proportion of workforce that are self-employed in Germany, by sex, 1983-2017



Source: Authors' calculations using the Labour Force Survey Data (EUROSTAT). Notes: Age 25-64 only.

Figure 19: Proportion of workforce who are self-employed with and without employees

in Germany, by sex, 1983-2017



Source: Authors' calculations using the Labour Force Survey Data (EUROSTAT). Notes: Age 25-64 only.

IV. Former Self-Employment and Financial Well-Being in Retirement

The aim of this subsection is to understand how the pension rules have affected the financial well-being of non-standard workers. We start with a comparison across 27 European countries (and Israel) from the same data source. We then report results of similar analyses for the UK and US. While our analyses are best viewed as descriptive due to the potential endogeneity of non-standard work, they suggest that engaging in such work may affect retirement security.

Europe (and Israel)

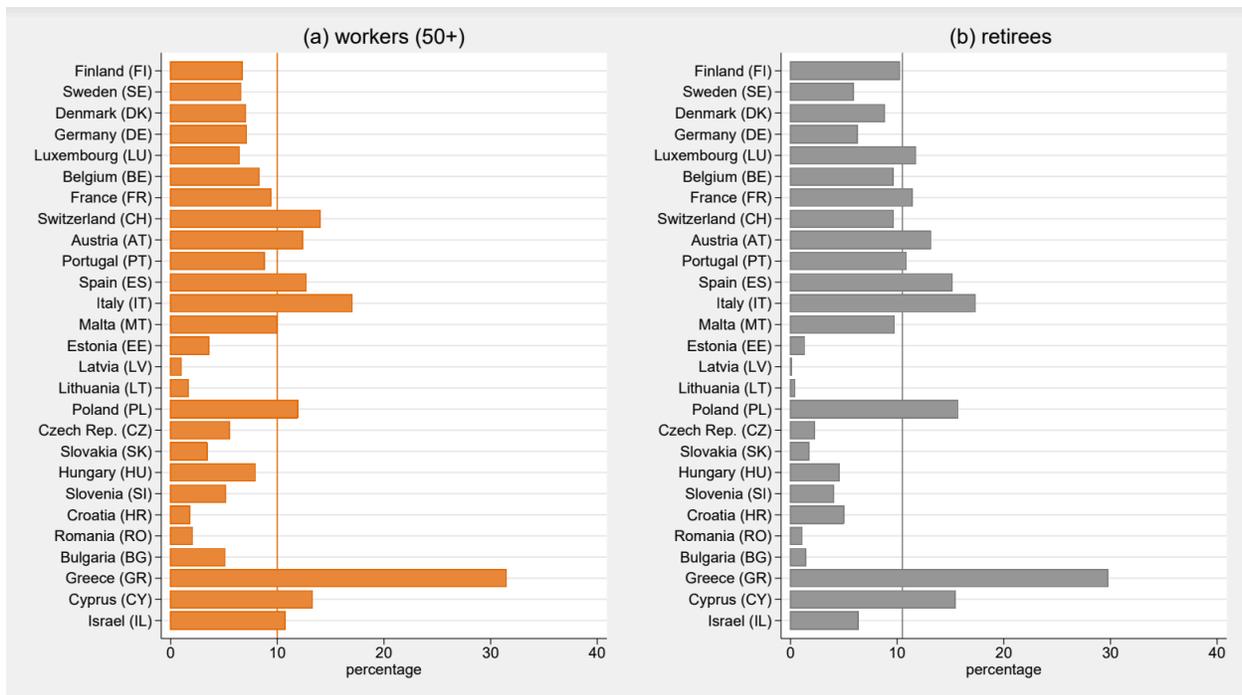
We use data from the Survey of Health, Ageing and Retirement in Europe (SHARE), a longitudinal study of workers and retirees age 50 and above. Retrospective data on each working spell lasting longer than 6 months was collected in waves 3 and 7 of the survey (“SHARELIFE”), while data on current and recent employment was collected in the interim waves. These data have the advantage of (retrospectively) observing individuals throughout their entire career, many of them far into their retirement. We are able to observe individuals who engaged in standard and non-standard work, both before and after retirement. An additional advantage is that we may broaden our view beyond the three countries discussed thus far to include all other EU member states and Israel. One disadvantage of these data is that we do not have sufficient sample size to analyze all categories of non-standard work separately; we therefore focus on self-employed vs. traditionally employed workers. We call a respondent “formerly self-employed” if she has worked for at least 50% of her working life so far; more information about the sample selection criteria for this analysis is available in Pettinicchi and

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Boersch-Supan (2018). The average duration of working lives in our sample is 38 (41) years for workers (retirees).

Figure 20 reports the prevalence of self-employment among current workers (panel a) and retirees (panel b) in our sample. Differences between countries reflect differences in labor markets. South-European countries display higher prevalence of self-employed while the lower prevalence in Eastern-European countries is due to the non-market economy in place before 1990.

Figure 20: Prevalence of self-employed among workers and retirees in SHARE, by country



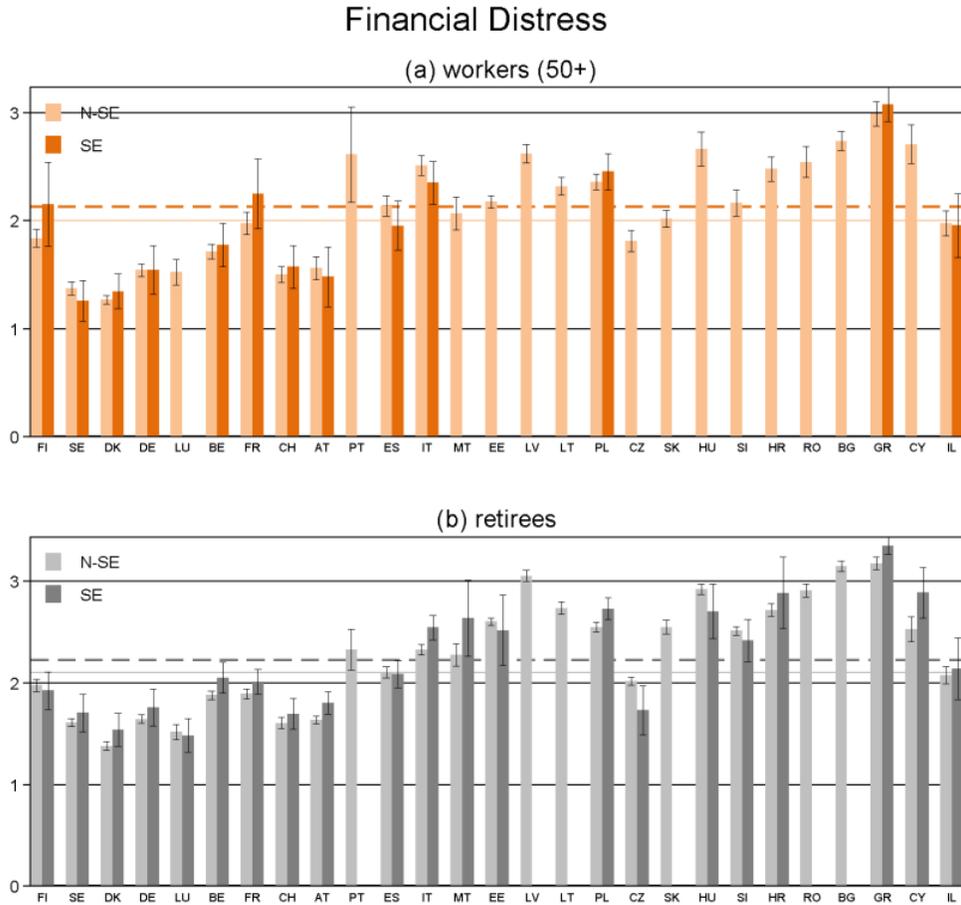
Note: Vertical lines are weighted averages over the SHARE. Panel (a) refers to workers. Panel (b) refers to retirees. Source: Wave 7 release 7.0.0.

Financial distress and poverty

We use two measures of monetary poverty: self-reported financial distress and an income-based poverty measure. Self-reported financial hardship is captured by the SHARE question “*Thinking of your household's total monthly income, would you say that your household is able to make ends meet... 1. With great difficulty 2. With some difficulty 3. Fairly easily 4. Easily.*” Our distress measure is computed based on recoded answers (1 to “easily” and 4 to “with great difficulty”), where higher values mean higher inability to make ends meet. Figure 21 displays the weighted average values by country. Formerly self-employed workers and retirees generally report higher financial distress than do their counterparts in regular employment, although differences are not always statistically significant.

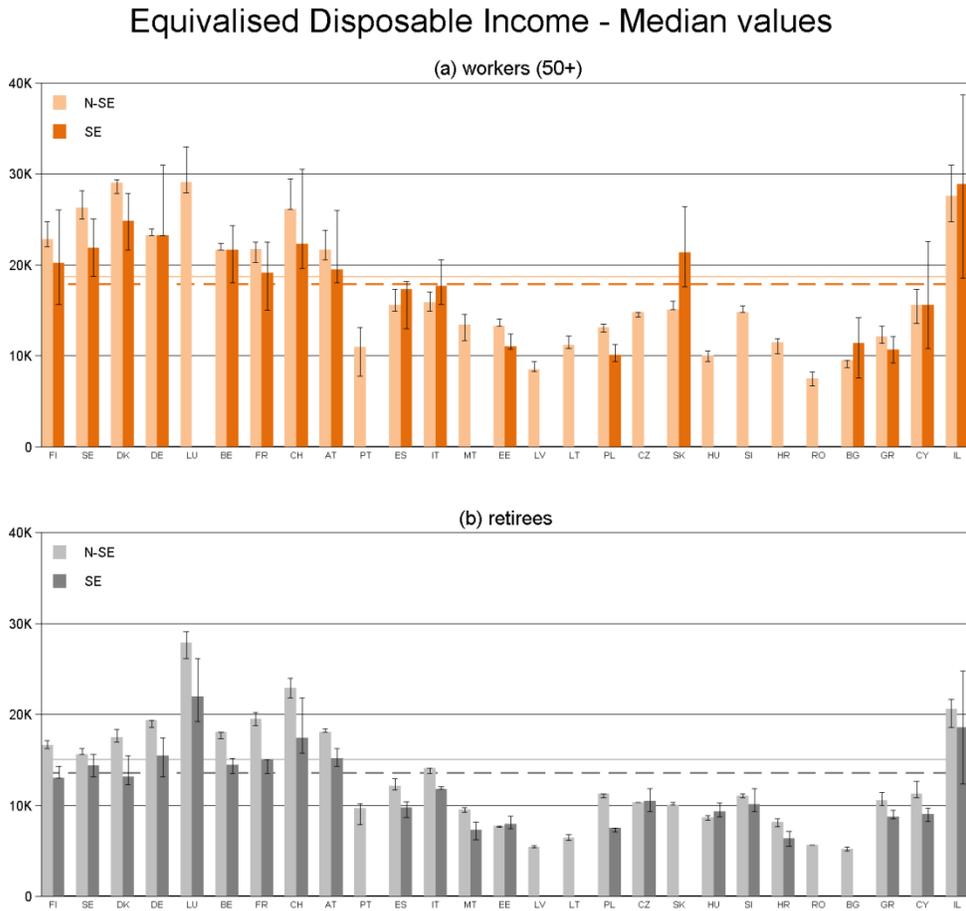
The income-based poverty measure is computed using equivalised disposable income. This is the total income of a household, after tax and other deductions, that is available for spending or saving, divided by the equivalized number of household members. Household members are equivalised by weighting each member according to their age, using the so-called modified OECD equivalence scale. Figure 22 displays country-specific median values of the equivalised disposable income. The values are adjusted for international differences in purchasing power. While we find mixed evidence for current workers, we find a statistically significant income gap between the formerly self-employed and formerly traditionally employed in the subsample of retirees.

Figure 21: Average level of financial distress among workers and retirees in SHARE by self-employment status, by country



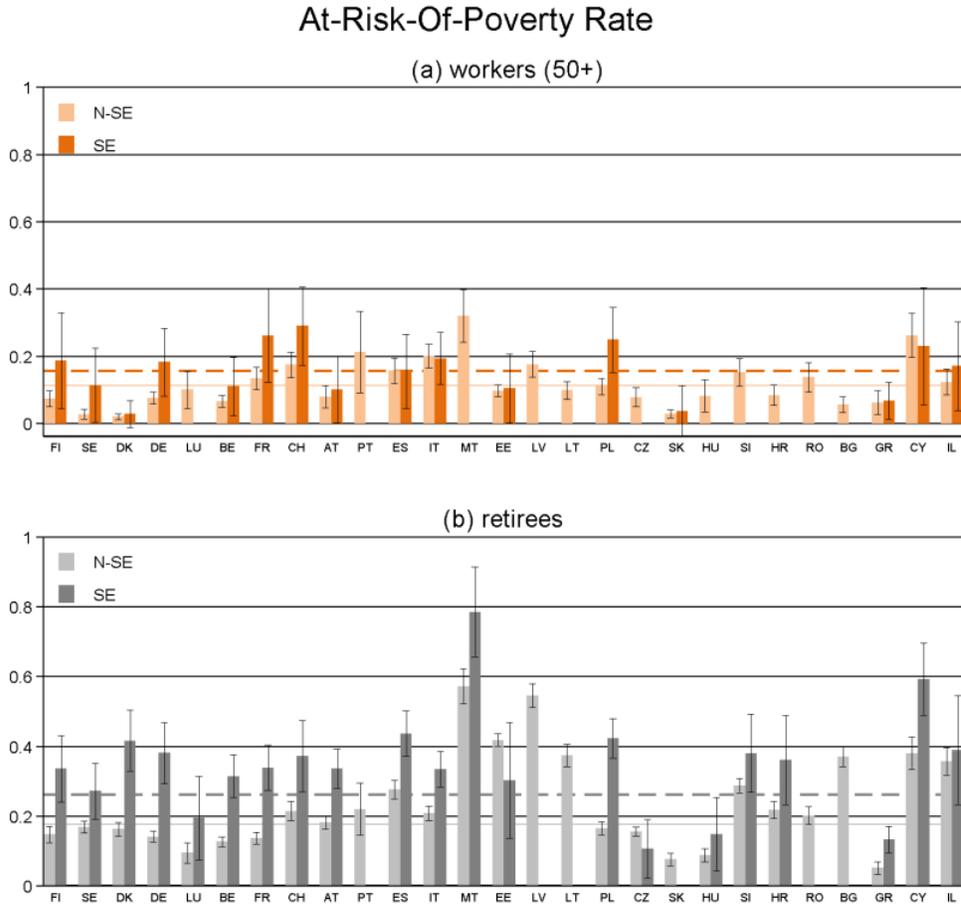
Notes: A high score indicates lower quality of life. Min: 1, Max: 4. Panel (a) refers to workers. Panel (b) refers to retirees. N-SE refers to formerly non-self-employed. SE refers to formerly self-employed. Horizontal lines are weighted averages over the SHARE countries. Value is not reported if the sample size is lower than 25 observations. Source: Wave 7 release 7.0.0.

Figure 22: Equivalised disposable income (median values) for workers and retirees in SHARE by self-employment status, by country



Notes: Panel (a) refers to workers. Panel (b) refers to retirees. N-SE refers to formerly non-self-employed. SE refers to formerly self-employed. Horizontal lines are weighted averages over the SHARE countries. Value is not reported if the sample size is lower than 25 observations. Source: Wave 7 release 7.0.0.

Figure 23: At-risk-of-poverty (AROP) rates for workers and retirees in SHARE by self-employment status, by country



Notes: Panel (a) refers to workers. Panel (b) refers to retirees. N-SE refers to formerly non-self-employed. SE refers to formerly self-employed. Horizontal lines are weighted averages over the SHARE countries. Value is not reported if the sample size is lower than 25 observations. Source: Wave 7 release 7.0.0.

Next we construct an income-based poverty measure, computed as the share of people with an equivalised disposable income (after social transfer) below the at-risk-of-poverty threshold, which is set at 60% of the national median equivalised disposable income (after social transfers). This indicator, the at-risk-of-poverty (AROP) rate, does not measure wealth or poverty, but low income in comparison to other residents in that country (which does not necessarily imply a low standard of living). Figure 23 reports the AROP rates by country. The formerly self-employed have higher AROP rates than the formerly traditionally employed, perhaps explained by lower lifetime earnings. The gap for retirees is almost twice as large as the gap for current workers.

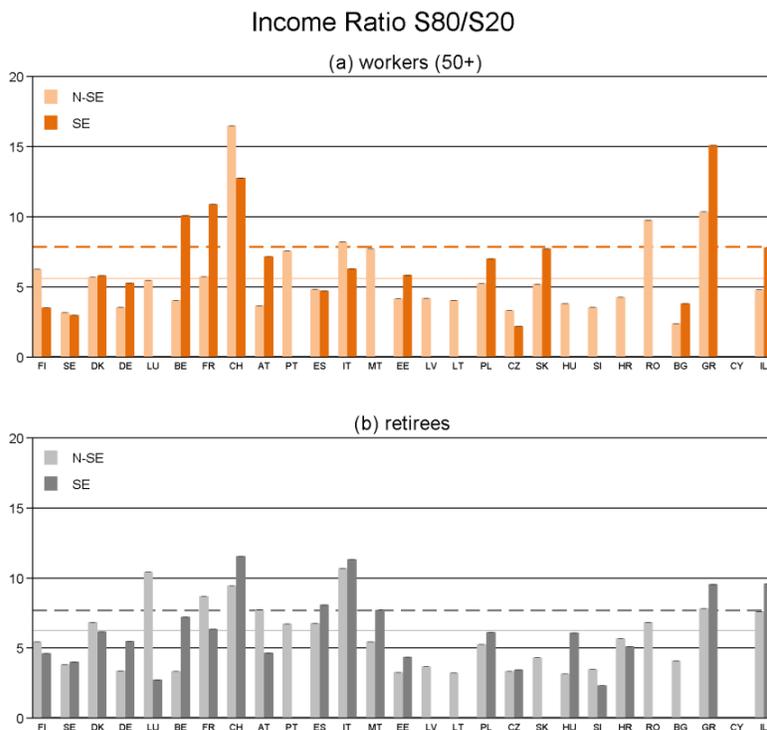
Income and inequality

In order to shed light on the composition of the formerly self-employed group, we look at country-specific income distributions. For several countries, the mode of income distribution of the formerly self-employed is just before the AROP threshold. This implies that a lump-sum transfer in addition to their pension income would reduce the AROP rates considerably. The income distribution of the formerly self-employed has a fatter right tail than that of the formerly employed. This reflects the presence of highly successful self-employed.

We can describe income inequality by a single number using the income quintile share ratio (also called the S80/S20 ratio). It is calculated as the ratio of total income received by the 20% of the population with the highest income (the top quintile) to that received by the 20% of the population with the lowest income (the bottom quintile). Figure 24 displays the income quintile share ratio by country. In most countries, formerly self-employed workers displayed

higher income inequality than formerly employed workers. This difference is smaller for the subsample of retired workers.

Figure 24: Income quintile share ratio (80/20) for workers and retirees in share by self-employment status, by country

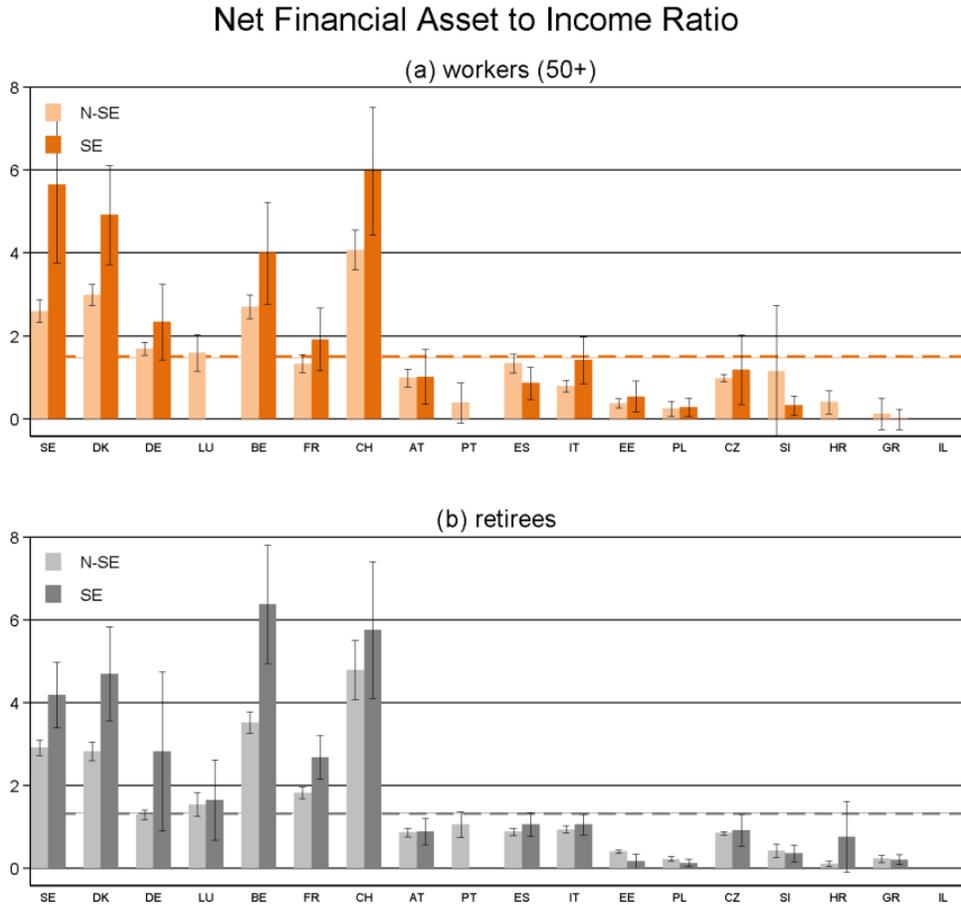


Notes: Figure displays the ratio between the sum of average equivalised household size of the top quintile and that one of the bottom quintile of the income distribution. Panel (a) refers to workers. Panel (b) refers to retirees. N-SE refers to formerly non-self-employed. SE refers to formerly self-employed. Horizontal lines are weighted averages over the SHARE countries. Value is not reported if the sample size is lower than 25 observations. Source: Wave 7 release 7.0.0.

Financial assets

SHARE also provides information about the accumulated financial assets outside of the public pension system. We compute the net liquid assets-income ratio, that is, the ratio of liquid assets minus debts to household annual income. This measure conveys the idea of how many years of consumption the household can fund out of liquid assets only. We use SHARE wave 6 data. Relative to their income, formerly self-employed accumulate more financial assets outside the public pension system than the formerly employed (Figure 25). This result suggests that the self-employed use financial assets as self-insurance. This finding holds for both workers and retirees and it is stronger for richer countries. Moreover, the gap between the two groups widens when they retire. This may be due to the cashing in of work-specific assets.

Figure 25: Net financial asset to income ratio for workers and retirees
in SHARE by self-employment status, by country



Notes: Net financial assets are calculated as the sum of value of deposits, mutual funds, bonds, non-self-employment business wealth, (publicly traded) shares and managed accounts, net of credit line/overdraft debt, credit card debt and other non-mortgage debt. Income is the total household income. Both measures make use of imputed values. Panel (a) refers to workers. Panel (b) refers to retirees. N-SE refers to formerly non-self-employed. SE refers to formerly self-employed. Horizontal lines are weighted averages over the SHARE countries. Value is not reported if the sample size is lower than 25 observations. Source: Wave 6 release 6.1.0.

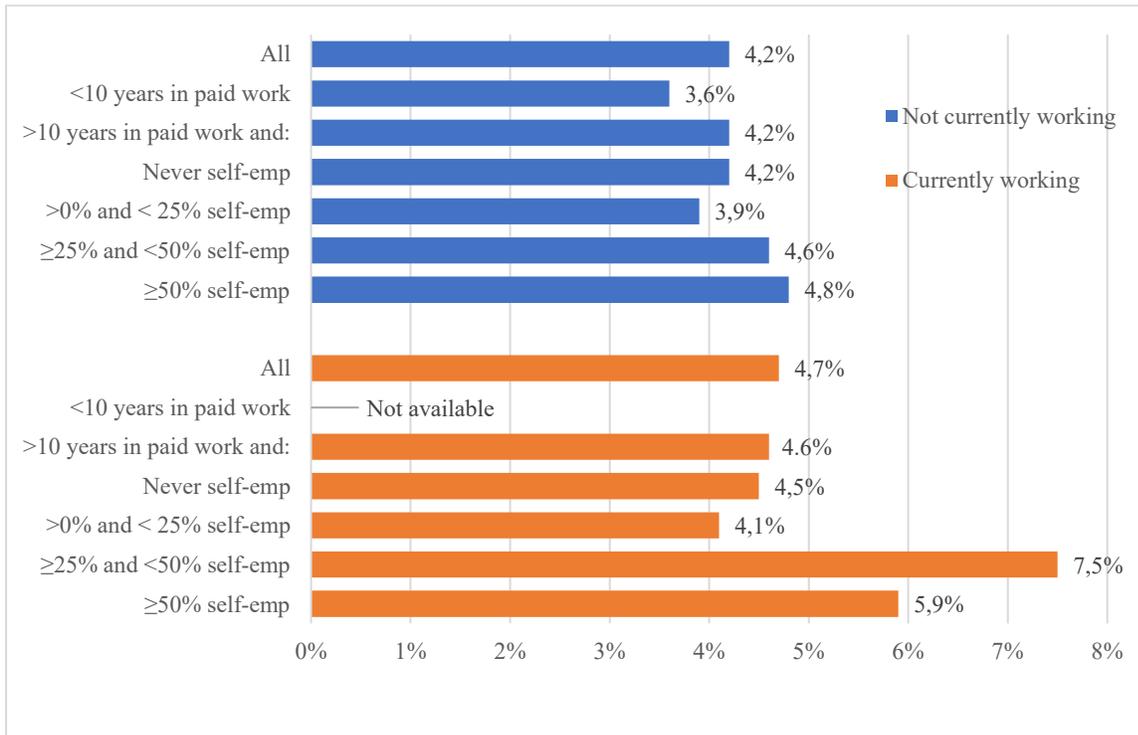
UK

For comparable analysis in the UK we take data from the 2006–07 wave of the English Longitudinal Study of Ageing (ELSA). This is designed to be representative of the household population aged 50 and over in England (it does not cover Scotland, Wales or Northern Ireland). Of the 7,500 individuals interviewed in 2006–07, about one-third were currently in paid work and two-thirds were not in paid work. A life history questionnaire was conducted as part of the interview. This shows that among those who had spent more than 10 years of their working life in paid work (which is the vast majority of men and women) just over one-quarter had spent some time in self-employment (26.4%) although far fewer (5.9%) had spent more than half of their working life in self-employment.

Financial distress

ELSA respondents are asked how best describes how they are getting on financially. We group responses into those saying “very well” (36% of those aged 50+), those saying “quite well” (31%), those saying “alright” (29%) and those giving less positive responses (just 4%). We find that those who have spent a relatively large proportion of their working life in self-employment (25% or more) are more likely to report that they are coping less well financially. As shown in Figure 26, this is particularly true among those who are currently in paid work. Among this group 4.7% report that they are not coping well, with this rising to 7.5% among those who have spent between a quarter and a half of their working life in self-employment and to 5.9% among those who have spent more than half of their working life in self-employment.

Figure 26: Proportion of English population aged 50 and over who report not currently coping well financially, by current paid work status and proportion of working life spent in self-employment, 2006–07



Source: Authors' calculations using data from the English Longitudinal Study of Ageing 2006–07.

Income and inequality

Despite this, we find that average current incomes are higher among those who have spent large proportions of their working life in self-employment. Across all those aged 50 and over in 2006–07 median equivalised household incomes among those not currently in paid work was £185 per week, with this rising to £225 per week among those who had spent between a quarter and a half of their working life in self-employment and to £243 per week among those

who had spent more than half of their working life in self-employment. Among those currently in paid work the difference was less marked: average incomes among this group were £357 per week, rising to £375 per week among those who had spent more than half of their working life in self-employment.

Similarly, we find that income poverty rates are, if anything, slightly lower among those who had spent more than half of their working life in self-employment than those who had not. Looking at the proportion of individuals in households with an income of less than 60% of the median income observed across all households in our sample, we found this was true of 27.3% of individuals not in paid work and 5.7% of those not in paid work. Among these two groups the figures for those who had spent more than half of their working life in self-employment were 24.7% and 5.6% respectively.

We find that income inequality is much greater among the retired “lifetime self-employed” than among retired individuals who are not “life-time self-employed.” For those not currently in paid work, we find that the ratio of average income across those in the highest income fifth to average income across those in the lowest income fifth is 7.7 among those with a large proportion of working-life spent in self-employment compared to 5.3 among those who did not spend a large proportion of their working-life in self-employment.

Financial assets

Finally, we look at the extent to which the net financial assets of different groups – that is wealth held outside of primary housing and accumulated pensions net of any (non-housing) debts – vary relative to the size of the income of that group. This is done for four groups: whether or not currently in paid work split by whether or not 50% or more of working-life has been spent in

self-employment (with those with fewer than 10 years of employment to date excluded from the analysis). We do this in two ways. First, we take the total amount of net financial wealth in each of our four groups and divide by the total amount of income in the same group. Second we take the median wealth in each group and divide through by the median income of the same group (where the two medians will be from different households).

Table 3: Ratio of net financial wealth to income, by current employment status and self-employment history

	Wealth to income ratio	
	(Sum)	(Medians)
Currently in paid work and:		
<50% of working-life in self-employment	4.4	1.5
≥50% of working-life in self-employment	18.3	4.1
Not currently in paid work and:		
<50% of working-life in self-employment	8.0	2.2
≥50% of working-life in self-employment	13.9	4.4

Source: Authors' calculations using data from the English Longitudinal Study of Ageing 2006–07.

The results are presented in Table 3. Both ratios are much higher for the “lifetime self-employed” than among those who have spent less than half of their working life in self-employment. (As we would expect they are also larger for those currently not working than those who are currently in paid work.) The ratio of median wealth to median income is lower than the

ratio of the total amount of wealth to income, which reflects the very unequal distribution of net financial wealth.

US

Finally, we conduct a similar analysis of financial well-being by self-employment status for the US. We use data from the first 12 waves of the Health and Retirement Study (HRS), covering the years 1992 to 2014. We use data from the RAND HRS, a user-friendly version of the data, as well as additional data (as needed) from the original survey.

While the HRS collects some information on current, last, and previous jobs (lasting five or more years), this information falls short of that which would be required to calculate the share of the work life spent in self-employment, as in the other analyses. We therefore make use of the available information to categorize the self-employed in several ways. First, among the currently employed, we divide workers by current self-employment status. Second, for retirees, we treat someone as “ever SE” if they are observed in self-employment at any survey wave. Finally, for retirees, we employ an alternate definition in which we treat someone as self-employed if we observe them spending at least 10 (or 20) years in self-employment, aggregating data on the current, last, and previous jobs and limiting the sample to those with at least 10 (or 20) years of employment in these jobs. Unsurprisingly, the share of our person-wave sample that is labeled as self-employed depends on the definition.

Similar to the earlier analyses, we measure the share of each group in poverty as well as the share reporting financial distress, here defined as reporting that paying monthly bills is

somewhat, very, or completely difficult (as opposed to not at all or not very difficult).¹⁴ We calculate equivalised income, defined as above using OECD modified equivalence scale, and use this as well as data on financial assets (excluding housing and pension wealth) to compute a wealth-to-income ratio. As in the UK analysis, we compute this ratio in two different ways – first as a ratio of total assets to total income and second as a ratio of the two medians (which will come from two different households).

Table 4: Financial well-being measures for workers and retirees in the HRS, by self-employment status

Table 4: Financial well-being measures for workers and retirees in the HRS, by self-employment status

Group		% of Sample	% in Poverty	% in Fin. Distress	Financial Assets / Income (sum)	(median)
Workers	Not SE	78%	5%	34%	1.4	0.2
	SE	22%	6%	32%	2.2	0.5
Retirees	Never SE	72%	12%	30%	2.8	0.4
	SE	28%	11%	28%	4.1	0.6
Retirees	<10 years SE	89%	7%	24%	3.2	0.6
	>= 10 years SE	11%	8%	27%	3.6	1.1
Retirees	<20 years SE	91%	6%	22%	3.6	0.8
	>= 20 years SE	9%	7%	21%	6.2	1.6

Notes: authors' calculations from the Health and Retirement Study. See text for details.

¹⁴ The poverty measure in the RAND HRS is available starting in 2002. The financial distress measure is based on data in the “Leave Behind” questionnaire, administered since 2004.

Results from this analysis are reported in Table 4. There is no consistent evidence of greater rates of poverty or financial distress for the self-employed, either for workers or retirees. However, the ratio of assets to income is consistently higher for the self-employed, across both ways of calculating the ratio and all definitions of self-employment. In terms of magnitude, most estimates suggest that this ratio is between 50 and 100 percent higher for the self-employed.

V. Conclusions

While the popular perception is that the nature of work is evolving rapidly due to the rise of the gig economy and other forms of alternative work, actual changes in the prevalence of non-standard work over time have been modest. Self-employment (as measured in survey data) has risen since 2000 in the UK, while falling in the US and remaining flat in Germany. Several measures of the share of workers in non-permanent or other kinds of atypical employment have fallen in all three countries in recent years.

Future trends are more difficult to discern. The German experience shows that the trend towards more atypical and less normal jobs is not cast in iron, as the steep increase in the share of atypical employment that had occurred since the 1980s came to an end before the 2008 financial crisis and has even reversed for women. Whether this will change again in the course of further digitalization and de-industrialization remains to be seen. While the gig economy is growing in the US, it remains a small share of the workforce and the overall share of workers engaging in alternative work is rising at most only modestly.

Even without a dramatic rise over time in alternative work, there remains a concern that workers who engage in such work, particularly over much of their career, may experience lower

pensions. Among the countries we have examined, this concern is most pronounced in Germany, where the self-employed and those in mini jobs have traditionally not been required to participate in the pension system. In the US and UK, pension rules are largely similar for the employed and self-employed, yet the self-employed may be less likely to accumulate pension benefits due to lower actual or reported income – in fact, we show that this is the case in the UK.

Reduced pension entitlements leave those who engage in alternative work at higher risk of financial insecurity in retirement. In a primarily descriptive analysis, we find that formerly self-employed retirees report a higher degree of financial distress in Europe and the UK than do retirees who held traditional jobs, although this is not the case in the US. The self-employed accumulate a higher level of financial assets relative to income in all three countries, suggesting that they may rely more on financial assets outside the public pension systems to cope with income and health shocks during their retirement. The empirical income distribution of the self-employed represents them as a highly diverse group with high degree of income inequality. While some are rich in retirement, many of the formerly self-employed may be at higher risk of poverty than their traditionally employed counterparts.

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