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### On the functioning of markets with frictions

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# CHAPTER 6

## Summary

This thesis is titled “On the functioning of markets with frictions”. It studies the coordination, dynamics and organization of economic activity in markets with search frictions, with applications in the labor, housing and goods markets. As discussed in the introduction of this thesis, search frictions make the occurrence of trade risky and dependent on the actions of others. Indeed, markets with search frictions are generally characterized by externalities. If there are multiple markets with search frictions, the expected benefits of trade in one market can depend on the presence and behavior of trading partners in another market.

The latter is the case in the second chapter of this thesis in the form of a demand externality. This chapter explains the observed counterclockwise cycles in the unemployment, vacancy rate-plane with a search and matching model that is not driven by shocks, but features endogenous fluctuations. The assumption that the revenue per worker-firm match increases with the level of aggregate economic activity makes firms to open vacancies now if they expect more economic activity in the future. However, if expectations are not sufficiently optimistic, the congestion of the labor market starts to dominate the demand externality before a steady state is reached, and oscillations result. Under plausible parameter values, the equilibrium dynamics include a stable limit cycle that resembles the empirically observed counterclockwise cycles around the Beveridge curve. Calibrated to the duration of the business cycle, these endogenous ‘Beveridge cycles’ are as persistent as the data, without losing any of the amplification of the standard model, and without the use of any (persistent) stochastic process.

The third chapter of this thesis is based on joint work with Espen Moen and Plamen Nenov. We argue that the search behavior of moving homeowners can be an important source of housing market volatility. By choosing whether to buy or sell first, households who move house affect the ratio of buyers to sellers and market liquidity, with important consequences for time-on-market, transaction volume, and prices. This chapter shows that when moving homeowners want to minimize the delay between transactions, they prefer to buy first whenever there are more buyers than sellers in the market, and to sell first when there are more sellers than buyers. Indeed, a market with more buyers relative to sellers exhibits a short time-on-market for sellers and a longer time-on-market for buyers, and vice versa. However, because the transaction sequence decision of moving homeowners not only depends on, but also affects housing market conditions, multiple steady state equilibria result: one with a high ratio of buyers to sellers and a short seller time-on-market, and one with a low buyer-seller ratio and long seller time-on-market. Equilibrium switches create large fluctuations in the housing market, which are qualitatively consistent with the empirical evidence that we document for Copenhagen.

In the fourth chapter, I build on the strategic complementarities identified in the previous chapter, but assume that the ratio of buyers to sellers is unknown to moving owner-occupiers. For that reason, homeowners that would like to move cannot always buy first when that ratio is high or sell first when it is low. Instead, households learn about the behavior of currently moving owner-occupiers in a contagion-like process. When contagion is fast enough, these dynamics give rise to three steady states, as in the previous chapter. However, not everybody buys first in the steady state with tightness bigger than one, and not everybody sells first in the steady state with tightness smaller than one, consistent with the heterogeneity in the data for Copenhagen. I extend this model by allowing real estate agencies to buy houses for speculation purposes. These boundedly rational agencies compare the return from buying and selling houses to a risk-free rate, and are active in the market when these returns have been positive for some time. When moving owner-occupiers take such speculation into account, the market turns at the troughs and bottoms, but, as the result of the adaptive expectations, does not return the economy to a steady state. Instead, the dynamics are described by a limit cycle, which closely matches the aggregate dynamics of the housing market of Copenhagen.

The fifth chapter, which is joint work with Piotr Denderski, provides a framework to explain the coexistence of firms and self-employment. Homogeneous households

face a choice between self-employment and searching for a job at a firm. In the mixed strategy equilibrium, they trade-off the risk of unemployment in a frictional labor market with the risk of not selling in a frictional goods market. We show that risk-averse self-employed can use their pricing decisions to increase their chances of selling, effectively buying insurance against goods market risk. Since firms offer similar insurance against labor market risk to risk-averse job seekers by posting lower wages, the model exhibits two variants of market insurance. Depending on the scope for each, there can be either too much or too little self-employment. In addition, customers face an inefficiently high probability of stock-out at the self-employed when these post low prices, and the wages posted by firms result in excessive firm entry. We show that insurance for the self-employed, as Denmark and Sweden offer, can restore efficiency if it is optimally combined with unemployment insurance and differentiated taxes for the self-employed and labor market participants.

In short, this thesis shows that markets with search frictions can feature excess volatility, inefficiencies, and diversity in market organization, implying that there is a potential role for government intervention.