

On the microeconomics of specialization

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Abstract

We consider individual consumer–producers who operate within a perfectly competitive market economy with transaction costs, presenting several propositions that characterize the optimal production and consumption plans of such a consumer–producer. First, we show that under rather sparse conditions on production technologies and consumer preferences, there exists a solution to the consumer–producer optimization problem if transaction costs are asymptotically high. Second, under strengthened properties on consumer preferences, there exists such a solution, even in the absence of transaction costs. Third, we discuss the conditions under which a consumer–producer specializes to different degrees. These results generalize the existing results in the literature.

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1. Introduction

A classic question in economics concerns the endogenous division of labor (e.g., Smith, 1776). The standard neoclassical framework has avoided this problem by introducing an exogenous dichotomy between consumers and producers. Recently, there has been a renewed interest in this issue, in particular through the study of markets with transaction costs and consumer–producer agents. Here, a *consumer–producer* is an individual who produces,

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trades, and consumes goods in a perfectly competitive market economy: this individual is subject to the hypothesis of price-taking behavior. In this paper, we provide general conditions under which consumer–producers configure optimally their economic activities of consumption, production and trade. This forms a foundation for the endogenous emergence of a social division of labor.

The main idea in our model is based on the Smith–Young approach to the relationship of specialization, the social division of labor, and increasing returns to scale (Smith, 1776; Young, 1928). Smith argued that the social division of labor is limited by the extent of the market so that the benefits of specialization to an individual are determined largely by the existing social division of labor in the economy. (This is also known as the *Smith Theorem*.) Young introduced a synergetic argument by stating that the extent of the market also depends upon the level of social division of labor. Thus, the presence of increasing returns to scale leads to specialization and further social division of labor. In turn, a high level of social division of labor leads to increasing economies of specialization that form further incentives to specialize and deepen the social division of labor.

As mentioned above, the main tool in our model is the notion of the consumer–producer. In the standard neoclassical, general equilibrium treatments (Debreu, 1959; McKenzie, 1959), consumers and producers are separate decision-making entities. Extensions of this approach to incorporate increasing returns are possible (see Villar, 2000, and the references therein), but they do not address or formalize the Smith–Young specialization hypothesis.

In a seminal contribution, Rader (1964) studied a general equilibrium model with consumer–producers, endowing each individual with a very general production set, an initial vector of commodities, and a preference relation. He proved the existence of competitive equilibrium and the two fundamental welfare theorems in his model. However, he did not address the Smith–Young specialization hypothesis.

Yang and his research group linked the notion of the consumer–producer to the Smith–Young specialization hypothesis (see Yang, 2001, for a survey and further references). In this approach, the “New Classical” framework, Yang introduces increasing returns to labor in each individual’s production set, which leads to specialization in trade and production. Following the discussion of Yang and Ng (1993) which used specific functional forms, Wen (1998, 2000) discussed more general conditions under which specialization occurs. Subsequently, Yao (2002) has refined and extended her results. In this paper, we are able to weaken these conditions even further.

In Gilles et al. (2003) and Gilles and Diamantaras (2003), we have discussed a general equilibrium model that combines consumer–producers with social production and transaction costs. In this work, we view the configuration of production as a collective decision. We have shown existence of equilibrium and the two fundamental welfare theorems. In particular, Gilles and Diamantaras allow for the endogenous determination of the set of tradeable goods, thus making the home production of non-tradeable goods vital for individuals’ consumption.

In the present paper, we do not address the formulation of a general equilibrium theory; we only report results on the fundamental properties of the behavior of an individual price-taking consumer–producer. Developing these basic results into a fully developed general equilibrium theory can be done along the lines of Rader (1964) and/or

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