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Comment

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1. Introduction

This paper explores an intuitive theory of invoicing for exporting firms, and then examines some new data on invoicing for the European Union accession countries. The paper makes a nice contribution to our understanding of invoicing practices. My comments are divided into two sections. In the first, I make some observations about the invoicing theory presented in the paper. In the second, I discuss the application of the theory to the data.

2. The Theory

The model presented in the paper is developed fully in Goldberg and Tille (2005) (hereinafter referred to as GT). The model builds on some work of my own (Devereux, Engel, and Storgaard 2004; Engel 2005), as well as work of Bacchetta and van Wincoop (2005), so my critique of the model applies to my work as well. All of these models are essentially static models that examine the price setting decision of a monopolistic firm that must set a price without knowledge of the realizations of various stochastic variables (exchange rates, and other variables that affect demand for its product). The expected discounted profits of the firm are affected by the currency in which prices are set. The goal of these papers is to examine the factors that determine which currency is optimal—the currency in which the firm incurs its costs, the currency of the importer, or some other currency.

The GT model assumes firms can index their export price to a basket of currencies, and determines the optimal weights on the firm's own currency, the importer's currency, and a vehicle currency. They refer to a "hedging" and a "herding" motive, which Goldberg nicely explains in this paper.

The terminology, however, may be a bit misleading. The firms in this model act as if they are risk neutral. That is, under the assumptions of the model, the decision of the firm is equivalent to maximizing expected profits. Firms do care how much their profits could fluctuate across states, but that is because the profit function is not linear in all variables. The desirability of having prices set in the producer's currency or some other currency depends on the shape of the profit function, as Giovannini (1988) and Bachetta and van Wincoop (2005) have explained. The model in this paper assumes that demand has constant elasticity, and costs are increasing, but the results do not carry over to more general settings.

A different set-up would allow firms to be genuinely risk averse. Firms in the model of this paper discount expected profits, but the discount factor is assumed to be exogenous to the firm. That is, the decisions of the firm do not affect the level of the discount factor in any state. As Engel (2005) explains: "Firm owners might be risk averse, so D [the discount factor] could be the marginal utility of an increment to profit denominated in the currency of the exporter." In short, this objective for the firm holds under a variety of possible assumptions about the objectives of the firm managers and the structure of asset markets and possibilities for hedging. The assumption that D is exogenous to the firm does rule out some possibilities, however. Suppose a single household owns the firm, and the owner-manager discounts profits by marginal utility. The outcome for the firm might directly affect the level of consumption of the owner, and thus the marginal utility. The assumption that D is exogenous to the firm would be violated. An exogenous discount factor is more sensible when, for example, there are many owners of the firm, and there are many other sources of income for each owner. Thus our assumption of an exogenous discount factor is violated in the models of Feenstra and Kendall (1997) and the model of risk-averse firm owners in Friberg (1998), who assume in essence that firm owners' only income is from profits (so that the firm maximizes the expected utility of profits). It may be that in modeling the decisions of many exporters in accession countries, the assumption of an exogenous discount factor is not the most plausible one. Modeling the price setting decision under genuine risk aversion may make more sense.

All of these models abstract, however, from what must be one of the most important determinants of the currency of pricing, which is the cost to the firms of setting prices in different currencies. The underlying assumption of modern models of price stickiness is that it is costly to set a price. The costs of price setting must increase if the firm sets the

price in many different currencies. That is, local currency pricing might be costly if firms export to many markets.

From many casual conversations I have had with businesspeople, as well as from a little survey I did a couple of years ago of Wisconsin-based exporters, I believe that these cost considerations do weigh heavily in the decision of the currency of price setting. Many small U.S. firms price only in dollars because it is too costly to figure out how to set prices in other currencies. Often these firms sell their product to distributors who may set a price in a different currency for export.

Those firms that maintain non-dollar price lists may set prices in only one or two other currencies. Typically these firms price in a foreign currency if a foreign market represents a large part of their sales. I interpret this to mean that there are fixed costs to setting prices, so that firms maintain a foreign currency price list only for large export markets.

These cost considerations may help explain why markets settle on a vehicle currency for setting prices. And, it may explain why so many firms that export to the U.S. set prices in dollars—because the U.S. market is large.

3. Application of the Theory to the Data

This paper considers a model of a firm, but it examines aggregate data on the fraction of export prices from a number of countries invoiced in various currencies. The data do not allow us to ask how an individual firm's decision changes when it is faced with different states. The data can only be described with an equilibrium model.

Bacchetta and van Wincoop (2005) show that multiple equilibria are possible in a setting that is a special case of the model considered here. If multiple equilibria are possible, then without a mechanism to choose among equilibria, the model can only predict features of the data that are common to all of the equilibria. Is there a way for choosing among equilibria? The answer might be related to the cost considerations noted above. Future work in this area might fruitfully examine the costs of changing prices, rather than taking as given that prices must be set in some currency (or some basket of currencies).

The empirical section puts a lot of emphasis on the currency of invoicing for goods that are traded in exchange markets. But the model does not apply to those types of goods. The model is one in which firms set prices in advance of shocks to exchange rates, and then sell whatever is demanded at the price they set. That is not a good description of

the pricing in organized exchanges. Those prices are just as flexible as exchange rates.

It is not even clear to me that the model applies to those goods that are "reference priced," although I do not know the details of these markets. If prices are published in catalogs, then it does seem like prices are sticky. But then do firms have price setting power, as the model assumes? Do these markets really work like the model, so that buyers accept the price that is listed and simply demand as much as they want at that price?

It would be helpful if the paper were explicit on exactly what "invoicing" means in the data. Do these statistical agencies actually look at invoices and write down what currency is used? The model determines what currency prices are set in. That is, in the model, the price is set in some currency and cannot change (presumably for some time) when there are shocks. Is this the same thing as the currency of invoicing? Can't a firm set its price in dollars but write its invoice in euros? Is there any evidence that this does not happen very much?

4. Conclusions

I view my comments here as suggestions for the direction of future research. I do not want to minimize the contribution of this paper, and the work it builds on by Goldberg and Tille (2005). I will close by emphasizing what I believe to be the main contribution of these papers: they take somewhat abstract theory of the currency of price setting, and rework it into a form that can be compared to data; the papers present unique data on invoicing from a large number of countries; and then they test some of the implications of the models against this data. All of this is novel, and a step forward.

Note

1. The revised version of Engel (2005) in turn benefited greatly from my reading of Goldberg and Tille (2005).

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