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Job Matching, Wage Dispersion, and Unemployment

Dale T. Mortensen and Christopher A. Pissarides

Edited by Konstantinos Tatsiramos and Klaus F. Zimmermann

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The book *Job Matching, Wage Dispersion, and Unemployment* by Dale T. Mortensen and Christopher A. Pissarides represents an interesting piece consisting of the authors' most important works, developed either individually or in collaboration. The book is a part of the *IZA Prize in Labor Economics Series* which means that the authors were awarded the prize and the book emerged afterwards. Naturally, the book should contain those works that had the most significant impact on the subject the prize is given for, i.e., on the development of the search and matching model of the labor market in this particular case.

First, a few words about the prize. It is given by the IZA[1], a private, independent research institute, which conducts labor market research. The award is given for "outstanding academic achievement in the field of labor economics" since 2002 on an annual basis. As a part of the prize, all the winners contribute some of their works (which should serve as an overview of their most significant findings) to the *IZA Prize in Labor Economics Series* published by Oxford University Press. This

1 Institut zur Zukunft der Arbeit (Institute for the Study of Labor).

award has become very prestigious in the respective field as it is the only award given exclusively to labor economists. In 2005, the award was given to Dale T. Mortensen and Christopher A. Pissarides for their "path-breaking contributions to the analysis of markets with search and matching frictions" (p. 1). Only five years later, these two authors (together with Peter Diamond) received the 2010 Nobel Memorial Prize in Economics for the same contribution, i.e., the analysis of markets with search frictions. As the authors themselves explain in the introductory part, the flows approach to labor market (flows in and out of unemployment) led to the theory of equilibrium unemployment which replaced the previously dominant disequilibrium theory under which unemployment reflected the excess supply at a real wage above the one that would clear the market.

The book is comprised of five main chapters with an additional introductory part that helps bring in the main concepts of the flows approach to the labor market. This part also provides a summary of all the subsequent chapters with additional discussion of their contributions and their relation to the available literature. All five main chapters are actually papers previously published by the two authors, either individually or jointly. Besides the introduction by the authors, there is also a short introduction by the editors of the series, Konstantinos Tatsiramos and Klaus F. Zimmermann. In this part, the editors of the book explain the rationale for the prize as well the organization of the book. Additionally, at the very beginning of the book there is also the Award Statement of the IZA Prize Committee, consisting of renowned experts in the field: George A. Akerlof, Armin Falk, Richard Portes, Joseph E. Stiglitz, and Klaus F. Zimmermann. The committee stresses the strength of the authors' approach to the analysis of markets with frictions that stimulated a vast literature afterwards and that led to the "success of job search theory and the flows approach in becoming a leading tool for microeconomic and macroeconomic analysis of the labor markets" (p. vii). At the end of the book, before the "standard package" that includes notes, references and indexes, there is a postscript that provides an extensive summary

of the developments in the literature concerning this specific area of labor economics.

As is explained in the committee statement as well as in the introductory part by the book editors, in their earliest works in this specific field, Mortensen was perhaps more familiar for his contribution to investigating the individual worker's job search decisions in a world without perfect information and the consequent equilibrium unemployment (Mortensen, 1970; Burdett and Mortensen, 1980), while Pissarides had more impact on studying macroeconomic implications of the flows approach to labor market by using the now well-known matching function as a tool for studying equilibrium unemployment (Pissarides, 1979; 1985). Later on, Mortensen used a search model (Burdett and Mortensen, 1998) to account for wage dispersion, while Pissarides introduced on-the-job search into the model (Pissarides, 1994). Pissarides has also set himself as a leading author in the field by further elaborating the matching approach in the labor market in his book *Equilibrium Unemployment Theory* (2000) which has for quite a while now been a leading textbook in the field. However, their joint work that combined their earlier individual research into a new model has brought the search and matching theory in the labor market to a whole new level. They introduced the so-called Mortensen-Pissarides model of equilibrium unemployment (Mortensen and Pissarides, 1994) which has become one of the leading models in studying the labor market ever since. Their equilibrium search framework was used not only in theoretical works, but also as a tool for evaluating labor market policies which they elaborate in their additional joint research (Mortensen and Pissarides, 1999a; 2003). These two authors have presented the "essence of their ideas and the insights of the immense literature that was stimulated by the search and matching framework" (p. ix) in two articles published in *Handbook of Macroeconomics* and *Handbook of Labor Economics* (Mortensen and Pissarides, 1999b; 1999c) which now serve as a key reference for researchers in the field.

However, this book is comprised of only five papers that have "highly enriched research on unemployment as an equilibrium phenomenon, on labor market

dynamics, and on cyclical adjustment" (p. 2). Two of them are authored by Dale T. Mortensen, two by Christopher A. Pissarides and one is their joint work. As the authors explain in the introductory part, the first two chapters were the first papers that initiated the research that led to what is today known as the *search and matching model of the labor market*. The third chapter provides an empirical foundation for the flows approach to the labor market while the fourth one gives the joint collaboration by the two authors with special emphasis on the cyclical asymmetry in job creation and job destruction. Chapter 5 discusses equilibrium wage distributions and wage inequality for identical workers.

Chapter 1 was originally published by Dale T. Mortensen in *The Economics of Information and Uncertainty*, edited by J. J. McCall in 1982 with the same title: "The Matching Process as a Noncooperative Bargaining Game". This chapter primarily deals with the decisions of agents to participate in the process of forming matches under conditions of imperfect information by introducing the so-called *partnership formation*. The main feature of this partnership is that it produces a joint value that exceeds the sum of what the two partners could accomplish independently, but they engage in a matching process only if it is in both their interests. The Nash bargaining solution became a focus of interest in the analysis given that the division of a surplus attributable to the existence of a match is by its nature a bilateral bargaining problem. In this way, matching outcomes actually depend on the bargains that agents who plan to engage in a matching process expect to negotiate. The paper discusses some externalities that appear in the model but it also demonstrates the existence and uniqueness of equilibrium which, together with the existence of the sharing rule, stimulates efficient choices. The author also extends the discussion by introducing middlemen into the model who have a continuing interest in the bargaining outcomes. Even though the author makes some assumptions that simplify the model, it still stands as groundwork in the analysis of the search and matching process.

The original version of Chapter 2 was published by Christopher A. Pissarides in 1985 as "Short-Run Equilibrium Dynamics of Unemployment, Vacancies and

Real Wages" in *American Economic Review*. This paper is more macroeconomic in its nature than the one in the first chapter, but it leans on the Nash bargaining theory that was more thoroughly discussed in Mortensen's paper (Chapter 1). It primarily tackles the problem of the dynamics of labor market adjustment following an exogenous shock. The paper discusses not only real wages and unemployment responses to shocks, but it also explicitly models job vacancies that "play a critical role in the transmission of output shocks to real wages and unemployment" (p. 45). The author points out that the model in this paper resembles a neoclassical Solow growth model with unemployment. Some of its main features include *wage stickiness*, i.e., real wages do not fully reflect changes in output because of the influence of non-market returns on the Nash wage equation; unemployment response to output shock is slow, while vacancies respond to shocks more quickly and with greater amplitude. It is important to mention one additional attribute of the model in the second chapter. Namely, even though the assumption of the model is ex-ante homogeneity of both workers and firms, the ex-post productivity of a match varies across matches. This assumption led to the idea of reservation match quality, a reflection of reservation wage and reservation profit level. It actually helped to show the asymmetry between rises and falls in unemployment; i.e., the response of unemployment to a negative shock is faster than a response to a positive shock because when the shock is negative, reservation wages and profits do not fall as much as actual wages and profits, leading to immediate job separations.

The third chapter is again a work by Christopher A. Pissarides, published in *Economic Policy* in 1986 under the title "Unemployment and Vacancies in Britain". This work is predominantly empirical and has to be viewed in the context of the changes that took place in European labor markets in the 1970s and 1980s. The paper takes, among other things, the model developed in the paper presented in the second chapter in order to account for the huge rise of unemployment in Britain in the late 1970s and early 1980s using the statistics on unemployment and vacancies. The author argues that the flows approach to

the analysis of the labor market in Britain could reveal some facts about the behavior of the stock of unemployment, which in the end is the prime interest of the public and policy-makers. The findings suggest that almost all changes in unemployment can be accounted for by changes in flows into employment. The author also discusses different policy measures as well as their implications for these flows, and consequently for the stock of unemployed, in Britain.

Chapter 4 brings the previously mentioned joint work of the two authors that they published in *Review of Economic Studies* in 1994. The article entitled "Job Creation and Job Destruction in the Theory of Unemployment" is "a complete statement of the equilibrium search and matching model of the labor market with endogenous job creation and job destruction" (p. 14). The authors develop a model of endogenous job creation and job destruction and incorporate it into the matching approach to equilibrium unemployment and wage determination. Naturally, many of the settings from the previous papers, such as noncooperative wage behavior, are used in this paper as well. Similarly as in the paper from Chapter 2, the job destruction decision is directed by reservation productivity. The authors show that an aggregate shock induces negative correlation between job creation and job destruction, whereas a dispersion shock induces positive correlation. Their model shows that when cyclical shocks arrive, job destruction changes first and job creation follows as the matching process gathers momentum, which suggests that the job destruction process has more volatile dynamics than the job creation process. The simulations in the paper also show that an aggregate shock process serves as a fairly good proxy for the cyclical changes found in the U.S. data. This paper is probably their most influential work because since its publication, the Mortensen-Pissarides model (MP model) has become "the canonical model for the study of unemployment" (p. 173).

The last main chapter presents the work of Dale T. Mortensen published in *Panel Data and Labor Market Studies*, edited by J. Hartog, G. Ridder and J. Theeuwes in 1990. The paper entitled "Equilibrium Wage Distributions: A Synthesis" brings into light the so-called *wage posting* models, as opposed to previously

considered *vacancy posting* models where the wage is determined by the Nash bargaining solution. Wage posting models consider wage dispersion – sustainable differences in wages for identical workers – in models where the firm sets the wage. The author reviews different papers that tried to model the equilibrium wage offer distribution and associated equilibrium reservation wage rates with special emphasis on the so-called Albrecht-Axell and Burdett-Mortensen models. There is also an extension of the original paper in the book, where the author introduces the case of heterogeneous workers and employers into the analysis.

Probably the most interesting part of the book is the concluding chapter or postscript, where the authors discuss the developments in the literature that use search and matching theory. They emphasize how the papers in this book helped to shape the equilibrium search and matching model that "has become the standard tool for the analysis of unemployment and wage inequality, and a host of other labor market issues" (p. 173). By reviewing a number of papers that emerged in the last couple of decades, they show how the use of their theory (including the constant returns matching function and the Nash solution to wage bargaining) proved to fit the data in a number of empirical studies. Additionally, the authors mention an application of their model to the study of labor market policy impact in a number of works. They also show how the theory itself evolved in several directions, but with the main aspects of the Mortensen-Pissarides model still being preserved. The authors do not hesitate to show some of the drawbacks of their own models and present some of the possible solutions given in papers by other scholars. Having a larger picture in mind, Mortensen and Pissarides often stress the need for further research in specific areas of the search and matching theory.

Obviously, the equilibrium search model is a principal tool in studying different aspects of the labor market nowadays. This is evident even without the IZA Prize in Labor Economics or Nobel Memorial Prize in Economics. One just needs to look at the literature in labor economics in the last couple of decades and will find that this model is used for studying different aspects of the labor market,

including cyclical movements in unemployment, unemployment durations, impact of technological shocks on the labor market, or wage inequality. What's more, search and matching theory is used not only to study interactions in labor markets; it is also applicable for housing markets, marriage markets, or any markets with frictions. Hence, the contribution of the two authors stretches further from labor economics implying that their impact on the development of economic theory will be marked for generations and generations to come.

I think that the book *Job Matching, Wage Dispersion, and Unemployment* by Dale T. Mortensen and Christopher A. Pissarides covers the origins and main developments of the search and matching model of the labor market quite well. However, this book is not sufficient to fully understand the model for someone who is encountering it for the first time. Even though the authors chose these particular papers as an overview of their most significant findings, it is my opinion that some other papers, such as those mentioned previously, deserve a place in this volume too. Then again, it is understandable that due to limited space only a few papers could make the cut. Thus, an inexperienced reader should probably not take this book as a starting point to learn about the equilibrium search and matching model, but should rather start with the book by Pissarides (2000) or some of the review articles that cover the topic in more depth, such as the one by Petrongolo and Pissarides (2001). The experienced reader in the topic, on the other hand, is probably familiar with all of the papers from the book. But he too can profit from the book by reading the comments from the authors in the introductory and concluding part, not only on their own contributions, but also on the contributions by others as well as on the need for further research in specific areas. Who knows, perhaps some of the unresolved questions mentioned at the end of this book could stimulate new developments in the area of the equilibrium search and matching theory.

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