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Essays on Matching Processes and Effects of Institutional Changes on Regional and Occupational Labour Markets

Michael Stops

Dissertationen

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I dedicate this work to my parents and my grand-parents.

Chapter 1

Introduction

This thesis consists of three essays that are organised in the following three chapters and either refer to mechanisms of creating new employment or selected changes of labour market institutions and their impact. Particularly, chapter 2 focusses on the structure and dynamic of matching processes and considers mobility on occupational labour markets – from my knowledge for the first time – in a search and matching framework. Chapters 3 and 4 deliver analyses of effects of important institutional changes; chapter 3 contributes new and more differentiated details about the effects of the German labour market reforms 2003–2005 on the matching efficiency. Chapter 4 provides a study of the effects of the introduction and the adjustments of the National Minimum Wage in the United Kingdom 1999–2010 that faces up some methodological issues in previous work. Beside others, this chapter explicitly considers interdependencies of local areas for the first time in a study for a nation wide minimum wage.

Each of the analyses considers aspects of labour market structure and functioning under the following common assumption: from a workers perspective, the decisions to search for jobs, to change jobs, to live in a certain local area or to work in another area are made taking, beside others, the situation on relevant partial labour markets as well as the institutional setting into account. Firms consider the same aspects when they decide about the location, the kind of their economic activities, where to search for workers, and which workers should be hired. The resulting behaviour can be observed as a number of key descriptive measures in relevant regional and/or occupational labour markets[1].

The analyses in the three chapters are based on different data sets. The commonality of these data is the panel structure that reveals to be a good basis for answering the addressed research questions (for the following, see also Hsiao, 2007). One reason for this is the gain of variation compared with pure time series or cross sectional data. E.g., in chapter 2 the methodology refers to groups of cross-sectional units in terms of jobs that are assumed to be alternatives in recruitment and job search processes and the repeated observations for each cross-sectional unit over time are used to derive robust inference. In chapters 3 and 4, a period before the institutional change is compared with the period after the change and the variation in the cross-sectional units is utilised for the identification of the effects. Another advantage of panel data, in order to get unbiased estimates of the impact of interesting variables, is that it is relatively

1 Here, occupations are understood as partial labour markets comprising jobs that share extensive commonalities in terms of requirements, skills and tasks.

easy to control for unobservable cross-sectional and time series heterogeneity by dummy coding or by using within estimators, respectively.[2]

The theoretical basis for the analyses of the matching processes in chapters 2 and 3 is the job matching function that relates the number of new hires to the number of job searchers and the number of vacancies. It is a central element of a theory to explain unemployment equilibria (compare Pissarides, 1979, 1985; Diamond, 1982a, b; Mortensen, 1982). This basis allows, beside others[3], to describe the efficiency of job matching processes. Lots of studies deal with the estimation of macroeconomic matching functions (compare the surveys by Petrongolo and Pissarides, 2001; Rogerson et al., 2005; Yashiv, 2007). A greater part of these studies is based on the assumption of homogeneous job searchers and worker searching firms in the whole labour market. Relaxing this assumption allows straightforwardly analyses whether and how the parameters of the matching function differ in partial labour markets. The literature refers to sectors (Broersma and Ours, 1999), regions (Burda and Wyplosz, 1994; Anderson and Burgess, 2000; Kangasharju et al., 2005; Lottmann, 2012), skill levels and occupations (Entorf, 1994; Fahr and Sunde, 2004; Mora and Santacruz, 2007; Stops and Mazzoni, 2010) as relevant and delimitable partial labour markets. Regarding occupational labour markets, Fahr and Sunde (2004) and Stops and Mazzoni (2010) showed that the matching efficiencies are notifiable different on these markets. Both studies are based on the assumption of separated occupational labour markets. This means that, generally, workers would not change their occupation during working life.

Based on the same administrative data sources used for the analyses in Stops and Mazzoni (2010), it is shown in chapter 2 that, on average, one third of all flows from one certain job to other jobs are associated with a change of the occupation. This clearly deteriorates the separation assumption for occupational labour markets. Chapter 2 discusses theoretically and empirically the implications of a relaxation of this assumption. It gives arguments that predictable or systematic relationships between new hires in a certain occupation and vacancies and unemployed in another occupation should be only observed for groups of occupations that can be regarded as alternatives to each other in recruiting decisions from the firms perspective or in job search decisions from the workers perspective, respectively (compare also with Gathmann and Schönberg, 2010).

2 Naturally, panel data also reveal – like the other data structures – certain issues depending on the specific analyses and the assumptions the employed methodology is based on. Thus, also this data has to be tested and the adequate methodology has carefully to be selected. This is, where necessary, further discussed in the following chapters.

3 E.g., it allows also to model the observable negative relationship between unemployed and vacancies during the business cycle (represented by the Beveridge curve, compare with Blanchard and Diamond, 1989) or the observable (positive) correlation of the labour market tension, in terms of the ratio of the number of vacancies and the number of unemployed, and the probability that unemployed find a new job.

Following this idea, chapter 2 shows theoretically the relevance of occupational changes for the job search intensity and matching efficiency. This is based on a model structure firstly described by Burda and Profit (1996) to explain the influence of regional distances between job searchers and jobs on matching elasticities. The empirical assessment of the derived hypotheses is conducted with a model framework that is formally equivalent to panel data models containing spatial lags of exogenous regressors (SLX models, as described in LeSage and Pace, 2009, S. 179). The model follows the idea that an observation of a dependent variable in a certain cross-sectional unit like regions or occupations does not only depend on exogenous variables in the same cross-sectional unit but also in other – selected – units. One very often used selection criteria for regions is Waldo Tobler's first law of geography: "Everything is related to everything else, but near things are more related than distant things." (Tobler, 1970, p. 236). This principle can be easily modelled with information about topology of the regions because in this case information about distances or contiguity of regions is available. Chapter 2 adopts this idea for occupational groups whereas it is distinguished between groups that are similar to each other from groups that are not. This information stems from the study by Matthes et al. (2008) in which groups of occupations are described that can be considered as alternatives for recruiting or job search processes. The SLX model can easily be implemented in more established model frameworks like the ordinary least squares (OLS), the within estimator or the Pooled-Mean-Group model that was firstly applied by Stops and Mazzoni (2010) to estimate matching elasticities. The latter model revealed to be more adequate for the used data; it is based on the assumption that a long-term relationship between the variables of interest exists, thus the relationship of new hires on the one side and unemployed and vacancies on the other. Finally, this model does not only allow implications for the (different) matching elasticities in different partial labour markets. Since the long-term relationship is modelled as error-correction term, the coefficient of this term allows implications for the question whether there is dynamics in the data that adjusts short term deviations to an equilibrium. The results of chapter 2 are compared with previous studies and, by using information criteria, the quality of the models considering occupational changes in matching models are compared with models that do not consider these changes.

In chapter 3 the effects of the German labour market reforms 2003–2005 are analysed taken the whole labour market and occupational labour markets into account. The reforms are a topic of unchanged importance for Germany (well documented in recent studies by Dustmann et al., 2014; Gartner and Fujita, 2014; Krebs and Scheffel, 2013; Rinne and Zimmermann, 2013, 2012; Hertweck and Sigrist, 2012; Burda and Hunt, 2011; Möller, 2010; Fitzenberger, 2009). Considering

that one of the main objectives of the reforms was to improve the matching process on the labour market, this chapter presents new details regarding the development of job-matching performance before, during, and after the reform years. Thus, it complements previous studies like these from Fahr and Sunde (2009); Hillmann (2009); Klinger and Rothe (2012); Klinger and Weber (2014), who found evidence for a better job matching after the reform years. The analysis in chapter 3 is conducted on the basis of a highly frequent administrative panel data set with a huge variation of detailed observations for occupations in local areas. The data set allows to control for local temporal shocks, e.g. induced by different economic situations in the German Federal States, and for time fixed effects in the same model. This allows a precise estimation of the pure time effect on the matching productivity for the whole economy but also for groups of occupations. Therefore, the chapter provides new details about the development of the matching productivity for the whole labour market, for occupational labour markets before and after the reform years, with and without considering the economic situation and it informs about the further development during the financial crisis and afterwards. Robustness checks are provided that are, beside others, based on the stock-flow matching approach proposed by Coles (1994); Coles and Smith (1998).

Finally, chapter 4 deals with the employment effects of the introduction and adjustment of the National Minimum Wage (NMW) in the United Kingdom (UK). The identification of these and other effects, e.g. on the wage distribution, is of general interest, particularly for Germany: here a nationwide minimum wage was recently introduced and its effects are widely discussed, though it is apparent that it is not possible to empirically assess its effects shortly after the introduction due to data availability and because firms are expected to react with a certain lag of time. From a theoretical perspective the direction of the effects depends on the minimum wage level and the assumptions about the type of the product market and the labour market. Theory based on the assumption of perfect competition on product and labour markets predicts negative employment effects of minimum wage rates that lie above the market clearing wage level, the equilibrium wage: A minimum wage at this level would raise the cost of labour and, therefore, the marginal cost of production. Firms would face higher output prices that lead to a decreasing demand for this products and the production will be downsized (the "scale effect"). The firms would further tend to substitute labour by capital (the "substitution effect") due to higher wages. Thus, due to both effects the demand on labour diminishes, firms lay off or do not recruit other workers with relative lower productivity, and generally these workers would face worse employment prospects (compare this neoclassic textbook approach with, e.g., Neumark and

Wascher, 2008). However, according to alternative theoretic approaches based on monopsony market types, a minimum wage can reduce recruitment and retention costs. In case of high turnover rates, like in low wage sectors, these costs could be substantial (compare with Card and Krueger, 1995). Considering a formal version of this model for a "single monopsonist", Manning (2003) argues that there is always a minimum wage at a certain level that would increase employment. But this is not necessarily the case in oligopsonistic labour markets, beside others due to firm heterogeneity and interdependencies between these firms. That is why the same author concludes that theory can only give an orientation but no answer in evaluating the effects of minimum wage schemes and that "[an] openminded empirical approach is appropriate for investigating the impact of minimum wages on employment" (Manning, 2003, p. 27).

With this in mind, the starting point of the analyses in chapter 4 are the empirical studies by Stewart (2002) and Dolton et al. (2012).[4] The latter study proposes an estimator that considers employment adjustments on the long run as well as short term adjustments due to the yearly changes of the NMW. The analysis in chapter 4 is based on two panel data sets for different geographies, one data set for 138 travel to work areas and one for 140 Unitary Authorities and Counties. As already mentioned, our empirical strategy addresses the main critics on previous studies. Firstly, the analysis takes the spatial dependence of local labour markets into account by estimating models that explicitly consider spatial dependencies of the error terms (SEMP models, compare, e.g., with Elhorst, 2010c). This is the most general case to consider spatial dependence, given a spatial dependency structure. In the chapter, it is assumed that commuting patterns and the contiguity structure of regions can represent this dependency structure and the advantages and disadvantages of these approximations are discussed. Not least because recent studies formulated some concerns regarding the identification of spatial lag effects, compare the study by Gibbons and Overman (2012) as an excellent summary, the baseline results for the standard errors are compared with the results of a methodology of computing standard errors considering spatial relatedness in the sense of the mentioned first law of geography by Tobler. This

4 The number of existing studies dealing with nation wide minimum wages is naturally quite larger, see the surveys by Brown et al. (1982); Card and Krueger (1995); Brown (1999); Neumark and Wascher (2008). There is also an increasing number of literature which attempts to identify the effects of a minimum wage on employment by using geographical variation in the bite of the MW in spatially separated markets, see Card (1992); Neumark and Wascher (1992, 2007); Card and Krueger (1994, 2000); Burkhauser et al. (2000); Dube et al. (2007, 2010); Baskaya and Rubinstein (2012); Neumark et al. (2014) for the United States; Baker et al. (1999) for Canada; Bosch and Manacorda (2010) for Mexico; Stewart (2002, 2004a,b); Dolton et al. (2009, 2012) for the UK. Studies for Germany are not explicitly considered in this analysis because they refer to minimum wages in certain sectors or branches, compare with König and Möller (2009) for the construction sector or Aretz et al. (2013) for the roofing sector to name two important examples. As already mentioned, an explicit German nation wide minimum wage did not exist before 2015.

methodology is described by Conley (1999). Secondly, the analysis implements regional demand side shocks for the first time; particularly the financial crisis lead to the concern of the UK Low Pay Commission how to adjust the minimum wage in times of (heavy) recessions without the risk of huge employment losses. Previous studies considered only rough measures for times of recessions (Dickens and Dolton, 2010; Dolton et al., 2011; Dolton and Rosazza-Bondibene, 2012). Thirdly, possible endogeneity of the Minimum Wage variable and the dynamic structure of the employment rate are discussed and addressed by estimating a further model class that belongs to the System General Methods of Moments (SGMM) estimators, as it is described by Roodman (2009b).

Each of the following chapters 2–4 starts with an abstract, ends with detailed conclusions, and is complemented by comprehensive appendices that make each analysis step transparent. The final chapter 5 draws some general conclusions.

Chapter 2

Job matching across occupational labour markets[1]

1 The contents of this chapter are published in the journal "Oxford Economic Papers" (Stops, 2014).