Optimal taxation with monopolistic competition

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Abstract This paper studies optimal taxation in a Dixit–Stiglitz model of monopolistic competition. In this setting, taxes may be used as an instrument to offset distortions caused by producer markups. Since markups tend to be higher in industries where firms face less elastic demand, tax rates will be pushed lower in these industries. This tends to work against the familiar inverse elasticities intuition associated with the Ramsey tax rule. However, a key feature of the model is that the Ramsey rule responds to the industry demand curve (Chamberlin’s \(DD\)) while the monopolistic markup is a response to the demand curve faced by firms (Chamberlin’s \(dd\)). Hence, the elasticities of both these curves influence the optimal tax rate, but in opposite directions.

Keywords Optimal taxation · Monopolistic competition

JEL Classification D43 · H21

1 Introduction

This paper addresses optimal taxation in a multi-sector version of the Dixit and Stiglitz (1977) model of monopolistic competition. Since firms with market power create economic distortions, taxes will be used in part to offset the adverse welfare consequences of producer markups. Thus, the focus of study is taxation that not only raises revenue efficiently, it must also have an optimal corrective component to combat the monopolistic distortions. This is potentially a rather complex problem with multiple policy objectives but only a limited number of policy instruments. Nonetheless, the problem is an important one since varying degrees of imperfect competition
are present in many markets yet the theory of optimal taxation has focused primarily on the perfectly competitive case.\(^1\) Fortunately, despite the complexity of the problem some valuable insights are available.

Since markups respond inversely to the elasticity of demand, corrective policy will work in the opposite direction: Taxes will respond positively to the elasticity of demand. This is in contrast to the familiar Ramsey rule for efficient taxation which tends to favor an inverse elasticities tax rule. So the two policy objectives respond in opposite ways to the elasticity of demand—a pro-elasticities rule for the corrective component and an inverse elasticities rule for the efficient component. The optimal policy is a combination of the two. But note that the Ramsey rule responds to elasticities of industry demand curves (Chamberlin’s $DD$). By contrast, the markups, and hence the tax corrections, respond to elasticities of firm demand curves (Chamberlin’s $dd$). Thus, the optimal balance between inverse elasticities and pro-elasticities tax rules depends on careful measurement of the different elasticities.

The optimal tax problem for the Dixit–Stiglitz economy—an imperfectly competitive economy with zero profits and heterogeneous goods—has the same form as the optimal tax problem for an imperfectly competitive economy with positive profits and homogeneous goods. The latter problem has been studied by Myles (1989). We exploit the equivalence between the two problems and use the methods of Myles to show the compensated effect of the optimal tax system on the number of firms in the free entry equilibrium. The results are consistent with the corrective role for taxation. If an industry faces a large monopolistic distortion, the tax system’s direct response is to cause only a small reduction in entry.

The rest of the paper is organized as follows. Sections 2 and 3 present the model and its equilibrium respectively. Section 4 studies the optimal tax problem when quantities are the control variables. Section 5 considers the case where prices are the control variables. Section 6 is a brief conclusion.

2 Model

There are $I$ monopolistically competitive industries, labeled $i = 1, \ldots, I$. The representative consumer has utility function

$$U(\ell, Y_1, \ldots, Y_I)$$

where $\ell$ is leisure and $Y_i$ is an aggregator for industry $i$:

$$Y_i := \int_0^{n_i} u_i(q_i(j)) \, dj.$$

Each firm in industry $i$ produces a distinct variety, so $n_i$ is both the number of firms and the extent of variety in the industry. The function $u_i$ gives the utility contribution

\(^1\text{Section 6 of Auerbach and Hines (2002) and Chap. 11 of Myles (1995) discuss optimal taxation under imperfect competition.}\)