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Financial development and the product cycle

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ABSTRACT

I develop a model to study how financial institution differences across countries affect the offshoring decision of Northern firms and whether a product cycle arises when the only comparative advantage of Northern suppliers is their access to better financial institutions. A Northern final-good producer needs to buy an intermediate input from a supplier to complete production. She can find this supplier either in the low-wage but financially underdeveloped South or in the high-wage and financially developed North. I show that financial institution differences affect the optimal contract offered to the supplier and are enough to generate a product cycle. The final-good producer faces a trade-off between low wages and contracting distortions. When the good is new, she finds it optimal to keep production in the North, at the cost of a higher wage but with the benefit of a less distorted contract. However, as the good becomes more standardized, the importance of the supplier increases and the cost of not shifting production to the South and take advantage of the lower wage offsets the contractual distortions that the underdeveloped Southern financial institutions create. The most salient empirical prediction is that the more R&D-intensive an industry is, the larger is the effect of financial development on offshoring. These results also hold when wages are endogenized. In the empirical section, the prediction is tested and confirmed using disaggregated trade data.

1. Introduction

Goods can either be entirely produced inside a country or production can be fragmented across countries. In a seminal paper, Vernon (1966) argues that these two production strategies reflect different stages in the natural cycle of goods. In this product cycle, goods are created and initially produced in rich countries until they become more standardized and their assembly is shifted to lower-cost countries.

In practice, this product cycle could arise because of Southern imitation, technology transfer, foreign direct investment, and so on. In this paper I focus on offshoring of production. A product cycle takes place because Northern firms prefer to buy intermediate inputs from Southern suppliers to complete the production of their final good. There exists a vast empirical literature that documents the increasing importance of offshoring of intermediate goods (see for example, Hummels et al., 2001 or Yeats, 2001).

Financial development is a key determinant of firm behavior. It affects not only the size of the investment that financially constrained firms can undertake but also which type of contracts are written and how revenues and expenditures are shared ex-ante and ex-post.[1] Even though there exists a widespread agreement about the importance of financial institutions and it is well known that financial development is heterogeneous across countries, the idea that financial institution differences

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[1] See, among others, Antràs et al. (2009) and Rajan and Zingales (1998).

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could be a driving force of the product cycle has been largely ignored in the literature. In this paper I fill this gap by developing a simple model of offshoring in which the only comparative advantage of Northern suppliers is their access to better financial markets.

The main result of the paper is that financial institution differences are enough to generate a product cycle akin to the one described by Vernon. Goods are created and assembled in the most financially developed country and, as the goods become more standardized, they are offshored to less financially developed countries. The most salient empirical prediction of the model is that the more R&D-intensive an industry is, the larger is the effect of financial development on offshoring. In the empirical section I test this prediction using, as a proxy of offshoring, the number of intermediate goods that a country exports to the United States in each industry.

The model builds on Antràs (2005). A Northern final-good producer provides headquarter services and needs an input to complete production. She can acquire this input from a supplier located either in the high-wage and financially developed North or in the low-wage but financially underdeveloped South.

Antràs (2005) assumes that contracts for revenues are enforceable in the North but not in the South. In contrast, I assume that contracts are enforceable in both countries but financial institutions are different. Therefore, the source of asymmetry in my model is the level of financial development. To be precise, I assume that the supplier can only pledge a fraction of future profits and this fraction increases with the quality of financial institutions.

One of the main contributions of the paper is to show that this difference in financial development leads to endogenous weights in the bargaining between the final-good producer and the supplier over investment decisions, which are not contractible. These weights are crucial yet unexplained in Antràs (2005).

Section 2 presents the model and derives the main results. I consider that the final-good producer, after contacting with a supplier, extends her a take-it-or-leave-it offer consisting of an ex-ante transfer and an ex-post payment. The supplier needs to pay a fixed cost (e.g., a relationship-specific plant) to enter into the relationship but she has no initial funds and has to cover this fixed cost with a loan from a local bank and the transfer from the final-good producer.[2] This transfer can be interpreted as trade credit.

Financial institution differences across countries affect the transfer that the final-good producer needs to provide. In more financially developed countries, the supplier can pledge a larger fraction of future profits and she receives, *ceteris paribus*, a larger loan from the bank. Thus, a lower transfer from the final-good producer is needed to pay the fixed cost. This is another departure from the related literature because it is usually assumed that both parties have deep pockets and the transfers are unconstrained.

Once this fixed cost is paid, the supplier and the final-good producer make their investment choices, which are non-contractbile, and after headquarter services and intermediate inputs are combined and the final good is sold, revenues are divided according to the optimal ex-post payment chosen by the final-good producer.

In Appendix, I consider a more general model in which the ex-post payment includes a transfer and a share of revenues. Moreover, in this generalized model I assume that, after the investments are made, there exists a small probability of a bad shock that drives revenues to zero. However, for expositional reasons and to gain a better intuition into the main result of the paper, my baseline model abstracts from uncertainty and the ex-post payment takes the form of a simple endogenous sharing rule.

The final-good producer would like to extract all the rents of the supplier by offering her a low transfer. However, when the supplier is located in the South, the final-good producer needs to leave her some rents. Otherwise the supplier would not have enough funds to cover the fixed cost. Therefore, the final-good producer chooses to tilt the ex-post sharing rule in her favor to extract more surplus from the Southern supplier ex-post. Changes in the sharing rule affect investment choices. Thus, one result of the paper is that financial underdevelopment leads to distorted contracts. Even though data on contracts are not available, this prediction is consistent with the findings of Antràs et al. (2009) and Desai et al. (2004) for U.S. multinational firms.

I show that differences in financial institutions are enough to generate a product cycle. The final-good producer chosses to keep production in the North when the good is new (intermediates are not very important) and locates production to the South when the good becomes more standardized (intermediate inputs are more relevant because the services provided by headquarters become relatively less important). The intuition is that the final-good producer faces a trade-off between low wages and contracting distortions. When the good is new, the role of the supplier is small and the final-good producer finds it optimal to keep production in the North, at the cost of a higher wage but with the benefit of a less distorted contract. However, as the good becomes more standardized, the importance of the supplier increases and the cost of not shifting production to the South and take advantage of the lower wage offsets the contractual distortions that the underdeveloped Southern financial institutions create.

I also show that when Southern financial institutions improve, more production is located in the South and, more importantly, the effect of financial institutions is larger, the less standardized the good is. The intuition is that with poor financial institutions, the Southern supplier is already producing the more mature goods and when financial institutions improve and contractual distortions decrease, the final-good producer prefers to also buy from the South the relatively newer goods.

[2] I assume, for easiness of exposition and without loss of generality, that the fixed cost is such that it is always the case that the transfer from the final-good producer to the supplier is positive.