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Subcontractors for tractors: Theory and evidence on flexible specialization, supplier selection, and contracting ☆

Tahir Andrabi [a], Maitreesh Ghatak [b], Asim Ijaz Khwaja [c,*]

[a] Pomona College, United States
[b] London School of Economics, United Kingdom
[c] Harvard University, United States

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Abstract

Buyer–Seller networks are pervasive in developing economies yet remain relatively understudied. Using primary data on contracts between the largest tractor assembler in Pakistan and its suppliers we find large variations in prices and quantities across suppliers of the same product. Surprisingly, "tied" suppliers – those that choose higher levels of specific investments – receive lower and more unstable orders and lower prices. These results are explained by developing a simple model of flexible specialization under demand uncertainty. A buyer faces multiple suppliers with heterogeneous types to supply customized parts. Specific investments raise surplus within the relationship but lower the seller's flexibility to cater to the outside market. Higher quality suppliers have a greater likelihood of selling outside and so this cost is greater for them. Therefore even if a buyer typically prefers high types, some low type suppliers might be kept as

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* Corresponding author.

E-mail addresses: tandrabi@pomona.edu (T. Andrabi), m.ghatak@lse.ac.uk (M. Ghatak), akhwaja@ksg.harvard.edu (A.I. Khwaja).

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marginal suppliers because of their greater willingness to invest more in buyer-specific assets. Further empirical examination shows that the more tied suppliers are indeed of lower quality.

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1. Introduction

Many industries, particularly in developing countries, are characterized neither as vertically integrated firms nor as a set of independent buyers and suppliers but as *networks*. Suppliers provide specialized inputs to several buyers selling related but different products and buyers have more than one supplier for the same input. The resulting investment pattern on the part of suppliers has been one of flexible specialization and is considered to be an optimal response to demand uncertainty and costly capacity-building or inventory-holding.[1] In such environments, there is considerable variation in the terms of the contracts faced by a set of sellers who differ in terms of how specific their assets are with respect to the main buyer.[2]

While there is a large literature on the determinants of the boundaries of the firm that highlights the importance of relationship-specific investments, we know very little about how relationship-specific investments affect contracts when the boundaries of the firm are given.[3] Moreover, the existing literature treats specificity as being driven purely by technology. In a network or cluster setting, given that investment is characterized by flexible specialization, the degree of asset specificity with respect to any particular buyer is also partly a matter of choice.

In this paper we address these questions both theoretically and empirically. We use primary data to examine a particular buyer–seller network in Pakistan characterized by high uncertainty, weak contracting, and costly capacity building. This description fits the industrial sector of most developing countries quite well, although the relevance of the framework is not limited to these countries. Our initial analysis of the network reveals several interesting and somewhat puzzling facts. We find that there is substantial variation in how suppliers are treated – prices differ by as much as 25% and quantities by a factor of three across different suppliers supplying the same product in the same year. Upon further examination we find that surprisingly, it is the "tied" suppliers (those that choose higher levels of specific investments) that are treated as second preference suppliers, not only in terms of receiving more unstable and lower orders but lower prices as well.[4]

We then develop a theoretical model to understand these findings. We take the existence of buyer–seller networks as given and address two main questions: do suppliers of the same product who differ in how specific their assets are with respect to the same buyer, receive

[1] See Piore and Sabel (1984) for a discussion of flexible specialization, and Kranton and Minehart (2000) for a formal analysis of when such networks are optimal relative to vertical integration.

[2] See, for example, Asanuma (1989) for a case study of the Japanese auto-manufacturing industry. In Section 2 we review other studies on this topic.

[3] See Hart (1995) and Holmström and Roberts (1998) for excellent reviews of the transactions costs and property rights literature on the boundaries of the firm.

[4] Asanuma (1989) uses the same terms in his case study of the Japanese auto-industry where he reports a similar hierarchy of subcontractors in terms of distribution of orders.