

Who Does High Employment Regulation Really Impact?
An investigation to see how typical employment regulation impacts part-time and temporary employment

James Oppenheimer
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Abstract

This paper investigates how regulation of typical employment affects atypical employment. We find that when typical employment regulation becomes stricter, atypical work increases. When regulation increases for typical employment, each employee's firing cost rises. In order for firms to justify paying these higher costs, its employees must become more productive. Economic theory tells us that marginal revenue product diminishes as the number of workers increase. Thus, firms must hire fewer workers to justify the higher firing cost. These workers who are no longer able to work in the typical market will enter the atypical market. We test this theory by using econometric analysis. The econometric results complement the theoretical findings and suggest that when the strictness of typical employment increases, the incidence of part-time and temporary work also increases.

Introduction

Part-time and temporary employment has become a global phenomenon. In the United States, the temporary service industry grew at an annual rate of 11 percent between 1972 and 2003 (Magani, 2004). The incidence of part-time work¹ in the Netherlands grew from 16.5 percent in 1986 to 22.7 percent in 2001 (Rasmussen et. al. 2004).

Part-time and temporary work definitions differ between various countries. In the United States, a part-time worker is considered anyone who earns normal wages and works less than thirty-five hours a week. This paper defines part-time work as any regular wage employment in which the hours of work are less than normal (Kalleberg, 2000). Temporary work is difficult to define because it is so broad. Kalleberg defines it as "any job in which an individual does not have an explicit or implicit contract for long-term employment or one in which the minimum hours worked can vary in a nonsystematic manner." This paper defines it simply as any sort of fixed-term work in which long-term employment is not guaranteed. We commonly refer to this as contingent work, fixed-term

¹ The incidence of part-time work refers to the percentage of the total population that work in part-time jobs.

work, or contract work. This essay defines atypical work as both part-time and temporary work. It defines typical employment² as all types of full-time and long-term normal work.

Atypical research can be categorized into two different areas. The first area investigates economy wide trends that have caused atypical work to increase in western countries since the 1970s. The most frequent trend that this area focuses on is the change from economies that are manufacturing-based to economies that are service-based. Research in this category has investigated whether this change has actually caused this shift in employment preferences (Magani). The second area investigates how short-run and market specific changes affect the quantity of atypical employment. This area often includes how market freedom, unemployment, and workforce demographics cause atypical and temporary employment to change.

This paper focuses on the second category of research. More specifically, it is concerned with how the amount of regular employment legislation in the typical market affects the atypical market. We find that increased regulation in the typical market causes the quantity of atypical employment to increase. We first show this by introducing a theoretical model, which connects both markets. The underlying assumption in this model is that individuals can choose to work in either market. Generally, individuals will work in the market that gives them the most utility. Therefore, these markets are substitutes. When firing costs for typical workers increase (i.e. by stronger regulation), firms will hire less of these employees. This causes fewer individuals to have the opportunity to work in the typical market. The fact that these extra individuals have no opportunity to work in the typical market means they are unable to derive any utility from it. Thus, these people will

² This essay also refers to *typical employment as normal employment or regular employment*.

move over to the atypical market, which will cause its supply to increase. This paper also conducts two econometric regressions to test this theory. The results show that both part-time and temporary work increases with strictness of typical employment regulation.

This paper is divided into five sections. Section I provides a review of literature written on this topic. This section summarizes conclusions on not only regulation but also on other findings regarding the second category of research. Section II introduces a theoretical model that shows how regulation affects atypical employment. Section III provides a description of the data used in our econometric tests. Section IV presents the results of these tests. Finally, Section V offers a conclusion and discusses the significance of this paper's findings.

Section I: Literature Review

According to the literature, regulation for full time jobs directly affects part-time and temporary jobs. Grub & Wells (1993) found that the temporary employment strongly increased as the strictness of regulation for regular workers increased. The authors ranked eleven countries strictness of employment protection. Spain was considered the strictest regulated country while the UK was considered the least strict. Spain had the highest incidence of temporary employment³ at roughly 27 percent while the UK had the lowest at roughly 5 percent. The authors argued that this occurred because firms used temporary employees to circumvent full time employee regulations. Thus, as normal employment became stricter, firms hired more temporary workers to circumvent these additional restrictions. Kalleberg (2000) argued that various regulations in the United States, such as the Federal and Family Leave Act of 1993, have caused full time labor costs to rise for firms.

³ Incidence of temporary employment refers to the percentage of the workforce that are temporarily employed.

As a consequence, firms have started to avoid these higher costs by hiring less full time employees and more part-time employees.

Union presence in a country also appears to affect atypical employment.

Hevenstone (2008) found that a 1 percent increase in union density resulted in fixed-term employment rising significantly by .20 percent. She argued that this occurred because unions imposed constraints that firms avoided by using fixed-term employment.

Rasmussen et. al. (2004) found that the bargaining power of unions in New Zealand decreased over time which made it easier for firms to circumvent union requirements. The authors argued that this was a major reason as to why the incidence of part-time work rose from 16.5 percent in 1986 to 22.7 percent in 2001.

The literature also infers that unions can have the opposite effect and decrease atypical employment. Union contracts often include clauses that limit the amount of atypical work that a firm can employ (Hevenstone: Lind et. al. 2008: Rasmussen et. al.). Hevenstone found that while this is not true for temporary employment, it is for part-time employment. Her results showed that when union density increased by 1 percent, the incidence of part-time employment decreased .08 percent. She speculated that this occurred because union contracts tend to include provisions for part-time work but rarely do for temporary work. Rasmussen et. al. found that unions had the opposite effect on part-time work in Denmark than in New Zealand. In Denmark, individuals rallied around unions, which caused them to gain power. This attributed to why part-time work decreased from 19.6 percent in 1986 to 14.5 percent in 2001.

Hevenstone also found that unemployment effects atypical work. Her results stated that a 1 percent increase in the unemployment rate resulted in the incidence of fixed-term

work to increase by .13 percent. When unemployment increases, jobs are scarcer and, for that reason, individuals have less choice of where to work. This causes people who prefer to work full time to work in fixed-term jobs.

Grip et. al. (1997) argued that governments use temporary and part-time employment as a tool to decrease unemployment. In business cycle downturns, firms are much more likely to hire atypical than typical workers in order to keep costs down. For this reason, governments put in place policies that encourage firms to hire atypical employees. Lang et. al. investigated European Union policy after the 2008 recession and found that European governments have loosened restrictions on part-time and temporary employment. For instance, in March of 2013, Spain put in place several policies that encourage firms to hire young part-time workers. Grip et. al. showed that in Belgium, between 1983 and 1991, a 3.7 percent increase in part-time employment correlated with a 4.9 percent decrease in unemployment. During those same years in France, a 13.2 percent increase in temporary employment coincided with a 1 percent decrease in unemployment.

Lind et. al. showed that part-time employment has become a voluntary youth phenomenon. In Denmark, the authors found that people between the ages of 15 and 24 went from making up 19 percent of the part-time labor market in 1983 to 40 percent in 2004. The authors' results showed that these youth workers were satisfied with this type of job. In 2004, of all the involuntary part-time workers in Denmark, only 18 percent of them were between the ages of 15 and 24. Lind et. al. argue that this has occurred because of education. Part-time employment allows individuals to earn income and participate in tertiary education. One third of part-time workers combine work and education.

The research indicates that the quantity of women employment can also affect atypical work. Grip et. al. found that a large majority of women employees work part-time. Their research showed that in the Netherlands in 1991, of the 54.5 percent of women who worked, 59.8 percent worked part-time. The authors argue that this is because women often supervise their children while their husband works. Part-time employment allows these women to earn income and look after their children simultaneously.

Rasmussen et. al. argued that women have used part-time work as a stepping-stone to full time employment. For this reason, while women have traditionally played a large role in part-time employment, their level of participation in it has decreased. They investigated women employment in Denmark and found that in 1976, roughly 45 percent of the women labor force worked part-time. In 2000, only 17 percent of the women labor force worked part-time.

Section II: Theoretical Explanation

This section provides a theoretical explanation of how typical employment regulation leads to an increase in atypical employment. The literature review explains how other variables such as gender, age, unemployment, and union presence all also affect atypical employment. While these factors are certainly important, this section does not focus on them. These variables will be taken into account and controlled when the econometric analysis is performed.

The Typical & Atypical Employment Markets

The market for typical employment, shown in *Figure 1*, investigates how a firm's fixed cost per employee affects the quantity of typical workers. A fixed cost is any cost that is paid one time per employee by the firm rather than throughout that employee's tenure.

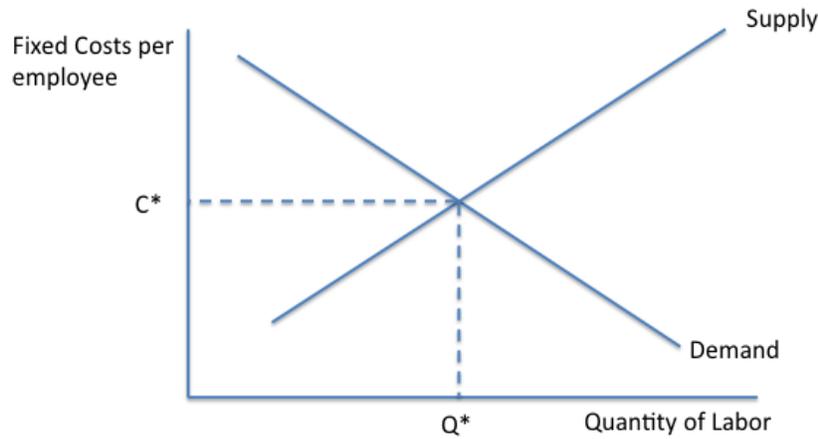


Figure 1: Typical Employment

These types of costs are generally associated with hiring or firing an employee. In *Figure 1*, the workers represent the supply and the employers represent the demand. As fixed costs increase, the quantity supplied increases. Firms invest more into their workers, which incentivizes more individuals to work for three reasons. First, workers will experience a better recruitment process because firms will invest more into it. Second, individuals will get a better employment experience through stronger training. Third, it increases employment security because firms will be less willing to fire workers. The opposite occurs when fixed costs fall. Quantity demanded increases when fixed costs fall. This is because firms can decrease their total costs by investing less in their typical employees. The opposite occurs when fixed costs rise.

The market for atypical employment, shown in *Figure 2*, also investigates how a firm's fixed cost per employee affects the quantity of atypical workers. The workers represent supply and the employers represent demand. The quantity demanded for atypical employment has the same characteristics as the quantity demanded for typical employment. Quantity supplied also increases as fixed costs rise. However, the supply curve has three different elasticity structures.

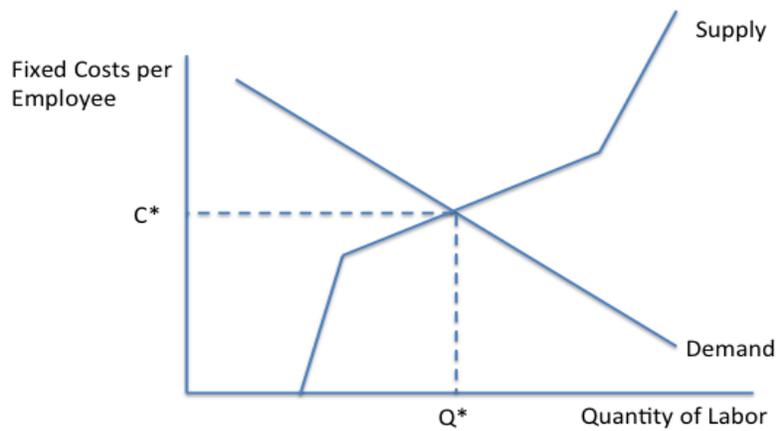


Figure 2: Atypical Employment

The first structure represents workers who can only work in atypical jobs because they do not have the skillsets to work in full time jobs. These workers must also earn an income. This part is very inelastic because no matter how much firms invest in these workers; they have no choice but to work atypically.

The second elasticity structure represents workers who must earn income but have the choice to work atypically or typically. These workers like the idea of working hours in an atypical job but only if the firm invests enough into them. If firms invest enough in these workers, they will then opt for the atypical option. This part is very elastic because the amount that the firm invests in their atypical workers will greatly impact the quantity of those that choose to work atypically.

The third category represents individuals who do not need to earn an income but only have the option to or want to work atypically. This category often includes stay at home parents. Stay-at-home parents do not necessarily need to earn an income because the other parent works full time and earns enough for the entire family. However, working in an atypical job would allow these families to earn more income and give this parent training for future typical opportunities. Thus, if a firm invests a large amount into their

atypical work force then some stay-at-home parents will begin to work. They would be able to earn extra income while still being able to supervise their children.

The Optimal Amount of Typical Workers a Firm Hires

A firm faces hiring costs, wage costs, and firing costs for each employee it hires. Hiring costs are all the costs associated with hiring an employee, including recruiting, administrative, and training costs. This is a fixed cost because it is paid only once when the firm hires the employee. Wage costs include both the employee's salary and any other benefits that he or she may receive. This is a variable cost because wages are paid throughout the employee's tenure and based on the amount that he or she works. Firing costs are all the costs associated with the workers voluntary or involuntary dismissal. These costs include any administrative, pension, or benefit payments that must be made when the employee departs. Firms predict the firing costs based on the contents of the contract and the regulation requirements in which the company must abide. This cost is a fixed cost because it is only paid once at the end of the employee's tenure. Firms predict the employee's tenure based on the duration of the employment contract. *Equation (1)* presents the aggregate present value of these costs where H represents hiring cost, W equals wages + benefits, F represents firing cost and N is the employee's termination time.

$$PVC(TYP) = \frac{H}{(1+r)^0} + \sum_{i=0}^n \frac{W_i}{(1+r)^i} + \frac{F_n}{(1+r)^n} \quad (1)$$

The marginal revenue product (MRP) measures the benefit that each employee contributes to the firm. MRP is the change in total revenue by employing one more unit of labor. MRP diminishes because of crowding out and diminishing returns. This is a variable benefit because an employee contributes to total revenue throughout their tenure.

Equation (2) shows the present value of an employee's benefit throughout his or her entire tenure.

$$PVB(typ) = \sum_{i=0}^N \frac{MRP_i}{(1+r)^n} \quad (2)$$

The net benefit of an employee is equal to their MRP subtracted by their total costs. A firm will continue to hire typical employees until the present net benefit value of the last employee hired equals zero. *Equation (3)* shows this.

$$PVNB(typ) = PV(B) - PV(C) = 0 \quad (3)$$

Thus, when we substitute in *Equation (1)* and *(2)* into *Equation (3)*, it equals *Equation (4)*:

$$0 = \sum_{i=0}^n \frac{MRP_i}{(1+r)^n} - \left(\frac{H}{(1+r)^0} + \sum_{i=0}^n \frac{W_i}{(1+r)^n} + \frac{F_n}{(1+r)^n} \right) \quad (4)$$

Equation 5 sets the present value of the fixed costs equal to the net present revenue of each employee.

$$\frac{H}{(1+r)^0} + \frac{F_n}{(1+r)^n} = \sum_{i=0}^n \frac{MRP_i - W_i}{(1+r)^n} \quad (5)$$

The Affect of Typical Employment Regulation on Atypical Employment

Increasing typical employment regulation will cause firms to hire fewer typical workers. We define typical employment regulation as any sort of dismissal requirement. This includes any required time between notice of employee dismissal and actual departure, any pension or benefit requirements paid at termination, and any sort of rules regarding when or how an employee can be dismissed. When regulation increases, a firm's firing cost will rise because a firm now has to pay more when an employee departs. For instance, if a firm initially had to pay 30 percent of an employee's salary for one year when it fired an employee but now has to pay 40 percent of that employee's salary then the firm's firing cost would rise. If regulatory standards made it harder to fire an employee, the

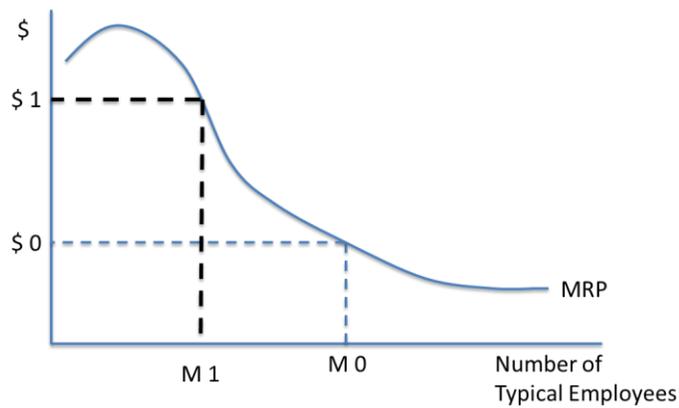


Figure 3

administrative segment of firing costs would increase. Referring back to *Equation (5)*, if firing costs increase on the left side of the equation then there must also be an increase on the right side. Wages are fixed because we are assuming that the typical employment market is perfectly competitive. For this reason, MRP must increase when firing costs increase. However, as explained earlier, MRP diminishes so it increases when a firm decreases the number of its typical employees. *Figure 3* shows that if a firm needs to raise MRP from \$0 to \$1 then the firm must dismiss or not hire workers from M0 to M1. Thus, workers from M0 to M1 will be unable to work in the typical market.

Increasing typical fixed costs causes a surplus of labor in the market. *Figure 4* shows that as costs rise to C\$1, a firm will only hire Q\$1 workers, even though QD workers would

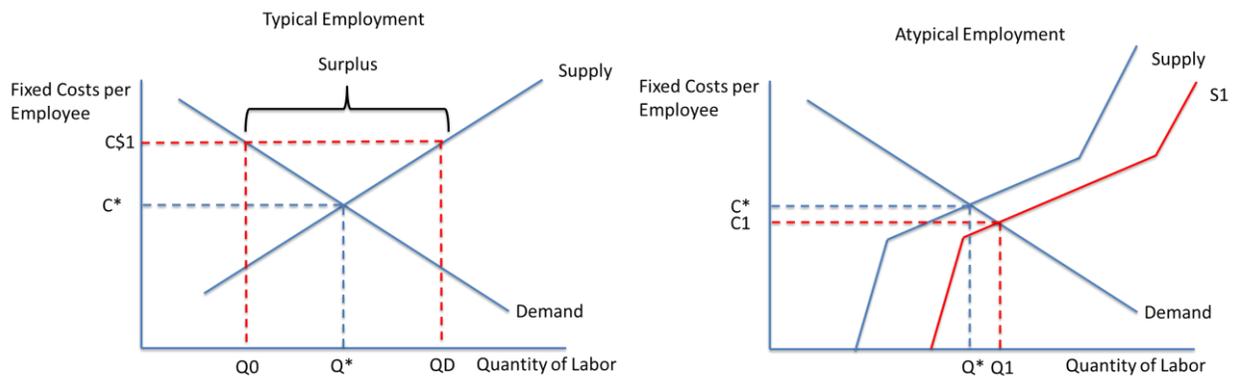


Figure 4

like to work typically. This surplus of workers will still need to earn an income but will not be able to work in the typical market. For this reason, these workers will turn to the atypical market, which will cause atypical supply to increase to S_1 and for the quantity of atypical labor to rise to Q_1 . Thus, as a result of the fixed cost rising due to regulation in the typical market, the supply will increase in the atypical market.

Section III: Data Description

Data was collected from the OECD and World Bank Databases on twenty countries between the years 1998 and 2011. The countries examined were Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the UK, and the United States. There are 280 potential observations for each statistic. However, several countries failed to report necessary information for certain years. For this reason, the observation size for three variables is less than 280. *Table 1* provides the observation sizes as well as all other summary statistics for all the data collected. The two dependent variables are the incidence of part-time employment, denoted as *Parttime* and the incidence of temporary employment, denoted as *Incidentemp*. The data for the incidence of part-time employment was collected from the World Bank and the data for the incidence of temporary employment was obtained from the OECD. The incidence of part-time employment represents the percentage of total employment that work part-time

Table 1. Descriptive Statistics of Data

Variable	OBS	Mean	Standard Deviation	Min	Median	Max
Parttime	277.00	15.68	9.33	2.5	14.70	49.10
Incidenttemp	267.00	12.93	5.73	4.00	12.18	34.04
Regulation	280.00	2.52	0.62	1.01	2.62	4.10
Additprovreg	280.00	3.15	0.73	1.63	3.13	5.13
Uniondensity	270.00	32.43	20.96	5.39	25.44	81.29
Unemployment	280.00	7.24	3.03	2.10	7.30	21.60
Femalelabor	280.00	44.25	4.44	26.16	52.85	48.68
Youthlabor	280.00	50.65	14.01	24.60	50.65	81.90

Source: OECD & The World Bank

in a given country. The incidence of temporary employment represents the percentage of total employment that works for a fixed amount of time in a given country.

This paper used the OECD's scale of *strictness of employment protection – individual and collective dismissals (regular contracts)*, denoted as *regulation*, to measure typical employment regulation. The scale ranges from zero to six, where zero equals no regulation and six equals the most regulation. It incorporates the following aspects of employment regulation for regular contracts:

1. Procedural inconveniences that employers face when starting the dismissal process, such as notification and consultation requirements.
2. Notice periods and severance pay. This usually varies by the tenure of the employee.

3. Difficulty of dismissal. This includes both the circumstances in which it is possible to dismiss workers and the repercussions for the employer if a dismissal is found to be unfair.

The second variable used to measure regulation is *strictness of employment protection- collective dismissals (additional provisions)*, denoted as *Additprovreg*. The OECD also determines this and it is also ranked from zero to six. This paper includes this variable because most countries impose additional delays, costs, or notification procedures when an employer dismisses a large number of workers at one time. This indicator measures these additional costs for collective dismissals. It does not reflect overall strictness of regulation for collective dismissals but rather only any additional cost that a firm would face.

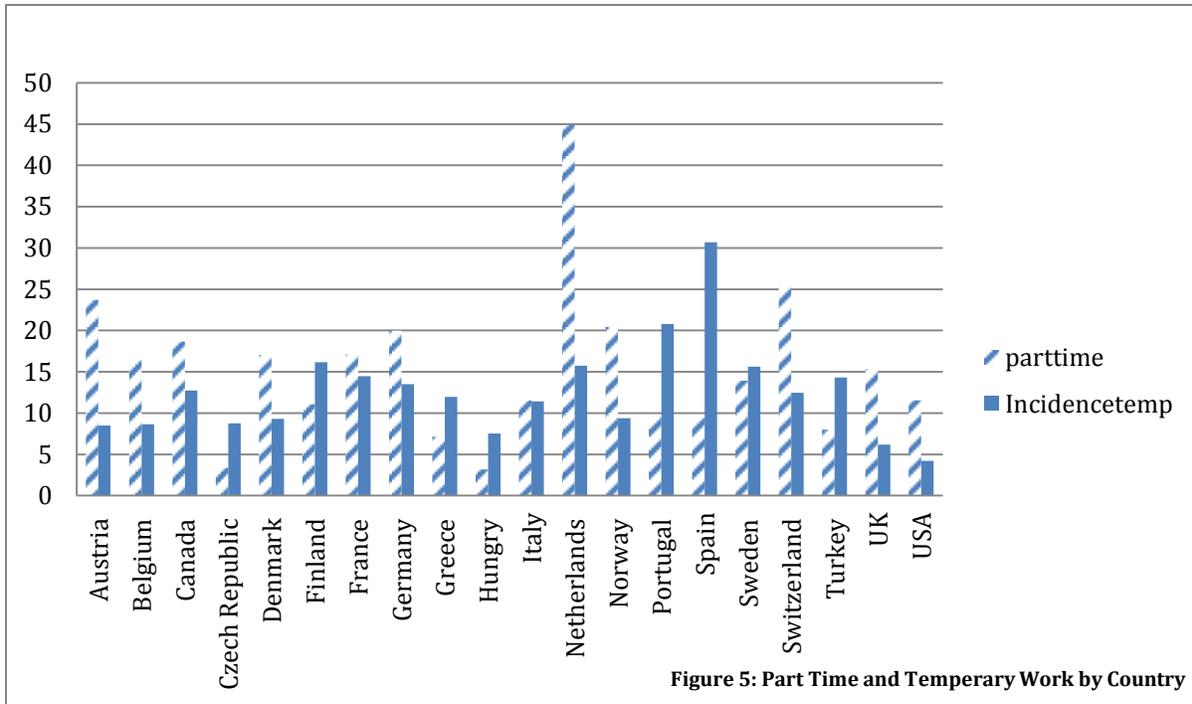
Union Density, denoted as *uniondensity*, is the first of four control variables. This OECD calculation is the percentage of the labor force that are trade union members in a given country. As noted in the literature review, Rasmussen et. al. (2004) and Hevenstone (2010) both found that unions affect part-time and temporary employment. However, the ways in which unions affect these markets can be different depending on the circumstances. In general, union density has not changed through time for any given country. However, union density has changed from one country to another. In 2013, Union density was 18.13 percent in the Netherlands but 69.49 percent in Finland. For this reason, this variable is used to hold changes across countries constant.

The second control variable is unemployment, denoted as *Unemployment*, and was obtained from the World Bank. As noted in the literature review, Hevenstone and Grip et. al. (1997) found that unemployment changes with atypical employment. Changes in the business cycle has historically caused the unemployment rate to change. For instance, the

unemployment rate in the United States was 4.6 percent in 2007 and 9.3 percent in 2009. Unemployment can also be very different from one country to another at any given time. In 2005, the unemployment rate was 4.7 percent in the Netherlands and 7.6 percent in Portugal. For these reasons, this variable is meant to hold constant changes in unemployment through time and across countries.

The female labor participation rate, denoted as *femalelabor*, is the third control variable. The World Bank determines this by calculating the percentage of the labor force that is older than fifteen and female. In all the countries observed, female labor participation has increased significantly. Rasmussen et. al. and Grip et al. found that female labor participation increased atypical employment. In most countries, as time has progressed, female labor participation has grown. For instance, the female labor participation rate in Spain increased from 38.62 percent in 1998 to 44.78 in 2011. Female labor also varies across countries. In 2013, female participation was 45.91 percent in the UK and 30 percent in Turkey. This variable is meant to hold constant changes in time and across countries.

The final control variable is youth labor participation, denoted as *youthlabor*. The World Bank calculates this as the percentage of the workforce who is in-between the ages of fifteen and twenty-four. Lind et. al. (2008) found that youth labor participation affects atypical employment. For some countries, youth labor appears to have increased steadily throughout time. For others, it seems to have decreased. For example, in Greece, youth participation fell from 41.5 percent in 1998 to 30.7 percent in 2014. In France, it rose 4 percent in the same time period. These statistics show that this variable must be controlled to account for changes in time and across countries.



Part-time and temporary employment has varied significantly between countries.

Figure 5 displays the average incidence of part-time employment and the average incidence of temporary employment for each country. The country with the highest average incidence of temporary employment was Spain at 30.67 percent. This was roughly one third higher than the second highest country, Portugal, at 20.80 percent. The countries with the lowest levels were the UK at 6.17 percent and the U.S. at 4.23 percent. The country with the highest amount of part-time employment was the Netherlands at 44.89 percent. This was almost twice the size of Switzerland, the second largest country, at 25.24 percent. Hungary had the lowest level at 3.18 percent.

Strictness of typical employment (measured by the variable *regulation*) varies among the surveyed countries. Table 2 shows the mean, median, standard deviation, and legal system origin for each country. Portugal, Italy, and Germany have the strictest regulatory standards, while the USA, Canada, and Finland have the weakest.

Country	Mean	Median	Standard Deviation	Legal System Origin
USA	1.00	1.00	2.30E-16	English
Canada	1.51	1.51	0.07	English
Finland	2.09	2.08	4.61E-16	Scandinavian
Switzerland	2.18	2.18	0	German
Norway	2.38	2.38	0	Scandinavian
Hungary	2.40	2.40	.09	German
Denmark	2.47	2.56	0.11	Scandinavian
Turkey	2.48	2.54	0.09	French
UK	2.54	2.55	0.03	English
Sweden	2.59	2.58	0.02	Scandinavian
France	2.68	2.67	0.04	French
Austria	2.72	2.62	0.14	English
Spain	2.75	2.76	0.03	French
Belgium	2.77	2.76	0.05	French
Greece	2.90	2.93	0.12	French
Czech Republic	2.90	2.97	0.09	German
Netherlands	2.91	2.92	0.02	French
Germany	3.03	3.09	0.06	German
Italy	3.15	3.15	9.22E-16	French
Portugal	3.92	3.98	0.23	French

Source: OECD

Besides a few exceptions, *regulation* has remained relatively unchanged within each country. This is shown by the small standard deviations. In general, countries with relatively higher standard deviations have loosened their regulation restrictions over the last five years. Portugal has the largest standard deviation at .23. In June of 2008, Portugal signed a bill that changed the country's dismissal restrictions in the following ways: 1) Administrative procedures for dismissing workers was simplified. 2) The required notice period changed from sixty days to fifteen days for workers with tenure that lasted less than nine months. 3) The amount of time that a dismissed employee could make an unfair dismissal complaint decreased from one year to sixty days (Venn, 2009).

Certain legal origins tend to have a direct impact on employment regulation. English judicial origin is based off common law while the French, German, and Scandinavian origins are rooted in civil law. Common law systems focus on judicial precedent while civil law systems place an emphasis on statutory laws. Common law systems tend to be relatively more flexible and dependent to interpretation. This causes common law systems to generally have less of a regulatory burden than civil law systems. This explains why English origin countries have less strict employment regulation than French origin countries. German and Scandinavian origins appear to fall in between (Venn, 2009).

Section IV: Econometric Results

The econometric results confirm the model explained in Section II. When regulation increased for typical employment, the amount of atypical employment also increased. Two different regressions were run. The first regression, *equation (6)* used the incidence of temporary employment as the dependent variable.

$$Incidentemp = \beta_0 + \beta_1 Regulation + \beta_2 Additprovreg + \beta_3 Uniondensity + \beta_4 Unemployment + \beta_5 Femalelabor + \beta_6 Youthlabor + \mu \quad (6)$$

The second regression, *equation (7)* used part-time employment as the dependent variable.

$$Parttime = \beta_0 + \beta_1 Regulation + \beta_2 Additprovreg + \beta_3 Uniondensity + \beta_4 Unemployment + \beta_5 Femalelabor + \beta_6 Youthlabor + \mu \quad (7)$$

Both regressions showed evidence of autocorrelation and heteroskedasticity. To account for this, this paper used a generalized least squares regression. However, an ordinary least squares (OLS) regression resulted in similar coefficient and significance results. For this

reason, this paper used the OLS regression for its findings. Both regressions were statistically significant.

As illustrated in *Table 3*, overall regulation had a positive effect on temporary employment. A 1-unit increase in *regulation* caused *incidencetemp* to increase by 4.58 percent. These results support the model explained in Section II and show that increasing regulation causes more temporary employment.

Additional provisions for collective dismissal negatively effected temporary employment. A 1-unit increase in *Additprovreg* resulted in the *incidencetemp* to decrease by 1.02 percent. This is surprising considering this variable was used as a proxy for

Table 3. Incidence of Temporary Employment

Variable	Coefficient	T-Value
Dependent Variable: Incidencetemp		
Regulation	4.58**	11.99
Additprovreg	-1.02**	-3.00
Uniondensity	-0.03**	-2.58
Unemployment	1.22**	7.84
Femalelabor	0.05	0.67
Youthlabor	0.19**	8.46
Constant	-15.72	-3.06
Observations	257	
R-squared	.40	

**Denotes Significance at the 5% level

regulation. These results suggest that firms do not fire a large amount of typical workers as a way to lower costs when it becomes more expensive to do so. Instead, they will begin to dismiss temporary workers. By doing this, firms can still lower costs and circumvent collective dismissal regulations.

Union density negatively effected temporary employment, while the unemployment rate and youth labor rate positively effected it. A 1 percent increase in *Uniondensity* caused *incidencetemp* to decrease by 1.02 percent. Regarding the two union theories, this implies that unions' ability to influence firms to hire less temporary workers outweighs firms' ability to hire non-unionized temporary workers. A 1 percent increase in *unemployment* resulted in a 1.22 percent increase in *incidencetemp*. This result validates the theory that in times of high unemployment, individuals have fewer choices and will be more willing to work temporarily. A 1 percent increase in *youthlabor* resulted in a .19 percent increase in *incidencetemp*. As explained above, youth workers often choose to work in temporary jobs for a variety reasons. For example, it causes them to have the ability to work and get educated simultaneously.

Table 4 shows that strictness of regulation and strictness of additional provisions for collective dismissals increased part-time employment. A 1 unit increase in *regulation* caused a 3.22 percent increase in *parttime*. For every 1 unit increase in *additprovreg*, *parttime* also increased by 3.63 percent. This result verifies the results found in the theatrical model for part-time employment.

Union density effected part-time employment negatively while female labor and youth labor participation effected it positively. A 1 percent gain in *uniondensity* caused a .07 percent loss in *parttime*. Similar to temporary employment, it appears that union presence does not cause firms to hire more part-time workers in order to avoid unionized employees. A 1 percent increase in *femalelabor* caused a .38 percent increase in *parttime*. Workers often prefer part-time employment to temporary employment (Grip et al. 1997). Thus, it makes sense that female laborers have chosen to work part-time where there was

Table 4. Incidence of Part-Time Employment

Variable	Coefficient	T-Value
Dependent Variable: Parttime		
Regulation	3.22**	4.47
Additprovreg	3.63**	9.20
Uniondensity	-0.07**	-3.86
Unemployment	-0.21	-1.76
Femalelabor	0.38**	5.20
Youthlabor	0.54**	13.79
Constant	-44.15	-9.15
Observations	267	
R-squared	.68	

** Denotes Significance at the 5% level

significance and not temporarily where *femalelabor* was insignificant. A 1 percent increase in *youthlabor* resulted in a .54 percent increase in *parttime*. Similar with temporary employment, working part-time gives youth more flexibility.

Section V: Conclusion

This paper found that stricter typical employment regulation results in more atypical work. Increasing normal employment regulation causes firms firing costs per employee to rise. The only way to justify paying these higher costs per employee is if the benefits or marginal revenue product of each worker rises. However, fundamental economic theory states that marginal product of labor diminishes as quantity of labor increases. Thus, firms must hire fewer workers in order to increase their typical workers marginal revenue product. These workers are unable to gain any utility from the typical market considering they are unable to get employed in it. Thus, these individuals will move over to the atypical market causing its supply to increase. The econometric results

validated this theory. Increasing typical employment regulation resulted in both the incidence of part-time and temporary work to increase significantly.

Governments must be cognizant of this when making policy decisions. Employee protection legislation does help individuals who have already secured full time employment. In times of high regulation, it is very costly for a firm to fire an already established employee. For this reason, firms are unlikely to fire any of these workers. However, these results show that these policies actually hurt employees who are not yet established workers. These workers get pushed out of the typical market and into the atypical market.

It is a problem if employees get forced into the atypical market because as time has progressed, fewer individuals wish to work in part-time or temporary jobs. According to the OECD database, in the United States, 11.5 percent of part-time workers are involuntarily working in this market as of 2012, whereas in 1998, it was a mere 6 percent. In the European Union, 23.5 percent of part-time workers worked involuntarily in 2012. In 1998, it was 14.5 percent. This has occurred because prior to the 1970's, the majority of part-time workers were women and young people who preferred this type of work. Since then, even though part-time work has increased, the incidence of voluntary part-time work has not changed (Kalleberg 2000). It is also a problem because part-time work is often affiliated with underemployment. In Alabama, 43.3 percent of part-time workers felt underemployed in 2004 (Bonnal et. al. 2009).

Many temporary employees also work involuntarily. Grubb & Wells (1993) find that in Belgium, Portugal, and Spain, involuntary temporary workers outweigh voluntary temporary workers 50 to 1. From a workers point of view, temporary employment is often

affiliated with low skilled jobs. Furthermore, it provides little employment security because no long-term tenure is guaranteed.

An argument could be made that while the number of involuntary atypical workers has rose, the market is still dominated by voluntary individuals. This is true, however, these voluntary atypical workers are already working in these conditions when the regulation change takes place. There could potentially be a small number of workers who prefer to work atypically but actually have typical jobs. However, a change in regulation will not suddenly cause these individuals to change to what they prefer. Thus, this change in the atypical employment must represent involuntary workers.

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