
Global value chains and multinational activity with financial frictions

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The increasing fragmentation of production across firm and country boundaries has transformed international trade over the last few decades. At the same time, cumulating evidence indicates that financial frictions severely impede export and multinational activity. This chapter discusses the effect of financial frictions on firms' position in the global value chain and on the pattern of multinational activity, drawing on recent findings in the literature.

1 Introduction

Two major phenomena have transformed the landscape of international trade over the last few decades: the rise of global value chains (GVCs) and the growth of multinational activity. Production is increasingly fragmented across borders, with trade in intermediate inputs for further processing and re-exporting expanding faster than trade in final goods. The International Labor Organization estimates that 60 million people worldwide work in 3,500 processing zones, located in 130 mostly developing countries. At the same time, multinational companies (MNCs) are of tremendous importance to international trade. Approximately one third of global trade is intra-firm, between subsidiaries of the same multinational enterprise, while another third occurs between a multinational and an unaffiliated party.

The splicing of supply chains across firm and country boundaries raises new policy questions of first-order importance. How should trade policy be designed in the presence of global production networks and multinational activity? How do these phenomena alter the aggregate gains from trade and its distributional effects? What are the implications for firm growth, technology transfer to emerging economies, and the transmission of shocks across borders? While these are largely open questions for future research, their answers depend on understanding the factors that shape the patterns of GVC and MNC activity.

A growing literature finds that financial market imperfections significantly affect international trade. Foley and Manova (2015) provide a detailed overview of this work. The evidence indicates that financial frictions restrict firms' entry into exporting, the scale of their operations conditional on exporting, and their position in global value chains. These distortions impede aggregate trade, especially during financial crises. Moreover, credit constraints disrupt cross-border trade significantly more than general production because of the larger financing needs of foreign transactions: Overall, 75-80% of the total reduction in trade due to financial sector underdevelopment is above and beyond any associated decline in total output. One third of the trade-specific effect can be attributed to limited firm entry into exporting, while two thirds reflect reduced firm-level exports (Manova 2013).

One strand of the trade and finance literature explores the implications of financial frictions particularly for firms' multinational activity and participation in global value chains. This chapter highlights three main insights emerging from this research. First, multinational companies are less credit constrained than domestic firms because they can use internal capital markets to arbitrage cross-country differences in external capital markets to some degree. Second, financial frictions restrict firms to performing lower value added, less profitable segments of global production. Third, credit constraints influence the organisation of production across firm and country boundaries.

2 No finance, no trade

2.1 International trade requires external finance

Firms routinely rely on external capital to cover upfront costs that cannot be financed out of retained earnings or cash flows from operations. These upfront costs may be fixed – such as R&D, marketing and capital investments – or variable – such as input purchases, salary payments, and land and equipment rental fees. Exporters are more likely to face credit constraints than non-exporters because they require more external funding. First, exporting involves additional costs. Fixed trade costs include gauging market profitability; investing in market-specific capacity, product customisation and regulatory compliance; and maintaining foreign distribution networks. Variable trade costs comprise transportation, duties and freight insurance. Second, cross-border shipping and delivery typically takes 60 days longer than domestic orders, further aggravating exporters' working capital needs. Third, transnational operations entail increased risks due to currency fluctuations and difficulties in resolving contractual breaches arising from different laws and practices across jurisdictions.

An active market exists for the financing and insurance of international trade, estimated to be worth \$10-\$12 trillion in 2008, or 90% of world trade (Auboin 2009). Exporters and importers decide the financing terms of each transaction, i.e. whether exporters are paid upfront (cash in advance) or after delivery (open account). Trade partners each meet their liquidity needs with financing from commercial banks, specialised export-import banks, or state-backed export credit agencies. They may alternatively use letters of credit jointly issued by their representative banks.

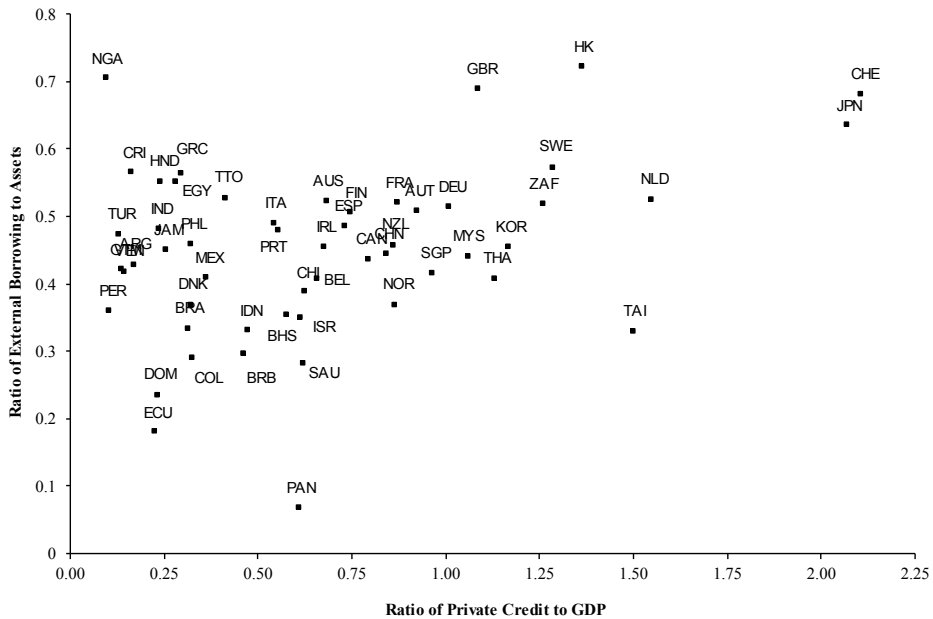
2.2 Multinational companies are less constrained than domestic firms

There are important differences between the financing practices of domestic firms and affiliates of multinational corporations. In terms of internal finance, both can use

retained earnings and cash flows from operations, but foreign-owned affiliates can also receive funding from parent companies. In terms of external finance, both can access local capital markets and buyer-supplier trade credit, but MNC subsidiaries can also tap foreign capital markets (directly or through their parent company) and indirectly benefit from buyer-supplier trade credits extended to related parties abroad. Compared to domestic firms, MNC affiliates thus have additional sources of financing.

Research shows that multinationals use internal capital markets opportunistically to overcome frictions in external capital markets. They raise more external finance and use less parent funding in countries with lower costs of capital. Desai et al. (2004) document that the affiliates of US-based multinationals raise less external finance in host countries with less developed capital markets or weaker protection of creditor rights. Figure 1 demonstrates the strong positive relationship across countries between affiliates' ratio of external borrowing to assets and the ratio of private credit to GDP. Bank credit to the private sector as a share of GDP is a standard measure of the availability of external financing in an economy, while creditor rights reflect how well formal institutions can support financial contracting.

Figure 1 Financing practices of US-based MNC affiliates



Source: Desai et al. (2004).

Evidence indicates that multinationals' use of internal capital markets makes them less financially constrained than domestic firms, especially when limited access to external financing is more likely to bind. Manova et al. (2014) find that the affiliates of foreign enterprises in China have a comparative advantage in sectors more dependent on the financial system relative to local enterprises. Foreign subsidiaries export relatively more than private domestic firms in sectors that require more external finance for long-term investment, sectors that need more liquidity for short-term working capital (i.e. with high inventory-to-sales ratios), sectors with fewer tangible assets that can serve as collateral in raising outside funds, and sectors with less access to buyer-supplier trade credit that can substitute formal borrowing. Table 1 illustrates this with a breakdown of Chinese exports by type of firm ownership for sectors with financial vulnerability above versus below the median. Joint ventures (foreign ownership typically around 50%) lie between domestic and fully foreign-owned affiliates, consistent with parent companies offering more internal financing at higher levels of control.

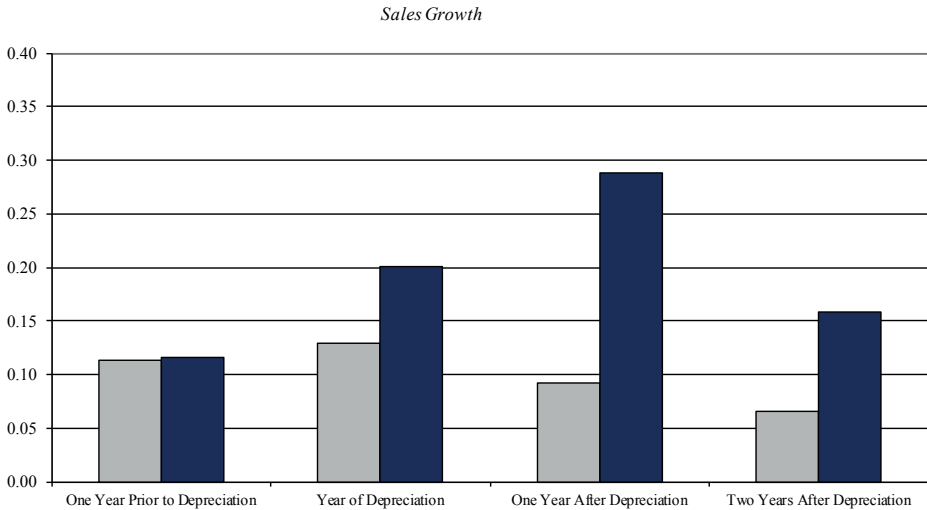
Table 1 Composition of Chinese exports by firm ownership and sector financial vulnerability

| Firm Type: | All Firms | State Owned | Private Domestic | Joint Ventures | Foreign Owned |
|--|-----------|-------------|------------------|----------------|---------------|
| | (1) | (2) | (3) | (4) | (5) |
| Total Exports | 531.36 | 9.8% | 12.9% | 26.3% | 51.0% |
| Panel A. Classifying sectors by external finance dependence | | | | | |
| Low | 173.47 | 14.9% | 23.4% | 29.4% | 32.3% |
| High | 357.89 | 7.3% | 7.8% | 24.8% | 60.1% |
| Panel B. Classifying sectors by inventories ratio | | | | | |
| Low | 94.01 | 19.9% | 18.8% | 32.1% | 29.2% |
| High | 437.35 | 7.6% | 11.6% | 25.1% | 55.7% |
| Panel C. Classifying sectors by asset tangibility | | | | | |
| Low | 423.04 | 6.2% | 9.9% | 25.9% | 58.0% |
| High | 108.32 | 23.8% | 24.4% | 28.1% | 23.7% |
| Panel D. Classifying sectors by trade credit intensity | | | | | |
| Low | 285.63 | 4.9% | 7.5% | 24.8% | 62.8% |
| High | 245.73 | 15.5% | 19.1% | 28.1% | 37.3% |

Source: Manova et al. (2014).

MNCs' superior access to financing also enables them to respond more to export growth opportunities relative to domestic firms. Desai et al. (2008) examine the impact of large real exchange rate devaluations in a host country on the operations of local firms and US-owned affiliates. Although depreciations reduce relative export prices and boost foreign demand, they are frequently accompanied by negative economic shocks including financial crises, which can prevent producers from scaling up exports. Data reveal that MNC subsidiaries increase sales and investment following devaluations, while domestic companies contract or exit. Moreover, the expansion of subsidiaries is often funded by the parent company. Figure 2 reports the differential sales growth for domestic and foreign enterprises in the years after large real exchange rate depreciations.

Figure 2 Sales growth of local firms and US multinational affiliates after currency crises



Source: Desai et al. (2008).

While MNC affiliates may be less financially constrained than domestic firms, they are not unconstrained and insensitive to the availability of external capital in the country where they operate. Desai et al. (2004) conclude that lending from the parent company compensates 75% of the reduced external debt of affiliates based in economies with underdeveloped financial markets. This suggests that multinationals cannot fully arbitrage away differences in the cost of capital across countries. A plausible explanation is that financiers hesitate to fund all foreign activities because of asymmetric information or weak enforcement of collateral claims in international lending.

3 Organising and financing global value chains

Developing economies often rely on exporting to large, rich destinations for economic growth. Consumers in developed countries, however, typically demand quality products whose production requires skill-intensive design and specialised inputs. Firms in developing economies with limited technological knowhow, skilled labour and quality inputs may be unable to make high-quality products without foreign inputs or

blueprints. Global supply chains enable such firms to participate in international trade by performing only manufacturing stages in which they have a comparative advantage.

From the perspective of developed nations, offshoring production can reduce certain costs, but poses challenges in monitoring and incentivising foreign suppliers to ensure quality control and timely delivery. Multiple factors govern companies' decision whether, where and how to offshore – in-house or at arm's length. Multinational enterprises arise when it is optimal to own and operate production facilities abroad, rather than to subcontract to independent suppliers.

3.1 Financial frictions determine firms' GVC position

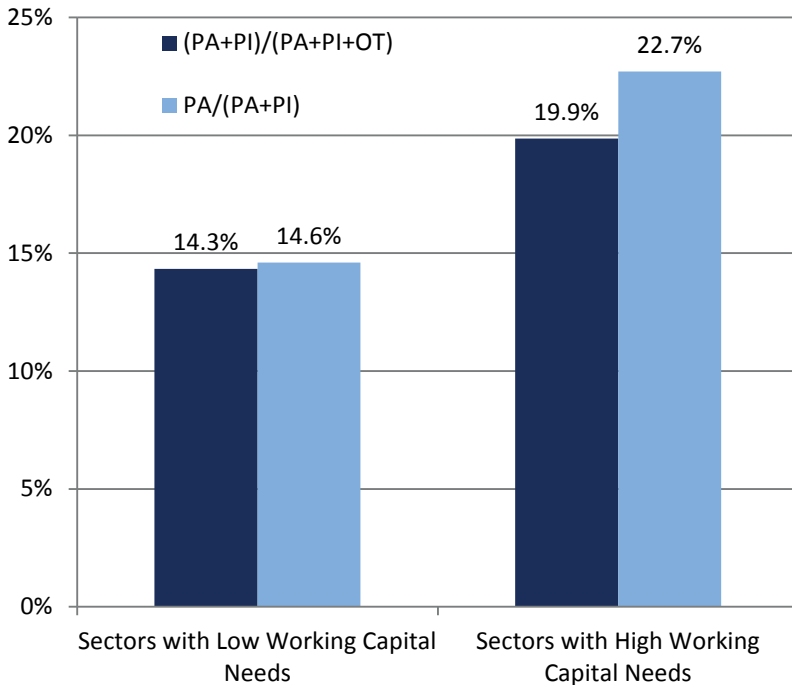
Financial factors can significantly affect the organisation of global value chains across firm and country boundaries. Different organisational structures may prevail depending on country, sector and firm characteristics. For example, Intel assembles microchips in wholly owned subsidiaries in China, Costa Rica, Malaysia and the Philippines, while Nike subcontracts to unaffiliated producers in Thailand, Indonesia, Cambodia and Vietnam. Even though both Apple and Ralph Lauren offshore production to independent parties in China, they employ different input and financing strategies. When outsourcing assembly to FoxConn, Apple provides customised inputs at no cost to FoxConn. By contrast, when manufacturing for Ralph Lauren, Youngor pays for foreign materials and retains ownership rights over them.

Spanning wider segments of production entails greater costs and requires more financing. Manova and Yu (2011) show that credit constraints restrict Chinese firms to lower value added, less profitable stages of global supply chains. In China, under ordinary trade (OT), companies design a product, pay for domestic and foreign inputs, incur import tariffs, assemble and distribute final goods abroad. Under processing trade, Chinese firms can import inputs duty-free to assemble them on behalf of a foreign buyer who handles product design and final distribution. While Chinese firms pay for foreign inputs under processing with imports (PI), the foreign buyer provides these for

free under pure-assembly processing (PA). Working capital needs thus rise from PA to PI to OT.

Financially healthier Chinese firms with more liquidity and less leverage have higher shares of ordinary exports in total exports and of processing with imports in processing exports. Both trade shares are strongly positively correlated with firm profits. Within firms across sectors, both shares fall with sectors' reliance on external finance. Figure 3 decomposes aggregate Chinese exports by trade regime for sectors with high and low liquidity needs (i.e. inventory-to-sales ratio).

Figure 3 Composition of Chinese exports by trade regime and sector



Source: Manova and Yu (2012).

The choice of export regime depends on the financial conditions of both trade partners. The impact of Chinese firms' financial health and sectors' financial vulnerability on trade shares is bigger in Chinese provinces with weaker financial systems, where liquidity constraints are more likely to bind for the Chinese exporter. By contrast, this

impact is stronger for financially more developed export destinations, where the foreign party is less constrained.

OT implies more segments of the supply chain being performed and financed by a single Chinese firm, while PT means shared financing and profits across the border. GVCs may thus enable credit-constrained firms that could not become ordinary exporters to share in the gains from trade by engaging in processing activities.

3.2 Financial frictions affect multinational operations

Multinational enterprises make three key decisions: the host countries for manufacturing facilities (location decision), the ownership of production abroad or offshoring at arm's length (integration decision), and the interaction among affiliates within the firm's global network of production chains and consumer markets (network decision).

An earlier trade literature focused on the location decision, and distinguished between horizontal, vertical and export-platform FDI. In practice, multinationals adopt complex global strategies and use foreign affiliates for multiple purposes. The average US-owned subsidiary abroad directs 75% of its sales to the host country, 7% back to the US and 18% to third markets. A later trade literature examined multinationals' integration decision, and highlighted the importance of imperfect contractibility and relationship-specific investments. Most recently, research has explored the interlinkages among the production, import and export activities of multiple affiliates belonging to the same multinational company. This work emphasises the optimisation difficulties that arise in network structures.

Financial frictions can also significantly affect MNCs' location, integration and network decisions. Bilir et al. (2014) show that host-country financial development relaxes credit constraints for both domestic firms and foreign-owned affiliates, but relatively more for the former. This generates a competition effect that reduces affiliate revenues in the host market due to increased entry by domestic firms, and a financing effect that encourages

affiliate entry by easing their borrowing constraints. Data on US MNCs confirm that economies with stronger financial institutions attract more multinational subsidiaries. Stronger financial institutions in the host nation also raise aggregate affiliate sales to the local market, to the parent country (the US), and to third destinations. At the level of the individual affiliate, exports to the US and other markets are increased, but host-country sales are reduced. Both in the aggregate and at the affiliate level, however, the share of local sales in total sales declines with host-country financial development, while the shares of return sales to the US and export-platform sales to other countries rise.

These findings suggest that financial considerations govern the location and network decisions of MNCs. Stronger financial institutions in the host economy lower the incentives to pursue FDI for horizontal motives in favour of vertical and export-platform motives.

Antràs et al. (2009) establish that capital market imperfections also influence multinationals' integration decisions. They examine how firms headquartered in a developed country offshore production to foreign suppliers who require external finance to make relationship-specific investments. Because of moral hazard, financiers are unwilling to fund suppliers located in economies with weak protection of creditor rights. Foreign headquarters then have an incentive to integrate the supplier and monitor its operations, which in turn encourages local lenders to finance it. The parent company may provide additional funding as well. Empirical results indicate that US multinationals are more likely to deploy technology through foreign affiliates rather than arm's-length licensing in host countries with worse investor protection. They also hold higher equity stakes in the subsidiary and finance more of its activity in such environments. Related to this, Javorcik and Spatareanu (2009) document that less credit-constrained Czech firms self-select into becoming arm's-length suppliers to foreign multinationals.

4 Open questions

Much scope remains for further work on the interactions among financial frictions, global value chains and multinational activity. Such research would inform policy by elucidating underlying economic mechanisms. Of interest is better understanding the organisation of international supply chains and the distribution of profits across firms and countries, especially in the presence of institutional and market frictions. Alleviating such frictions might be an important prerequisite for (firms in) developing countries to move into higher value added, more profitable GVC stages (Manova and Yu 2011).

Also relevant are the effects of GVCs and MNCs on knowledge transfer across borders. Emerging economies can benefit from technological spillovers from multinational activity to firms in the same sector, as well as to upstream and downstream firms (Javorcik 2004). Likewise, the extent of learning from exporting can depend on the GVC segment that firms occupy and their engagement with processing trade (Bai et al. 2013).

Equally important is how GVCs and MNCs influence the transmission of local and global supply and demand shocks across countries. This speaks to macroeconomic concerns about contagion, sudden stops and reversals in international capital flows. For instance, the effect of the 2008-09 financial crisis on a country's credit conditions and trade activity did not depend on its total foreign capital inflows, but was alleviated by a higher pre-crisis share of FDI in foreign capital inflows (Tong and Wei 2010). Indeed, multinational affiliates maintained higher sales during the crisis than domestic establishments, especially affiliates with stronger production and financial linkages to their parent company (Alfaro and Chen 2012).

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