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Positive welfare effects of trade barriers in a dynamic partial equilibrium model ☆

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ABSTRACT

We develop a simple two-region, cobweb-type dynamic partial equilibrium model to demonstrate the existence of optimal, possibly non-zero, trade barriers. A pure comparative statics analysis of our model suggests that a reduction of trade barriers, modeled as small but positive import tariffs, always enhances welfare. However, taking a dynamic perspective reveals that nonlinear trade interactions between two regions may generate endogenous price fluctuations which can hamper welfare. Finally, we allow special interest groups, such as consumers or producers from these two regions, to lobby for a particular level of trade barriers. Our model predicts that time-varying trade barriers may be another channel for market instability.

1. Introduction

Conventional economic wisdom tells us that trade barriers have a negative impact on allocative efficiency.[1] While protectionist policies may be beneficial to specific groups, aggregate welfare is typically best promoted by free trade. This conclusion is based on a comparative statics approach where steady-state allocations with and without trade barriers are compared. Such an analysis seems to be reasonable as long as these steady-state allocations are stable and give a good description of the trading patterns that emerge.

In general, however, it may be that the stability properties of steady-state allocations are affected by trade barriers. For example, free trade may induce larger swings in the supply of a certain commodity in the domestic market, since a perceived profit opportunity will attract more foreign suppliers. This increase in supply elasticity may destabilize the domestic commodity market and lead to a higher volatility of prices, consumption levels and firm profits than when there

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[1] See the famous models of comparative advantage by Ricardo (1963) and Heckscher and Ohlin (Ohlin, 1933; Samuelson, 1948). For a textbook introduction to models of international trade, see Krugman et al. (2011), for example.

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are sufficient trade barriers. Higher volatility will be detrimental to welfare such that a trade-off between higher allocative efficiency at the steady state and welfare-decreasing volatility may emerge.

In this paper, we investigate this trade-off by considering a simple dynamic partial equilibrium model with two regions, region *A* and region *B*. The same homogeneous commodity is produced and consumed in each region. In the absence of trade relations, however, the steady-state equilibrium price in region *A* is lower than in region *B*. This may be due to differences either in the number of firms or the cost efficiency of those firms in the two regions, or in the demand for the commodity in the two regions. In either case, firms from region *A* will have an incentive to export their commodity to region *B* where they may obtain a higher price. However, these firms may face trade barriers which we model as small but positive import tariffs.

We consider a behavioral model in which firms from region *A* decide on the basis of past profits in which region they want to supply their product in the next period. As there is a production lag, the production decision of all firms has to be based on their price expectations, which are formed on the basis of past prices. In this setting we study the effect trade barriers imposed by region *B* concerning supplies from region *A* may have on price stability and aggregate welfare. We find that relaxing trade barriers may indeed induce instability and thereby decrease aggregate welfare. As a consequence, and in contrast to conventional economic wisdom, there may be an optimal and non-zero level of trade barriers in such an environment. We extend the analysis by considering the political economy of trade policy. In particular, we allow special interest groups, i.e. consumers and producers from region *B*, to lobby for a decrease or increase in trade barriers. We study the impact of these lobbying efforts on the dynamics and find that it presents another channel for instability.

The mechanism driving instability in our model is closely related to and inspired by that studied in Dieci and Westerhoff (2009, 2010). They consider an economic environment with two cobweb markets that are stable when isolated from each other but that may become unstable when interactions occur and suppliers are permitted to move between markets. In Dieci and Westerhoff (2009, 2010), however, there is only a comparison between the scenarios of full isolation and full interaction, whereas in the current paper the level of the trade barrier exactly determines the extent to which markets interact. In addition, we analyze the welfare effects of trade barriers.

Although our results remain – to a certain extent – valid under rational price expectations, we assume that firms use simple prediction rules, such as naive and adaptive expectations. We believe that this is relevant because there is empirical (see e.g. Baak, 1999; Chavas, 2000) as well as experimental evidence (Sonnemans et al., 2004; Hommes et al., 2007) that suggests that human decision-makers indeed use simple prediction strategies.

Related in spirit to our paper is the contribution by Commendatore and Kubin (2009) who identify a similar type of trade-off between allocative efficiency and stability. They study labor and product market deregulations in a general equilibrium model with monopolistic competition and show that, although these deregulations increase equilibrium employment, they may also lead to instability and endogenous fluctuations. Moreover, Commendatore et al. (2007, 2008) and Agliari et al. (2011, 2014) develop discrete-time New Economic Geography models and show that different levels of trade costs may imply different dynamic behaviors, including fixed-point dynamics, cycles and chaos. A reduction of trade barriers in the form of a cut in trade costs tends to increase the volatility of key model variables.

Crucial to our results is the trade-off, associated with a decrease in trade barriers, between the increase in welfare due to a greater allocative efficiency at the steady state and the potential decrease in welfare because of the emergence of endogenous fluctuations. At the outset, however, it is not obvious that volatility in prices and consumption levels is actually detrimental to aggregate welfare. Lucas (1987), for example, claims that the negative welfare effects of business cycles are relatively small – a conclusion that has led to a substantial body of literature, and has been challenged by others (see e.g. Barlevy, 2004; Jung and Kuester, 2011). Moreover, Matsumoto (1999), Matsumoto and Nonaka (2006) and Huang (2008), using nonlinear cobweb and Cournot models, show that chaotic fluctuations may increase all firms' profits and may even lead to increases in aggregate welfare. In our setting, however, fluctuations typically have a substantial negative effect on aggregate welfare.

Even if our results are entirely theoretical there is some empirical evidence that is consistent with our findings. For example, Cashin and McDermott (2002) find that real commodity prices have become increasingly volatile over time. Although the relationship between trade openness and output volatility is ambiguous, Karras and Song (1996) provide empirical evidence of a positive correlation between the two. Moreover, Bordo et al. (2001) show that financial and economic crises occur more frequently than in the past, which they believe is due to an increase in deregulation. The recent financial and economic crisis sadly confirms the interdependence and fragility of the world's markets.

The remainder of this paper is structured as follows. In Section 2 we describe the steady-state equilibria of the model under autarky, free trade and trade barriers. Stability properties of the steady-state equilibria are investigated in Section 3. In Section 4 the welfare aspects of a decrease in trade barriers, modeled as import tariffs, are explored and in Section 5 we discuss the political economy of such import tariffs. Concluding remarks are provided in Section 6 and the Appendix contains the proof of the main stability result.

2. Steady-state market equilibria in a two-region model

In this section we outline our basic economic model of trade between two related markets and characterize the steady-state equilibria that emerge under different trading policies. We consider a homogeneous product that is sold on two markets, *A* and *B*. Demand for the product on these markets is given by well-behaved downward sloping demand functions