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Inspecting the Relation of Search Cost and Search Duration for New Hires*

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Abstract

Fixed search costs, i.e. costs that don't vary with search duration, can amplify the cyclical volatility of the labor market. To assess the size of fixed costs, we analyse the relation of search costs and search duration with data from Germany. Using an OLS regression we find that fixed search costs are nearly half of total search costs. If we use an instrumental variable estimation, it turns out that search costs are mainly fixed costs. Furthermore, we show that a search and matching model calibrated for Germany with fixed costs close to 100 percent can generate a labor market volatility that is consistent with the data.

Keywords: Search costs, search duration, unemployment volatility puzzle.
JEL: E32 J32 J63 J64

1 Introduction and Background

The cyclical variation of vacancies, unemployment and labor market tightness is empirically much larger than explained by the standard search and matching model (Shimer, 2005). A way to solve this puzzle is suggested by Pissarides (2009). He extends the standard model by distinguishing two types of search costs: search costs that depend on the duration of the vacancy and search costs that are fixed, i.e. they are independent from the duration of the vacancy. The first is labeled as variable search cost and the second as fixed search cost. Pissarides shows that a high share of fixed costs over the total search costs is able to generate the elasticity of tightness observed in the data. However, up to now, there is no evidence on the size of the share of fixed search costs.

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Our contribution is threefold. First, we asses empirically the proportion of the two types of cost using data for Germany. Second, we simulate a search and matching model for Germany with the observed structure of search cost to compare the volatility generated by the model with the volatility of the German labor market. Third, we present additional evidence on the variation of search costs across firm and job characteristics.

Let us first clarify the argument of Pissarides (2009) to solve the unemployment volatility puzzle. It can be pinned down analytically as follows. The job creation condition in the canonical model is

$$\frac{p-w}{r+s} = \frac{c}{q(\theta)}, \tag{1}$$

where p is the labour productivity, w is the wage, r is risk-free interest rate, s is the separation rate, c is the generic search cost per period and $q(\theta)$ the vacancy filling rate. According to the matching function, the vacancy filling rate depends on the labor market tightness θ, the relation of the vacancy rate to the unemployment rate. Note that $1/q(\theta)$ is the search duration and $c/q(\theta)$ is the total search cost. It follows that the total search costs move one to one with the duration of a vacancy. This is the assumption we test later empirically. The elasticity of tightness with respect to p can be expressed as,

$$\varepsilon_\theta = \frac{1}{\eta}\frac{p-\varepsilon_w w}{p-w}, \tag{2}$$

where ε_w is the elasticity of the wage with respect to productivity shocks. η is the elasticity of new matches with respect to unemployment. Under the standard parametrization with flexible wages, $\eta = 0.5$, $p = 1$ and equilibrium values of $w = 0.983$ and $\varepsilon_w = 0.985$, ε_θ takes a value of 3.7, while the observed elasticity in the U.S. is around 7.56. This is the core of the unemployment volatility puzzle. Note that in Germany, where our data came from, the puzzle also exists. The volatility of tightness relative to productivity in Germany is even twice as large as in the U.S. (see Gartner, Merkl, and Rothe, 2012).

According to Pissarides, fixed search costs H enter the model without modifying the Nash-bargained wage, because this is a cost that is not taken into account at the moment of the bargain, but it enters the value of a new vacancy. The job creation condition becomes

$$\frac{p-w}{r+s} = \frac{c}{q(\theta)} + H. \tag{3}$$

The elasticity of θ with respect to p computed from (3) is

$$\varepsilon_\theta = \frac{1}{\eta}\frac{p-\varepsilon_w w}{p-w-(r+s)H}. \tag{4}$$

The intuition is as follows. A positive productivity shock leads to more vacancies created by firms. This increases the tightness on the labor market as well as the vacancy duration. A higher duration also raises the search costs and thereby dampens the incentive to create vacancies. The higher the share of fixed search costs, the smaller is this dampening effect and the higher is the elasticity of θ. Pissarides

shows in a calibration exercise that if the share of H on the total search costs is about 93%, we end up with an elasticity consistent with the data for the U.S.[1]

Search cost represents a wide range of expenditures, such as the vacancy posting, the screening and negotiation activity with candidates, the headhunters or the personal human resources staff. Despite the important implications for the search models, there is scarce research on the size and structure of search costs. Exceptions are for example Dolfin (2006), Barron, Berger, and Black (1997) or for Germany Muehlemann and Pfeifer (2016), but they all have no information on search duration and do therefore not distinguish fixed and variable costs.

2 Data and Descriptive Evidence

We use of the German Job Vacancy Survey conducted by the Institute for Employment Research (IAB), a random sample of establishments with at least one employee, stratified by 23 economic sectors and 7 firm size classes (see Moczall, Müller, Rebien, and Vogler-Ludwig, 2015). The yearly survey started in 1989 and reports information on establishment characteristics and on the most recent hiring.

In the waves 2014 and 2015 we included two further questions: "What is the total number of hours spent on this recruitment?" and "If you add up all other costs, including advertising, headhunters, travel expenses, etc., which further costs (without labor costs) emerged for this recruiting?". The first question refers to what we call the *search hours*, the second to the *monetary search costs*. We build a measure of search costs that account for both the monetary search costs and the costs of the recruiting staff of the establishment. Thus we multiply the hours spent on recruiting by the average hourly cost of labour taken from the German Federal Statistical Office, that is 31.80 Euro in 2014 and 32.60 Euro in 2015 , and we add that up to the monetary search costs. We call this measure *compounded search costs*. Moreover, we compute the vacancy duration as the time span between the date when the search started and the date when the applicant is selected. The dataset for our analysis contains 9.654 observations.

We provide the descriptive evidence across establishment and vacancy characteristics and across search channels in Table 1. The average compounded search costs are 1.475 Euro, what is similar to the result of Muehlemann and Pfeifer (2016), however their sample is different. Their search costs refers to vacancies for apprenticeship in firms with more than 4 employees. There is also a substantial heterogeneity in search costs and the search duration. First, the monetary cost and the working time for searching is higher in larger establishments and if qualificatory requirements are high. Second, additional skill requirements, such as experience and leadership, associated with longer duration and higher costs. Third, searching workers for part-time or temporary contract requires less search costs. Finally, the channels used to find the workers reveal some unexpected results:[2] Searching among the internal market or using internet is associated with the highest costs, second only to the use of a private employment agency. This includes for example head hunters. More intuitive are the consequences of hiring a trainee or through a social contact. It is worthwhile to notice that the use of the Federal Employment

[1] See also Silva and Toledo (2013) for an extensive discussion of the Pissarides (2009) calibration. They highlight the difference between sunk and non-sunk (i.e. training) fixed costs.

[2] Note that the use of multiple channels is possible.

Table 1: Descriptive statistics according to plant and vacancy characteristics

Characteristics		Monetary Search Costs (Euros)		Search Hours		Search Duration (days)		Comp. Search Costs (Euros)	
Plant size (# employees)	<20	384	(1475)	17	(26)	67	(63)	925	(1773)
	20-49	555	(1770)	18	(24)	61	(64)	1138	(2046)
	50-199	794	(2701)	20	(34)	57	(56)	1440	(3086)
	200-499	2208	(7624)	18	(18)	63	(59)	2791	(7868)
	>500	1333	(3429)	23	(33)	61	(53)	2079	(3776)
Qualification	Unskilled, max. 1 year of training	151	(473)	17	(30)	46	(54)	690	(1092)
	Vocational qualification	476	(1331)	17	(24)	62	(61)	1011	(1646)
	Master craftsman, technician	1342	(3199)	22	(29)	69	(68)	2044	(3655)
	Bachelor's degree	1975	(7832)	24	(25)	65	(56)	2729	(7920)
	Master's degree or similar, PhD	2621	(6338)	28	(39)	74	(59)	3508	(6738)
Additional skills	Long Experience	1573	(4649)	22	(31)	74	(68)	2273	(4998)
	Leadership skills	3088	(7223)	29	(45)	80	(70)	4025	(7679)
Type of contract	Part-time	295	(937)	15	(23)	57	(62)	783	(1210)
	Temporary Contract	448	(1531)	18	(29)	57	(58)	1015	(1851)
Search channels	Newspaper	1119	(3860)	21	(28)	71	(65)	1783	(4053)
	BA	851	(3968)	21	(29)	68	(61)	1532	(4202)
	Own web site	1223	(4302)	22	(30)	68	(61)	1910	(4566)
	Internet	1244	(4271)	24	(31)	74	(65)	2011	(4511)
	Unsolicited Application	848	(4685)	19	(27)	63	(61)	1451	(4858)
	Private job placement	3943	(7868)	29	(33)	77	(72)	4876	(8309)
	Internal job advertisements	1617	(5955)	23	(38)	66	(58)	2353	(6233)
	Social contact	480	(2099)	17	(26)	63	(64)	1027	(2381)
	Trainee	712	(1996)	16	(18)	65	(66)	1215	(2244)
Overall mean		868	(3488)	19	(28)	62	(60)	1475	(3749)

Mean and standard deviation (in parenthesis), weighted values. 9.654 observations. Source: German Job Vacancy Survey 2014 and 2015. The survey weights are based on strata for 23 economic sectors and 7 firm size classes.

Agency (BA, *Bundesagentur für Arbeit*) is a cheap search channel for the employers, but it is also related to a long vacancy duration. Further descriptive results across sectors can be found in Table 6 in the Appendix. The data reveal that those sectors affected by high compounded search costs need also a longer search to find the right staff (in days).

3 The empirical Relation of Search Costs and Search Duration

Turning to the econometric analysis, our aim is to check whether and to what extent the compounded search costs (henceforth simply search costs) are related to the search duration, conditionally on other observables. In the first step we use an OLS approach. Because of potential endogeneity we interpret the results as correlations, not as causation. In the second step we use an instrumental variable approach that allows fore a more structural interpretation.

The results of the OLS models are presented in Table 2. We add subsets of covariates progressively from Model 1 to Model 3 to provide information on the specific contribution of the characteristics. The results confirm the descriptive evidence, with more consistent results for the search channels - the inclusion of which improves the explained variability of our dependent variable. The search costs and the search duration enters the estimation model in logs, thus the coefficient can be interpreted as elasticity of search costs with respect to search duration. The coefficient is positive and significant in all specifications. Model 1, regressing only on firm size and sectors, shows an elasticity of search costs to search duration of 0.37. Looking at Model 3 where we account for all the controls, the elasticity is much smaller: a 10% increase in search duration is associated with an increase of the search costs of 2%. The result reveals a positive relation of search costs and duration, but the elasticity is much smaller than one, as asserted by the canonical search and matching model.

As regards the control variables, the table shows that large firms display higher search costs, that required qualification and additional skills are positively correlated with the search costs, while hiring a worker for a temporary or a part-time contract is negatively correlated with the search costs.

Concerning the search channels, when social contacts are used or the firm searches among the trainees the search costs are lower. The coefficient of the Federal Employment Agency (BA) is positive, but the smallest among the channels with a correlation greater than zero. Using newspaper or a private job placement is associated with the highest search costs. Lastly, hiring a underexperienced worker correlates positively with the search costs; this result gives support to the result of (Brenčič and Norris, 2009) according to which when employers face high search costs they are more willing to hire under-skilled staff to conclude the search as soon as possible.

For an exercise let us take the result of Model 3 as given to assess the fraction of fixed search costs. The fixed costs are given by the search costs when the search duration converges to zero. Therefore we calculate the fixed costs by running a weighted regression of Model 3 and predict the search costs when the search duration is one day, given that the other characteristics takes average values.[3] It turns

[3]We use a variant of the Duan smearing estimate for predictions when the dependent variable is

Table 2: OLS Regression: Search cost and search duration

Dependent variable: log of compounded search costs		**Model 1**		**Model 2**		**Model 3**	
log of search duration		0.37^{***}	(0.01)	0.32^{***}	(0.01)	0.20^{***}	(0.01)
Plant size (# employees)	<20	-0.16^{***}	(0.03)	-0.15^{***}	(0.03)	-0.05	(0.03)
	50-199	0.17^{***}	(0.04)	0.14^{***}	(0.04)	0.03	(0.03)
	200-449	0.42^{***}	(0.06)	0.34^{***}	(0.05)	0.08	(0.05)
	>500	0.63^{***}	(0.06)	0.45^{***}	(0.06)	0.23^{***}	(0.06)
Qualification	Unskilled, max. 1 year of training			-0.35^{***}	(0.04)	-0.27^{***}	(0.04)
	Master craftsman, technician			0.29^{***}	(0.07)	0.19^{***}	(0.06)
	Bachelor's degree			0.47^{***}	(0.06)	0.38^{***}	(0.05)
	Master's degree or similar, PhD			0.53^{***}	(0.04)	0.50^{***}	(0.04)
Additional skills	Long Experience			0.22^{***}	(0.03)	0.15^{***}	(0.03)
	Leadership skills			0.29^{***}	(0.05)	0.25^{***}	(0.05)
Type of contract	Part-time			-0.15^{***}	(0.04)	-0.10^{***}	(0.03)
	Temporary Contract			-0.15^{***}	(0.03)	-0.09^{*}	(0.04)
Search channels	Newspaper					0.78^{***}	(0.02)
	BA					0.23^{**}	(0.02)
	Own Website					0.25^{***}	(0.03))
	Internet					0.42^{***}	(0.03)
	Unsolicited application					0.00	(0.03)
	Private Job Placement					0.80^{***}	(0.06)
	Internal job advertisements					0.27^{***}	(0.03)
	Social contact					-0.19^{***}	(0.02)
	Trainee					-0.15^{*}	(0.06)
Mismatch	Underqualification					-0.01	(0.05)
	Underexperience					0.15^{**}	(0.05)
Sectors		Yes		Yes		Yes	
	R^2	0.14		0.19		0.36	

Robust standard errors in parentheses. 9,654 observations. Reference group: Plant size 20-49, Vocational qualification.
Significance levels: *, **, *** indicate significance at 0.05, 0.01 and 0.001.

out that the fixed search costs amount to 484 Euros. The search costs at an average search duration are predicted as 1120 Euro. Thus, under the assumption of loglinearity in the variables the share of fixed costs is 43%.

The OLS estimates can be criticized because there may be unobserved firm characteristics that influence search duration as well as search costs. As mentioned above, we adopt therefore as a second step an instrumental variable approach. As instruments we use variables that are external for the firm and that are motivated by the standard search and matching model. According to the model, the expected duration of the vacancy is a function, $1/q(\theta)$, of the labour market tightness. Therefore, we use unemployment rate and vacancy rate at district (*Kreise*) level to instrument the search duration. The first stage regression is basically a matching function. We estimate fixed effects for 262 districts, thus the result is driven by the time variation within the districts. The same control variables as in model 3 are included.

Table 3 displays the first and the second stage estimation. In the first stage, unemployment and vacancy rate are significant and reveal an impact on search duration consistent with the matching model: a higher number of vacancies makes the hiring process more competitive for the firms and increases the search duration, while a higher number of unemployed makes the hiring process quicker and reduces the search duration.

In the second stage, the significance of the logarithm of search duration vanishes, implying that search duration does not correlate with the search costs. In other words, these results suggest that search costs are mainly fixed as they are independent from the search duration. To summarize, the share of the fixed component of the search costs is substantial. According to the OLS estimate it is above 40%, according to the instrumental variable estimate it is close to 100%. In the next session we carry out a simulation of a search and matching model for the German labour market and we assess the role of the structure of search cost for the unemployment volatility puzzle.

Table 3: IV Regression: Search cost and search duration

	First stage FE	Second stage FE
Dependent variable	log of search duration	log of compounded search costs
vacancyrate	150.73*	
	(59.04)	
unemploymentrate	−14.76*	
	(6.13)	
log of search duration		−0.40
		(0.24)
R^2	0.09	0.16

Robust standard errors in parentheses. 9,654 observations, F statistics in the 1 stage 28.70. Reference group: Plant size 20-49, Vocational qualification. Significance levels: *, **, *** indicate significance at 0.05, 0.01 and 0.001. Controls: plant size, qualification, required additional skills, type of contract, search channels, sectors.

in logs. See the Appendix for details.

4 The Role of Search Costs

As discussed in Section 1, Pissarides (2009) shows that the existence of fixed search costs increases the response of tightness to a labour productivity shock. In absence of data on the search cost structure, he proposes a tentative simulation of how the elasticity of tightness, ε_θ, changes with different shares of fixed over total search costs. To relate our empirical finding to the unemployment volatility puzzle we simulate the impact of fixed search costs in a search and matching model calibrated for the German labour market.

As it is standard in the literature, we assume a Cobb-Douglas matching function $m = m_0 u^\eta v^{1-\eta}$ and we use $\eta = 0.75$, estimated in Kohlbrecher, Merkl, and Nordmeier (2016) for Germany. We get the job finding probability and the separation rate from Gartner, Merkl, and Rothe (2009) and θ for 2014 and 2015 from the SIAB and the Data Warehouse of the Federal Employment Agency. Then, as in Pissarides (2009), we derive the remaining parameters from the theoretical model. Since we have information on the amount of fixed and total search costs, we calibrate the value of non-labour income z in order to match the expected total search cost as share of monthly output for Germany, namely 22%[4]. More precisely, we calibrate the model to reach that share when the fixed search costs amount to 43% of the overall search costs, as the analysis on search cost and search duration reveals.

Before discussing the simulation, we compute the elasticity of tightness with respect to labour productivity for Germany, by making use of the summary statistics from Gartner, Merkl, and Rothe (2009). The corresponding elasticity amounts to 17.09, while according to our calibration of the canonical search and matching model for Germany, it equals 7.05. This gap reflects the existence of the unemployment volatility puzzle also in Germany.

Table 5 displays the result of the simulation. In line with the result of Pissarides (2009), the higher the share of fixed costs H_s the larger the elasticity of labour market tightness to labour productivity. A fixed component of search costs of 43% delivers a higher elasticity than the canonical model, but not enough to target the value observed in the data. As for the United States, only search costs entirely composed by a fixed component are able to generate the desired amplification to labour market tightness. However, the assumption of a high share of fixed costs is consistent with our result of the instrumental variable model.

[4]Source: Federal Statistical Office.

Table 4: Parameter values, monthly data

Parameter	Value	Description	Source/Target
r	0.004	Interest rate	
s	0.013	Exogenous separation rate	Gartner, Merkl, and Rothe (2009)
z	0.855	Unemployment benefit and value of leisure time	Share of H over monthly output
c	0.152	Search costs	Mean θ
m_0	0.329	Matching efficiency	Job finding probability
η	0.75	Unemployment elasticity	Kohlbrecher, Merkl, and Nordmeier (2016)
β	0.345	Share of labor	$\beta = \eta$ (efficiency)
		Mean values	
θ	0.29	Mean tightness at sectoral	SIAB and DWH
$m_0\theta^{1-\eta}$	0.13	Job finding probability	Gartner, Merkl, and Rothe (2009)

Table 5: Model Results at Different Combinations of Job Creation Costs. German labour market simulation in Italics.

H	c	H_s	$\frac{c}{q(\theta)}+H$	ε_θ
0	0.152	0	0.18	7.05
0.04	0.135	0.20	0.20	7.52
0.10	*0.105*	*0.43*	*0.22*	*8.68*
0.21	0.050	0.78	0.27	11.80
0.31	0.002	0.99	0.31	17.11

5 Conclusion

In this paper we compute the size of the search costs and analyse the relation of search costs with search duration. Using new information from the German Job Vacancy Survey, we measure the cost of advertising the job, paying the headhunters, inviting and screening the candidates as well as the cost of the staff within the establishment that cares about the hiring process. According to an OLS-analysis, the elasticity between search costs and search duration is 0.20. This is much smaller than one, as assumed in the canonical search and matching model. If an IV-regression is applied, with district unemployment and vacancy rates as instruments, we find no significant relation between search duration and search cost. This suggest that search costs are mainly fixed costs as proposed by Pissarides (2009). We calibrate the Pissarides (2009) model for Germany. The simulation with fixed costs close to 100% (a plausible upper bound according to our empirical finding) predicts an elasticity of labor market tightness with respect to productivity of 17. Thus, the model can generate the volatility in the data.

The German Job Vacancy Survey allows for a deep analysis of the heterogeneity of search costs and can thus help for a better understanding of matching on the labor market. Future research should analyse in greater detail the relation of search costs with the use of different matching technologies that are related with different search channels. Also the relation of search costs with the recruiting intensity (Davis, Faberman, and Haltiwanger, 2013) is an issue for future work.

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Appendix

Calculation of predicted search costs

To calculate the total search costs we use a version of the Duan smearing estimate for predictions when the dependent variable is in logs as explained in Wooldridge (2009), page 210-215. We estimate model 3,

$$lnCSC_i = \alpha + \beta lnSD_i + \gamma C_i + u_i, \tag{5}$$

where *CSC* are the compounded search costs, *SD* is the search duration, *C* is the vector of control variables and calculate the residuals $\widehat{u}_i s$. Then we predict *lnCSC* given the log of the average search duration $\overline{SD}$ and compute the average total search costs as

$$\widehat{CSC} = \left(n^{-1} \sum_{n=1}^{n} \widehat{u}_i \right) exp(\widehat{lnCSC}) \tag{6}$$

Monetary and compounded search costs are non-negative skewed and include some zeros. Therefore we adopt a Box-Cox transformation, $ln(x+1)$, which maps zeros to zero and converges with rising costs to log values.

Table 6: Descriptive statistics across industries

Sectors	**Monetary Search Costs (Euros)**		**Search Hours)**		**Search Duration (days)**		**Comp. Search Costs (Euros)**	
Financial Services, Insurance	4929	(16619)	22	(22)	75	(62)	5615	(16787)
Machinery and equipment, electrical equipment and motor vehicles	2804	(7145)	19	(17)	68	(53)	3399	(7503)
Information and communication	1342	(2907)	24	(31)	65	(55)	2096	(3230)
Mining and quarrying+Electricity, gas, steam and air conditioning supply	1331	(2969)	20	(18)	69	(63)	1958	(3157)
Professional, scientific and technical activities	1236	(3012)	20	(18)	69	(62)	1874	(3282)
Coke and refined petroleum products, chemicals and plastic products	1204	(3040)	21	(58)	51	(49)	1872	(3739)
Food; textile, clothes and furniture	1089	(3791)	16	(20)	57	(60)	1613	(4095)
Water supply; sewerage, waste management and remediation activities	830	(1541)	24	(48)	64	(63)	1608	(2434)
Wholesale and retail trade; repair of motor vehicles and motorcycles	1019	(3176)	18	(26)	61	(60)	1606	(3607)
Real estate activities	966	(2150)	19	(18)	57	(46)	1580	(2319)
Public administration and defense; compulsory social security	735	(1275)	24	(22)	65	(55)	1489	(1617)
Wood, paper and printing	866	(3195)	18	(26)	60	(61)	1453	(3416)
Basic metals, fabricated metal products	840	(2539)	17	(19)	65	(62)	1376	(2695)
Education	537	(1305)	26	(39)	64	(56)	1361	(1855)
Arts, entertainment, recreation	631	(2191)	21	(22)	52	(43)	1296	(2458)
Transportation and storage	573	(1529)	23	(38)	62	(63)	1293	(1990)
Other services	424	(1014)	18	(19)	65	(62)	1001	(1286)
Accommodation and food service activities	325	(1135)	18	(29)	63	(64)	897	(1556)
Human health and social work activities	406	(1079)	15	(19)	60	(60)	897	(1263)
Administrative and support service activities	260	(745)	19	(35)	53	(61)	862	(1420)
Construction	335	(882)	15	(23)	71	(65)	828	(1252)
Agriculture, forestry and fishing	175	(911)	14	(17)	59	(56)	621	(1193)
Overall mean	868	(3488)	19	(28)	62	(60)	1475	(3749)

Mean and standard deviation (in parenthesis), weighted values. 9.654 observations. Source: German Job Vacancy Survey 2014 and 2015. The survey weights are based on strata for 23 economic sectors and 7 firm size classes.

Table 7: Appendix: Sector coefficients of Model 3

Dependent variable:	log of compounded search costs
Agriculture, forestry and fishing	-0.52^{**}
	(0.09)
Food; textile, clothes and furniture	-0.22^{**}
	(0.08)
Wood, paper and printing	-0.17
	(0.09)
Coke and refined petroleum products, chemicals and plastic products	-0.08
	(0.07)
Basic metals, fabricated metal products	-0.25^{**}
	(0.08)
Machinery and equipment, electrical equipment and motor vehicles	-
	-
Mining and quarrying; Electricity, gas, steam and air conditioning supply	0.1
	(0.07)
Water supply; sewerage, waste management and remediation activities	-0.05
	(0.07)
Construction	-0.31^{***}
	(0.08)
Wholesale and retail trade; repair of motor vehicles and motorcycles	-0.13
	(0.08)
Transportation and storage	-0.19^{*}
	(0.08)
Accommodation and food service activities	-0.42^{***}
	(0.08)
Information and communication	0.13
	(0.07)
Financial Services, Insurance	0.1
	(0.08)
Real estate activities	0.22^{**}
	(0.07)
Professional, scientific and technical activities	0.01
	(0.07)
Administrative and support service activities	-0.36^{***}
	(0.07)
Public administration and defense; compulsory social security	-0.13^{*}
	(0.07)
Education	-0.31^{***}
	(0.07)
Human health and social work activities	-0.35^{***}
	(0.07)
Arts, entertainment, recreation	-0.08
	(0.08)
Other services	-0.02
	(0.07)

Robust standard errors in parentheses. Reference group: Machinery and equipment, electrical equipment and motor vehicles.
Significance levels: $*$, $**$ and $***$ indicate significance at 0.05, 0.01 and 0.001