

National Context and Atypical Employment

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“Atypical” employment is a term used to describe many forms of employment that are not full-time, permanent jobs, through a single, direct employer. This paper examines the macro level factors that contribute to the level of three types of atypical employment (fixed-term, part-time, and self employment) in the oecd countries. Three hypotheses are tested: Are atypical work arrangements the product of a more entrepreneurial culture? Do constraints on firms’ hiring, firing, and other human resources policies encourage atypical work? And do economic constraints encourage workers to accept atypical employment? The causal relationship between the three hypotheses and levels of atypical employment are delineated for each of the three types of atypical employment.

Keywords: Atypical employment, contingent labor, EPL, flexible labor

National Context & Atypical Employment

1 Introduction

“Atypical” employment is used to describe any type of employment that is not full-time and permanent with a single direct employer. It includes many diverse forms of work including part-time, self-employment, fixed-term contracts, temp work, free-lancing, piecework, unpaid family labor, and informal day labor. The label lumps together arrangements that workers choose for various reasons and with varied consequences. This article tests three hypotheses about the contexts that might influence the level of three types of atypical employment (fixed-term, part-time, and self-employment). Fixed-term employment is similar to regular full-time work, with the exception that it has a specified end-date at the time of hire. In the United States, which has employment at will, this is not theoretically different than regular employment, which can be terminated by the firm at any time. Definitions of part-time work vary by country with thresholds normally between 30 and 35 hours a week. Workers working less than 10 hours per week are often considered “casual” workers rather than “part-time,” and are usually excluded from analyses of part-time work. Self-employment is usually self-reported and includes entrepreneurs employing others as well as free-lance workers who resemble traditional employees more than entrepreneurs. It is difficult to estimate exactly how many self-employed workers are actually self employed, and how many are in “dependent employment relationships.” Many of the reports breaking these numbers down are from Italy because Italy has administrative data on these types of workers from their social security program. Estimates range from 5.3% of the Italian workforce (Alteri and Oteri,

2004) to .88, 1.52 or 1.68% Muehlberger and Pasqua (2006) depending on how the workers are identified. Estimates for other countries suggest 1.3% of UK workers (Bheim and Muehlberger, 2006), and 1.6% of the Austrian workforce (Heinick and Neuwirth, 2004).

This article proposes three main hypotheses regarding the macro level contexts influencing the level of atypical employment. First, atypical employment might arise when firms' permanent employment contracts are over-constrained and over-regulated but atypical are not. Under these conditions firms might seek alternative arrangements that allow them to hire and fire workers more easily. This is the "free-market seeking hypothesis." The second hypothesis is that in a weak labor market firms have more bargaining power and offer new workers probationary atypical jobs which generally have lower salaries, benefits, and protections. This is the "constrained individual choices" hypothesis. These two hypotheses should have the greatest effect in combination, when firms have incentives to use atypical contracts and when workers have no choice but to accept them. The third hypothesis, "entrepreneurial spirit," posits that workers prefer atypical employment when they have entrepreneurial goals and seek more flexible work arrangements. This is primarily a micro cause of atypical employment since individuals seek flexible employment based on their own entrepreneurial aspirations. However, it is also a macro level hypothesis as overall entrepreneurial motivation can vary across time and between cultures. While the entrepreneurial hypothesis is normally discussed in the context of self-employment, it could also be an explanation for other forms of atypical employment. A fourth, well-established, hypotheses is that the proportion of women in the labor force strongly influences the overall level of part-time employment because women often split their time between work and child care. This could also

influence other forms of flexible employment. This fourth “hypothesis” is so well-established in the literature that we regard it as a “control”.

Each of the the hypotheses is related to each type of atypical employment through its own mechanism although they can jointly contribute to the overall level of atypical employment. For example, self-employment might primarily be driven by entrepreneurial spirit, but it could also be driven by the other two hypotheses as individuals chose self-employment in economies with high unemployment and few employment opportunities (constrained individual choices) and as firms constrained by over-regulation use more independent contractors (free-market seeking hypothesis). Similarly, for part-time work firms might seek flexibility from constraints by using less tightly regulated part-time workers (free-market seeking hypothesis) but part-time work can also be a form of underemployment (constrained individual choices). Entrepreneurial spirit should be the least important hypothesis for part-time work, but might be a small factor when part-time work enables individuals to start their own businesses on the side. The primary motivation for fixed-term employment should be strict EPL, particularly with respect to dismissal rules (free market hypothesis) though again, in a weaker labor market workers preferring full-time work will be forced into these positions, and workers with entrepreneurial aspirations might prefer short-term assignments.

2 Literature

The most common explanation for atypical employment is what I have termed the “free-market seeking” hypothesis. Several authors suggest that a countries’ EPL influences the incidence of fixed-term and temporary work (OECD,

2003; Kalleberg, 2000; Kahn, 2007) since they can increase firms' flexibility and extend screening periods in an environment where it is difficult to sever relationships with permanent employees (Kalleberg, 2000). These regulations can also encourage firms to shift towards internal flexibility, which would not affect atypical employment, as in the case of Germany (Keller and Seifert, 2005). Even in liberal markets like the United States, it has been shown that firms use atypical work to avoid legal constraints. For example, federal tax exemptions encouraging firms to offer health insurance to all their employees inadvertently encourage firms to use atypical workers (not receiving health insurance) while still receiving the tax incentives for providing benefits to their other employees. Similarly, research has shown that the post-1970 increase in part-time work in America may be partially attributed to increases in full-time benefit costs following the Federal and Family Leave Act of 1993 (Kalleberg, 2000).

The "constrained individual" hypothesis is highly contested probably because it is a good explanation in some contexts and a poor explanation in others. Some studies find that in a weak economy workers are forced into part-time, short-term, and self-employment (Grip et al., 1997; Blau, 1987) while others find that part-time employment does not increase in a bad market (Grip et al., 1997), and still others find an ambiguous relationship between economic conditions and atypical employment (Blachflower, 2000). Grip and Basardi find that on the couple-level, husbands' wages have no effect on women's decisions to work part-time, suggesting that, at least for women, economic constraints are not a consideration in choosing part-time work (Grip et al., 1997; Bardasi and Gornick, 2000). The reasons for this uncertain relationship between economic conditions and atypical employment becomes clear in the next section, where we explore the high levels of part-

time work in the economically robust Netherlands and the high levels of self-employment in the weaker Greek economy.

With respect to the third hypothesis, “entrepreneurial spirit,” one type of atypical employment, self-employment, is often used as the *definition* of entrepreneurship (Chandler and Lyon, 2001; Gartner and Shane, 1995; Iversen et al., 2005). In fact, self-employment is not a direct measure of entrepreneurship, as it includes free lancers (who might prefer to work as employees) and casual workers using self employment as a last resort, for example selling food on the street. “Entrepreneurial spirit” is seldom considered a motivation for other forms of atypical employment largely because it is difficult to capture in a quantitative variable. Theoretically, entrepreneurship should be related to many types of atypical employment, as part-time, fixed-term, and temp work all provide the flexibility for workers to start their own enterprises while guaranteeing a secondary source of income.

The macro hypotheses posited in this article are neither the only nor the most important motivations for atypical employment. Some of the most important motivations for atypical employment happen at the individual-level. For example, age and gender are important determinants of self-employment since older men are the most likely and able to start their own businesses (Blachflower, 2000) and women with young children are more likely to be both self-employed and work part-time (Carr, 1996; Grip et al., 1997; Bardasi and Gornick, 2000). In addition part-time work is more common among the very old and very young during partial retirement or one’s studies (Grip et al., 1997). Personal values and experiences are also important determinants of atypical employment. For example, religion and family experience in self-employment can both motivate self-employment (Carrol and Mosakowski,

1987). Besides individual-level factors, this study omits some of the firm-level factors that are important determinants of atypical employment. For example, service sector firms and seasonal industries are more likely to use atypical workers (Grip et al., 1997; Kalleberg, 2000). Finally the study omits one macro factor of atypical employment- the variability in economic conditions. Prior research shows that firms are more likely to use short-term workers during *unanticipated* periods of high economic activity (Pfeifer, 2005) and we do not consider economic or employment growth rates. In fact, this hypothesis contradicts the constrained worker hypothesis since it posits that a firm in a booming economy is seeking these types of workers, while the constrained worker hypothesis posits that in a booming economy workers can pressure employers to offer permanent employment.

This study tests these three macro hypotheses, assessing their influence on overall levels of atypical employment in OECD countries from 1990 to 2006. With a strong international data set, this study is one of the first to consider how these macro conditions influence atypical employment.

3 Atypical Employment

There is considerable variation in levels of atypical employment across countries, though less variation over time. While many articles claim there has been a recent proliferation of atypical employment, the OECD and Eurostat data used in this article suggest that levels have been relatively stable since 1990. Many of the initial increases in atypical employment actually occurred earlier, in the 1980's. Of course trends are also hard to measure since the reported level of atypical employment can vary depending on whether data

is reported by employers or employees, by grouping together different types of atypical employment, and by analyzing shorter time periods extrapolating from small blips in an otherwise stable trend (Grip et al., 1997; LeBlansch et al., 2000; Keller and Seifert, 2005; Magnani, 2003).

Figure 1 shows the level of self, part-time, and short-term employment in 2005 for 16 countries and just the levels of self and part-time employment for the US, Canada, New Zealand, Switzerland, Japan, and Australia. There are three outliers, one for each type of atypical employment. Spain has very high fixed-term employment, Greece (and to a lesser extent the other Mediterranean countries) have more self-employment, and the Netherlands has more part-time employment. The US, with its extremely liberal labor law and flexible labor force, has less of all three types of atypical employment.

INSERT FIGURE 1 HERE

The first panel of figure 2 shows the time trends for the average percent of the workforce in atypical employment across all countries in figure 1.¹ Part-time and fixed-term work have increased slowly while self-employment has declined. The second panel illustrates a few representative countries: UK (anglo), Czech Republic (former eastern bloc), Sweden (Nordic), and Italy (Mediterranean), as well as two large economies: France and Germany. Across *all* countries (those not illustrated in the graphic), self-employment was relatively stable from 1990 to 2006 with higher levels in poorer countries and recent declines in Greece, Japan, Ireland, France, and Spain. Self-employment has only increased in former eastern-bloc countries like the Czech Republic and Romania. Fixed-term employment has increased slightly in Europe with the exception of Ireland and Norway, increasing most rapidly in Poland and Portugal. Part-time work has increased in most countries

(particularly Germany) with the exception of Iceland and the United States.

INSERT FIGURE 2 HERE

Before constructing general causal arguments from quantitative data, we describe trends in atypical employment for the three extreme cases: short-term employment in Spain, self employment in Greece, and part-time employment in the Netherlands. The description should suggest whether the three hypotheses are plausible and whether quantitative analysis will capture them.

About 30% of Spain's workforce is in fixed-term employment, about twice that of any other European country. The original growth in short-term contracts (from 10 to 30% of the workforce) occurred in the 1980's and was the consequence of labor market policies and conditions. Under Franco's regime, and in the first few years following it, employment policy was centralized and employment protection was strict. Employment policy was dominated by Instituto Nacional de Empleo (INEM), a central clearinghouse designed to match jobs and workers and to manage unemployment benefits, vocational training programs, and employment records. Originally unemployed workers and firms with vacancies were obliged to register with INEM although by 1980, 90% of vacancies were filled independently. Centralized administration and strong worker protections were liberalized in 1980 under the pressure of rising unemployment rates (Dolado et al., 2004). The "Ley Basica de Empleo" or "Ley del Estatuto de los Trabajadores" deregulated fixed-term contracts, allowing these contracts for temporary activities or as preliminary contracts for young workers. The law mandated equal wages for these workers, reinforced temporary work agencies' illegal status, and reaffirmed INEM's place as the central placement organization. This legislation allowed firms the first legal means to circumvent strict employment regulations for

permanent employees. In another attempt to reduce unemployment, fixed-term contracts were liberalized again in 1984 under the Worker's Statute Reform which allowed firms to use fixed-term workers for permanent activities and created a new form of contract enduring a minimum of 6 months, renewable up to 3 years. Under this contract, after three years the worker had to be permanently hired or replaced with 12 days of severance pay. The last step towards liberalizing atypical employment was legalizing temporary work agencies under Royal Decree 18 (1993), although in fact, temporary work agencies already existed in practice. Limitations on temporary work agencies exist to this day, as they must be officially registered and authorized as non-profits and are generally run by local governments, unions, and employers' associations.

In the early 1990's, when it became apparent that the liberalization of fixed-term contracts had divided the labor market into separate and unequal sectors of employment, the government began to relax the strict EPL governing regular employment contracts and increase constraints on short-term employment, equalizing their legal status. In 1992, the typical 6 month-3 year renewal contract was changed to a 1 year contract, again renewable up to a total of 3 years. In 1994 this contract form was restricted to workers over 45 years old and the long-term unemployed, and in 1997 the contract was entirely eliminated. In 1997 and 1998, laws 8/1997, 63/1997, and 15/1998 made small adjustments to the difference in EPL for fixed-term and permanent employees. Finally in 2001, dismissal costs for temporary workers were introduced (8 days per year of service). The most recent limitations on fixed-term employment were passed in 43/2006 "Reforma Laboral," a direct response to the 1999 EU directive demanding either limits on fixed-term contract renewals or their cumulative duration (MTAS, 2006). This requires

fixed-term contracts to be justified by the employer as “training,” and to satisfy “short-term production needs” such as specific projects or replacing employees on leave. The law specifies that contracts cannot endure beyond 2 contract cycles for a maximum of 24 months in a 30 month period, after which the worker automatically becomes a permanent employee. The reform also set tax benefits for firms converting fixed contracts to permanent ones, offering 850 euro for women, 1,200 euro for people over forty-five, 600 euro for the long-term unemployed, and 6,300 euro for the disabled with all bonuses annual and renewable for four years of employment, except the disabled bonus which endures indefinitely. According to the Spanish government this legislation was successful: from 2005 to 2006 there was 108% growth in the rate of turnover from fixed to permanent contracts and the proportion of permanent contracts that began as indefinite grew to 42% (the low was 30.1% in December 2006) (MTAS, 2007b). However other research suggests there has been no increase in the hazard of transitions to a permanent contract (Guell and Petrongolo, 2007).

In sum, Spain has come full circle in their EPL, first supporting fixed-term contracts as a solution to high unemployment, and then creating incentives for transitions to permanent employment after realizing the detrimental aspects of a two-tier system. Despite the policy reversal, fixed-term contracts are still more common in Spain than elsewhere in Europe. While some (Toharia, 1999) argue that Spain naturally has a labor market with a core/periphery structure that lends itself to two-tier employment, it seems more likely that the high rate of short-term contracts is a historical legal legacy of the earlier policies (Toharia, 1999; Casals, 2004; Royo, 2005; Amuedo-Dorantes and Serrano-Padial, 2005; MTAS, 2007a). The econometric analysis will partially capture this dynamic, measuring the strictness of

regular and fixed-term workers' employment protection though it will fail to capture the historical legacy from the 1980's.

This type of policy reversal, first liberalizing atypical employment and then bringing its regulation closer to that of regular employment (either through restricting atypical EPL or loosening permanent worker EPL) is typical, albeit normally not as dramatic as in the Spanish case. For example, Germany, another country with strict EPL, liberalized atypical employment as a solution to unemployment, legalizing temporary work agencies under the Loan Worker Employment Act (1972) and relaxing restrictions on fixed-term employment in 1985. In 2000 they reversed course, equalizing EPL with the "Act of Part-time and Fixed Term Employment," which gave workers the right to reduce their work time, required that temp work be used only for specific tasks, and limited the renewal of fixed-term contracts to three years. In 2003 the Hartz Laws reversed course, increasing protections for atypical workers, forcing employers to pay health insurance and pension contributions for part-time workers, charging them an additional 2% wage tax, and promoting temporary work agencies as a *transition* to real market employment. In Germany, just as in Spain, there has been a u-turn in policies, first promoting a two-tier system of employment as a solution to unemployment and then discouraging it.

The second outlier in atypical employment is Greece, with 35% of its workforce self-employed and an average firm size of 2 employees rather than the EU's average 6 (Mihail, 2003). There are three reasons Greece has high levels of self-employment. First, Greece has strict EPL with high severance costs (higher for white collar than blue collar workers), strong minimum wage laws, and unusual collective agreements that can be imposed on business owners

when the majority of employers in an industry agree on wages even if they were not part of the negotiations (OECD, 2007). This type of strict EPL has been shown to encourage self-employment (Cazes and Nesporova, 2003; Robson, 2003; OECD, 1999). In Greece, firms cannot circumvent strict EPL by using atypical employment since regulations on part-time, temporary, and fixed-term work are also strict (Miaouli, 1998).

For more than half of the period covered by this study self-employed workers were entirely free of the regulations governing both permanent and other atypical workers in Greece. This changed in August 1998 when the Law on Industrial Relations demanded that agreements between self-employed persons and companies notify the ministry of labor within 15 days of the contract. If the contract is not registered the relationship becomes that of regular employment in the eyes of the law (Kouzis, 2002). This initiative should provide better estimates of how many self-employed are actually self-employed, as the self-employment numbers prior to this law were exaggerated by independent contracts. Since 1998 the court has also enforced a new more general definition of employment. An employee is a worker who is personally subordinate, does not direct work, place of work, hours, or control their own performance. This new definition has been applied to offer these workers more protections. In March 2007 the Mediation and Arbitration Service demanded that any worker placed in a position of legal subordination to the employer has the right to be covered by the union contract. However, the relevant employer organization sought the reversal of the decision which has still not been resolved. In sum, in the period covered by this study, free lance “self-employed” workers were the primary way around EPL although the government has begun to track the number of pseudo self-employed and begun the initial steps to remove this loophole. In addition, small firms,

which have a higher proportion of self-employed, also have an EPL advantage. Qualitative studies suggest that small firms are able to circumvent legislation on overtime hours, dismissal policies, and sometimes even negotiate pay and bonuses individually, in defiance of union contracts (Mihail, 2003; Kufidu and Mihail, 1999). As such, the labor laws, and their enforcement favor self-employment.

Second, Greece has relatively high unemployment rates around ten percent and there is evidence that self-employment is related to high unemployment rates, although the direction of causality is contested (Rissman, 2003; Blachflower, 2000; Audretsch et al., 2006). Finally, tourism, an important economic sector for Mediterranean countries, might present more opportunities for self-employment. For example, Italy, recognizing tourism as a source of self-employment opportunities, passed Act 236 in 1993, offering individuals financial aid and technical assistance to start their own tourism firms (OECD, 2000). This combination of strict EPL favoring self-employment and small firms, relatively high unemployment, and a strong tourism sector all contribute to Greece's high levels of self-employment. The quantitative analysis will capture two of these three elements, missing tourism's possible contribution.

The third outlier is the Netherlands, which has an extremely high part-time employment rate, almost ten percentage points higher than the next highest country, Australia. A full 66% of working women in the Netherlands work part-time compared with 30% in most EU countries; the median employed woman works only 16 to 23 hours per week (Doorne-Huiskes, 2004). The high part-time employment rates seem to result from some combination of social values, economic prosperity, and insufficient child care. In the Netherlands

both men and women with children are more likely to reduce their working hours than other Europeans though married, less educated women with young children are the most likely to work part-time (Wel and Knijen, 2006). Surveys find that employed Dutch women prefer part-time employment, and more educated women prefer part time work for *both* themselves and their partners (Wel and Knijen, 2006). This preference is further encouraged by legislation improving part-time work's standing relative to full-time work. In 1993 laws extended minimum wages and paid holidays to part-time workers working less than one-third normal hours and in 1996 the provision was expanded to force full equality between part-time and full-time work with prorated pay and benefits. Finally, in 2000 legislation allowed all workers to request the right to move between full and part-time work, requiring firms to accommodate these requests and requiring them to justify any rejections. The government first introduced legislation supporting part-time work when the country was experiencing high growth and needed to attract additional workers into the labor market (Plantenga, 1996) and unions supported it to prevent part-time workers from becoming a cheap substitute for regular labor (Rasmussen et al., 2004). Dutch women also prefer part-time work because child care is scarce and the government was reluctant to address the issue until the mid 2000's (Euwals, 2007). Finally, surveys shows that the Netherlands has the lowest *involuntary* part-time employment rates in Europe (Doorne-Huiskes, 2004). In sum, Dutch women seem to prefer to work part-time, and the government encourages that preference through legislation and the lack of child care. The econometric analysis will capture some, though not all, of the dynamics behind the Netherlands' exceptional levels of part-time employment. It will find the relationship between the proportion of women in the marketplace and the high level of part-time work, the

relationship between legislation and part-time work, and it will show a weak relationship between economic constraints and part time work. However, the quantitative analysis will not capture the importance of child care or cultural preferences for part-time work.

Looking at short-term employment in Spain, self-employment in Greece, and part-time employment in the Netherlands, it is clear that economic, legal, and cultural motivations are all at play. In Spain, temporary work is primarily a legacy of legislative changes originally designed to combat high unemployment in the 1980's. In Greece self-employment is the result of the combination of high unemployment, strict EPL for both regular and atypical employment, and a strong tourism sector. Finally, in the Netherlands, part-time employment is the result of workers' preferences to balance family and work, economic prosperity, legal protections for part-time workers, and a limited supply of child care. Some, but not all, of these dynamics will be captured by a statistical analysis.

4 Research Design

4.1 Data

This study uses a series of predictors for atypical employment designed to capture the three hypotheses: the “free-market seeking”, “constrained individual”, and “entrepreneurial spirit” hypotheses. The study also controls for the proportion of women in the labor force, a well-proven factor in part-time employment rates. Data are drawn from a variety of sources (see the index) but primarily rely on OECD, ILO, and Eurostat statistics.

The first two variables related to the free market seeking hypothesis measure union strength: union density (or the proportion of the workforce that belongs to unions) (Checchi and Lucifora, 2003; OECD, 1990-2006) and total strikes and lockouts per 100,000 population (ILO, 2004; UN, 2007). Many studies use union coverage (how many workers are affected by collective agreements) in addition to union density. Union coverage is generally similar to density except in France which has much higher coverage than density. The second union measure, the number of strikes and lockouts, is not as well standardized as union membership². Union density ranges from 8 to 88% of the workforce in the OECD countries and has declined over time. Strikes and lockouts range from 0 to 25 per 100,000 population, with no discernable time trend. Most countries have few incidents (Austria, Canada, Czech Republic, Estonia, Hungary, Japan, Netherlands, Romania, Sweden, Switzerland, UK, US) or infrequent activity (Belgium, Cyprus, Finland, France, Greece, Ireland, Italy, New Zealand, Norway, Portugal, and Spain). Only Denmark, Iceland, and Poland had high strike rates during the 1995-2006 period. Denmark suffered the highest levels of activity with strikes peaking in the 1998 general strike, and again climbing in 2002 when the public sector contracts were renegotiated. The union variables could have mixed effects on atypical employment rates. On one hand, unions impose constraints that firms seek to avoid through atypical employment but on the other hand, union negotiations often include clauses limiting atypical employment.

The second two variables related to the “free-market seeking hypothesis” are indices of EPL published in the OECD Employment Outlook (OECD, 1990-2006). The first index is a 0 to 6 index coding rules for dismissal notice, procedures, severance pay, and probationary periods. The second index measures EPL for fixed-term workers including: when fixed-term work is allowed,

the maximum number of contract renewals, and the maximum cumulative duration of renewed contracts. The third variable takes the difference between these two and captures whether there is a legal advantage to using temporary workers. According to these three variables, regular EPL is most liberal in the US, UK, and Switzerland, while it is strictest in Portugal, Sweden, and the Netherlands. Regular EPL is relatively constant over time, with the few countries that altered their laws generally liberalizing (Spain, Portugal, Finland, Austria). Temporary EPL has more variation and is stricter in Belgium, Greece, Italy, Spain, and Portugal and more liberal in the US, UK, Canada, and Switzerland. Belgium, Italy, Sweden, Portugal, Spain, Germany, Norway, Netherlands and Denmark all liberalized their policies between 1990 and 2006. By 2006 most countries had relatively liberal policies for fixed-term employment with the exception of Italy, Spain, Portugal, and France. While it is not taken into account here, EPL can also vary by occupation. Austria, Belgium, Denmark, Greece, France, and Italy all have stricter protections for white collar than blue collar workers while Germany and Spain recently equalized such differences³.

In the past several years two EU directives on atypical employment have passed and a third has been proposed. In 1997 Directive 97/81/EC outlawed discrimination against part-time workers, mandated pro-rated pay, required the elimination of laws limiting part-time work, and prohibited firms from terminating employment when workers refuse requests to move from full to part-time work or vice versa. In 1999 Directive 99/70/EC outlawed discrimination against fixed-term workers, required employers to inform fixed-term workers about permanent opportunities, and mandated that national governments pass legislation doing one or more of the following: 1) specify the circumstances under which fixed-term contracts are permitted, 2) specify the

maximum total duration of renewed fixed-term contracts and 3) limit the number of permitted contract renewals. Finally, in 2002 Directive 0072 was proposed to prohibit discrimination against temp workers, to ensure temp workers have access to all workplace facilities, to require temp firms to pay workers for time between assignments when they are employed by the temp firm before and after an unemployed spell, to ensure that temp workers receive overtime breaks and paid holidays, to require agencies to inform temp workers about permanent openings, to prohibit temp agencies from charging workers fees, and to encourage unions to negotiate on behalf of temp workers along with permanent employees. This proposal never passed. The EU directives affect most of the countries in this analysis though some argue that are too weak to have an impact anyhow (Jefferey, 1998). Past research has found that strict EPL has no effect on unemployment, slows down the labor market (increasing average job tenure and the length of unemployment spells), and increases self-employment (though not part-time or temporary work) (Cazes and Nesporova, 2003).

The final variable related to “the free market seeking hypothesis” is the proportion of the firm’s employment costs that are non-compensation costs (BLS, 2007b; ILO, 2002) ⁴. This variable captures different aspects of labor policy in different countries. The variable was initially included with the intent of capturing the United State’s employer-based health insurance system, a costly component of regular employees’ wages and consequently a widely cited reason for firms to use atypical contracts. In fact, the US does not have extremely high non-compensation costs compared to other OECD countries as business taxes are relatively low. Between low taxes and high health care costs, American non-compensation costs are a middling 20 percent of wages. Countries with the lowest non-compensation costs are New

Zealand and Denmark while Belgium, France, Italy, and Sweden all have high non-compensation costs. Most countries have stable non-compensation costs over time with the exception of Poland which dramatically reduced them in the mid 1990's. As such, non-compensation costs measure both an incentive for individuals to stay in regular employment (such as health insurance in the US) and also general labor market benefits that are not job-worker specific and might make atypical jobs more appealing for workers.

There are three variables related to the second hypothesis, "constrained individual choices." The first, unemployment rates, measures whether difficult labor market conditions might force workers into atypical jobs⁵. Unemployment rates vary widely within and between countries. Countries with relatively constant unemployment rates over time include Switzerland, the United States, Luxembourg, Norway and Austria while Finland, Spain, Sweden, and Ireland all had high unemployment in the 1990's with a later recovery. The Eastern European countries showed a steady increase in unemployment rates over the entire period.

The second variable related to "constrained individual choices" is a measure of real wages which was constructed by using mean manufacturing wages (BLS, 2007b) and adjusting them using PPP exchange rates (WorldBank, 1990-2005) and the CPI-U inflation index (BLS, 2007a) to convert them to 2006 dollars. Real wages are stable across time for all countries with slow steady growth. The only exception to this is Norway, showing some fluctuations in the late 1990's.⁶ Theoretically as workers' real wages increase, they should be able to withstand longer periods of unemployment and be less pressed to accept atypical employment arrangements.

The final variable related to "individual constraints" is unemployment in-

insurance wage replacement rates.⁷ Denmark and the Netherlands have the highest unemployment insurance replacement rates while the US and the UK have the lowest. Unemployment replacement rates changed in several countries during this period: Italy increased benefits as did Switzerland and Ireland to a lesser extent while Denmark first increased and then decreased them. This variable should measure whether workers are pressured into taking atypical employment or if they have the luxury of slowly looking for a permanent job.

The third hypothesis, “entrepreneurial spirit” is the most difficult to measure. Traditionally, researchers use self-employment, entry into self-employment, and the TEA index (a measure combining self-employment stocks and flows) (Gartner and Shane, 1995; Iversen et al., 2005; Chandler and Lyon, 2001). I also use self-employment rates as a predictor of fixed-term and part-time employment. According to the TEA, the US was entrepreneurial in the late 1990’s but less so in the 2000’s while Romania and Estonia show consistent increases and Sweden, Finland, and Belgium have consistently low entrepreneurship. While self-employment is the most common measure of entrepreneurship, it is also a poor one, as it is often an indicator of a weak rather than an innovative economy. A third measure, the patent application rate, was also tested, with the intent of measuring individual initiative, independent of economic constraints. Unfortunately, the patent application rate is dominated by corporate (not individual) filings and it includes foreign innovators seeking protection in the domestic market. In fact, in the United States about 46% of patent applications are by US corporations while only 13% are individuals and the remainder is government and foreign applications. Patent application rates have primarily cross country variance as they are low and constant with the exception of Cyprus, Ireland, Estonia, Lux-

embourg, and Slovenia, which all grew over the period (USPTO, 2007). All the measures of entrepreneurship (TEA index, self-employment, and patent application rates) suffered flaws which are apparent in the results.

The last independent variables are controls. The first is the proportion of the labor force that is women. All countries had progressively more women in the labor force from 1995 to 2006. Denmark, Iceland, and Sweden all approached 50% of the labor force by the end of the period, while Spain and Italy only reached 40%. The gini coefficient was also tested as a control as was a dummy for EU membership (to capture the effect of EU-wide policies, directives, and trends).

Variables are inconsistently available across years and countries as the data comes from various sources. Self-employment and part-time employment come from the OECD while short-term employment comes from Eurostat, and is thus only available for Europe. Table 2 shows the availability of the three dependent variables by country and year.

INSERT TABLE 2 HERE

The different types of atypical employment are each distinct phenomenon with levels varying across countries. Fixed-term employment is correlated weakly with part-time and self-employment (Pearson correlation .15 and .084 respectively) while part-time and self-employment have a .24 correlation. Descriptive statistics for all variables are in table 1 in the appendix. The independent variables are predominantly unrelated to one another as illustrate in their correlations in table 3. All correlations take into account the panel data structure and are calculated as $((\beta_{x|y} * \beta_{y|x})^{.5})$ from two bivariate two-level regressions for each pair of variables. This is a simple back-door method since β is $\frac{cor_{xy}}{cor_x}$, so the product of the two beta's is simply $\frac{cor_{xy}^2}{cor_x * cor_y}$.

Taking the square root gives the correlation coefficient, having adjusted for within country-correlation in the regression. The correlations illustrate that the independent variables are not correlated with each other, with the exceptions of union density which is related to average manufacturing wages and the proportion of the workforce that is female which is correlated with temporary worker EPL and manufacturing wages.

INSERT TABLE 3 HERE

4.2 Methods

In pooled time-series data, observations are correlated across years and countries can also be correlated spatially, violating ordinary least squares (OLS) assumptions. To illustrate this correlation structure, the residuals from three OLS regressions predicting the proportion of the workforce in each type of atypical employment were correlated across pairs of years within countries for each regression. This tested not just for correlation across adjacent years, but across all temporal lags. The scatter plot in figure 3 shows the correlation between residuals for a pair of years on the x axis (e.g. the correlation between self-employment residuals for 1998 and for 1999) and the difference in years on the y axis ($1998-1999 = 1$). If there were only correlations between adjacent years, all the points would align along the x axis at a zero and there would be forty-eight points near (1,1). Instead, self-employment and short-term employment residuals for predictions within five years are highly correlated while residuals from predictions more than five years are primarily uncorrelated. Part-time work has a much stronger time correlation, never dropping into negative numbers while short-term employment has a weaker time correlation.

INSERT FIGURE 3 HERE

There are several models that adjust for pooled time series correlation structures. First, we present a fixed effects model which transforms each variable into a comparison between the country-year and the country-specific mean which is the equivalent of using country dummy variables, or in other words uses exclusively within country variance. In equation 1, Y is the level of atypical employment, X_{ij} is the set of independent variables for each country i in time period j , and $X_{\bar{i}}$ is the mean of the independent variable for each country. While this model deals with the correlation across time within countries, it ignores the variance between countries when estimating parameters. This is a significant loss of information, particularly for those variables that are relatively static within countries, for example unemployment insurance replacement rates.

$$Y_{ij} - \bar{Y} = \beta + (X_{ij} - X_{\bar{i}}) + \epsilon_{ij}, \quad (1)$$

In comparison, model 2 uses a random error component (ϵ_{ij}), an error component specific to the country (ϵ_i) and a country-specific intercept ($\beta_{\bar{i}}$), while the effects of all the independent variables X are assumed to be the same for all countries. In this model, ϵ_i and β_i are random parameters that are not estimated along with the fixed parameters, but their variance is estimated along with ϵ_{ij} 's variance. The model reduces the total number of parameters from the fixed effects model and uses the variation between countries as well as within to estimate parameters. Just as the country-specific error is assumed to be drawn from a normal distribution (random effects) the country-specific intercepts are also assumed to follow a normal distribution.

I also tested random coefficients for each of the independent variables in this model. This model assumes that the independent variables' coefficients vary by country (again drawn from a normal distribution)⁸. For the temporary and self employment models, I found that this simple random intercepts model was the best model.

$$Y_{ij} = \beta + \beta_i + X_{ij} + \epsilon_{ij} + \epsilon_i, \quad (2)$$

While atypical employment levels are correlated over time within countries, it is also possible that they could be correlated by year. For example, there could be a European recession or perhaps organizational fads spread across countries simultaneously. If this is the case, years are not only nested within countries, but countries are also nested within years. If this is the case, a crossed random effects model is necessary⁹. In equation 3 μ_i and ν_j are the random intercepts for firms and countries. The random intercept for a given year is shared by all countries and the random intercept for an individual country is shared by all time observations within that country. As in the other models, X_{ij} indicates the independent variables, while Y_{ij} indicates the outcome variable, one of the three types of atypical employment.

$$Y_{ij} = \beta + \beta_2 X_{ij} + \mu_i + \nu_j + \epsilon_{ij}, \quad (3)$$

5 Results

5.1 Fixed and random effects

The fixed effects regressions for fixed-term employment (Europe only) shows that fixed-term employment increases with union density, higher unemployment benefits, higher wages, and more women in the workforce. In terms of the hypotheses this suggests some support for the “free market seeking” hypothesis if firms avoid union-imposed constraints through fixed-term contracts. There are interesting results for “individual constraints” as higher real wages and unemployment benefits are related to *more* short-term contracts perhaps because individuals are less fearful of facing periods of unemployment after their contracts end. The entrepreneurial variables have insignificant and inconsistent findings, which is unsurprising given the measurement problems. In table 4 σ_u and σ_e show the standard deviations of the residuals for the mean values for each country, and for the observations within each country while ρ indicates the fraction of the variance due to the country specific effect.¹⁰

INSERT TABLE 4 HERE

The fixed effects and random effects regressions for part-time employment show that part-time work increases when there are fewer strikes and lockouts, when real wages are higher, and when there are more women in the workforce. A higher strike rate probably discourages part-time employment because hours are often included in union negotiations. The result for wages confirms the fixed-term employment results; countries with higher mean wages have more part-time work. Finally, there are tentative effects for self-employment being related to higher part-time employment, perhaps lending some cre-

dence to the entrepreneurship hypothesis. The proportion of women in the work force plays a significant role in predicting part-time work. There is little support for the three main hypotheses in this regression since strikes seem to discourage part-time work and a high income encourages it. Rather, the statistics seem to reinforce the Netherlands' story: changes in part-time employment are not driven by tight economic conditions or firms' desires to circumvent union and government regulation, but rather by a prosperous environment with union representation, where women are free to choose part-time work.

Finally, the fixed and random effects regressions for self-employment show that patent rates, stricter EPL, lower non-compensation costs, higher unemployment, lower unemployment benefits, lower wages, and fewer women in the workforce are all related to more self-employment. This provides clear support for two hypotheses and mixed findings for the third. For "constrained individual choices" we find that in a context of economic insecurity with low benefits and low wages, more individuals look towards self-employment. With respect to the "free-market seeking hypothesis" in a context of strict EPL there is more self-employment (perhaps free lancers) though non-compensation costs, conceived of as a constraint on employers, actually decrease self-employment. This could be because higher non-compensation costs fund a more secure safety net for workers, measuring something akin to the unemployment benefits variable. In part they also measure the amount of benefits a worker receives from an employer, which should encourage workers to prefer regular employment. While the patent application rate effect might lend additional support to the entrepreneurial hypothesis, we consider the results tentative given the measure's aforementioned faults and the weakly significant results.

5.2 Crossed effects

While random and fixed effects are two of the most common methods to deal with pooled time series data, this data could also have correlation between countries by year or predictors could have different slopes for different countries, two possibilities ignored up to this point. Table 5 shows in the first column for each type of atypical employment a crossed effects regression with all variables and in the second column the “best” results. The “best” results are not necessarily the “best” in a strict hierarchy of statistical tests. Because data availability varied by variables, the most limited variables (like strikes and lockouts) were removed. Then several models were run with restricted samples including all remaining variables. These models were compared using a likelihood ratio test and once the significant variables were found, the model was rerun with the largest possible sample, omitting non-significant variables as necessary, to increase sample size. Models tested include both crossed effects (shown in the first column) and nested models with various combinations of controls including an interaction term between EPL and unemployment rates, designed to capture the effect of concurrent firm demand for atypical workers and individual willingness to accept atypical employment. The interaction term is not shown because it was never significant. Crossed effects was found unnecessary for part-time and self-employment as coefficients for the two models were almost identical and the change in log likelihood was negligible. In contrast, the regressions for fixed-term employment improved dramatically using crossed effects.¹¹

INSERT TABLE 5

For self-employment and short-term employment, the crossed effects and best models’ findings mirror the findings from the fixed and random effects

regressions. The regressions for part-time employment do not contradict the fixed effects and random effects regressions, but removing some variables that limited the sample size brought formerly insignificant predictors into the significant range.

The “entrepreneurial spirit” hypothesis fares surprisingly well in these analyses. Patent rates are positively associated with self-employment as expected, but negatively associated with part-time work. Self-employment is positively related to both short-term and part-time work, as expected. Patent application rates might be associated with lower levels of part-time work because patent applications inadvertently measures the strength of certain economic sectors. For example, in the United States companies with patent applications are disproportionately in the tech sector, chemicals, pharmaceuticals, and engineering. The negative relationship between patents and part-time work could be a consequence of patent-utilizing industries hiring more full-time workers. Regardless, the results suggest that that in an economy with high levels of self-employment there are also higher levels of part-time or fixed-term work. Presumably this measures the cultural-entrepreneurship aspect, given the strong economic and legal controls.

There was mixed evidence for the “free-market seeking” hypothesis. First, union strength is related to more fixed-term employment but less part-time employment. This could result because working hours are included in union contracts (which is traditionally the case) but fixed-term employment is not. In the early 2000’s union contracts began to limit fixed-term employment, mandate fixed term workers’ benefit levels, and even include clauses automatically converting fixed-term workers to permanent positions (Campbell, 2005). As such, firms were able to escape union pressures through fixed-

term work until recently but have never been able to do this through part-time employment. EPL, a more clear cut measure of the “free-market seeking” hypothesis, has the anticipated effect of increasing fixed-term and self-employment and a wide gap between EPL for regular and fixed-term workers is associated with more fixed-term employment, as shown in the “reg-temp EPL” row of table 5. Surprisingly, stricter EPL is associated with *less* part-time employment which can only be explained when part-time workers are covered by regular EPL, as in the case of the Netherlands or following 1997 EU directive guaranteeing part-time workers the same rights as full-time workers.¹² Overall, firms in countries with strict EPL and unions seem to use both self and short-term employment to avoid constraints, though part-time workers are prevented from playing the same role by virtue of union contract provisions and recent legal protections.

Higher non-compensation costs are consistently and strongly linked with *less* atypical employment, except in the aforementioned analysis of self-employment. Originally this variable was included to measure constraints on firms, but it also measures the general strength of the safety net and those employer-provided benefits that might tie workers to regular jobs. As such, the variable became part of the “constrained individual choices” hypothesis since it measures how workers are tied to regular jobs through benefits as well as the general strength of the safety net. In sum, the variable measures two opposing effects simultaneously- one binding workers to regular employment and one offering a safety net that might make atypical work more feasible.

The most robust findings were for the “constrained individual choices” hypothesis. High unemployment rates are related to higher levels of fixed-term and self employment while generous unemployment benefits encourage fixed-

term employment, presumably because workers can bridge between assignments with public benefits. I hypothesized that an economy with high wages would have less of all forms of atypical employment, but in fact it is related to more fixed-term and part-time employment. This is the relationship anticipated by the Netherlands story, where workers (particularly women) in a prosperous economy willingly choose part-time work. Results show that in a more robust economy workers are *less* likely to become self-employed, confirming the literature, though regressions over shorter time periods (not shown here) suggest that the relationship between a weak labor market and self-employment strengthened in the post-2000 period.

Finally, with respect to the control variables, we confirmed that with more women in the workforce the proportion of workers in part-time positions increases. In addition, as prior work has shown that women are less likely to be self-employed, we confirm that the proportion of women in the workforce is negatively related to the proportion self-employed.

Figure 4 shows the time trends for predicted and actual levels of atypical work in a few countries. Overall the models do a relatively good job of predicting trends. For the most part, smaller fluctuations are captured by the model, although Greece's dramatic declines in self-employment are underestimated as is the US's recent decline in part-time work.

Figure 5 breaks down the predictions for two countries for each type of atypical employment in 2006, focusing on the three countries we examined in the qualitative narrative. For example, the model predicts 32.23% of workers will be part-time in the Netherlands in 2006 compared to 12.17% in France. While the variables of interest are statistically significant, they contribute little in terms of the predictions' magnitude, which are primarily driven by

country effects. While we might expect the Netherlands' prediction to be driven by the women and the income variables, in fact they play a very similar role in predicting France's part-time employment rate. The big difference between the two countries is actually the country effect. For fixed-term employment EPL plays a slightly larger role in predicting Spain's short-term employment rate than the UK's, but fails to capture the dramatic roll we would expect it to play. For self-employment there is no visible difference between the two cases displayed beyond the country effects and the proportion of women in the labor force. This graphic draws our attention to how deceptive these models can be. While the model has statistically significant effects in the expected directions, and overall predicts the countries' trends, largely it does so through countries' random effects, and very little through the explanatory variables of interest.

INSERT FIGURES 4 and 5 HERE

6 Conclusion

In terms of statistical significance the quantitative analysis found significant support for all three hypotheses. At the same time, our predictions suggest that the model did not capture the same information as our historical narratives of Spain, the Netherlands, and Greece's experiences. First, there was some support for the entrepreneurship hypothesis. Countries with high levels of self-employment seem to have high levels of both part-time and short-term employment controlling for national constraints on firms' employment activities and on economic conditions. We can imagine then, that in a society that values entrepreneurship, workers use other forms of atypical employ-

ment as a means to meet their entrepreneurial goals. The results from the patent variable were sometimes significant in the expected directions, though overall, it was uncertain that the variable captured entrepreneurship as it is also related to the distribution of firm types in the country and is affected by exogenous factors such as international firms' interest in the country's market.

There were particularly interesting results for the "individual constraints" hypothesis. For all factors, as a country becomes more prosperous and has more social protections, there is less self-employment. On the other hand, as the society becomes more prosperous and the social insurance expands, the levels of fixed-term and part-time employment rise, perhaps because workers are more willing to reduce their work load to take care of children or are willing to risk periods of unemployment between fixed-term contracts. On the other hand, social benefits provided by employers through non-compensation costs seem to discourage atypical employment, encouraging workers to hold permanent regular jobs.

Finally, constraints on the firm such as union strength and strong EPL increase self-employment and fixed-term employment but discourage part-time work. Most likely, the early inclusion of part-time work in EPL, and its traditional inclusion in union contracts excludes the opportunity for firms to circumvent constraints through these employment relationships.

It is important to consider the macro determinants of atypical employment as there are some well-proven consequences of atypical employment. In the United States atypical workers have lower wages and are less likely to receive health insurance and pensions and in Europe fixed term workers receive lower wages than their equally qualified permanent counterparts. Given that con-

tract negotiations, public policy, and economic conditions influence both the incidence of atypical employment and its consequences, future research needs to determine the chain of causality disentangling first the causes of atypical employment and second its repercussions for workers.

Notes

¹The average is not weighted by the size of the countries' workforce.

²A description can be found at <http://laborsta.ilo.org/applv8/data/c9e.html>. The ILO data comes from a variety of sources including employers, conciliation services, and newspapers. The method for counting strikes and lockouts is inconsistent across countries with some countries counting incidents by disputes and others by affected employers. Some countries also include definitions of minimum countable incidents. For example, Denmark does not count incidents lasting less than 10 days and has no minimum number of workers per incident while the US does not count events involving less than 1,000 workers and lasting less than one full shift (before 1982 the minimum was 6 employees). Portugal, with a middling level of strikes and lockouts, has no minimum rules for counting a strike or lockout.

³A full description of EPL for all oecd countries is available in the OECD Employment Outlook

⁴Two sources were used for this variable, one using all workers and the other using only production workers (values were almost identical for those countries covered by both sources).

⁵OECD data, standardized using ILO guidelines

⁶According to (Johansen et al., 2007) Norway's manufacturing wages fluctuate, declining when the Social Democrats are in power and rising when they are not. Johansen argues that this results from the combination of the centralized wage bargaining institutions and the link between the Social Democrats and Labor. This hypothesis matches the odd fluctuations in Norway's wages as a labor coalition was in control of the parliament from 1990

to 1997, regaining power briefly in 2000-2001, and again in 2005.

⁷The measure was calculated by the OECD and is defined as the average of the gross unemployment benefit replacement rates for a worker with a full record of employment at two earnings levels (67% and 100% of average production worker earnings), in three family situations (single, married with dependent spouse, married with spouse in work) and for three unemployment spell durations (first year; second and third year; fourth and fifth year).

⁸Both testing random coefficients models, and then for additional confirmation, running individual models by country, I found that the effects of the independent variables were similar for all countries, and thus the intercept model was sufficient.

⁹Crossed random effects models were tested and found to be the best model for predicting short-term employment. The crossed effects model was compared to the nested model using a likelihood ratio test. Short-term employment is the only atypical employment that required the crossed effects model. It could be that short term employment rates are subject to international trends as it is a relatively new form of atypical employment and prone to fads, public debates, and the aforementioned EU legislation.

¹⁰Based on a Hausmann test I do not test a simple random effects model for short-term contracts since the random effects are correlated with predictors.

¹¹The random effects for the self employment equation were not normally distributed. Rerunning the model using a transformed dependent variable, $\ln\left(\frac{\text{proportionselfemployed}}{\text{proportionnotselfemployed}}\right)$, still yields non normal random effects, as tested by the skewness kurtosis test, Shapiro-Wilk test, and plots of the random effect against the normal distribution. I present the results despite violating

the normality assumption in the self-employment regressions.

¹²The negative relationship between EPL and part-time work is consistent over time, not increasing after the 1997 directive, when we test sub-periods. In addition, EPL's relationship to part-time work is not driven by the part time outlier, the Netherlands, as the results hold excluding the Netherlands.

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7 Appendix

	Observations	Mean	Std Dev	Minimum	Maximum
Self employment	536	18.07	11.11	4.7	62
Part-time employment	444	15.17	7.31	1.6	35.7
Short-term employment	351	7.96	5.65	.7	30.4
Union density	480	37.51	20.51	8.1	88
Strike rate	264	1.69	3.62	0	25.08
Temporary EPL	388	1.97	1.35	.3	5.4
Regular EPL	388	2.18	.91	.2	4.8
EPL difference	388	.21	1.28	-3.6	3.1
Non-compensation costs	407	20.95	7.08	2.6	36.4
Unemployment rate	467	7.71	4.11	.5	24.2
PPP manufacturing wage	402	20.43	5.83	7.56	29.77
UI replacement	356	30.18	12.29	3	65
Innovation index	198	.38	.20	0	1
Patent application rate	552	.030	.078	0	.56
Proportion women	561	.44	.041	.34	.49
Gini coefficient	470	.29	.043	.207	.41

Table 1: Descriptive Statistics

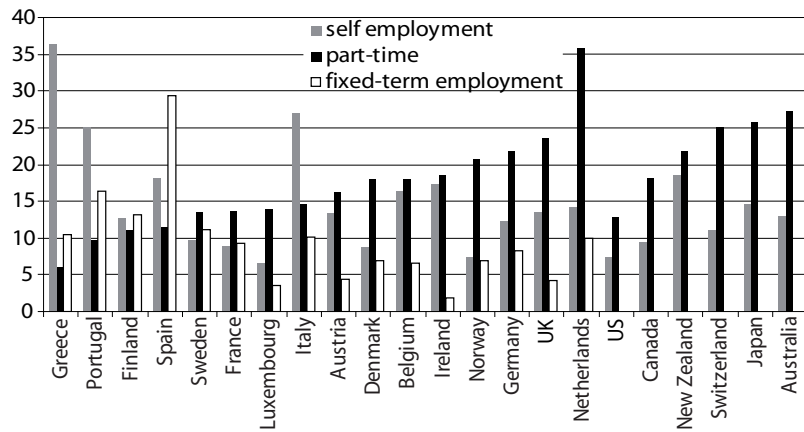


Figure 1: Levels of atypical employment by country, 2005

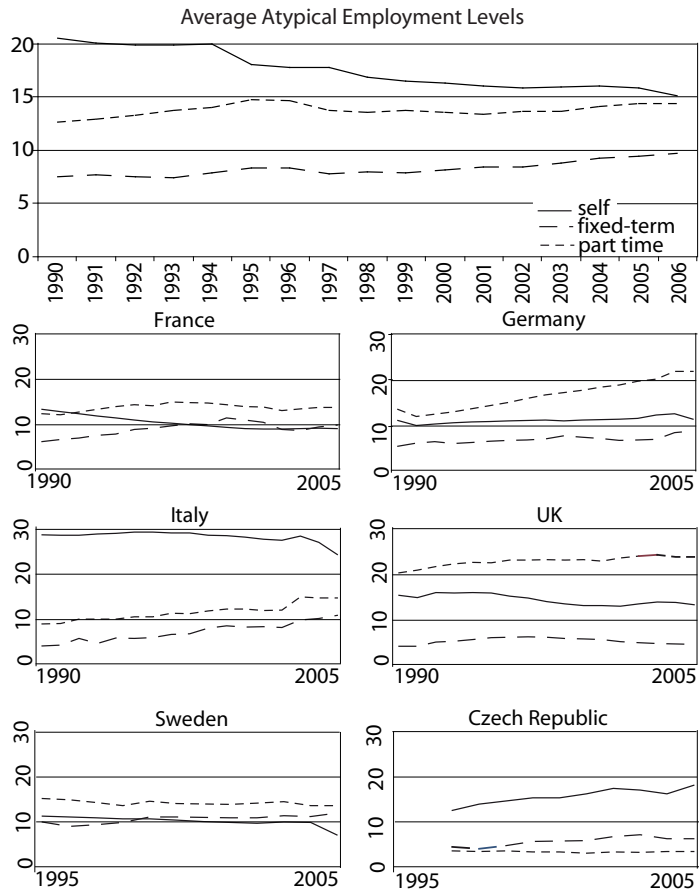


Figure 2: Trends in atypical employment

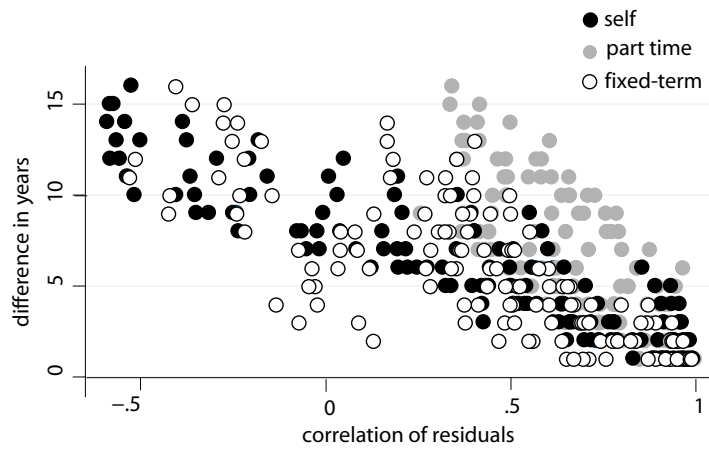


Figure 3: Correlation between residuals predicting atypical employment

	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06
Australia	o*	o*	o*	o*	o*	o*	o*	o	o*	o*	o*	o*	o*	o*	o*	o*	o*
Austria	*	*	*	*	*	*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*
Belgium	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo	xo*	xo*
Canada	o*	o*	o*	o*	o*	o*	o	o*	o	o*	o*	o*	o*	o*	o*	o*	o*
Czech								xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*
Denmark	xo	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo	xo*	xo*
Finland	o*	o*	o*	o*	o*	xo*	xo*	xo*	xo	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*
France	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo	xo*	xo*
Germany	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo	xo*	xo*
Greece	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo	xo*	xo*
Hungary			*	*	*	o*	o*	xo	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*
Iceland	o*	o*	o*	o*	o*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	x*	x*	x*	x*
Ireland	xo	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo	xo*	xo*
Italy	xo	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo	xo*	xo*
Japan	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*
Lithuania			*	*	*	*	*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Luxembourg	xo*	xo*	xo*	xo*	xo*	xo*	xo	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo	xo*	xo*
Netherlands	xo*	xo*	xo*	xo*	xo*	xo*	xo	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo	xo*	xo*
N Zealand	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*
Norway	o*	o*	o*	o*	o*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*
Poland	*	*	*	*	*	*	*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*
Portugal	xo*	xo	xo	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo*	xo	xo*	xo*
Romania			*	*	*	*	*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Slovakia					o*	o*	o*	o*	xo*	xo*	xo*	xo	xo*	xo	xo*	xo*	xo*
Slovenia				*	*	*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*	x*
Spain	xo*	xo*	xo*	xo	xo	xo	xo	xo	xo*	xo*	xo*	xo	xo*	xo*	xo	xo*	xo*
Sweden	o*	o*	o*	o*	o*	xo	xo	xo	xo	xo	xo*	xo*	xo	xo	xo*	xo*	xo*
Switzerland	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*
UK	xo*	xo*	xo*	xo	xo	xo	xo	xo	xo	xo	xo	xo	xo	xo	xo	xo	xo*
US	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*	o*

x short term work
o part-time work
* self-employment

Table 2: Dependent variable availability

	UD	SR	REPL	TEPL	DEPL	NCC	U	MW	UR	I	WW
Union Density	1										
Strike/Lockout Rate	.073	1									
Regular EPL	.036	.029	1								
Temp EPL	.14	.22	.081	1							
Regular-Temp EPL	.14	.24	.24	.95	1						
Non-Compensation	.078	.080	.22	.091	.16	1					
Unemployment	.19	.089	.044	.038	.016	.031	1				
Manufacturing Wage	.46	.21	.0042	.22	.20	.24	.21	1			
Unemploy Rep Rate	.11	.0020	.091	.29	.25	.22	.051	.17	1		
Innovation	.14	.037	.041	0	.0054	.20	0	.27	.073	1	
Women Working	.32	0	.27	.41	.31	.0026	.29	.34	.30	.29	1

Table 3: Independent variables correlations

	fixed-term		pt employment		self-employment	
	fe	re	fe	re	fe	re
entrepreneurship						
patent app rates	6.13	NA	-6.97	-13.09	21.9*	27.3*
self employment	.264	NA	.221*	.121	NA	NA
employer constraints						
union density	.232**	NA	.020	-.029	.021	.006
strike rates	-.124	NA	-.102*	-.109*	.036	.029
regular EPL	-1.30	NA	.138	-.664	1.97***	1.87***
reg-temp EPL	.799	NA	-.521	.045	.390	.323
non-comp costs	-.140	NA	.111	-.058	-.219**	-.140*
worker constraints						
unemployment	.012	NA	-.037	-.024	.296***	.276***
unemp replacement	.161**	NA	.028	.007	-.038*	-.034
median income	.651**	NA	.212	.255*	-.237**	-.352***
controls						
women	58.8*	NA	115	87.8***	-41.0***	-54.1***
constant	-44.0	NA	-45.2***	24.3**	37.3***	45.0***
σ_u	11.61	NA	7.43	4.86	7.14	4.61
σ_e	1.355	NA	.797	.797	.584	.584
ρ	.987	NA	.989	.974	.993	.984

() indicates the P value for the coefficient

u indicates the random or fixed effects, as appropriate

Table 4: Fixed and random effects coefficients

	fixed-term		pt employment		self employment	
	full	best	full	best	full	best
cntry/obs	14/123	15/234	20/181	21/330	10/183	24/369
Fixed Part						
entrepreneurship						
patent app rates	-2.24	NA	-11.99	-59.37***	25.05*	-16.49
self employment	.38*	NA	.15	.32***	NA	NA
employer constraints						
union density	.12*	.20***	-.02	-.082***	.01	NA
strike rates	-.12	NA	-.11**	NA	.03	NA
regular EPL	-1.94	-1.0	-.52	-2.12***	1.91***	1.66**
reg-temp EPL	.91	.51 *	-.084	.15	.36	-.03
non-comp costs	-.04	-.43***	-.017	-.13*	-.18**	-.11*
worker constraints						
unemployment	-.02	.13**	-.025	-.05	.28***	.20***
unemp replacement	.15**	.042	.01	.038	-.036	NA
median income	.44*	NA	.24*	.48***	-.30***	NA
controls						
women	39.43	-18.51	94.86***	87.50***	-47.81***	-59.69***
EU member	3.70	NA	-.76	NA	.43	NA
Random Part						
country(sd cons)	8.07	9.02	5.93	5.53	6.83	6.38
year	.00035	1.52	.00025	NA	.044	NA
residual variability sd(resid)	1.31	1.25	.776	1.09	.58	1.20
Log Likelihood	-248.21	-458.02	-273.45	-559.68	-274.22	-558.90

*** P = .001, ** P = .01, * P = .05

Table 5: Crossed effects and best regression coefficients

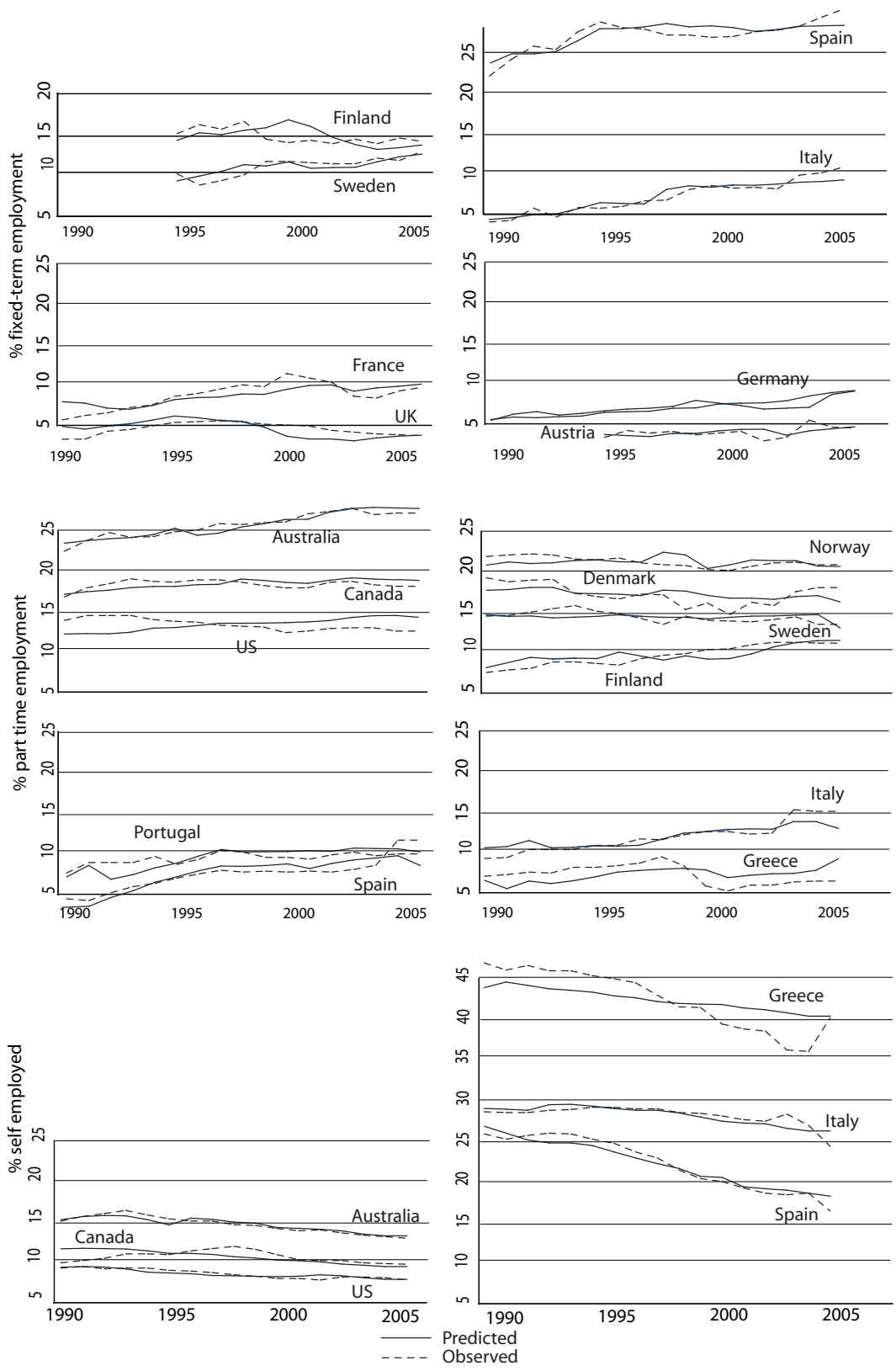
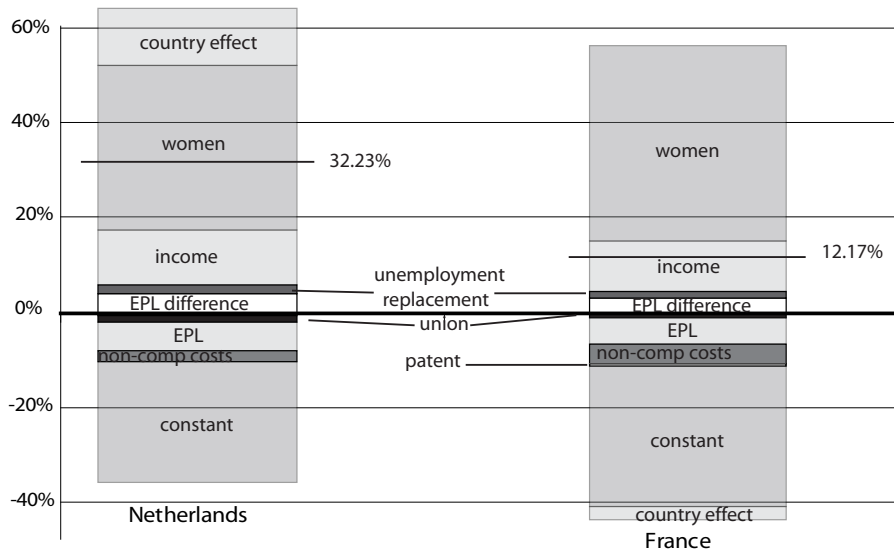
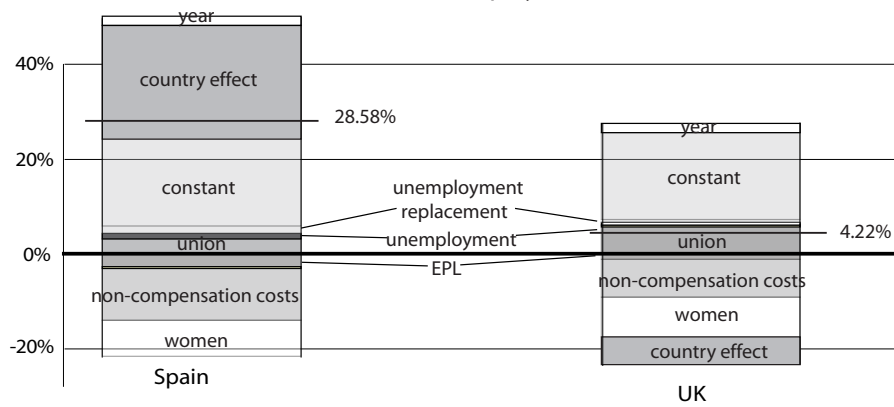


Figure 4: Predicted versus observed atypical employment

Part-Time Employment



Fixed-Term Employment



Self-Employment

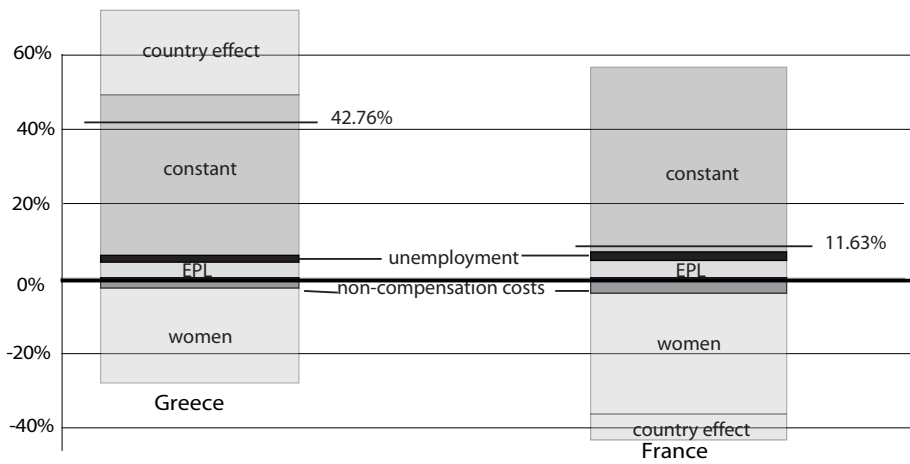


Figure 5: Decomposing predicted atypical employment for 6 cases in 2006