

**Nobel Prize Winners**

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**THREE HEROES
OF LABOUR MARKET RESEARCH –
PETER A. DIAMOND, DALE T. MORTENSEN
AND CHRISTOPHER A. PISSARIDES
OBTAINED THE NOBEL PRICE
IN ECONOMIC SCIENCES FOR 2010**

JEL: Y9.

I. What they have in common

Peter A. Diamond, Dale T. Mortensen and Christopher A. Pissarides are a trio of outstanding researchers, who built already in the 1970s the basis of our understanding of labour markets. The decisive impetus came from Peter Diamond who has shown already in 1971 why the classical (general) equilibrium model (the so called Arrow-Debreu model) is unable to work on «search markets» as e. g. the labour market. Dale Mortensen and Christopher Pissarides expanded the search theory of Diamond in particular to the labour market. Therefore one talks today of the Diamond-Mortensen-Pissarides model, which is, however, not only applicable to the labour market but to almost all «real» markets, where some time elapses until buyers and sellers come together. In the classical

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view, buyers and sellers meet immediately, without costs, have full or perfect information over prices of all goods and services. This, however, is not the «real» picture of most markets. Therefore, the model explains how unemployment, vacancies and wages are influenced by institutions (regulation). They give in their model answers to the question why there are unemployed and vacancies at the same time. Today the DMP model is the standard instrument of labour market theory.

The 1939 born Dale Mortensen is professor at Northwestern University in Illinois. He has done his studies at Willamette University and Carnegie-Mellon in Pittsburgh. His Cypress borne colleague Christopher Pissarides studied in Essex, Great Britain. Today the 1954 borne Pissarides teaches at the London School of Economics. His book about «Equilibrium Theory of Unemployment» goes as the standard textbook on this subject. Despite the political relevance of the theme, their attention lays on economic theory; they feel at home in science and not so much in the wide public.

Just the opposite may be true for Peter Diamond. The 71 years old New York borne studied in the early sixties first mathematics and then economics, when all industrialized countries suffered from increasing unemployment. His thesis adviser (in 1963) was Robert Solow, also one of the early Nobel laureates. Today he teaches at MIT. He is familiar with the political business of Washington – and is esteemed as a praxis oriented researcher. President Obama wanted to appoint him at the Board of the Federal Reserve System – against the opposition of republicans. Republican Senator Richard Shelby who was heading the opposition against Diamond is quoted to have said: «I think it is not good in these times of uncertainty if decisions about monetary were decided by Members of the Board who must first learn their job». Maybe, his chances to belong soon to the most important «Monetary guardians» have increased with the Nobel Prize. His great merits lay, however, in «analyzing central questions or queries about the basics and functions of search markets» – so the Nobel Prize Committee says in its decision. Peter Diamond has shown why by purchasing a house or searching for a job the two sides of the market not always come together – just opposite to neoclassical economics. He explains this via search costs of such markets: These markets could be very non-transparent and searching very expensive, and this hinders that supply and demand come always together and balance perfectly – via flexible prices. Diamond's proposals also explain why in the same time thousands of vacancies exist and nevertheless thousands of people are unemployed.

II. The difficulties in coordinating trade: externality and increasing returns

Let me first focus on Peter Arthur Diamond. He made several fundamental contributions to a variety of areas: First, in the field of optimal taxation, together with James A. Mirrlees, Nobel Prize Winner of 1996. They published this path-breaking article in 1971 in the *American Economic Review*. Second, he served in several committees relating to social insurance. He published an influential paper on «A framework for social security reform» in 1977 in the *Journal of Public Economics*. Also important was his «Organizing the health insurance market» published in *Econometrica* 60, 1992. His ideas were also shown in «Social security Reform» published in 1994 as well as in «Macroeconomic aspects of social security reform» published in 1997, or his article «Social Security» in *American Economic Review* 2004.

But the Nobel Prize he won for his outstanding contributions to search markets. In 1971 he published «A model of price adjustment» in the *Journal of Economic Theory* and then in 1981 «Mobility costs, frictional unemployment, and efficiency» (*Journal of Political Economy*). Here he showed how the externality that «the rate at which workers are offered jobs with different moving (and training) costs depends on the decisions of other workers as to which jobs to refuse» (p.798) implies that «equilibrium will not generally be efficient» (ibid) and that «there can be multiple steady-state equilibria» (p. 799). Very famous became his «coconut model» in «Aggregate demand management in search equilibrium» (*Journal of Political Economy* 90, 1982), where he introduced «a third cause for macro unemployment problems – the difficulty of coordination of trade in a many-person economy» (p. 881). Here he proofed that people's expectations play a crucial role in determining the actual level of aggregate economic activity. As a result he has shown, that people's rational expectations become a self-fulfilling prophecy. Applied to the labour market one can show that the natural rate of unemployment (NRU), the equilibrium concept now, may not be unique but there may exist a multitude. However, if NRU is unique, it may not be efficient. This ideas were summarized in «Wage determination and efficiency in search equilibrium» published in *Review of Economic Studies* XLIX in 1982. His «Money in search equilibrium» published in *Econometrica* 1984 (which together with the mentioned *JPE* 1982 article are the Fisher-Schultz lecture presented at the Amsterdam Econometric Society Meetings in 1981) is also a highlight. Here he «drops the fictional Walrasian auctioneer and introduces trade frictions ... to get macro unemployment problems in an economy with correctly perceived, flexible prices and wages» (p. 1). This proposition is analyzed in a model where money plays a critical role in coordinating transactions. Also here multiple equilibria or multiple natural rate of unemployment result (for a given constant nominal money

supply). This is also true of his Wicksell Lectures «A search equilibrium approach to the micro foundations of macro economics» given in 1982 and published in 1984. Here Peter Diamond stressed just at the beginning, that «the micro foundations of macro» has become the name of a well defined branch of economic theory in the decade since the publication of the book of E. S. Phelps¹ in 1970. However, he also remarked that «the name is somewhat misleading», because this also must «have changed micro economics to incorporate the macro reality of cyclical unemployment, which is ... missing in general equilibrium micro models» (p. 1). Also here he shows that multiple equilibria exist, and that «rational expectations is obviously an incomplete theory of expectations», because it does not select one of the different paths for the economy: With multiple equilibria «there is an important potential role for government». In his Nobel Price Lecture about «Unemployment, Vacancies and Wages» he summarized these outstanding contributions (to appear in the American Economic Review in June 2011).

III. Search equilibria and matching

As early as 1970 Dale Thomas Mortensen published his «Job search, the duration of unemployment, and the Phillips curve» in the American Economic Review. This article was quickly followed by his contribution to the mention Phelps' 1972 volume about «A theory of wages and employment dynamics». Here he developed his ideas about matching, later famous under this catchword: «Job matching under imperfect information» (1976) and «The matching process as a non-cooperative/bargaining game» (1982). However, as criticized by Peter Diamond, these are partial equilibrium models. But as early as 1980 he published together with K. Burdett «Search, layoffs and labor market equilibrium». Hence his reputation as a labour market specialist was born, leading him to publish survey articles and contributions to handbooks like «Job search and labor market analysis» (chapter 15 in the HbLE, vol. 2, 1986) or «Search theory and macro-economics: A review essay» (1992).

These interests brought him together with another labour market specialist, namely Christopher A. Pissarides, the youngest of this trio. Under the main supervision of Michio Morishima he wrote his Ph.D. thesis about «Individual Behaviour in Markets with Imperfect Information» (1973). While he is known for his contributions to search and matching theory and the development of the concept of the matching function and pioneering the empirical work on it, more recently he has done research on structural change and economic growth². He started his

¹ Also a Nobel Prize winner, see e. g. Eisen (2007).

² See e. g. „Structural change in a multi-sector model of growth»(together with L. Rachel Ngai) published in the American Economic Review.

publications with a well-received book on «Labour market adjustment: Microeconomic foundation of short-run neoclassical and Keynesian dynamics» in 1976 (of which a 2009 re-issue in paperback appeared). In 1976 he also published his first article in search theory titled «Job search and participation», followed in 1982 by «Job search and the duration of layoff unemployment». In 1983 «Efficiency aspects of the financing of unemployment insurance and other government expenditures» followed. In his «Search intensity, job advertising, and efficiency» (1984) he discussed that both firms and workers ignore a positive externality of their search. This «positive externality arises because each participant's job-matching probability is an increasing function of the search intensity of participants on the other side of the market» (p. 129). And here he cites the work of Peter Diamond (1982) and of Dale Mortensen, who «in two independently written papers» has noted the positive externality discussed here. Very important then was his paper «Short-run equilibrium dynamics of unemployment, vacancies and real wages», published in 1985 in the *American Economic Review* and his «Job search and the functioning of labour markets: A survey». Then followed his path-breaking book «Equilibrium Unemployment Theory» in 1990, of which a second edition appeared in 2000. In 2006 he published (together with Barbara Petrongola) «Scale effects in Markets with search». These scale effects in matching models have featured prominently in the economics literature since Peter Diamond's (1982) claim that they can generate multiple equilibria. Here the authors show that «it is feasible for constant returns in aggregate matching functions and hazard rates to coexist with increasing returns at the micro level, because the responses of firms and workers can cancel out these effects at the aggregate level. Together with Costas Azariades he published a very nice piece on «unemployment dynamics with international capital mobility». Here they show that rapid capital movements across national borders ... substantially amplify the impact on the domestic unemployment rate of domestic fluctuations in total factor productivity. Hence, capital flows increase the riskiness of labour income and reduce the riskiness of capital income. Let me mention at least his «The unemployment volatility puzzle: Is wage stickiness the answer?» (2009).

Most influential was then the cooperation of Mortensen and Pissarides, these two outstanding labour market researchers in «Job creation and job destruction in the theory of unemployment» in 1994. They also worked together on «Technological progress, job creation, and job destruction» published in 1998 and with «Unemployment responses to 'skill-biased' technology shocks: The role of labour market policy». These papers built on the previous individual contributions. This fruitful cooperation then led to two handbook articles: «Job Reallocation, Employment Fluctuations and Unemployment» (*Handbook of Macroeconomics*, 1999) and «New developments in Models of Search in the Labor Market» (*HbLE*, vol. 3, 1999). And it culminated first in the IZA Prize in Labour Economics which they together received in 2005, and second, and still more important, in the Nobel Prize of the year 2010.

In his Nobel lecture Dale Mortensen put his emphasis on «Markets with search frictions», Pissarides on «Equilibrium in the labour market with search frictions»!

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The article was received on March 6, 2011.