



# Income distribution and exchange in a dynamic search model

Ensar Yilmaz<sup>a,\*</sup>, Burak Ünveren<sup>b</sup>

<sup>a</sup> Yildiz Technical University, Department of Economics, Yildiz, Besiktas, 34349, Istanbul, Turkey

<sup>b</sup> Yildiz Technical University, Department of Economics, Turkey

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## ABSTRACT

This paper studies the link between income distribution and trade mechanisms in a dynamic search model with two-sided asymmetric information. Buyers and sellers have imperfect information about the income levels of the other group. Furthermore, asymmetry of information about incomes is the source of price dispersion. In such a frictional environment, we capture the effects of a change in inter- and intra-class income distribution on the trade mechanism, which is represented by the expected trade volume and the flux of buyers and sellers in the market.

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## 1. Introduction

The relationship between trade processes and income distribution as a source of information asymmetry has not received the attention it deserves. We seek to remedy this by providing a framework in which income distribution, as a source of information asymmetry, enters into the determination of trade volumes and into market entry and exit decisions.

A large body of work has used decentralized matching and bargaining models to analyze frictional exchange. Much research has focused on characterizing and outlining the efficiency properties of equilibria in decentralized matching and bargaining models with search frictions (e.g. Corominas-Bosch, 2004; Lamoureux & Schnitzlein, 1997; Yavas, 2001). However, only some of these models are dynamic and have the property of two-sided incomplete information (e.g. Atakan, 2007; Blouin & Serrano, 2001; Satterthwaite & Shneyerov, 2007; Wolinsky, 1990).

Using a similar structure, we draw attention to a different subject: the link between income distribution and trade in a realistic environment rather than highlighting the efficiency properties of equilibria. For this, we build an exchange economy with a trading mechanism as described above.

In contrast to Walrasian models of competitive market equilibrium, in which the Walrasian auctioneer adjudicates the process of tâtonnement, we consider a market for an indivisible good in which the trade process is decentralized: prices are determined in direct contacts between pairs of buyers and sellers. There are continua of heterogeneous buyers and sellers. Each seller has one unit of the homogeneous and durable good for sale and each buyer wishes to buy exactly one unit. Time elapses discretely over an infinite horizon. Trade between buyers and sellers is coordinated by a stochastic pairwise matching process.

\* Corresponding author. Tel.: +90 212 2597070 2795.

E-mail addresses: [enyilmaz@yildiz.edu.tr](mailto:enyilmaz@yildiz.edu.tr) (E. Yilmaz), [bunveren@yildiz.edu.tr](mailto:bunveren@yildiz.edu.tr) (B. Ünveren).

One of the interesting features of two-sided asymmetric information in exchange models is that they possess price dispersion. In this study, dispersion of prices originates from the dispersion of income, specified as the unique source of asymmetric information to deduce a relationship between income distribution and how the trade mechanism operates. In the literature, there is no consensus on the sources of price dispersion. Several alternative explanations of the origin of price dispersion have been suggested, usually relying on some form of exogenously specified heterogeneity amongst agents in the economy (*inter alia* Reinganum, 1979; Burdett & Judd, 1983; Rob, 1985; Paulsen & von Ungern-Sternberg, 1992).

Referring to income dispersion as a source of price dispersion deserves an explanation. It is a well-known observation that there is causality between the income levels of buyers (their purchasing power) and the threshold prices that they can accept. However, it is not as clear that price dispersion arises as a consequence of differences in income distribution. In fact, the level of sellers' income can emerge as a significant parameter of optimal price offers if participants in the market are only individuals, or the markets are personalized markets like second-hand markets (for example, durable goods like (used) cars and houses). Individual sellers may become more reluctant to sell their goods and ask for higher prices as they become richer. Such an income effect on optimal pricing behavior of sellers may originate from the fact that sellers with higher income would have a luxury of waiting.

The closest study to ours in terms of referring to the source of asymmetry, as far as we know, is the study by Edmonds and Veldkamp (2006). In their model of decentralized trade specified differently to ours, income dispersion leads only to one-sided asymmetric information about buyer characteristics. However, we introduce income distribution as the origin of two-sided asymmetric information. This gives us an opportunity to analyze the relationship between the trade mechanism and income distribution, an approach which is lacking in previous research.

We categorize income distribution as inter-class and intra-class income distribution. While inter-class income distribution describes the position of the average income of buyers with respect to that of sellers, intra-class income distribution refers to the income distribution within each separate group (buyers and sellers). We track the connection between what these definitions of income distribution imply and the indicators that capture trade mechanism. For this purpose, we use two indicators to capture the trade mechanism: trade volume and the volume of active buyers and sellers in trade. Using the indicator of trade volume, we assess whether income distribution is essential in determining the change in trade activities in a frictional environment or not. Appraising changes in the volume of active buyers and sellers assists us to understand the dynamics of trading mechanism: the flux mechanism. Among many other indicators that represent how the market works, we choose these indicators since they are analytically tractable in a frictional set-up.

The results that we find imply that changes in income distribution may be crucial in terms of affecting the direction of trade volumes and the entry and exit decisions of agents. One important result among many is that the effect of an increase in total income level that leads to a change in inter-class income distribution on the amount of expected trade and the entry and exit decisions of agents depends on how that increase is distributed between buyers and sellers. An increase in income that is sufficiently high on behalf of buyers apparently increases the volume of expected trade and causes more buyers to enter the market. However the change in the volume of active sellers requires that we know the degree of the response of buyers when they raise critical prices in response to increased reluctance of sellers due to sellers having higher income.

We also find that if a change occurs in intra-class income distribution that results in deterioration of income dispersion among sellers, the volume of expected trade increases. However, the relationship between the buyers' income dispersion and the volume of expected trade is ambiguous, because it depends on the relative strengths of income, price and uncertainty effects. In contrast, we look at the effects of specific changes in both inter-class and intra-class income distributions. For example, a fall in income disparity that results in an increase in the income of buyers at the bottom and a decrease in income of sellers at the top may yield an increase in the expected amount of trade.

These results are important from two perspectives. Firstly, they are useful to understand how selective welfare and tax policies can be used to improve trade mechanisms. Secondly, they help us to understand the channels through which probable external shocks on income distribution spill over on trade in a frictional environment, shedding light on the mechanics of income, price and uncertainty effects. Several studies show that income dispersion changes coincide with business cycles (e.g. Caballero & Hammour, 1994; Lustig & Van Nieuwerburgh, 2005). Hence, a contribution to understanding the link between trade mechanisms and income dispersion in a realistic environment can assist policy-makers to produce desirable redistributive policies to minimize welfare losses during business cycles.

The rest of the paper is organized as follows: The model is presented in Section 2. In Section 3, we provide relevant definitions of income distribution. Section 4 argues the comparative statistics for income distribution and trade volume. Section 5 introduces the flux mechanism and relevant comparative statics. Concluding remarks are in Section 6.

## 2. Model

### 2.1. Environment

There are continua of agents divided into two types: buyers and sellers. The population of buyers and sellers is normalized to 1. Heterogeneous and anonymous buyers and sellers meet once per period and trade an indivisible, homogeneous good in a dynamic matching environment with two-sided asymmetric information.

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