



# Vertical integration and investor protection in developing countries

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## ABSTRACT

The industrial organization of developing countries is characterized by the pervasive use of subcontracting arrangements among small, financially constrained firms. This paper asks whether vertical integration relaxes those financial constraints. It shows that vertical integration trades off the benefits of joint liability against the costs of rendering the supply chain more opaque to external investors. In contrast to the commonly held view that pervasive input and capital market imperfections are conducive to vertical integration, the model predicts that the motives for vertical integration are not necessarily higher in developing countries. In particular, vertical integration is more likely to arise at intermediate levels of investor protection and better contract enforcement with suppliers reduces vertical integration only if financial markets are sufficiently developed. Evidence supporting both predictions is discussed.

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## 1. Introduction

The industrial organization of developing countries is characterized by the pervasive use of subcontracting arrangements among small firms. Evidence of these subcontracting arrangements in the developing world (see, e.g., the footwear industry in Taiwan [Levy, 1990](#)), Mexico ([Woodruff, 2002](#)) and Brazil ([Schmitz, 1995](#)) contrasts with the intuition that, in response to input market failures and poor contract enforcement, firms should tend to be larger and more vertically integrated in those countries (see, e.g., [Khanna and Palepu, 1997, 2000](#)). A second well-known characteristic of the industrial organization of developing countries is that underdeveloped financial markets are a serious constraint to investment for small and medium-sized firms (see, e.g., [Banerjee and Duflo, 2004](#) for a survey of the literature).<sup>1</sup> This paper argues that the relationship between capital and input market development and vertical integration is a complex

one. In contrast to commonly held views, the motives for vertical integration are not necessarily higher in developing countries. In particular, the relationship between financial development and vertical integration is, instead, likely to take an inverted U-shape.

To explore the connection between financial constraints and vertical integration, a first necessary step is to ask whether vertical integration makes it easier or harder to raise external finance. [Section 2](#) starts by introducing an incomplete contract model in which a seller can produce a good that can be used by a buyer or sold on a spot market. Which of those two trading configurations yields a higher surplus depends on market conditions, which are unknown at the time of initial contracting. Neither the seller nor the buyer has cash, and both need to borrow from an external investor. Since owners can steal part of the profits of their firms, rents need to be provided in order to ensure repayment of the loan. This implies that entrepreneurs can only pledge a fraction of the profits of their project to external investors and, therefore, face borrowing constraints. When borrowing constraints are binding, the choice between vertical integration and non-integration depends on the borrowing capacity associated with the two organizational forms. In other words, the organizational form is chosen to maximize the pledgeable income (i.e., the expected returns that can be promised to the investor) of the two projects.

[Section 3](#) highlights the main mechanisms through which the choice between vertical integration and non-integration affects

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<sup>1</sup> The paper provides a framework to think about small and medium-sized enterprises, for which borrowing constraints are likely to be important. The focus on borrowing constraints is not intended to deny that other characteristics of the business environment in developing countries (e.g., low skills in the labour force, labour regulation, other reasons pushing firms into the informal sector) are important drivers of the vertical integration decision.

pledgeable income. The main message is that, from a financial point of view, vertical integration trades off the benefits of joint liability against the costs of rendering the supply chain more opaque for the external investor. The positive “*joint liability*” effect associated with vertical integration comes from the fact that, given final product market conditions, the profits of two vertically related firms depend, through bargaining, on input market conditions and are, therefore, negatively correlated. When the price of the input is high, so are the profits of the upstream firm. When, instead, the price of the intermediate input is low, it is the downstream firm that benefits. Negatively correlated returns make joint liability relatively more attractive. Vertical integration, however, comes with a negative “*demonitoring*” effect. Under vertical integration the financier of the firm can seek repayment from a single entrepreneur but not from an employee, whilst under non-integration she can seek repayments from both the downstream and upstream owners. In other words, under non-integration the investor can claim repayments from two parties rather than one, as well as over earnings which represent a compensation for effort.

The trade-off implies that vertical integration is preferred when pledgeable income is higher. For instance, high cash flows at the end of the chain imply that the optimal financial structure chooses a relatively low level of debt, which guarantees repayment regardless of input market conditions. Under those circumstances, vertical integration achieves higher pledgeable income since it insulates the profits of the firm from input market conditions. When the value of production at the end of the chain is low, instead, the optimal contract sets a high debt, which is repaid only when input market conditions are favorable to the downstream firm. While the pledgeable income of an integrated firm is equal to that of a non-integrated downstream firm, non-integration allows the investor to receive the pledgeable income of the upstream firm as well and is, therefore, preferred.

Section 4 presents two extensions to the baseline model and derives testable predictions linking the institutional environment to the vertical integration decision. The two extensions combine the baseline model implication that vertical integration is preferred when pledgeable income is higher with well known mechanisms associated with imperfect contracting and borrowing constraints.

The first extension introduces a distinction between “investor protection” and “contract enforcement”. Investor protection refers to the costs that entrepreneurs face when stealing profits from external investors. Contract enforcement, instead, refers to the costs incurred by buyers in avoiding repayment to suppliers. In particular, in stealing the profits of her firm, the buyer can also default on a fraction of the trade credit extended by the supplier. As a consequence of this imperfection, to ensure loan repayment the financial contract must leave higher rents to the entrepreneur.

Imperfections in the enforcement of contracts between the seller and the buyer have an ambiguous effect on vertical integration. On the one hand, since input transactions among independent firms occur at higher prices, the rents necessary to ensure repayment are higher under non-integration than under vertical integration. This effect captures the common argument that vertical integration is preferred in the presence of contractual imperfections with input suppliers. On the other hand, by increasing the rents necessary to ensure loan repayment, imperfect contract enforcement with input suppliers reduces the income that can be pledged by the two firms. According to the logic of the baseline model, this favors non-integration.

The interplay of those two effects implies that the relationship between vertical integration and the institutional environment is complex. In particular, contract enforcement and investor protection are complementary determinants of vertical integration, in the sense that non-integration is more prevalent when both are either relatively high or relatively low. The overall quality of the institutional environment, in terms of both investor protection and contract enforcement, therefore, has a non-monotonic effect on the incentives for vertical integration.

The second extension to the baseline model introduces product market competition at the end of the value chain. The interplay between product market competition and the positive relationship between vertical integration and pledgeable income gives an additional mechanism through which the relationship between investor protection and vertical integration is non-monotonic. At very low levels of investor protection, it is not possible to finance both the downstream and upstream units. The industry is then characterized by small, vertically disintegrated, firms that purchase their input in the market. As investor protection increases, two effects kick in. On the one hand, as access to finance gets easier, it becomes possible to expand the firm and finance the investments required to set up the upstream unit as well. This effect pushes towards vertical integration. On the other hand, better investor protection fosters entry of firms in the industry, increases competition, and eventually leads to lower equilibrium cash flows at the end of the chain. This effect, as emphasized above, pushes towards non-integration. The first effect is stronger at relatively low levels of investor protection; while the second effect is stronger at higher levels of investor protection.

Section 5 confronts the theoretical predictions with empirical evidence based on the historical experience of the textile industry in the nineteenth century as well as contemporary cross-country studies. Section 6 discusses the implications of relaxing many of the assumptions alongside with other possible extensions to the model.

### 1.1. Related literature

This paper contributes to the literature on the relationship between financial development and the industrial organization of developing countries. Banerjee (2004) and Banerjee and Munshi (2004) present insightful evidence on the relationship between financial constraints and vertical integration in industries based within communities in India. The model in this paper provides a theoretical framework to the issues studied in those papers. Mookherjee (1999) also provides a discussion of the costs and benefits of vertical integration in less developed countries, but he focuses on the role of uncertainty in input supply. More recently, Kranton and Swamy (2008) have studied the microeconomics of exporting in a model that also features multiple hold-up problems between various actors along the supply chain (exporters, agents and producers). They discuss why vertical integration might not be feasible in institutionally poor environments, which complements the insights of this paper. Moreover, they provide an analysis of putting-out systems, a hybrid organizational form closely related to some of the discussion in this paper. Finally, this paper is related to the theoretical literature on microfinance and joint liability contracts across firms in developing countries (see, e.g., Ghatak and Guinnane, 1999, 2001). An important difference, however, is that in our context the joint liability of the two productive units is linked to an input transaction.

This work is also closely related to the literature on the theory of the firm. The influential property rights approach to firm boundaries (see, e.g., Hart, 1995) emphasizes the importance of ex-ante non-contractible investments in determining the vertical integration decision. Without denying the importance of the insights generated by those theories, this paper focuses on the implications of vertical integration for the relationship between the external investor and the entrepreneurs. Property rights theories of the firm with financially constrained entrepreneurs (see, e.g., Legros and Newman, 2008) predict that the allocation of control rights is twisted in favour of the entrepreneur with more ex-ante bargaining power or wealth. The ex-ante distribution of wealth and bargaining power, however, might be context specific and difficult to observe, making those theories hard to test. The approach in this paper emphasizes the financial properties of the organizational form and allows for predictions that do not depend on those details. Finally, in defining a firm as a nexus of contracts characterized by a centralized allocation of control rights and joint liability, the paper borrows from the legal literature (e.g., Cheung, 1983; Hausmann and Kraakman, 2001), as well as from the work of business historians (e.g., Lamoreaux, 1998).

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