PROJECT 1: LEGAL INSTITUTIONS AND THE ORGANIZATION OF PRODUCTION: THE CASE OF INDIA

One of the most important topics in economics is to understand why there are such large differences in income across countries. The last two decades of research have found that institutions play a key role for development. That said, the exact mechanisms and their relative importance are not yet clear. This project aims to study how weak legal institutions - more precisely, imperfect enforcement of contracts - shapes the organization of production, and to quantify the importance of these frictions for aggregate productivity and growth. More generally, this can help us understand how much of the cross-country income differences are due to inefficiencies in the use of intermediate inputs.

It is well known that firms in less developed countries make different sourcing decisions than firms in industrialized economies. For example, in less developed countries, a larger share of production is done in-house, the intermediate inputs that firms purchase tend to be standardized rather than specialized, and family firms are more prevalent. All of these decisions are made to avoid having to rely on outside enforcement of contracts, and are hence symptoms of weak legal institutions.

As a consequence, weak contract enforcement will distort the organization of production. This can take the form of firms using the wrong inputs relative to the inputs they would use in an environment with better enforcement. The fact that transactions between buyers and suppliers may be distorted means that the impact of weak enforcement will be amplified, as a small distortion at each step in supply chains can accumulate to a large overall distortion of aggregate output.

We will study these mechanisms using a theoretical model and subsequent empirical analysis using data from India. India provides an ideal setting for studying enforcement frictions and the organization of production. First, compared to other countries, Indian courts are infamous for their slowness, which results in large backlogs of undecided cases. Second, there is substantial variation across states in the speed of enforcement. This will help us to isolate the effect of enforcement frictions on economic activity. Third, India has unusually rich and well-documented data on intermediate inputs used in the production process. We will use data from the Annual Survey of Industry (ASI), India’s main source of data on the formal manufacturing sector. The ASI is unique in its detail on intermediate inputs used in the production process. This will allow us to study how the firm’s intermediate input use is related to institutional quality, as measured by the size of the backlogs of cases in state and district courts. Fourth, there is plenty of anecdotal evidence on contracting frictions severely affecting the organization of production: the prevalence of large conglomerates (Tata, Reliance

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3 There are many examples of cases taking several decades to be decided, and in some cases, only after the plaintiffs or defendants had passed away. See New York Times (2000), or World Bank (2013).
Industries, etc.) that integrate the full supply chain within the firm is often linked to the weakness of formal enforcement institutions (Khanna and Palepu, 2000).

In a second step, we will also look at heterogeneity within the states. Individuals within a state vary in how much they are affected by lack of formal enforcement in a way that is partially observable. When formal institutions are not available to enforce contracts, one substitute is informal enforcement: imposing social stigma or exclusion from future transactions. Such informal enforcement may be easier when the parties share the same caste. In a district in which all individuals are from the same caste, individuals can rely on informal punishments in all potential transactions even if the formal system is unavailable. In contrast, if the population within a district is extremely fragmented across castes, such enforcement will be available on a narrower range of transactions. Thus across districts with the same judicial backlog, the impact should be larger in more fragmented districts. Further, within districts, the same weak formal institutions should have different impacts on members of widely represented castes than on members of minority castes.

This project lies squarely at the intersection of each of the researchers’ previous work. Oberfield (2013) explored the formation of input-output linkages, and explains how individual choices of input output linkages are related to aggregate productivity. The model is tractable and allows for frictions between firms. On the other hand, Boehm (2013) studies the importance of contracting frictions due to high enforcement costs for the firm’s sourcing decision. Using industry-level data from a cross-section of countries, he finds that high enforcement costs decrease the use of intermediate inputs, particularly those that are highly specialized and tailored to a particular buyer.

By embedding contracting frictions into the firm-level sourcing model of Oberfield (2013), we can obtain predictions on the level and dispersion of intermediate input use, and how these should depend on institutional quality. We will estimate the model using the data from India, and will perform a series of counterfactuals to evaluate the importance of legal institutions in shaping aggregate productivity. In a further step, we will evaluate the role of caste and social capital in facilitating informal enforcement.

REFERENCES


The bursting of the U.S. housing bubble in 2007-08 and the subsequent global recession has shown that even shocks that affect only narrow sectors of the economy may have huge repercussions for the whole economy, and indeed for the global economic environment. How do these shocks get transmitted across firms, sectors, and countries? The is an abundance of anecdotal evidence that supply chains play an important role. In the wake of the financial crisis of 2008, Ford’s C.E.O. Alan Mullaly testified before the U.S. Congress to offer support for a government bailout of General Motors and Chrysler, Ford’s traditional rivals:

“If any of the domestic companies should fail, we believe there is a strong chance that the entire industry would face severe disruption. Ours is in some significant ways an industry that is uniquely independent – particularly with respect to our supply base, with more than 90 percent commonality among our suppliers. Should one of the other domestic companies declare bankruptcy, the effect on Ford’s production operations would be felt within days – if not hours. Suppliers could not get financing and would stop shipments to customers. Without parts for the just-in-time inventory system, Ford plants would not be able to produce vehicles.” (Mullaly, 2008)

Our project is the first to investigate the role of supply linkages between firms for the propagation of shocks on a global scale. Whereas existing empirical work has only studied this phenomenon in isolated instances or with data covering a limited sample of firms and linkages our dataset will allow us to comprehensively study the network structure of U.S. domestic and international supply linkages.

Our dataset is provided by a business intelligence data provider and covers more than 35,000 global companies, including the universe of companies that are actively traded on U.S. stock exchanges. For each company, it lists suppliers and customers by name, which will allow us to expand the network structure in the sample by matching suppliers and customers to (existing and already licensed) company information that is provided by other data vendors. The dataset constitutes a unique resource for the study of inter-firm linkages. To the extent of our knowledge, it has never been used in economics research so far.

The first step in our analysis will be to describe the network structure of global supply linkages. Who supplies whom? Do more productive firms use more productive suppliers? Are the more productive firms at the center of the input-output network? How is the number of links distributed, and which firms are sourcing locally or from abroad?

These questions are important to determine both the allocative efficiency and the aggregate risk structure of the macroeconomy. A network where all firms buy each input from the single most productive firm is good at allocating resources – but if that particular supplier faces disruptions, the whole economy may be affected. This is interesting from a welfare point of view: should we prefer to have networks with few key economic agents? Or, should we have broad, ‘diversified’ firms, in a network structure where shocks dissipate quickly? Needless to say, these are important questions for regulatory authorities.

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4 Carvalho et al. (2014) study the propagation of supply disruptions during the 2011 earthquake in Japan; Kelly et al. (2013) use Compustat data on publicly listed U.S. firms, but observe links only when the customer accounts for more than 10% of the sales revenue.
Finally, we can use the data to learn about what determines the network structure of production. (1) Our research agenda on the institutional determinants of intermediate input use highlights the role of legal institutions. Does this mean that there will be fewer links in the face of imperfect contract enforcement? Or will firms prefer to switch to large buyers and suppliers, where the danger of a hold-up may be less severe because the trading partner may be facing the danger of losing his reputation? More generally, are there network externalities in the contracting problem? (2) There is evidence that ethnicity and culture shape the extensive margin of international trade (Rauch, 2001). Do we observe this in firms’ sourcing decisions? Are these patterns present in domestic linkages? (3) How does geography and the spatial structure affect vertical linkages? Do more productive firms deal with suppliers from farther away?

The dataset may also be useful to study questions that lie beyond the field of macroeconomics. One central topic in microeconomics is to find out why some firms grow, and some firms exit (Jovanovic, 1982, Helpchayn, 1992, Foster et al., 2008). Particularly for firms that produce intermediate inputs, the acquisition of new customers may play a crucial role for survival and growth. Similarly, access to a reliable, efficient supplier may also play an important role. Furthermore, the linkage data may give insights into the presence and magnitude of positive spillovers from R&D activity: do buyers and suppliers benefit from R&D? Is this different for product innovation vs. process innovation?

REFERENCES


