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## OFFSHORING, LABOR MARKET MOBILITY AND WAGE GROWTH

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# Offshoring, labor market mobility and wage growth<sup>1</sup>

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## Abstract

This paper uses longitudinal linked employer-employee data to study how firms' offshoring decisions affect labor market mobility and the wage growth of their employees. The results show that offshoring affects mobility primarily in occupations that are easily offshored. Wage growth, however, is weaker in the occupations that are offshorable, even if the employer has not offshored, and for employees whose initial employer has offshored some activities, irrespective of their occupation.

Keywords: wages, job mobility, linked employer-employee data, unemployment

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## 1. Introduction

Offshoring often impacts workers directly because it often means relocating particular tasks completely or substantially<sup>2</sup>. From the view point of an individual, offshoring might require switching jobs – at least switching the company and potentially also the occupation (Egger et al., 2007). These types of movements in the labor market are not frictionless and could lead to a higher risk of unemployment (Geishecker, 2008; Munch, 2010) and weaker wage growth (Feenstra and Hanson, 1996; Geishecker and Gorg, 2013; Hummels et al., 2011; Hummels et al., 2012). Offshoring impacts employees differently depending on their occupation, as transferring some tasks abroad is easier than others (Goos et al., 2010). However, the literature studying the interaction between offshoring and offshorability is still sparse (see e.g. Baumgarten et al., 2010; Becker et al., 2009; Goos et al., 2010).

In this paper, I study the interaction between the offshoring decisions of firms and the offshorability of occupations (see e.g. Blinder and Krueger, 2009). I use representative linked employer-employee data to study the relationship between offshoring and subsequent employee outcomes such as unemployment, job mobility and wage growth. I show that offshoring decisions primarily affect easily offshored occupations, but that in the case of wages, there are broader effects.

## 2. Data

The research makes use of the Statistics of Finland combined employer-employee data (FLEED), which is merged with the International Sourcing Survey (ISS). FLEED is a 33% sample of all 16- to 70-year-old Finnish people and of all Finnish companies for the years 1998-2006. The dataset enables the tracking of employees over time. FLEED contains information on the income, occupation, education, and employment status of an individual. The International Sourcing Survey, in turn, covers the private sector (excluding the finance sector) over the years 2001-2006. This survey contains information on whether the company has offshored any functions during 2001-2006.

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<sup>2</sup> In this paper, offshoring refers to both in-house and out-of-house offshoring.

I focus on the individuals working in the private sector in 2000. The primary focus of the analysis is on their labor market position and wage growth until 2006, conditioned on whether their initial employer, i.e., the firm that employed them in 2000, offshored jobs between 2001 and 2006. To obtain a complete picture of the issue, I report the results for seven different variables from 2000 to 2006: employment, unemployment, changing employer, changing employer and occupation, changing occupation within the same employer, staying with the same employer in the same occupation, and wage growth.

Employment and unemployment capture individuals' employment status in the last week of 2006. Change of occupation is measured at the one digit level using the Statistics Finland classification of occupations (ISCO). Change in wage is measured in monthly wages. The annual income variable in the dataset has been transformed to a monthly wage using the number of months spent at work.

### 3. Results

The baseline results are presented in Table 1. The first column considers the likelihood of being employed at the end of 2006. The analysis takes into account several individual characteristics of the employees (measured in 2000), such as, age, sex, education, occupation (at the one digit level), and industry (27 classes). The results show that offshoring in 2001-2006 lowers the likelihood of being employed in 2006 by 0.8 percent, but the result is not statistically significant.

The second column examines the likelihood of unemployment. The impact of offshoring is again small (0.6 percent) and not statistically significant. Based on these results, offshoring, on average, has not influenced the employment status of individuals.

The next four columns describe labor market mobility. In the fourth column, the likelihood that an employee has a different employer in 2006 is analyzed. The analysis reveals that offshoring increases the probability that a worker changes his or her employer by 4.6 percentage points. In the fifth column, it is shown that the same result applies to changing both the company and the occupation. The sixth column considers the likelihood of changing occupations within the same company: offshoring does not have a statistically significant impact on this probability. These results indicate that offshoring increases the

likelihood of moving to another company, but it does not otherwise have an impact on labor market mobility or employment.

The last column in Table 1 assesses wage growth. The results indicate that wage growth has been approximately 3 percentage points slower for those employed in 2000 by a company that later offshored some functions abroad. It is probable that the observed effect arises partially due to the link between offshoring and a change of employer.

### **3.1 Occupations with high and low degree of offshorability**

The results from Table 1 suggest that, on average, offshoring has not had a large impact on employees' labor market mobility. These results might, however, conceal considerable heterogeneity between occupations because the offshorability of tasks varies.

Goos et al. (2010) have ranked the two digit level international occupational classifications by how easily they can be offshored. The ranking is based on detailed, occupational level information collected on offshorings by European companies. I use their index of offshorability in the following analyses.

Table 2 repeats the analyses of Table 1, taking into account the differences in the offshorability of tasks. In addition to the offshoring variable already present in Table 1, Table 2 reports the effects of offshorability and the interaction of these two variables.

The first column of Table 2 shows that offshoring affects the likelihood of being employed at the end of 2006 only for those individuals who are employed in relatively easily offshorable tasks. For example, compare two plant operators, one of which is employed by a company that decided to offshore. The employee at that company has a 1.28 percentage point lower probability of being employed at the end of 2006 compared to the other plant operator.<sup>3</sup> In the second column, the same analysis is performed for the likelihood of being unemployed. Again, it is apparent that the effects of offshoring are concentrated on occupations that are easily offshored. The same plant operator from the example has a 1.12 percent higher likelihood of being unemployed at the end of 2006 when the operator's initial employer has offshored some jobs.

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<sup>3</sup> The coefficient of the interaction is -0.8, and the offshorability index of process workers is 1.6.

The fourth and fifth column demonstrate how the impact of offshoring on the likelihood of switching employers is significant for only some occupations. Neither offshoring nor the high offshorability index of a task have a significant impact independently, but there is an impact when the two conditions are fulfilled simultaneously. Thus, offshoring increases movement in the labor markets of only particular types of occupations.

The last column examines wage growth. There are three results. First, wage growth has been approximately 3 percent slower amongst the employees who were employed in 2000 by companies that subsequently offshored some activities. Secondly, wage growth has been approximately 1 percent slower in occupations with high degree of offshorability. Thirdly, the interaction between offshoring and offshorability is not statistically significant. The negative impact of offshoring on wage growth in offshoring companies is thus not limited only to those occupations with high degree offshorability. One explanation for the negative impact of offshoring on wage growth is that offshoring has curbed the wage drift of other occupations within the company as well. However, the slower wage growth amongst the easily offshored occupations might be explained by a weaker demand for these jobs.

#### **4. Conclusions**

Offshoring has changed the role of international trade. In this paper, I examined the impact of offshoring on employees. I focused on workers employed in Finnish private sector firms, some of which offshored business operations during the observation period.

The results indicate that the offshoring decisions made by companies impact different occupational groups in distinct ways. Offshoring increases the likelihood of being unemployed, of changing employers, and of changing employers and occupation only in occupations with high offshorability. Other occupations are relatively unaffected by offshoring decisions.

The case with wage growth, however, is different. Wage growth has been weaker in the easily offshorable occupations, regardless of whether the company itself has offshored. In addition, wage growth in the companies that offshored has been slower than the average and not only among the occupations with high degree offshorability.



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## Tables

Table 1. Labor market mobility, wage growth and offshoring

	Employed	Unemployed	Employer change	Employer and occupation change	Occupation change within the same employer	Same employer and occupation	Wage growth
Offshoring	-0.008 (0.006)	0.006 (0.004)	0.046** (0.024)	0.026** (0.012)	-0.014 (0.015)	-0.032* (0.017)	-0.030** (0.012)
Observations	112803	112803	112803	112803	112803	112803	95047
R-squared	0.118	0.016	0.053	0.046	0.034	0.052	0.039

Notes. The table considers persons who were employed in the last week of 2000 and compares their situation to the last week of 2006. Standard errors that take into account the clustering of employees within firms are in parentheses. The other variables in the OLS regressions are education, occupation (1-digit level), gender, age and industry.

Table 2. Labor market mobility, wage growth, offshoring and offshorability

	Employed	Unemployed	Employer change	Employer and occupation change	Occupation change within the same employer	Same employer and occupation	Wage growth
Offshoring	-0.005 (0.005)	0.003 (0.003)	0.036 (0.024)	0.015 (0.011)	-0.016 (0.015)	-0.02 (0.018)	-0.031** (0.013)
Offshorability	0.000 (0.004)	0.002 (0.002)	0.002 (0.007)	0.004 (0.005)	-0.017 (0.015)	0.015 (0.018)	-0.016** (0.006)
Interaction	-0.008** (0.004)	0.007*** (0.002)	0.027** (0.012)	0.026*** (0.007)	0.005 (0.009)	-0.031** (0.014)	0.004 (0.008)
Observations	110453	110453	110453	110453	110453	110453	93072
R-squared	0.12	0.017	0.051	0.044	0.032	0.049	0.037

Notes. The table considers persons who were employed in the last week of 2000 and compares their situation to the last week of 2006. Standard errors that take into account the clustering of employees within firms are in parentheses. The other variables in the OLS regressions are education, occupation (1-digit level), gender, age and industry.