

Economic Studies 145



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Employment Dynamics

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Abstract

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The main focus of this thesis is the employment decisions of firms. The thesis consists of three self-contained but closely related essays, all enlightening employment dynamics in different ways. The thesis is mainly empirical but there are also some theoretical developments when existing theory is insufficient to explain the empirical findings. The impact on employment of product market conditions and labor market conditions facing firms are investigated. The results suggest that product demand has a robust impact on firms' employment dynamics, but also the market price, the wage costs, and the matching between vacancies and unemployed workers seem to matter. The empirical evidence of the relevance of imperfect competition in the product market is important, particularly since most research on labor market dynamics has assumed perfect competition. The results with respect to matching of vacancies and unemployed workers contradict the standard search and matching model as well as simple efficiency-wage or bargaining models with wage rigidity and excess supply but no frictions in the labor market. A richer model of the labor market is needed to explain the results, including on-the-job search and perhaps more heterogeneity between employed and unemployed workers.

Essay I, "What are the Determinants of Hiring? - The Role of Demand and Supply Factors", studies the importance of demand and supply factors for hiring in local labor markets. Essay II, "Vacancy Matching and Labor Market Conditions", studies the probability of filling a vacancy, how it varies with the number of unemployed and the number of vacancies in the local labor market, and what impact it has on firms' employment dynamics. Essay III, "The Dynamics of Firms' Factor Demand", studies firm-level adjustments of employment, the capital stock, and inventories in response to exogenous shocks theoretically and empirically. These three decisions have typically been studied one at the time, but here they are studied together in a way which allows for interactions and a better understanding of firm behavior.

Keywords: Employment dynamics, Labor demand, Matching, Vacancies, Unemployment, Business cycle, Firm behavior, Capital stock, Inventories

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Uppsala, Spring of 2014
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Introduction

The main focus of this thesis is the employment decisions of firms. The thesis consists of three self-contained but closely related essays, all enlightening employment dynamics in different ways. Most studies on labor market dynamics have focused on the supply side of the labor market, particularly during recent years, while this thesis focus more on the demand side. The impact on employment of product market conditions and labor market conditions facing firms are investigated. Also the joint behavior of employment, the capital stock, and inventories is studied. These three decisions of firms have typically been studied one at the time in earlier literature. The thesis is mainly empirical but there are also some theoretical developments when existing theory is insufficient to explain the empirical findings. The results have implications for macroeconomic models.

During recent years, economists have put much effort into developing the microeconomic foundations of macro models. This is often motivated by arguing that micro-founded models give better understanding of what happens in the economy and hence enable better predictions of the consequences of alternative policies. The motivation mainly goes back to Lucas (1976) who argued that economists would remain unable to predict the effects of new policies unless they built models based on economic fundamentals that are not expected to change when there is a policy change. He mentioned fundamentals such as individuals' preferences and firms' technologies. Advocacy of methodological individualism is widespread among economists who generally insist on the importance of understanding individual behavior in order to understand aggregate outcomes.

The debate about scientific understanding of the whole based on its parts reaches far back in time. A good example from ancient Greece can be found in a dialog between Socrates and the young man Theaitetos as recalled by Plato. They discussed whether we by the whole should understand either the elements, or an of these elements formed entity that has its own creature and is something other than the elements. Socrates raised the question of whether it is possible to give a satisfactory scientific explanation of something when you with correct meaning have attached a profound penetration of the object of study through its elements. They didn't seem to find this sufficient for a scientific explanation but no final conclusion was reached in the dialog.

Cullenberg (1999) has associated methodological individualism with the concept of a Cartesian Totality. This is an assertion about the structure of the

world where any totality is composed of a set of basic elements or atoms that exist prior to and independent from the totality. Society is nothing more than the patterns that emerge from the actions of independently constituted individuals. Cullenberg contrasted this concept with the holistic concept of a Hegelian totality, which assumes that the whole is a pre-given totality. The totality is presumed to exist prior to and independent from its parts, and the parts express the inner essence of the totality. According to Cullenberg, Descartes was important to influence Western thinking towards the view of the Cartesian totality. According to Hodgson (2007), the emphasis on the individual in the analysis of socio-economic phenomena became even more prominent with the Enlightenment and is found in the works of authors such as John Locke and Jeremy Bentham.

The term methodological individualism was invented by Joseph Schumpeter in the early 20th century, with the meaning that one starts from the individual in order to describe economic relationships. Austrian economists such as von Mises and Hayek have since then been strong advocates of methodological individualism. Economic theories that are closer to the holistic approach can be found in the works of Marx, Keynes, and older historicist economics. However, there can be no strict grouping between individualistic and holistic theories. Traditional Keynesian macroeconomics is not formally microfounded but there are many references to individual behavior that are used to motivate the theory. Hayek acknowledged that the overall order of actions in a group cannot be wholly reduced to the actions of the individuals, since there is essential interaction between individuals, and groups of individuals, and the outside world. Popper described methodological individualism as a doctrine where all social phenomena should be understood as resulting from the decisions of human individuals and that we should never be satisfied by an explanation in terms of collectives alone. This is not a very strict individualistic definition and seems to be quite in line with the dominating view of today.

In the Western philosophical tradition there has also been criticism of the whole idea of constructing aggregates from individual phenomena. Nietzsche is an important philosopher who has profoundly criticized rational thinking and the construction of concepts based on experiences of individual persons and individual phenomena in nature, which according to him, is bad for perception.¹ Sjestov is another philosopher with a somewhat similar view. No matter how much we have achieved through science, he declared,

¹Nietzsche in 1873: "We obtain the concept, as we do the form, by overlooking what is individual and actual; whereas nature is acquainted with no forms and no concepts, and likewise with no species, but only with an X which remains inaccessible and indefinable for us. [...] We have seen how it is originally language which works on the construction of concepts, a labor taken over in later ages by science. Just as the bee simultaneously constructs cells and fills them with honey, so science works unceasingly on this great columbarium of concepts, the graveyard of perceptions."

we must never forget that rational knowledge neglects the essential in existence, namely the individual, the unpredictable, and the incomprehensible; science will not be able to give us truth. Even though this very pessimistic view of concepts and science is not adapted, it can be good to keep in mind that the knowledge acquired will not be some kind of absolute truth and that problems of aggregation and conceptualization are relevant to highlight.

In order to relate aggregate outcomes to the decisions of individuals, it is necessary to aggregate. In economic theory there is often a representative agent representing an average consumer or an average producer. There is one representative, utility maximizing agent whose choices are supposed to coincide with the aggregate outcomes resulting from the choices of heterogeneous individuals. The implicit assumption is that the peculiarities of the individuals constituting the aggregate balance. This is an approximation but to understand some general economic relationships, the concept of the representative agent might be a workable simplification. The purpose of economic models is not to give perfect descriptions of the real world, instead they are used to understand the economy. More realism can give a better understanding but more realism can also give rise to more complicated models that are difficult to use and to models that generate results that are hard to interpret.

Micro datasets covering the whole economy make microeconomic statistical studies of macro questions possible. In a sense, this enables the study of individual firms, local labor markets and the whole economy at the same time, testing micro and macro theory using micro data. When estimating the empirical equations in this thesis, the variables included are decided from what is suggested by the theory, but there are no restrictions put on the coefficients since I want the empirical observations to speak as freely as possible. If the theoretical micro foundations are set up in a way which is wrong, they will not improve the understanding of the economy. Economists such as Krugman and Wren-Lewis have emphasized that an aggregate relation that is not derived from micro behavior can be more useful when predicting the impact of policies than an aggregate relation derived from inaccurate micro foundations. Wrong assumptions about the underlying individual behavior often result in aggregate relations that are wrong. However, wrong micro assumptions can also happen to imply the same aggregate relation as more reasonable assumptions, but they are still problematic. Different microeconomic foundations may result in the same aggregate relation, but they give different understandings of the economy and thus they can have different policy implications. The theoretical models in this thesis are used to suggest underlying mechanisms that may explain the empirical findings. My intention is to set up the empirical investigation in such a way that the relevance of the theoretical specification can be tested.

I am particularly interested in the role of firms in the macro economy. Firm level effects of the type of persistent but transitory shocks which are relevant for macroeconomic outcomes are studied. Average employment

fluctuations are typically accounted for by transitory, aggregate shocks, while permanent, idiosyncratic shocks are the dominant source of firm level employment changes.² The behavior of firms reflects back on the shock variables but how this happens is not modelled in this thesis. The shocks are assumed to be exogenous to firms and the explanation for them initially happening and their development over time is just taken from the data. This allows me to focus on firm behavior. In future research, deep structural parameters describing firm behavior can be estimated in order to be used in general equilibrium models. This would formally allow macroeconomic conclusions.

The results in this thesis suggest that product demand has a robust impact on firms' employment dynamics, but also the market price, the wage costs, and the matching between vacancies and unemployed seem to matter. The empirical evidence of the relevance of imperfect competition in the product market is important, particularly since most research on labor market dynamics has assumed perfect competition. The results with respect to matching of vacancies and unemployed workers have interesting implications. Congestion among firms searching for workers and competition between unemployed workers searching for jobs seem to be important. However, vacancies are not filled much more quickly if there are more unemployed workers available and unemployed workers do not find jobs much more quickly if there are many vacancies open. These results contradict both the standard search and matching model and simple efficiency-wage or bargaining models with wage rigidity and excess supply but no frictions in the labor market. A richer model of the labor market is needed to explain the results, including on-the-job search and perhaps more heterogeneity between employed and unemployed workers.

Summaries of the Chapters

I. What are the Determinants of Hiring? - The Role of Demand and Supply Factors (co-authored with Stefan Eriksson)

In this essay, we study the relative importance of demand and supply factors for hiring. We use a search and matching model with imperfect competition in the product market to derive an equation for total hiring in a local labor market and estimate it on monthly Swedish panel data. Our main finding is that product demand is important for hiring. This highlights the importance of taking imperfect competition in the product market into account in studies of employment dynamics and hiring. We also find that the number of unemployed workers has a positive effect on hiring, confirming the importance of search frictions. Both supply and demand factors seem to be important for hiring.

² See, e.g., Caballero, Engel, and Haltiwanger (1997) and Franco and Philippon (2007).

II. Vacancy Matching and Labor Market Conditions

This essay studies the probability of filling a vacancy, how it varies with the number of unemployed and the number of vacancies in the local labor market, and what impact it has on employment. A greater availability of unemployed workers should make it easier for a firm to fill a vacancy but more vacancies at other firms should make it more difficult, due to the congestion effect. I use monthly panel data for all local labor markets in Sweden 1992-2011. The results suggest that the number of vacancies in the local labor market has a significant and robust negative effect on the probability of filling a vacancy while unemployment has a weak positive effect. One likely reason why unemployment has a small effect is that many vacancies are filled with workers coming directly from another job. Simulations of a theoretical model of employment at the firm level, with parameters based on the estimation, show economically significant effects of shocks to the number of vacancies on employment dynamics, while shocks to the number of unemployed are not very important. The simulations show that matching frictions are more important for employment during booms than during recessions.

III. The Dynamics of Firms' Factor Demand

In this essay, detailed, yearly register data for Swedish firms are used to study firm-level adjustments of employment, the capital stock, and inventories in response to exogenous shocks. In earlier literature, these three decisions have typically been studied one at the time, but in this essay they are all studied together in a way which allows for important interactions and a better understanding of firm behavior. A theoretical model is set up and used to interpret the empirical findings. The main focus is on employment. Increased product demand and market price have positive effects on employment while an increased wage cost has a negative effect. Product demand has the strongest and most robust empirical effect on employment. The number of unemployed and the number of vacancies in the local labor market where the firm is located have no significant effects on employment indicating that matching frictions are not very important for firms' employment dynamics on yearly frequency. Bigger stocks of real capital and inventories imply that the firm will hire more workers in the following period. The capital stock typically responds in the same direction as employment but more slowly. Inventories seem to be adjusted to keep a balanced relation between product demand and products available to sell so as to avoid stocking out, not to smooth production.

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