Essays on labor market frictions and wage rigidity

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Abstract

This dissertation consists of three essays each of which explores a different topic within the common theme of macroeconomics of labor markets.

In the first essay, I study pension reform outcomes in a frictional labor market. More specifically, I analyze how labor market structure - whether there is a single labor market or multitude of age-specific labor markets - affects pension reform outcomes in a labor market with frictions. I do this using a search and matching model with an overlapping generations structure, endogenous retirement decisions and exogenous health shocks. I find that a pension reform, where the official retirement age is increased by 2 years, has virtually the same effect on the effective retirement age, total labor input and social security outlays in the single labor market and the age-specific labor market cases. The participation and unemployment rates of 65- to 69-year-olds, however, react differently to the pension reform. Moreover, the importance of the labor market tightness response differs by labor market structure. It plays a role when labor markets are age-specific whereas the effect is negligible with a single labor market.

The second essay studies the role of collective bargaining in shaping the individual-level wage change distribution and in creating wage rigidity in Finland in 2005-2013. The analysis is based on a micro-level data set that I have constructed by combining self-collected and -coded data on collective agreements with Statistics Finland Harmonized Structure of Earnings data. I find that the collective bargaining system is associated with wage rigidity. Moreover, the degree of wage rigidity varies across worker groups - such as workers of different age and tenure - as well as across time. In addition, I show that, instead of a fixed fraction of firms resetting their wages each period, like in traditional wage rigidity models, the share of workers with their contracted wage increases readjusted each period varies depending on the bargaining cycle.

In the third essay, I measure the relative importance of labor market flows to men’s and women’s unemployment and employment fluctuations at cyclical frequency using Finnish Labor Survey data. The aim is to quantify gender differences in the relative importance of labor market flows, especially the flows involving inactivity, to labor market fluctuations. I find that the participation margin contributes more to the unemployment fluctuations of men while the opposite holds for variations in employment. My results also imply that the over-representation of men in the Goods-sector and the disproportionate share of women in the Services-sector and service occupations is more likely to contribute to the gender differences in labor market dynamics and, especially, in the relative importance of the participation margin than fertility and child-rearing decisions.

Keywords frictions, retirement, wage rigidity, worker flows, unemployment
Acknowledgements

At times, writing this dissertation felt like hitting my head against a brick wall. In the end, it was the brick wall that gave in and I got away with only a minor headache. For that, I owe big thanks to several people.

First, I want to thank my supervisor Professor Marko Terviö. I appreciate the fact that, although my dissertation topics weren’t exactly a perfect match with his research interests, Professor Marko Terviö still put in a lot of effort to help me. The commentary on my work - be it the essay drafts or presentations - was always swift and thorough and helped me to get forward. Never was the progress of my research hindered by having to wait for input on my work. I am also very thankful to my other advisor, Research Director Niku Määttänen, and especially for his help on the first essay of this dissertation. The help both on the methodological side and the topic matter were important in completing the essay.

It is always a privilege if someone has a through look at your work. Therefore, I am very grateful for the time and effort that my pre-examiners Associate Professor Johanna Wallenius and Dr. Juuso Vanhala put into reading and commenting on my dissertation. I also acknowledge financial support from OP-Pohjola Group Research Foundation, Aalto University and Yrjö Uitto foundation.

Along the way, I have been happy to share lunches and discussions with many fellow PhD students. My biggest thanks, however, go to Eero with whom I shared an office during the whole duration of my PhD studies. I think we have never really understood each others’ research, but the peer support on the universal questions of dissertation work has been very important.

My parents Kalle and Kaarina and my siblings Katti and Pekka have always been there for me. It is important to have people around you that have 100% trust in your work and skills - although the they may not even fully know what you are doing. My parents and siblings have also greatly contributed to the finalization of this dissertation as they have constantly reminded me that writing a dissertation is not a lifelong project and, thus, I should not get too preoccupied with polishing trivial details. Moreover, Katti and Pekka, you have made sure that I don’t take myself or my research too seriously. Lastly, I want to thank my husband Niki and my daughter Enni. Niki, thank you for serving as my practice audience, reading my papers and reminding me that research left in the drawer isn’t really worth anything. Most importantly, you calmed down at the worst moments of frustration, had confidence in me when I didn’t and helped me to have a more laid-back attitude on things. Enni, you have given me a lot of laughter and perspective in the dissertation work and life in general. Thanks to you, I have learned that a bug in the code is not such a big deal after all.

Annaliina Kotilainen
Helsinki, March 2018
List of essays

This thesis manuscript consists of three essays:

**Essay 1:**
"Retirement policy in a frictional labor market with health heterogeneity"  
Annaliina Kotilainen. *Unpublished manuscript*

**Essay 2:**
"Wage rigidity and the collective bargaining cycle in Finland"  
Annaliina Kotilainen. *Unpublished manuscript*

**Essay 3:**
"Dynamics of unemployment and employment by gender - role of the participation margin"  
Annaliina Kotilainen. *Unpublished manuscript*
Part I
Introduction

The labor market is a central part of the economy. It is important be it from the perspective of individuals, firms or the whole economy. The labor market gives rise to a plethora of research questions and, due to this abundance, this dissertation consists of three essays each of which explores a different topic within the common theme of labor markets.

Labor market topics can be approached both from microeconomic and macroeconomic perspective. The microeconomic approach focuses on the behavior and decisions of individual workers and firms in the labor market - often with microeconometric techniques - while, in the macroeconomic approach, the emphasis is on aggregate variables such as unemployment, employment and labor market participation. The first and third essay of this dissertation adopt a macroeconomic approach to the labor market, whereas the second essay makes use of micro-level data and methods to study a question relevant to the macroeconomy.

Labor market topics are often featured in the public discussion and public discussion has served as the motivation for all the three essays in this dissertation. The first essay, Retirement policy analysis in a frictional labor market, is inspired by the discussion around the increase in the official retirement age in Finland and the anecdotal stories about older workers finding it difficult to find employment. The essay aims to study if popular concerns about the retirement age increases being ineffective due to older people having difficulties in finding employment bear any truth in them. The second essay, in turn, explores the link between wage rigidity and collective bargaining. The motivation stems from the debate on the effect of collective bargaining on the ability of the Finnish economy to respond to shocks in the aftermath of the global financial crisis. The third and final essay, Dynamics of unemployment and employment by gender - role of the participation margin, is inspired by the vivid public and political discussion on the time women spend at home caring for children and the need to renew family policies to encourage more equal division of child care responsibilities. This discussion gave rise to the essay’s initial hypothesis on participation decisions related to childbearing and -rearing contributing to gender differences in labor market dynamics. Accordingly, the third essay seeks to quantify gender differences in the relative importance of labor market flows, especially the flows involving inactivity, to cyclical unemployment and employment fluctuations.

In the first essay, I study pension reform outcomes in a frictional labor market. More specifically, I analyze how labor market structure - whether there is a single labor market or multitude of age-specific labor markets - affects pension reform outcomes. When retirement policy is analyzed in a frictional labor market, assumptions about labor mar-
ket structure become important. This is because firms’ labor demand responses may
be very different depending on whether one assumes, for example, a single labor market
or age-specific labor markets. These are both extreme assumptions, but there exists
justification for both. On one hand, labor market discrimination by age is illegal in
many countries, but, on the other hand, in reality, firms may be able to age-discriminate
job applicants by arguing that an applicant is rejected based on quality while the true
reason is age. I analyze the effect of labor market structure on pension reform outcomes
in a frictional labor market by considering these two extreme labor market structure
assumptions.

I build my analysis on a search and matching labor market model which has an
overlapping-generations structure and endogenous retirement decisions. I have two
sources of worker heterogeneity - age and health - in the model. Through worker het-
erogeneity, I allow characteristics of the job seekers in the unemployment pool to affect
the expected value of hiring and, thus, firms’ incentives to create vacancies. Age affects
the value of hiring a worker through, for example, the so called horizon effect (Cheron
et al., 2011): shorter remaining work horizon makes hiring and training older workers
(other things equal) less valuable to firms. Health, in turn, affects the value of a worker
through disability risk. This is because health-dependent disability probability gives rise
to a ”horizon effect of health”: high-disability risk decreases expected work horizon and,
thus, value of a worker. Moreover, there is a close link between health and age as health
tends to deteriorate with age.

I study the effect of labor market structure on pension reform outcomes by conduct-
ing a policy experiment where the official retirement age is raised from 65 to 67 years
while the early retirement age is kept intact at 62 years. This experiment materializes,
in effect, through a decrease in retirement benefits for those retiring between ages 62
and 67. In analyzing the effects of the pension reform, I distinguish between two cases.
In the first case, I treat labor market tightness as a parameter while in the second case,
I allow labor market tightness and, thus, firms’ vacancy creation decisions to adjust to
the new policy.

I find that the pension reform doesn’t only affect the retirement decisions, but also
the job start and quit decisions elsewhere in the life-cycle. These decisions, in turn, have
an effect on firms’ vacancy creation through changes in the number of unemployed, the
composition of the unemployment pool and the value of hiring a worker of a given type.
The changes in vacancy creation and, thus, labor market tightness have a feedback effect
on worker decisions via the match finding probability. The strength of the firm and the
labor market tightness response depends on the size of the population mostly affected
by the policy change - the older workers - relative to the relevant labor market. In the
single labor market case, the affected workers represent only a small share of the total
labor market whereas with age-specific labor markets, all workers in the labor markets
for older workers are affected by the policy change. Moreover, in the single labor market
case, only the level of labor market tightness changes while, in the age-specific labor market case, the policy change does not only affect the labor market tightness in existing labor markets, but also the number of active labor markets. This is because, due to the policy change, it becomes profitable to post vacancies in selected labor markets for older workers where hiring was previously unprofitable.

In find that, quantitatively, the effects of the pension reform on the effective retirement age, total labor input and social security outlays are virtually the same in the single labor market and the age-specific labor market cases. The effective retirement age rises by approximately one year and the total labor input by 2.4% in both models. The effects of the pension reform on the participation rate and unemployment rate of 65- to 69-year-olds, however, differ by labor market structure. In the single labor market case, the pension reform induces a 20.3 percentage point increase in the participation rate of 65- to 69-year-olds while, in the model with age-specific labor markets, the increase is 0.6 percentage points smaller. Following the pension reform, the unemployment rate in the same age-group, in turn, rises to 1.5% in the model with age-specific labor markets compared to 2.6% in the single labor market case. The reason is that, in the age-specific labor market model, labor markets cease to exist for workers very close to the official retirement age, since posting vacancies for these workers is not profitable. Under the new pension policy, these unemployed workers who are very close to the official retirement age and have zero probability of finding a job retire early due to the weakness of the labor markets. In the single labor market model, in turn, these same workers remain in the labor force and continue job search because they face a positive probability of finding a job. As a result, both the unemployment rate and participation rate for 65-69-year-olds are lower in the model with age-specific labor markets. The mechanisms through which the effects of the policy change are realized also vary depending on the labor market structure. With age-specific labor markets, the labor market tightness response has a notable effect on the labor market outcomes whereas in the single labor market case this effect is negligible.

In the second essay, I analyze the role of collective bargaining in shaping the individual-level wage change distribution and creating wage rigidity. Wage rigidity constrains downward adjustment of wages. One of the suggested explanations for the existence of wage rigidity is collective bargaining. In Finland, legally binding collective agreements constrain the level of wage changes. General increase, set in the collective agreement, governs the minimum wage increase offered to all workers (Uusitalo and Vartiainen, 2009) while contract increase sets the floor to the average wage increase.

I analyze the relationship between wage rigidity and collective bargaining using individual-level earnings data from Statistics Finland and a data set on collective agreements that I have hand-collected and hand-coded. I develop a key that enables me to combine these two data sets into a matched individual-collective agreement data set. The focus is mainly on white-collar workers since, due to data limitations, basic wage
can’t be reliably measured for workers on hourly pay. In contrast to earlier Finnish studies, this micro level data enables me to fully account for the variation in contract increases across collective agreements and, thus, to more accurately capture the role of collective bargaining in shaping the wage change distribution.

I analyze wage rigidity in two ways. First, I construct individual-level wage change distributions for job stayers. I center the data around the general increase by calculating, for each individual and year, the difference between the actual wage change and the general increase applicable to the individual. I then construct a histogram of all the centered wage changes for the observation period spanning from 2005 to 2013. The idea is to see if the wage change distribution exhibits bunching of observations at the bin containing wage changes equal to the general increase - the minimum wage increase offered to all workers - and missing mass of observations below it. I find that there is a spike in the wage change distribution at wage changes equal to the general increase with the height of the spike averaging at 19%. This suggests that collective bargaining is associated with downward wage rigidity. Moreover, the wage change distributions by age and tenure imply that downward wage rigidity is stronger among older and more tenured workers. The distributions by educational level, in turn, suggest that there is no difference in the degree of wage rigidity by educational level.

Secondly, to analyze the variation in wage rigidity across time, I study the share of job stayers receiving wage increases below, equal to and above the contracted wage increases each year. I find that, each year, a substantial share of job stayers experience wage changes equal to the general increase. This share varies between 6% and 36%, with the peak reached in 2009, the year with difficult economic conditions. In 2010, the share of job stayers receiving wage increases equal to the general increase drops to 17%. This suggests that upon the renegotiation of majority of the collective agreements in late 2009 and 2010, contracted wage increases were adjusted to better reflect the prevailing economic situation.

The results also suggest that the traditional ways of modeling wage rigidity in macroeconomic dynamic stochastic general equilibrium (DSGE) models are perhaps better suited for studying economies with decentralized bargaining than the Finnish collective bargaining system. Instead of a fixed fraction of firms renegotiating their wages each period, like in traditional models, the share of firms and, thus, workers, who have their contracted wage increases adjusted each period varies significantly depending on the bargaining cycle. In the data, the share of workers covered by collective agreements with two or more years until the readjustment of contracted wage increases ranges across years from 0 to 96% whereas the share of workers with wage settlements up for readjustment in less than 3 months fluctuates between 0 and 60%\(^1\).

In the third essay, I quantify gender differences in the relative importance of labor...

\(^1\)As per October
market flows, especially the importance of the flows involving inactivity, to labor market fluctuations at cyclical frequency. In addition, I seek to present indicative evidence of potential explanations for the gender differences in labor market dynamics.

Contrary to what has traditionally been thought, the participation margin does matter for labor market fluctuations (Shimer, 2012; Elsby et al., 2015). Furthermore, the unemployment of men and women have differing cyclical properties: during recessions, men tend to be more adversely affected than women (Albanesi and Şahin, 2013). This leads one to wonder how large the gender differences in labor market dynamics and, more specifically, in the importance of the participation margin are.

I study the labor market dynamics of men and women using the Finnish Labor Force Survey data which allows me to take into account worker flows involving non-participation. I measure the relative importance of the labor market flows to (un)employment fluctuations using a variance decomposition method suggested by Elsby et al. (2015). I find that the participation margin is relatively more important for the unemployment fluctuations of men than women. The participation margin accounts for 42% of the total variation in men’s unemployment and 35% of the variation in women’s unemployment rate. However, regarding fluctuations in the employment-to-population ratio, the reverse holds; the participation margin is more important for women, with a contribution of 75%, compared to men’s 58%.

Gender differences in labor market dynamics and the importance of the participation margin can be due to many things such as women assuming a larger share of child care responsibilities, men often taking the role of the primary earner and/or differing industry and occupation structures among men and women. I obtain indicative evidence of the reasons behind the gender differences by analyzing labor market dynamics for sub-groups based on gender and age, and education. My findings don’t support the hypothesis that fertility and child-rearing decisions would significantly contribute to gender differences in labor market dynamics and, especially, in the relative importance of the participation margin. Instead, the results imply that the over-representation of men in the Goods-sector and the disproportionate share of women in the Services-sector and service occupations would be a more likely explanation.
Bibliography


