

CESifo **CONFERENCES 2020**

10th ifo Conference on Macroeconomics and Survey Data

Munich, 21–22 February 2020

On-the-Job Search and the Business Cycle

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Date: 20.02.2020

Abstract:

This paper provides first empirical evidence for the cyclicity in the on-the-job search behavior of workers, using data from the Dutch National Bank Household Survey (DHS), an annual panel survey, and from the OECD, Eurostat, and Statistics Netherlands for the years 1993 until 2018. Overall, on-the-job search intensity is counter-cyclical, although most models assume the opposite. The cyclicity of on-the-job search activity depends on the tenure of workers, being counter-cyclical for workers with short tenure and a-cyclical for workers with long tenure. Workers with short tenure are more likely to search on-the-job and search more intensely in downturns. Furthermore, the findings suggest that the precautionary motive is more prevalent in downturns and improving working conditions in boom periods.

JEL Codes:

E24, E32, J22, J64

Keywords:

On-the-Job Search Behavior, Business Cycle

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1. Introduction

The search behavior of workers over the business cycle can have important consequences for the aggregate dynamics of the labor market (Elsby et al. 2015). Yet, there is very little empirical evidence on the search behavior of employed workers over the business cycle, mainly due to a lack of data on the job search behavior of employed workers. This study provides empirical evidence for the cyclical behavior in the on-the-job search behavior, using Dutch panel data.

Many studies that include on-the-job search in the search-and-matching model predict that on-the-job search behavior is pro-cyclical. On-the-job search effort is assumed to be low during economic downturns because the marginal benefit of job search decreases when it becomes harder to find a better job (Pissarides 1994; Nagypal 2007; Krause and Lubik 2010). The recent study by Eeckhout and Lindenlaub (2019) underlines pro-cyclical on-the-job search behavior as a key driver generating unemployment cycles without exogenous shocks through strategic complementarity between on-the-job search and vacancy postings.

On the other hand, there are studies suggesting that on-the-job search could be counter-cyclical. Fujita (2012) shows that a non-negligible fraction of employed workers searches because they fear losing their job. This observation points to a precautionary motive for workers to search on-the-job. Workers that have a job look for a new job to insure against a possible job loss. Shimer (2004) argues that instead of being complements, job search effort and the probability to finding a job could be substitutes. There is empirical evidence for the unemployed that job search effort is higher during downturns (Shimer 2004; Mukoyama et al. 2018). Due to the contrary effect of the two mechanisms on the on-the-job search behavior, the unfolding of total on-the-job search behavior over the business cycle is ambiguous. Therefore, it is necessary to test empirically the assumption of pro-cyclical on-the-job search often presumed by theoretical studies.

Existing empirical studies on job search behavior mainly focus on unemployed individuals because of abundant data availability on the job search behavior of the unemployed. They find that patient individuals and individuals with an internal locus of control are more likely to search for a job (DellaVigna and Paserman 2005; Caliendo et al. 2015). DellaVigna et al. (2017) find that search effort declines as unemployed individuals get accustomed to lower benefit levels. A recent study by Faberman and Kudlyak (2019) shows that the length of the search is negatively related to search intensity of the unemployed, and

that search intensity is lower in areas with more slack labor markets. There is mixed evidence regarding the job search behavior of unemployed workers over the business cycle. DeLoach and Kurt (2013) as well as Gomme and Lkhagvasuren (2015) find that job search is pro-cyclical. On the other hand, Shimer (2004) and a recent study by Mukoyama et al. (2018) find that job search effort is counter-cyclical.

There are only few empirical studies on the job search behavior of employed workers, mainly due to the lack of existing data. Most large panel datasets only report the job search behavior of unemployed respondents, or they report it for employed workers only for a few years (Carrillo-Tudel et al. 2015). Pissarides and Wadsworth (1994) are the first to study the determinants of on-the-job search for a cross section of British workers. They find that more educated, younger, and part-time employed workers are more likely to search on-the-job. The job tenure and, in the cross-section, the regional unemployment rate is negatively related to the likelihood to search on-the-job. Two studies examine the cyclicity of on-the-job search by indirectly measuring on-the-job search behavior inferring it from job transition data. The study by Elsby et al. (2015) finds that search effort is slightly counter-cyclical, while Eeckhout and Lindenlaub (2019) find that on-the-job search intensity is pro-cyclical and search activity is slightly counter-cyclical. So far, only the study of Ahn and Shao (2017) explores on-the-job search behavior over the business cycle by directly observing on-the-job search behavior, using the American Time Use Survey (ATUS). They find evidence that on-the-job search effort is slightly counter-cyclical. However, despite using a large sample, only 0.5% of the employed respondents search on-the-job, leaving the authors with a small sample to study on-the-job search behavior.¹ There is good reason to assume that on-the-job search behavior is underreported in the ATUS. Furthermore, the ATUS data is a pooled cross section, therefore, the authors are unable to control for unobserved heterogeneity of workers.

I add to the existing literature by studying the cyclicity of on-the-job search behavior using a large Dutch panel dataset, and I complement this data with business cycle indicators from the OECD, Eurostat, and Statistics Netherlands for the years 1993 until 2018. Using the DHS panel has the advantage that employed workers report their on-the-job search behavior. Furthermore, the panel structure allows me to apply individual fixed-effects estimations to examine whether the cyclicity of on-the-job search is driven by changes in individual behavior or shifts in the composition of searcher. Additionally, I study the heterogeneity of

¹ Previous studies for the US find that 4.4% of the employed workers are searching on-the-job (Fallick and Fleischman 2004).

the relationship between the business cycle and on-the-job search with respect to the tenure of the workers' current job as well as the motives for on-the-job search.

My results show that overall, on-the-job search intensity is counter-cyclical and that on-the-job search activity is a-cyclical, but that the cyclicity depends on the tenure of workers. In a downturn, workers with shorter tenure are more likely to search and search more intensely. In contrast, the search activity of workers with longer tenure does not vary over the business cycle, while search intensity is slightly counter-cyclical. Concerning the motives for searching on-the-job, the results show that workers are more likely to have a precautionary motive to search for a new job in a downturn, and they are more likely to have the motive to improve their working conditions in a boom period.

This is one of the first papers to study on-the-job search over the business cycle by directly observing on-the-job search behavior. While I cannot conclusively disentangle the mechanisms driving the cyclicity of on-the-job search, I shed light on the channel that drives the counter-cyclicity by analyzing changes in the reasons to search on-the-job over the business cycle. Nevertheless, my findings are of great importance, since they inform theoretical research that have largely disregarded the precautionary motive of on-the-job search and assume pro-cyclical search behavior.

The paper proceeds as follows. Section 2 describes the data I use in the empirical analyses. Section 3 presents the empirical strategy. Section 4 presents and discusses the regression results, including various robustness tests and heterogeneity checks. Finally, Section 5 summarizes the main findings and concludes.

2. Data and Descriptive Statistics

To study the cyclical behavior of the job search behavior of employed workers, I use data from the Dutch National Bank Household Survey (DHS), an annual panel survey of Dutch households and the cyclical indicators from the Organization of Economic Co-operation and Development (OECD), Eurostat², and Statistics Netherlands³, for the years 1993 until 2018. The year 1993 is the first and the year 2018 the last year with available data on the job search behavior.

The DHS is designed to be representative of the Dutch population over the age of 16. I restrict the sample to employed individuals that are between the age of 16 and 65 (the retirement age in the Netherlands).⁴ I use the information about the province of residence as well as the year and quarter a respondent answered the questionnaire to merge the data on the cyclical indicators. My main estimation sample consists of 34,491 observations for 11,822 individuals.⁵

DHS respondents report their job search behavior in each year they respond to the survey. They report whether they search for a job and, if they are, how many applications they sent out in the last two months, what methods they have used to search for a new job, and the reasons why they search for a job. To analyze the extensive margin of the cyclical behavior of on-the-job search, I create a dichotomous variable taking value one if a respondent reports to be “seriously looking for another job”, and zero otherwise. I denote the binary variable indicating if a respondent is searching on-the-job as *high search activity*. To analyze the intensive margin of the cyclical behavior of on-the-job search, I use two alternative measures to proxy job search intensity; first, the number of times the respondent applied for a job in the last two months and (Faberman and Kudlyak 2019), second, the number of different ways⁶ a respondent used to look for a job (Shimer 2004; Lammers 2014).⁷

² Eurostat is the statistical office of the European Union, with the mission to provide high quality statistics for Europe.

³ Statistics Netherlands is an autonomous administrative authority providing statistical information and data for the Netherlands.

⁴ For a detailed description of the DHS, visit the CentERdata website at www.centerdata.nl.

⁵ On average individuals are in the sample for 2.9 years.

⁶ Respondents can report 8 different methods they have used to look for a job: answered advertisements, placed advertisements myself, asked around with employers, asked friends and other relations, through a job center, through temporary employment agency, reading advertisements, other.

⁷ There is no information on the time spend on job search activity, yet, Mukoyama et al. (2018) show that for unemployed workers there is a strong positive correlation between the number of search methods used and the time spend on job search.

Table 1 presents the on-the-job search activity and intensity for the entire sample, and separately for individuals with short as well as long tenure on the current job (2 years). 5% of the workers report that they search on-the-job. It is evident that individuals with short job tenure are more likely to search for a job than individuals with longer tenure. Compared to a recent study by Ahn and Shao (2017) for the U.S., where only 0.5% of the employed workers search for a job, on-the-job search is more prevalent in this sample. The share of workers reporting on-the-job search activity is comparable to other studies for the U.S. and the U.K., that report that 4.4% and 4.3% of employed individuals search on-the-job, respectively (Fallick and Fleischman 2004; Fujita 2012). Concerning the job search intensity, workers that search on-the-job send out more than three applications and use on average 2.2 methods to search for a job. Table 9 in the Appendix depicts the fraction of searchers that use the different methods searching for a job. Most workers read and answer advertisements, about 30% use informal methods by asking friends or family, and only few respondents use formal search methods like a job center or temporary employment agencies.

Table 1: Job search activity and intensity

	High search activity	Search intensity if searching on-the-job	
		Number of applications	Number of search methods
All	0.053	3.32	2.23
Short tenure (≤ 2 years)	0.095	4.53	2.54
Long tenure (> 2 years)	0.043	2.68	2.07

Notes: Column (1) depicts the share of individuals reporting high search activity. Column (2) and (3) depict the average number of applications sent out and the number of methods used searching for a job, for individuals indicating high search activity, respectively. The results are presented for the whole sample, individuals with tenure equal or below 2 year, and individuals with tenure above 2 years.

Concerning the reasons why workers search for a job, Table 10 in the appendix shows that about 20% of the individuals search for a job because they want to improve their working conditions by earning more money or having a better work environment. This suggests that on-the-job search could be pro-cyclical because in boom periods it is easier, while in a downturn it is harder for workers to find a better job than their current one. Yet, a non-negligible fraction of respondents also searches for a job because they expect to lose their job or want a job that gives more security. This precautionary motive could render the on-the-job search behavior counter-cyclical.

The data on the business cycle indicators comes from the OECD, Eurostat, and Statistics Netherlands. From the OECD database, I use quarterly information on economic indicators, such as the GDP, house price index, and bankruptcy index.⁸ From the Eurostat database, I use quarterly information on labor market indicators such as the unemployment rate, employment rate, and the job vacancy rate. From Statistics Netherlands, I use information on the quarterly unemployment rate at the province level.⁹ Additionally, I construct the cyclical indicator, labor market tightness, by dividing the vacancy rate by the unemployment rate.¹⁰ Data on the vacancy rate and the unemployment rate at the province level is only available after the year 2000.

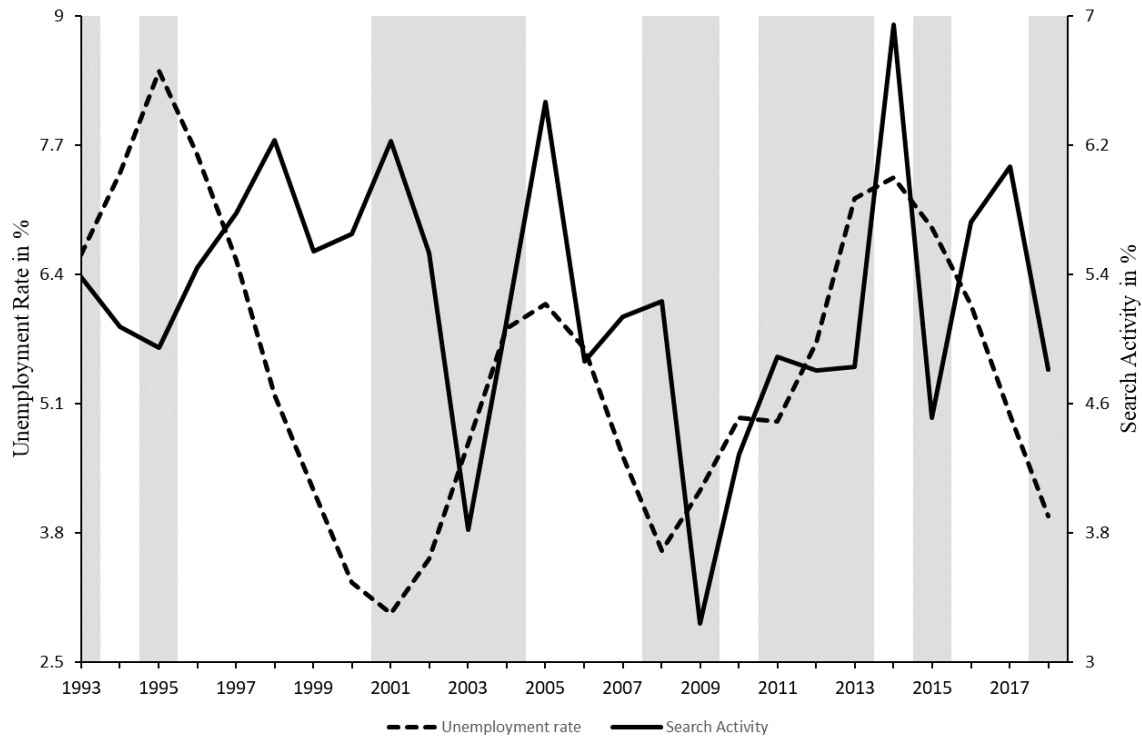
Figure 1 depicts the variation in the yearly average of the unemployment rate and the average share of respondents reporting high search activity over the sample period. The variation in the extent of job search activity and the unemployment rate is sizeable, ranging from 3.3% to 6.9% and from 3.0% to 8.4%, respectively. The figure does not show any blatant relationship between the unemployment rate and the extent of on-the-job search.

⁸ The indicators House Price and Bankruptcies are index variables that are 1 in the year 2015.

⁹ There are 12 provinces in the Netherlands.

¹⁰ Detailed Information on the Business Cycle Indicators are presented in table 16 in the Appendix.

Figure 1: Share of workers with high search activity and the unemployment rate



Notes: Grey background depicts recession periods as defined by the Federal Reserve Bank of St. Louis.

Figure 2 in the appendix depicts the on-the-job search intensity, measured by the number of applications sent out in the last two months and the unemployment rate over the sample period for workers reporting high search activity. The average number of applications sent out seems to increase over the observation period. Concerning the relationship between the two variables, there seem to be a slight positive association, especially after the year 2000. This suggests that on-the-job search intensity is greater when the labor market is slack and lower when it is tight, indicating that search intensity is slightly counter-cyclical.¹¹ Figure 3 in the appendix depicts the on-the-job search intensity, measured by the number of methods used to search for a job and the unemployment rate over the sample period for workers reporting high search activity. In this case, there seems to be a strong association between the two variables, indicating that the number of search methods is high when the unemployment rate is high, and vice versa. This supports the notion that on-the-job search intensity is counter-cyclical.

¹¹ A sharp increase in the number of applications sent out by workers reporting very high search activity is observable for the year 2009. This sharp increase is mainly driven by the relatively low number of observations of workers reporting very high search activity in that year and one observation with a relatively large number of application sent out.

Additionally, I use information on a wide array of demographic and economic attributes of the respondents in my analyses. I consider the tenure at the current employer, and whether the respondent is temporarily employed, full-time employed¹², self-employed, or employed by the government. For a considerable amount of respondents, information on income (26 %) and wealth (21 %) are missing. I use imputed values for both variables.¹³ The imputation process uses linear regression analyses on the logarithm of the income variable. The regressors in the imputation equation include up to the third polynomial in age, a dummy for the year of the survey, the individual's education, gender, marital status, number of children, and interaction effects of gender with the age and education variables. Additionally, I have information on a variety of sociodemographic variables such as age, gender, educational attainment, marital status, province of residents, and if the respondent has children. Table 11 in the appendix depicts the descriptive statistics.

¹² A worker is full-time employed when she reports that she is working more than 35 hours a week.

¹³ Not including the wage and wealth of respondents as control variables in the regressions does not change the results. Results are available from the author upon request.

3. Empirical Strategy

The previous section shows suggestive evidence that the extent of on-the-job search activity is a-cyclical while the search intensity is counter-cyclical. To investigate the cyclicity of on-the-job search behavior more rigorously in the following sections, I use regression analyses.

To study the extensive margin of on-the-job search over the business cycle, I estimate various versions of the following linear probability model¹⁴:

$$\begin{aligned} Search\ activity_{iqt} = & \alpha_1 + \alpha_2 Cyclical\ Indicator_{qt} + \mathbf{x}'_{iqt}\omega \\ & + Year_{it} + \mu_q + \gamma_i + \varepsilon_{iqt}, \end{aligned} \tag{1}$$

where $Search\ activity_{iqt}$ is a dichotomous variable taking value one if individual i at quarter q in year t is searching on-the-job. \mathbf{x}'_{iqt} is the vector of controls, γ_i is an individual fixed-effect, μ_q indicates a set of dummy variables controlling for seasonal effects, and $Year_{it}$ is a linear time trend. The vector \mathbf{x}'_{iqt} includes the gender, polynomial of age, children, marital status, educational attainment, the income, the wealth of the respondent, and a set of indicator variables for the province of residence, as well as a variable indicating if the respondent is temporarily employed, full-time employed, self-employed, a civil servant, and the number of years the respondent is working for the current employer. I estimate three different versions of this model. First, I only include the cyclical indicator variable, the year in which the respondent answered the questionnaire, and the seasonal fixed-effect. Second, I additionally include the vector \mathbf{x}'_{iqt} of controls. Third, I include the cyclical indicator, individual fixed-effects, the year of the questionnaire, the seasonal fixed-effect, a squared function of tenure, the year of the questionnaire, the income, the wealth, and if the respondent is temporary employed, full-time employed, self-employed, or a civil servant. The explanatory variable of key interest is $Cyclical\ Indicator_{qt}$. It is a measure for the state of the business cycle at quarter q in year t .

To study the intensive margin of on-the-job search over the business cycle, I estimate various versions of the following model:

¹⁴ Estimating probit or logit models produces similar results.

$$\begin{aligned} \text{Search intensity}_{iqt} = & \beta_1 + \beta_2 \text{Cyclical Indicator}_{qt} + \mathbf{x}'_{iqt} \boldsymbol{\omega} \\ & + \text{Year}_{iqt} + \mu_q + \gamma_i + \varepsilon_{iqt}, \end{aligned} \tag{2}$$

where $\text{Search intensity}_{iqt}$ is a variable indicating either the number of applications sent or the number of methods used to search for a job of individual i , at quarter q in year t . I estimate the same set of specifications as described above.

4. Results

4.1 Main Results

Table 2 presents the main regression output of the relationship between the cyclical indicator variables and the extent of respondents' on-the-job search activity. I use the unemployment rate and GDP as the business cycle indicators for the regressions depicted in the first three columns and last three columns, respectively. Column (1) and (4) depict the results without any controls, besides the year of the questionnaire and seasonal fixed-effects. Column (2) and (5) depict the results with the full set of controls. Column (3) and (6) depict the results for the regressions with individual fixed effects. The results show that there is no statistically significant association between the business cycle indicators and the likelihood of on-the-job search. Table 12 in the appendix shows the same set of regression using different business cycle indicators, e.g. employment rate, bankruptcy index, house price index, labor market tightness, and the province level unemployment rate.¹⁵ Again, there seems to be no statistically significant evidence that on-the-job search varies over the business cycle.

These regression results do support the suggestive evidence of the previous section that the job search activity of employed workers is a-cyclical. Additionally, I find that more educated, unmarried, and temporary employed individuals are more likely to search on-the-job. Women and full-time employed individuals are less likely to search on-the-job

¹⁵ For the regressions using labor market tightness and the province level unemployment rate as the cyclical indicator, the estimation sample is restricted to the years 2001 until 2018.

Table 2: Search activity I

	Unemployment rate			GDP		
	No Controls	Controls	Individual FE	No Controls	Controls	Individual FE
Cyclical Indicator	0.000 (0.001)	0.001* (0.001)	0.002 (0.001)	-0.001 (0.006)	-0.009 (0.007)	-0.014 (0.010)
Tenure		-0.003*** (0.000)	0.006*** (0.001)		-0.003*** (0.000)	0.006*** (0.001)
Tenure ²		0.000*** (0.000)	-0.000*** (0.000)		0.000*** (0.000)	-0.000*** (0.000)
Age		0.003** (0.001)			0.003** (0.001)	
Age ²		-0.000*** (0.000)			-0.000*** (0.000)	
Female		-0.008** (0.003)			-0.008** (0.003)	
Children		-0.005* (0.003)			-0.005* (0.003)	
Married		-0.016*** (0.003)			-0.016*** (0.003)	
High-school		0.009*** (0.003)			0.009*** (0.003)	
College		0.023*** (0.003)			0.023*** (0.003)	
Temporary employment		0.069*** (0.008)	0.052*** (0.012)		0.069*** (0.008)	0.052*** (0.012)
Full-time employment		-0.018*** (0.004)	-0.033*** (0.008)		-0.018*** (0.004)	-0.033*** (0.008)
Self-employed		0.007 (0.006)	-0.007 (0.018)		0.007 (0.006)	-0.007 (0.018)
Civil servant		-0.008** (0.003)	-0.013 (0.008)		-0.008** (0.003)	-0.013 (0.008)
Ln(Income)		-0.000 (0.002)	-0.003 (0.003)		-0.000 (0.002)	-0.004 (0.003)
Ln(Wealth)		-0.002* (0.001)	0.001 (0.001)		-0.002* (0.001)	0.001 (0.001)
Year	-0.000 (0.000)	-0.000** (0.000)	-0.003*** (0.001)	0.000 (0.001)	0.000 (0.001)	-0.002 (0.001)
Seasonal FE	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	No	Yes	No	No	Yes	No
Individual FE	No	No	Yes	No	No	Yes
N	34,491	31,520	28,940	34,491	31,520	28,940

Notes: Columns (1) to (3) and (4) to (6) depict the results using the unemployment rate and GDP as an indicator variables for the business cycle, respectively. The dependent variable is a binary variable indicating if a respondent is searching on-the-job. Columns (1) and (4) depict the results including the seasonal fixed-effect and the year of the interview. Columns (2) and (5) depict the results additionally including the full set of control variables. Columns (3) and (6) depict the results including individual fixed-effect, the year of the questionnaire, the seasonal fixed-effect, a squared function of tenure, the year of the questionnaire, the income, the wealth, and if the respondent is temporary employed, full-time employed, self-employed, or a civil servant. ***, **, * denote statistical significance at the 1%, 5%, and 10% level. Robust standard errors are reported in parentheses.

Table 3 and 4 present the main regression output for the relationship between the cyclical indicator variables and the intensity of individuals' on-the-job search, restricting the sample to workers that search on-the-job.¹⁶ Table 3 depicts the results using the number of applications sent out as the measure for search intensity. I present the same set of regressions as in table 2. The results depicted in Column (1) show that the unemployment rate is negatively and statistically significant related to the number of applications sent out. Specifically, an increase in the unemployment rate by one standard deviation (1.54) decreases the number of applications sent out by 0.30. Including control variables, depicted in column (2), yields similar results. For the regression with individual fixed-effects, depicted in column (3), the coefficient of the cyclical indicator variable is smaller and imprecisely estimated. The results show that on-the-job search intensity is greater when the labor market is slack and lower when the labor market is tight, indicating that on-the-job search intensity is counter-cyclical. The fact that the coefficient of the cyclical indicator variable decreases, in absolute terms, and is not statistically significant when I control for unobserved differences across individuals indicates that changes in the composition of the employed searchers contribute to the change in search intensity over the business cycle rather than a change in individuals' search behavior. The observed counter-cyclical of search intensity could be explained by the fact that in a downturn the pool of employed searchers is composed of individuals who search more intensely.

For the regressions using GDP as the cyclical indicator, I find similar results. The coefficient of the cyclical indicator variable is negative and statistically significant for the regressions without individual fixed effects and becomes smaller, in absolute terms, and imprecisely estimated when individual fixed-effects are included. Table 13 in the appendix shows the same set of regressions using different business cycle indicators, e.g. employment rate, bankruptcy index, house price index, labor market tightness, and the province level unemployment rate. The results are similar across the different business cycle indicators, indicating that on the job search intensity is counter-cyclical.

Table 4 and table 14 in the appendix depict the results using the number of search methods as the measure for search intensity. Again, I find that workers that search on-the-job search more intensely in a downturn. These results support the suggestive evidence of the previous section that the search intensity of workers that search on-the-job is counter-cyclical.

¹⁶ Estimating Poisson models produces similar results.

Additionally, I find that search intensity is lower for workers with children and higher for workers in temporary employment.

The results of this section show that overall, on-the-job search intensity is counter-cyclical and on-the-job search activity is a-cyclical. This finding is robust to using different business cycle indicators. That means that overall the effective on-the-job search is higher during economic downturns, driven by workers that search more intensely during downturns rather than the amount of employed workers that search on-the-job. It is important to note that the finding that the counter-cyclical of on-the-job search intensity seems to be driven by a change in the composition of searchers rather than a change in behavior by searchers, does not make the finding less relevant as total search intensity matters for the matching process in the search and matching model.

Table 3: Search Intensity: Number of Applications I

	Unemployment rate			GDP		
	No Controls	Controls	Individual FE	No Controls	Controls	Individual FE
Cyclical Indicator	0.197** (0.090)	0.238** (0.099)	0.158 (0.257)	-1.501*** (0.539)	-1.574** (0.618)	-0.528 (1.593)
Tenure		-0.186** (0.075)	-0.096 (0.128)		-0.186** (0.075)	-0.091 (0.126)
Tenure ²		0.005* (0.003)	0.006 (0.006)		0.005* (0.003)	0.006 (0.006)
Age		0.252 (0.155)			0.252 (0.155)	
Age ²		-0.003 (0.002)			-0.003 (0.002)	
Female		0.152 (0.380)			0.158 (0.380)	
Children		-0.675 (0.414)			-0.664 (0.412)	
Married		-0.633 (0.409)			-0.613 (0.410)	
High-school		-0.647 (0.683)			-0.650 (0.684)	
College		-1.062 (0.675)			-1.041 (0.673)	
Temporary employment		1.927*** (0.593)	2.169** (1.095)		1.888*** (0.596)	2.201** (1.105)
Full-time employment		0.145 (0.417)	0.032 (1.160)		0.141 (0.418)	0.029 (1.164)
Self- employed		1.255 (1.007)	-1.568 (2.168)		1.226 (1.007)	-1.510 (2.196)
Civil servant		-0.624* (0.342)	-1.455 (1.335)		-0.658* (0.338)	-1.503 (1.327)
Ln(Income)		-0.254 (0.287)	-0.775 (0.650)		-0.278 (0.285)	-0.781 (0.642)
Ln(Wealth)		0.073 (0.093)	-0.029 (0.187)		0.069 (0.093)	-0.047 (0.186)
Year	0.122*** (0.023)	0.103*** (0.024)	0.057 (0.083)	0.273*** (0.066)	0.254*** (0.076)	0.104 (0.182)
Seasonal FE	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	No	Yes	No	No	Yes	No
Individual FE	No	No	Yes	No	No	Yes
N	1,808	1,644	765	1,808	1,644	765

Notes: Columns (1) to (3) and (4) to (6) depict the results using the unemployment rate and GDP as an indicator variables for the business cycle, respectively. The dependent variable is the reported number of applications sent out. The sample is restricted to respondents that search on-the-job. Columns (1) and (4) depict the results including the seasonal fixed-effect and the year of the interview. Columns (2) and (5) depict the results additionally including the full set of control variables. Columns (3) and (6) depict the results including individual fixed-effect, the year of the questionnaire, the seasonal fixed-effect, a squared function of tenure, the year of the questionnaire, the income, the wealth, and if the respondent is temporary employed, full-time employed, self-employed, or a civil servant. ***, **, * denote statistical significance at the 1%, 5%, and 10% level. Robust standard errors are reported in parentheses.

Table 4: Search Intensity: Number of Methods I

	Unemployment rate			GDP		
	No Controls	Controls	Individual FE	No Controls	Controls	Individual FE
Cyclical Indicator	0.087*** (0.022)	0.086*** (0.023)	0.060 (0.048)	-0.565*** (0.149)	-0.570*** (0.171)	-0.479 (0.402)
Tenure		-0.036*** (0.014)	0.018 (0.030)		-0.036*** (0.014)	0.018 (0.030)
Tenure ²		0.001 (0.000)	-0.001 (0.001)		0.001 (0.000)	-0.001 (0.001)
Age		-0.015 (0.030)			-0.015 (0.030)	
Age ²		0.000 (0.000)			0.000 (0.000)	
Female		-0.033 (0.087)			-0.031 (0.087)	
Children		-0.219*** (0.080)			-0.214*** (0.080)	
Married		-0.007 (0.081)			0.000 (0.081)	
High-school		-0.052 (0.123)			-0.054 (0.123)	
College		-0.058 (0.127)			-0.051 (0.127)	
Temporary employment		0.333*** (0.109)	0.635*** (0.226)		0.319*** (0.109)	0.643*** (0.226)
Full-time employment		-0.114 (0.086)	0.217 (0.217)		-0.116 (0.086)	0.214 (0.218)
Self- employed		0.280 (0.182)	1.062** (0.417)		0.271 (0.183)	1.064** (0.421)
Civil servant		-0.152 (0.099)	-0.102 (0.265)		-0.164* (0.098)	-0.101 (0.267)
Ln(Income)		-0.047 (0.057)	-0.077 (0.117)		-0.055 (0.057)	-0.086 (0.118)
Ln(Wealth)		-0.028 (0.028)	-0.056 (0.068)		-0.030 (0.028)	-0.062 (0.067)
Year	0.005 (0.005)	-0.002 (0.005)	-0.042** (0.017)	0.061*** (0.017)	0.053*** (0.018)	0.002 (0.039)
Seasonal FE	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	No	Yes	No	No	Yes	No
Individual FE	No	No	Yes	No	No	Yes
N	1,828	1,664	775	1,828	1,664	775

Notes: Columns (1) to (3) and (4) to (6) depict the results using the unemployment rate and GDP as an indicator variables for the business cycle, respectively. The dependent variable is the reported number of methods used to search for a job. The sample is restricted to respondents that search on-the-job. Columns (1) and (4) depict the results including the seasonal fixed-effect and the year of the interview. Columns (2) and (5) depict the results additionally including the full set of control variables. Columns (3) and (6) depict the results including individual fixed-effect, the year of the questionnaire, the seasonal fixed-effect, a squared function of tenure, the year of the questionnaire, the income, the wealth, and if the respondent is temporary employed, full-time employed, self-employed, or a civil servant. ***, **, * denote statistical significance at the 1%, 5%, and 10% level. Robust standard errors are reported in parentheses.

4.2 Heterogeneity Tests

In this section, I explore whether the on-the-job search behavior over the business cycle depends on the tenure of the workers. Most studies assume that on-the-job search is procyclical, mainly because the marginal benefit of finding a better job is greater in boom periods. On the other hand, there is evidence that workers have a precautionary motive for searching on-the-job. That means that workers search on-the-job in order to insure against a future job loss, suggesting that on-the-job search is counter-cyclical. This precautionary motive might be more prevalent for workers with short tenure. Workers with short tenure are more likely to lose their job because it is less expensive for firms to fire these workers, due to the lesser human capital that has been accumulated, the shorter term of notice, and lower severance payments. Additionally, it is more costly for short tenure workers to lose their job because they receive less unemployment benefits and lower severance payments. In general, the likelihood to lose a job is higher and the probability to find a new job lower in a downturn, therefore, for short tenure workers the marginal benefit of searching on-the-job might be greater in downturns than in boom periods. On the other hand, workers with long tenure are less likely to lose their job and it is less costly for them to become unemployed. Therefore, the marginal benefit of searching on-the-job for long tenure workers might be greater in boom periods than in downturns.

A simple regression of the self-reported probability to lose their current job in the next 12 months, asked to a sub-sample of respondents, on the tenure of workers, the cyclical indicator variables, and the full set of control variables, is depicted in table 15 in the appendix. The hump-shaped relationship between the tenure of workers and the self-reported probability to lose their job indicates that the self-reported probability declines with tenure and does so more strongly in the first years. Furthermore, the self-reported probability to lose their job is counter-cyclical. This is first evidence that shows that the fear of losing their job is greater for workers with short tenure and that it is counter-cyclical.

To analyze whether the cyclical nature of on-the-job search differs conditional on the tenure of workers, I estimate several specifications including an interaction term between the cyclical indicator variables and the variable indicating the tenure of workers in model (1). I construct three dichotomous variables indicating if a worker has tenure above 2, 5, or 8 years at their current job. Table 5 presents the results for the same set of regressions as above using the binary variable indicating if a worker is searching on-the-job as dependent variable. Panel A presents the results for the regressions with the interaction between the cyclical indicator and

the continuous measure for a workers tenure. Panel B, C, and D depict the results with the interaction between the cyclical indicator and the binary variable indicating 2, 5, and 8 or more years of tenure, respectively.

The coefficients of the unemployment rate, depicted in the first three columns in table 5, are negative and statistically significant throughout. Concerning the interaction between the unemployment rate and the different variables indicating a workers' tenure, the coefficients are negative, statistically significant, and in absolute terms of similar size than the coefficients of the unemployment rate. These results show that workers with short tenure are more likely to search on-the-job when the unemployment rate is high. For long tenure workers the total effect of a change in the unemployment rate on the likelihood to search on-the-job is close to zero,¹⁷ indicating that search activity of long tenure workers does not change with the unemployment rate. Using GDP, as depicted in table 5 in the last three columns, and the other variables as business cycle indicators (not depicted) yield similar results.¹⁸

These results indicate that for short tenure workers, on-the-job search activity is counter-cyclical, while for long tenure workers search activity is a-cyclical.

¹⁷ The effect of a change in the unemployment rate is determined by adding the coefficient of the cyclical indicator variable and the coefficient of the interaction between the cyclical indicator variable and the tenure together.

¹⁸ The regression results using the employment rate, bankruptcy index, house price index, labor market tightness, and the province level unemployment rate as the cyclical indicator are available from the author upon request.

Table 5: Heterogeneity Test: Search Activity and Tenure

	Unemployment rate			GDP		
	No Controls	Controls	Individual FE	No Controls	Controls	Individual FE
<u>Panel A: Tenure continuous</u>						
Cyclical	0.004***	0.006***	0.006***	-0.006	-0.015**	-0.026**
Indicator	(0.001)	(0.001)	(0.002)	(0.006)	(0.007)	(0.011)
Cycl. Ind. x Tenure	-0.000***	-0.000***	-0.000***	0.000***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
<u>Panel B: Tenure dummy above 2 yrs.</u>						
Cyclical	0.009***	0.011***	0.007*	-0.012*	-0.023***	-0.018
Indicator	(0.002)	(0.002)	(0.004)	(0.007)	(0.008)	(0.012)
Cycl. Ind. x Tenure	-0.010***	-0.012***	-0.006	0.006	0.018***	0.004
	(0.002)	(0.002)	(0.004)	(0.004)	(0.005)	(0.008)
<u>Panel C: Tenure dummy above 5 yrs.</u>						
Cyclical	0.006***	0.007***	0.008***	-0.009	-0.020***	-0.031***
Indicator	(0.002)	(0.002)	(0.003)	(0.006)	(0.007)	(0.007)
Cycl. Ind. x Tenure	-0.006***	-0.009***	-0.009***	0.004	0.015***	0.013**
	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.006)
<u>Panel D: Tenure dummy above 8 yrs.</u>						
Cyclical	0.003**	0.005***	0.007***	-0.005	-0.013*	-0.023**
Indicator	(0.001)	(0.001)	(0.002)	(0.006)	(0.007)	(0.010)
Cycl. Ind. x Tenure	-0.004***	-0.007***	-0.009***	0.002	0.009***	0.009
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.006)

Notes: Columns (1) to (3) and (4) to (6) depict the results of the cyclical indicator variable using the unemployment rate and GDP as an indicator variable for the business cycle, respectively. The dependent variable is a binary variable indicating if a respondent is searching on-the-job. Columns (1) and (4) depict the results including the seasonal fixed-effect and the year of the interview. Columns (2) and (5) depict the results additionally including the full set of control variables. Columns (3) and (6) depict the results including individual fixed-effect, the year of the questionnaire, the seasonal fixed-effect, the year of the questionnaire, the income, the wealth, and if the respondent is temporary employed, full-time employed, self-employed, or a civil servant. Panel A presents the results for the regressions including the continuous tenure variable and the interaction between the cyclical indicator and the continuous tenure variable. Panel B, C, and D present the results for the regressions including the binary tenure indicating 2, 5, and 8 years and the interaction between the cyclical indicator and the binary tenure variables. ***, **, * denote statistical significance at the 1%, 5%, and 10% level. Robust standard errors are reported in parentheses.

Next, I test whether there is heterogeneity in the on-the-job search intensity of searchers depending on the tenure of workers. I conduct the same set of regressions as above for the on-the-job search intensity measures. The results for the regressions using the number of applications sent out as the dependent variable are depicted in table 6. The first three columns present the results using the unemployment rate as the cyclical indicator variable. The coefficient of the cyclical indicator variable is positive and statistically significant. The coefficient of the interaction term between the cyclical indicator and the tenure of works is negative but the absolute size is smaller than the coefficient of the cyclical indicator variable.

These results indicate that the search intensity is counter-cyclical for short as well for long tenure workers. However, the search intensity of long tenure workers varies less over the business cycle than the search intensity of short tenure workers. The findings for the regressions using the number of search methods used as a measure for search intensity are similar. The findings are robust to using different variables as the business cycle indicator.¹⁹

The results of this section show that the cyclicity of on-the-job search behavior depends on the tenure of workers. For short tenure workers, on-the-job activity as well as intensity is counter-cyclical. For long tenure workers, on-the-job activity is a-cyclical while search intensity is counter-cyclical.

¹⁹ The regression results using the employment rate, bankruptcy index, house price index, labor market tightness, and the province level unemployment rate as the cyclical indicator are available from the author upon request.

Table 6: Heterogeneity Test: Number of Applications and Tenure

	Unemployment rate			GDP		
	No Controls	Controls	Individual FE	No Controls	Controls	Individual FE
<u>Panel A: Tenure continuous</u>						
Cyclical Indicator	0.277** (0.130)	0.363*** (0.140)	0.350 (0.302)	-1.273** (0.564)	-1.527** (0.635)	-0.488 (1.618)
Cycl. Ind. x Tenure	-0.016 (0.010)	-0.020* (0.011)	-0.034 (0.023)	0.002 (0.020)	-0.006 (0.022)	-0.006 (0.049)
<u>Panel B: Tenure dummy above 2 yrs.</u>						
Cyclical Indicator	0.241 (0.184)	0.393** (0.198)	0.855** (0.421)	-1.267** (0.628)	-1.514** (0.702)	-1.129 (1.701)
Cycl. Ind. x Tenure	-0.051 (0.199)	-0.217 (0.214)	-1.044** (0.460)	-0.260 (0.396)	-0.094 (0.438)	0.817 (0.808)
<u>Panel B: Tenure dummy above 5 yrs.</u>						
Cyclical Indicator	0.295** (0.135)	0.397*** (0.144)	0.522* (0.314)	-1.319** (0.568)	-1.604** (0.640)	0.491 (0.952)
Cycl. Ind. x Tenure	-0.209 (0.159)	-0.329** (0.167)	-0.888** (0.435)	-0.145 (0.326)	0.076 (0.363)	0.015 (0.677)
<u>Panel B: Tenure dummy above 8 yrs.</u>						
Cyclical Indicator	0.265** (0.114)	0.364*** (0.121)	0.375 (0.276)	-1.381** (0.548)	-1.692*** (0.622)	-0.600 (1.608)
Cycl. Ind. x Tenure	-0.267* (0.159)	-0.403** (0.168)	-0.634** (0.307)	0.060 (0.344)	0.377 (0.381)	0.068 (0.799)

Notes: Columns (1) to (3) and (4) to (6) depict the results of the cyclical indicator variable using the unemployment rate and GDP as an indicator variable for the business cycle, respectively. The dependent variable is the reported number of applications sent out. The sample is restricted to respondents that search on-the-job. Columns (1) and (4) depict the results including the seasonal fixed-effect and the year of the interview. Columns (2) and (5) depict the results additionally including the full set of control variables. Columns (3) and (6) depict the results including individual fixed-effect, the year of the questionnaire, the seasonal fixed-effect, the year of the questionnaire, the income, the wealth, and if the respondent is temporary employed, full-time employed, self-employed, or a civil servant. Panel A presents the results for the regressions including the continuous tenure variable and the interaction between the cyclical indicator and the continuous tenure variable. Panel B, C, and D present the results for the regressions including the binary tenure indicating 2, 5, and 8 years and the interaction between the cyclical indicator and the binary tenure variables. ***, **, * denote statistical significance at the 1%, 5%, and 10% level. Robust standard errors are reported in parentheses.

Table 7: Heterogeneity Test: Number of Search Methods and Tenure

	Unemployment rate			GDP		
	No Controls	Controls	Individual FE	No Controls	Controls	Individual FE
<u>Panel A: Tenure continuous</u>						
Cyclical	0.125***	0.137***	0.110	-0.547***	-0.662***	-0.456
Indicator	(0.030)	(0.031)	(0.075)	(0.154)	(0.180)	(0.436)
Cycl. Ind. x Tenure	-0.007**	-0.008**	-0.009	0.009*	0.012**	-0.003
	(0.003)	(0.003)	(0.008)	(0.005)	(0.006)	(0.015)
<u>Panel B: Tenure dummy above 2 yrs.</u>						
Cyclical	0.146***	0.172***	0.133	-0.581***	-0.712***	-0.546
Indicator	(0.041)	(0.043)	(0.091)	(0.160)	(0.190)	(0.424)
Cycl. Ind. x Tenure	-0.085*	-0.119**	-0.110	0.053	0.155	0.093
	(0.047)	(0.049)	(0.101)	(0.081)	(0.097)	(0.194)
<u>Panel B: Tenure dummy above 5 yrs.</u>						
Cyclical	0.133***	0.144***	0.084	-0.591***	-0.718***	-0.407*
Indicator	(0.030)	(0.031)	(0.072)	(0.155)	(0.181)	(0.208)
Cycl. Ind. x Tenure	-0.098**	-0.116***	-0.045	0.116	0.217**	0.022
	(0.041)	(0.043)	(0.089)	(0.072)	(0.086)	(0.178)
<u>Panel B: Tenure dummy above 8 yrs.</u>						
Cyclical	0.099***	0.111***	0.109	-0.555***	-0.656***	-0.559
Indicator	(0.027)	(0.028)	(0.066)	(0.151)	(0.175)	(0.434)
Cycl. Ind. x Tenure	-0.052	-0.074	-0.136	0.112	0.180**	0.091
	(0.043)	(0.045)	(0.094)	(0.076)	(0.089)	(0.190)

Notes: Columns (1) to (3) and (4) to (6) depict the results of the cyclical indicator variable using the unemployment rate and the GDP as an indicator variable for the business cycle, respectively. The dependent variable is the reported number of methods used to search for a job. The sample is restricted to respondents that search on-the-job. Columns (1) and (4) depict the results including the seasonal fixed-effect and the year of the interview. Columns (2) and (5) depict the results additionally including the full set of control variables. Columns (3) and (6) depict the results including individual fixed-effect, the year of the questionnaire, the seasonal fixed-effect, the year of the questionnaire, the income, the wealth, and if the respondent is temporary employed, full-time employed, self-employed, or a civil servant. Panel A presents the results for the regressions including the continuous tenure variable and the interaction between the cyclical indicator and the continuous tenure variable. Panel B, C, and D present the results for the regressions including the binary tenure indicating 2, 5, and 8 years and the interaction between the cyclical indicator and the binary tenure variables. ***, **, * denote statistical significance at the 1%, 5%, and 10% level. Robust standard errors are reported in parentheses.

4.3 Reasons to Search for a New Job

The results of the previous section show that cyclical of on-the-job search depends on the tenure of workers. In this section, I delve deeper into the motives for on-the job search to shed some light on the mechanism driving on-the-job search over the business cycle.

Previous studies that assume that on-the-job search is pro-cyclical argue that job search decreases during downturns because it is harder to find a better paying job, reducing the marginal benefit of job search. Yet, table 10 in the appendix and previous studies show that there is also a non-negligible fraction of workers searching on-the-job because they fear losing their current job or want a more secure job. I explore whether the motives for workers that search on-the-job change over the business cycle.

Table 8 presents the results of different regression models with the binary dependent variables indicating the reason why workers search for a job and the unemployment rate as the cyclical indicator. Panel A depicts the results of a linear probability model with the year of the questionnaire and seasonal fixed effects as controls, panel B depicts the results adding the full set of controls, and panel C include individual fixed effects, the year of the questionnaire, the seasonal fixed-effect, a squared function of tenure, the year of the questionnaire, the income, the wealth, and if the respondent is temporary employed, full-time employed, self-employed, or a civil servant.

The coefficients of the cyclical indicator variable are positive and statistically significant for the regressions using the binary variable indicating a worker that searches because she fears losing her job as the dependent variable. On the other hand, the coefficients of the cyclical indicator variable are negative and statistically significant for the regressions using the binary variable indicating a worker that searches because she wants to work in a better work environment as the dependent variable. Interestingly the likelihood that workers search on-the-job because they want to earn more money does not seem to vary over the business cycle. These results indicate that workers that search on the job are more likely to search because they fear losing their job and less likely to search because they want to improve their working conditions during economic downturns. These findings suggest that the precautionary motive for searching on-the-job is more prevalent during downturns and improving non-pecuniary working condition more prevalent during boom periods.

Table 8: Reasons for Searching On-the-Job and Labor Market Tightness

	Fear losing job	Want secure job	Earn more	Better work env.	Don't like job	Additional job	Work more hours
<u>Panel A: No Controls</u>							
Cyclical Indicator	0.018*** (0.006)	0.006 (0.005)	-0.005 (0.006)	-0.020*** (0.006)	-0.029*** (0.007)	-0.002 (0.002)	0.010*** (0.003)
<u>Panel B: Controls</u>							
Cyclical Indicator	0.024*** (0.007)	0.008 (0.005)	-0.010 (0.007)	-0.024*** (0.007)	-0.032*** (0.007)	-0.002 (0.002)	0.009*** (0.003)
<u>Panel C: Individual Fixed Effects</u>							
Cyclical Indicator	0.046*** (0.016)	0.019* (0.010)	-0.017 (0.013)	-0.028* (0.014)	-0.039*** (0.014)	0.002 (0.004)	0.008 (0.009)

Notes: Columns (1) to (7) depict the results using the unemployment rate as the business cycle indicator. The dependent variable is a binary variable indicating the reason why a respondent is searching for a job. Panel A depict the results including the seasonal fixed-effect and the year of the interview. Panel B depicts the results additionally including the full set of control variables. Panel B depicts the results including individual fixed-effect, the year of the questionnaire, the seasonal fixed-effect, a squared function of tenure, the year of the questionnaire, the income, the wealth, and if the respondent is temporary employed, full-time employed, self-employed, or a civil servant. ***, **, * denote statistical significance at the 1%, 5%, and 10% level. Robust standard errors are reported in parentheses.

5. Conclusion

I study the cyclical behavior of on-the-job search, using Dutch panel data, and find that overall on-the-job search intensity is counter-cyclical and job search activity a-cyclical, but that the cyclical behavior depends on the tenure of workers. On-the-job search activity is counter-cyclical for short tenure workers and a-cyclical for long tenure workers. Furthermore, the results show that the precautionary motive in on-the-job search is more prevalent in downturns and improving working conditions in boom periods. These findings suggest that employed workers in unstable jobs are more likely to search on-the-job and search more intensely in downturns because they fear losing their job while the search activity of workers in more stable jobs does not depend on the economic conditions.

The findings of this study have important implications for the literature on search models of the labor market and contrast recent studies modeling labor market fluctuations by assuming pro-cyclical on-the-job search. It is important to take into account that on-the-job search of workers is also driven by a precautionary motive.

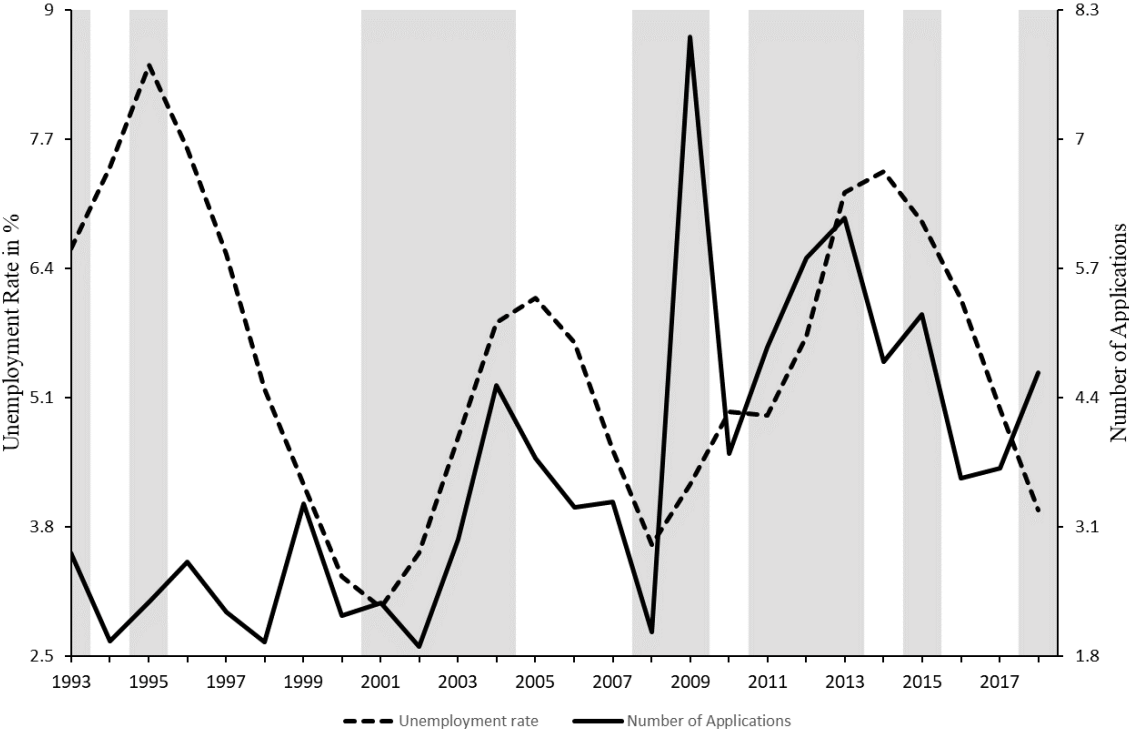
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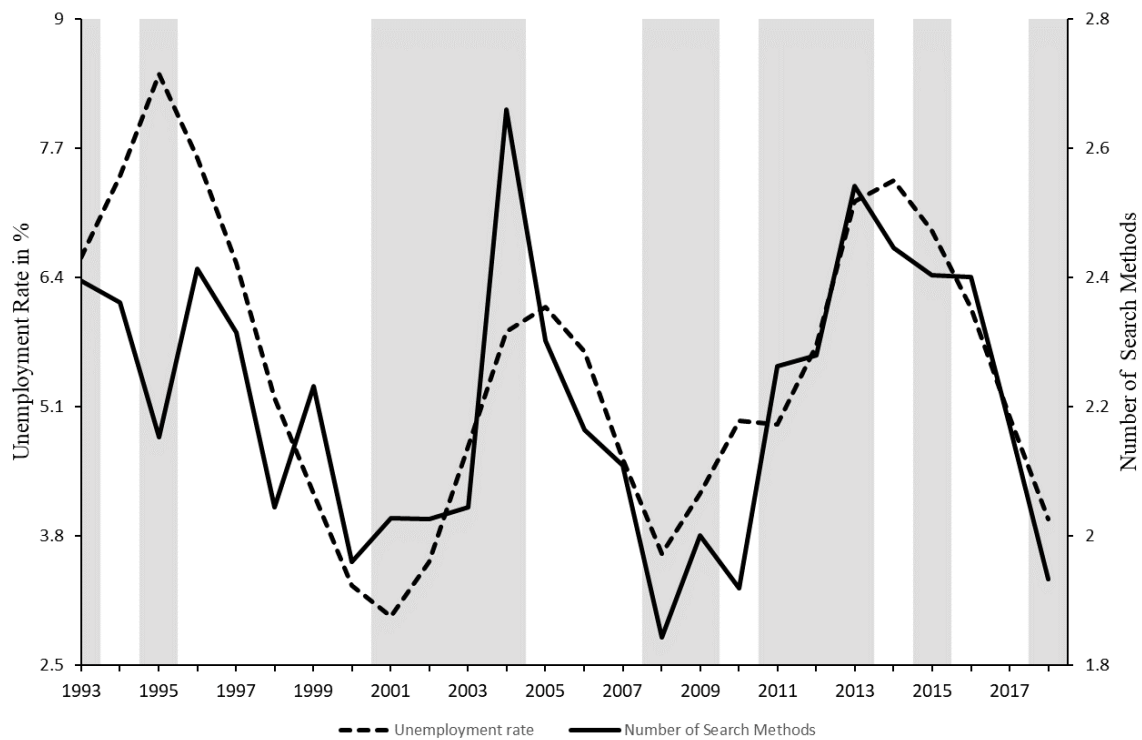
Appendix

Figure 2: Average number of applications sent out for workers reporting high search activity and unemployment rate



Notes: Grey background depicts recession periods as defined by the Federal Reserve Bank of St. Louis.

Figure 3: Average number of methods used to search on-the-job for workers reporting high search activity and unemployment rate



Notes: Grey background depicts recession periods as defined by the Federal Reserve Bank of St. Louis.

Table 9: Job search methods

Method	Share of on-the-job searchers using this method
Answered advertisements	0.63
Reading advertisements	0.45
Asked friends and other relations	0.32
Asked around with employers	0.24
Other	0.22
Through a temporary employment agency	0.19
Through a job center	0.16
Placed advertisements myself	0.02

Notes: 1,828 observations. The sample is restricted to respondents that report high search activity.

Table 10: Reason why to search for a job

Method	High search activity
I do not like my current job	0.26
I probably lose my current Job	0.22
I want to work in a better work environment	0.21
I want to earn more	0.19
Other reason	0.17
I consider my current Job as preliminary	0.15
I want a job that gives more security	0.11
Changed circumstances at home	0.06
I want to work more hours	0.05
I want to work fewer hours	0.04
I want an additional job	0.02

Notes: 1,828 observations. The sample is restricted to respondents that report high search activity.

Table 11: Descriptive Statistics

Variable	Mean	S.D.	Min.	Max.
Age	42.4	10.5	16	64
Female	0.40	0.49	0	1
Children	0.48	0.50	0	1
Married	0.64	0.48	0	1
High-School degree	0.34	0.47	0	1
College degree	0.40	0.49	0	1
Tenure	11.0	10.1	0	48
Temporary employment	0.07	0.27	0	1
Full-time employment				
Self-employed	0.05	0.22	0	1
Civil servant	0.13	0.34	0	1

Notes: 34,491 observations.

Table 12: Search activity II

	Employment rate	Bankruptcy Index	House price index	Labor market tightness	Unempl. rate of provinces
<u>Panel A: No Controls</u>					
Cyclical Indicator	-0.000 (0.001)	-0.009** (0.005)	-0.009 (0.008)	0.006 (0.007)	0.002* (0.001)
<u>Panel B: Full Controls</u>					
Cyclical Indicator	-0.001** (0.001)	-0.002 (0.005)	-0.017* (0.009)	-0.003 (0.007)	0.003** (0.001)
<u>Panel C: Fixed-Effect</u>					
Cyclical Indicator	-0.002** (0.001)	-0.013* (0.007)	-0.037** (0.015)	0.011 (0.009)	0.002 (0.002)

Notes: Columns (1) to (5) depict the results using the employment rate, the bankruptcy index, the house price index, the labor market tightness measure, and the province level unemployment rate as business cycle indicators. The dependent variable is a binary variable indicating if a respondent is searching on-the-job. Panel A depict the results including the seasonal fixed-effect and the year of the interview. Panel B depicts the results additionally including the full set of control variables. Panel B depicts the results including individual fixed-effect, the year of the questionnaire, the seasonal fixed-effect, a squared function of tenure, the year of the questionnaire, the income, the wealth, and if the respondent is temporary employed, full-time employed, self-employed, or a civil servant. ***, **, * denote statistical significance at the 1%, 5%, and 10% level. Robust standard errors are reported in parentheses.

Table 13: Search Intensity: Number of Applications II

	Employment rate	Bankruptcy Index	House price index	Labor market tightness	Unempl. rate of provinces
<u>Panel A: No Controls:</u>					
Cyclical Indicator	-0.101* (0.052)	2.527*** (0.805)	-0.824 (0.860)	-3.020*** (1.026)	0.203 (0.214)
<u>Panel B: Controls</u>					
Cyclical Indicator	-0.113* (0.060)	2.540*** (0.830)	-0.636 (0.990)	-2.692** (1.045)	0.433* (0.236)
<u>Panel C: Fixed-Effect</u>					
Cyclical Indicator	-0.006 (0.164)	0.324 (1.613)	1.635 (2.160)	-2.290 (2.382)	-0.016 (0.358)

Notes: Columns (1) to (5) depict the results using the employment rate, the bankruptcy index, the house price index, the labor market tightness measure, and the province level unemployment rate as business cycle indicators. The dependent variable is the reported number of applications sent out. The sample is restricted to respondents that search on-the-job. Panel A depict the results including the seasonal fixed-effect and the year of the interview. Panel B depicts the results additionally including the full set of control variables. Panel B depicts the results including individual fixed-effect, the year of the questionnaire, the seasonal fixed-effect, a squared function of tenure, the year of the questionnaire, the income, the wealth, and if the respondent is temporary employed, full-time employed, self-employed, or a civil servant. ***, **, * denote statistical significance at the 1%, 5%, and 10% level. Robust standard errors are reported in parentheses.

Table 14: Search Intensity: Number of Methods II

	Employment rate	Bankruptcy Index	House price index	Labor market tightness	Unempl. rate of provinces
<u>Panel A: No Controls</u>					
Cyclical Indicator	-0.046*** (0.014)	0.242* (0.136)	-0.620*** (0.202)	-0.654*** (0.198)	0.129*** (0.035)
<u>Panel B: Controls</u>					
Cyclical Indicator	-0.047*** (0.016)	0.237* (0.135)	-0.603*** (0.227)	-0.506*** (0.193)	0.135*** (0.037)
<u>Panel C: Fixed-Effect</u>					
Cyclical Indicator	-0.030 (0.036)	-0.184 (0.232)	-0.789 (0.584)	-0.414 (0.343)	0.080 (0.061)

Notes: Columns (1) to (5) depict the results using the employment rate, the bankruptcy index, the house price index, the labor market tightness measure, and the province level unemployment rate as business cycle indicators. The dependent variable is the number of methods used to search for a job. The sample is restricted to respondents that search on-the-job. Panel A depict the results including the seasonal fixed-effect and the year of the interview. Panel B depicts the results additionally including the full set of control variables. Panel B depicts the results including individual fixed-effect, the year of the questionnaire, the seasonal fixed-effect, a squared function of tenure, the year of the questionnaire, the income, the wealth, and if the respondent is temporary employed, full-time employed, self-employed, or a civil servant. ***, **, * denote statistical significance at the 1%, 5%, and 10% level. Robust standard errors are reported in parentheses.

Table 15: Probability to lose Job

	Unempl. rate	GDP	Empl. rate	Bankruptcy Index	House price index	Labor market tightness
Cyclical Indicator	1.670*** (0.169)	-13.736*** (1.303)	-1.396*** (0.177)	8.417*** (0.813)	-26.399*** (2.487)	-10.505*** (0.963)
Tenure	-0.145*** (0.024)	-0.144*** (0.024)	-0.144*** (0.024)	-0.144*** (0.024)	-0.142*** (0.024)	-0.144*** (0.024)
Tenure ²	0.926*** (0.181)	0.917*** (0.181)	0.934*** (0.181)	0.930*** (0.181)	0.907*** (0.181)	0.923*** (0.181)
Age	-0.009*** (0.002)	-0.008*** (0.002)	-0.009*** (0.002)	-0.009*** (0.002)	-0.008*** (0.002)	-0.009*** (0.002)
Age ²	0.003 (0.451)	0.021 (0.450)	0.009 (0.451)	0.027 (0.451)	0.032 (0.451)	0.004 (0.452)
Female	-1.409*** (0.448)	-1.347*** (0.448)	-1.390*** (0.448)	-1.375*** (0.449)	-1.289*** (0.449)	-1.330*** (0.449)
Children	-0.861* (0.463)	-0.876* (0.463)	-0.916** (0.463)	-0.920** (0.463)	-0.901* (0.464)	-0.837* (0.464)
Married	-0.794 (0.607)	-0.850 (0.608)	-0.847 (0.607)	-0.850 (0.608)	-0.873 (0.609)	-0.742 (0.608)
High-school	-2.303*** (0.610)	-2.294*** (0.610)	-2.316*** (0.610)	-2.306*** (0.610)	-2.235*** (0.611)	-2.359*** (0.611)
College	19.329*** (1.006)	19.352*** (1.006)	19.283*** (1.007)	19.301*** (1.007)	19.309*** (1.007)	19.294*** (1.010)
Temporary employment	-6.495*** (0.715)	-6.463*** (0.716)	-6.436*** (0.715)	-6.430*** (0.715)	-6.425*** (0.716)	-6.450*** (0.720)
Self-employed	-4.678*** (0.512)	-4.695*** (0.512)	-4.713*** (0.512)	-4.715*** (0.513)	-4.731*** (0.511)	-4.642*** (0.514)
Civil servant	-1.693*** (0.400)	-1.629*** (0.398)	-1.682*** (0.399)	-1.651*** (0.399)	-1.583*** (0.397)	-1.745*** (0.403)
Ln(Income)	-0.229 (0.152)	-0.226 (0.152)	-0.216 (0.152)	-0.220 (0.152)	-0.222 (0.152)	-0.204 (0.152)
Ln(Wealth)	0.045 (0.051)	1.475*** (0.157)	-0.049 (0.052)	-0.038 (0.052)	0.405*** (0.069)	0.468*** (0.066)
Year	-0.145*** (0.024)	-0.144*** (0.024)	-0.144*** (0.024)	-0.144*** (0.024)	-0.142*** (0.024)	-0.144*** (0.024)
Seasonal FE	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	No	Yes	No	No	Yes	No
N	20,025	19,890	17,775	20,025	19,890	17,775

Notes: Columns (1) to (7) depict the results using the measure for labor market tightness, GDP, unemployment rate, province level unemployment rate, employment rate, bankruptcy index, and house price index as business cycle indicators. The dependent variable is self-reported probability that the respondents will lose their current job in the next 12 months. ***, **, * denote statistical significance at the 1%, 5%, and 10% level. Robust standard errors are reported in parentheses.

Table 16: Cyclical indicator variables

Cyclical Indicator	Source	Definition	Time period	Business Cycle
Unemployment rate	Eurostat (https://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do)	Unemployment rate is the number of unemployed people as a percentage of the labor force, where the latter consists of the unemployed plus those in paid or self-employment. (Unadjusted Data i.e. neither seasonally nor calendar adjusted) Percentage of active Population	1993Q1-2018Q4	Counter-cyclical
Employment rate	Eurostat (https://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do)	Employment rates are defined as a measure of the extent to which available labor resources (people available to work) are being used. They are calculated as the ratio of the employed to the working age population. (Unadjusted Data i.e. neither seasonally nor calendar adjusted) Percentage of total Population	1993Q1-2018Q4	Pro-cyclical
Number of Bankruptcies Index (2007=100)	OECD (https://stats.oecd.org/Index.aspx?QueryId=74180#)	Number of bankruptcies pronounced by Dutch courts (including sole proprietorships)	1993Q1-2018Q2	Counter-cyclical
House Price Index (2015=100)	OECD doi: 10.1787/63008438-en	The real house price is given by the ratio of nominal price to the consumers' expenditure deflator in each country, both seasonally adjusted, from the OECD national accounts database.	1993Q1-2018Q4	Pro-cyclical
GDP	OECD (https://stats.oecd.org/index.aspx?queryid=350#)	Gross domestic product at market prices (VOBARSA: National currency, volume estimates, OECD reference year, seasonally adjusted)	1993Q1-2018Q4	Pro-cyclical
Job vacancy rate	Eurostat	A job vacancy is defined as a paid post that is newly created, unoccupied, or about to become vacant for which the employer is taking active steps and is prepared to take further steps to find a suitable candidate from outside the enterprise concerned and which the employer intends to fill either immediately or within a specific period of time. Job Vacancy Rate = number of job vacancies/(number of occupied posts+number of job vacancies)*100	2001Q1-2018Q4	Pro-cyclical
Province level unemployment rate	Statistics Netherlands	.	2001Q1-2018Q4	Counter-cyclical
Labor Market tightness	OECD, Eurostat	Job vacancy rate / Unemployment rate	2001Q1-2018Q4	Pro-cyclical