The Economics of Offshoring: Theory and Evidence with Applications to Asia

Devashish Mitra
Syracuse University, NBER and IZA

Priya Ranjan
University of California – Irvine
Terminology

• “Outsourcing”
  – usually refers to any task or activity that is moved from the developed North to the developing South.
  
  – “the acquisition of an input or service from an unaffiliated company” (Helpman, 2006)
  
  – restricted usage to offshoring of services to unaffiliated foreign firms (Bhagwati, Panagariya and Srinivasan, 2004)

We will follow Helpman’s broader usage of the word. However, our focus in this paper will be on “offshoring”
Terminology

• “Offshoring”
  – the sourcing of inputs (goods and services) from foreign countries.
  – includes offshore outsourcing, as well as foreign direct investment (FDI).
  – While offshore outsourcing involves interfirm (arm’s length) trade, FDI involves intrafirm trade.

• Large overlap between “outsourcing” and “offshoring”
Objectives

• Does the growing new literature help us understand the tradeoffs for a firm between outsourcing and integration?
  – Can it explain the kinds of organizational forms we see?

• Can this literature provide insight into the location of outsourced activity we actually see?

• Can we offer plausible explanations for what triggers offshoring and thereafter what determines its dynamics?

• Can we draw inferences from existing theory and empirical work about the developmental impact of offshoring on Asia?
  – special attention to the issue of inequality and poverty.

Applications focused on Asia for all of the above.
The New Literature: Theory, Empirics and Applications to Asia

• International fragmentation and the rationale for it (Jones, 2000)
The New Literature: Theory, Empirics and Applications to Asia

• Contract theory and the organization of fragmentation: The Role of Capital-Abundance, Institutions and Market Thickness

  – Should fragmentation of the production process be done within the same firm or should it involve arm’s length transactions?
Basic Elements of Theory Based on Incomplete Contracts

• Production of final goods may require highly customized and specialized intermediate inputs (to be produced by input suppliers).

• Therefore quality of inputs is not verifiable by a third party.

• Hence, it is impossible to write a complete contract that fully specifies the price-quality relationship.

• The division of the surplus from the production of the input and its use in the production of the output is subject to ex post bargaining.

• This potentially results in a hold up problem and distorts the incentives for investment and effort in input production.
• Helpman (2006) argues that “intermediate inputs under the direct control of the final good producer suffer less from agency problems than intermediate inputs that require the engagement of suppliers.”

• However, the effective bargaining power of the final good supplier is higher under integration than under outsourcing
  
  – as under the former the final good supplier has some control over inputs and can recover some of its value if bargaining fails.

• Thus incentives are closer to optimal under integration in the case of goods and services that require intensive use of headquarter services in their production.

• Outsourcing is better in the case of goods whose production is intensive in the use of specialized inputs.
The Role of Capital Abundance

• (1) Headquarter services are capital intensive and input production is labor intensive (Assumption).

• (2) The two are to be combined in the same country to produce a specific tradable intermediate input used in the production of a given tradable final good (Assumption).

→ a positive correlation between intrafirm import share and exporting country capital abundance (Helpman, 2006 and Antras, 2003).

• Intrafirm imports are correlated with vertical FDI.
• Interfirm imports are correlated with offshore outsourcing.

• Thus, according to this theory, in China and India, we should see more offshore outsourcing than offshore through FDI as compared to the more capital-abundant countries.
  – Of course, legal institutions are going to be weaker in these countries than in the more capital-abundant countries – an offsetting force.
  – Contract enforcement is going to be weaker (congested courts due to low judge-population ratios).
The role of market thickness
(Grossman and Helpman, 2002 and McLaren, 2000)

• Large number of actors on either side of the market
  → High probability and quality of a match.
  – biases the equilibrium towards offshore outsourcing.
  – Both China and India are large countries, each with a large pool of skilled labor with a wide variety of skills.
    • arm’s length offshore outsourcing is fairly common in several industries.
    • vertical FDI is also prevalent especially in industries requiring sophisticated technology whose know-how firms might not want to share with others.

• Other roles for market thickness.
  – disciplining device and can substitute for weak institutions.
    • the possibility of repeated interactions, another substitute.
Export Processing in China: Ownership and Control, “Contractual” versus “Generic” Outsourcing

• Feenstra & Hanson (2005) explain the following arrangements in China:
  – Input control: (a) “Pure Assembly”, and (b) “Import and Assembly”.
  – Factory ownership: (a) foreign-owned and (b) Chinese-owned.
  – their theory can explain their empirical finding:
    • in most cases in China, the export processing plant is owned by a foreign firm and a Chinese manager controls the search for and purchase of inputs.
      – investment specificity is low (resulting in lower hold up costs) and value added from processing is high (export markets are thick): plants in the coastal areas.

Feenstra and Hanson speculate that this can be modified to explain ownership and control in the Indian programming industry.
• Feenstra and Spencer (2005) explain the determinants of “contractual” outsourcing (related to processing exports) and “generic” outsourcing (related to other exports).

– Consistent with their comparative static exercise of transport cost reduction, coastal provinces in China do a lot more of processing exports relative to non-processing exports compared to interior provinces.
Temporary shocks and the triggering of permanent offshoring: theory with applications to India

- What has remained unanswered so far is what starts this process of offshore outsourcing, and thereafter what determines its dynamics.

  - temporary shocks can trigger this process but the effects of such shocks can be permanent, eg, Y2K in India’s case (Mitra and Ranjan, 2006)

- External economies in outsourcing

  - With heterogeneous firms, in a dynamic framework, outsourcing takes place in decreasing order of productivity over time.
Figure 3: Indian software exports as a share of software sales

Source: Arora and Gambardella (2005)
India: Business Services (Source: Balance of Payments Statistics, IMF)
Offshoring and Wage Inequality: Theory and Evidence

• Feenstra and Hanson (1996, 1997a, b, 1999, 2001 and 2003), in a series of papers, have studied this link.

  – movement of capital from US to Mexico that shifts production activities (input production) in the same direction raises wage inequality in both countries.

• Since production activities shifted from the US to Mexico are the least skill intensive in the former and the most skill intensive in the latter, the demand for skilled labor goes up in both countries.

• This result is consistent with the recent increase in wage inequality in the US and Mexico, for which Feenstra and Hanson provide sophisticated and very convincing empirical evidence.
• Using ILO wage data for wages and employment by occupation in five East Asian countries (Hong Kong, Singapore, Korea, Philippines, Thailand and Korea) for the period 1985-98, te Velde and Morrissey (2004) find that:

  – Wages associated with all skill levels increase with FDI.

  – There is a positive and statistically significant correlation between FDI and wage inequality in Thailand.

  – There is no statistically significant relationship between the two in the case of the remaining four countries.

While the right-hand side variable of interest here is FDI, it needs to be noted that a large proportion of FDI is vertical FDI and so amounts to offshoring.
• Avalos and Savvides (2006)
  – Wage inequality in Latin America increased in the 1980s and 90s.
  – Roughly constant in East Asia in the same period.
  – Increase in FDI leads to an increase in wage inequality in Latin America.
  – No such effect for East Asia.

• Owen and Yu (2003), using a panel of 29 Chinese provinces over the years 1986-2001, find that
  – FDI in export-oriented industries lowers wage inequality.
  – No such effect is found for import-substituting FDI.
Finally, while we do not have clear evidence on what exactly is happening to wage inequality, it is pretty clear that wages are rising.

– Both China and India have experienced very high GDP growth rates in the last few years.

– There is clear evidence that poverty has gone down.
Offshoring: India versus China

- Activities offshored to India have been mainly services.

- China has been an important player in the global production sharing network in manufacturing.
  - known for its processing exports, with Hong Kong playing the role of an intermediary.

- China has a large number of important ports from where processing exports from its coastal provinces are shipped directly (or through Hong Kong) to other countries.

- Comparative advantage in manufacturing is a function of both physical infrastructure and human capital.

- China has been able to combine the two to arrive at this comparative advantage.

- India, in the case of services, was able to bypass the physical infrastructure bottleneck.
  - What was needed was a fiber optic cable and the global communications infrastructure.