Now I.T.'s "Personal": Offshoring and the Shifting Skill Composition of the US Information Technology Workforce

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Summary

Background
There have been many studies into what makes certain jobs more offshorable and what kind of skills are becoming more important for US based IT workers. But directly linking offshoring and skill shifts has so far been difficult because there is very little data in this area. For this paper some new and more specific data has been collected and analysed.

This study uses Blinder's analysis for task level comparison of jobs. Blinder classifies tasks to be non-tradable when they require personal input, such as interpersonal communication or interaction with object that must remain in USA. He then combines the tasks of a job to create offshorability index, where higher index value means that it is easier to offshore certain job. For example tasks of computer programmer are considered to be very easily offshorable and so programmer has offshorability index of 100. Sales manager work is much more difficult to offshore and so it has index of 26.

Based on previous analyses two hypothesis were made. First was that in firms that use offshoring there would be less people in US employed in easily offshorable jobs. And second was that offshoring companies would have less hourly workers.

Data
Two sets of data were collected: offshore IT employment and US IT workforce. Data was collected from leading online career networking service in 2006 and for the period from 1995 to 2006. It contained information about employee’s occupation, location, education, experience, job tenure and more. This source of data was used because it was assumed that for example survey data could contain response errors if responders did not want to reveal information about offshoring, also it was much more detailed than any survey data that could have been collected. Several tests comparing it to other sources of data confirmed that it was reasonably good.

For offshore IT employment data, a random sample of about million workers from this data was chosen. Of these workers only IT workers that worked in captive centers of public US firms in India were chosen, there were about 2500. India was chosen because previous studies have shown that offshoring can have different impact on US workforce depending on offshoring location and jobs being offshored. For example offshoring to high cost location usually means expansion to new markets. Offshoring to India has been shown to be primarily for cost or skill. This data does not include outsourcing, but it was shown that this would not change the results.

US IT workforce data consisted of about 500 000 IT workers. 2006 data also indicated if workers were full-time or hourly workers, this was used to test hourly workers hypothesis.
This data was then aggregated by employers to get an overview of US companies, their US based workers and offshored workers. To calculate relative demand for IT workers performing tradable tasks a threshold of 92 in Blinder's index was chosen, this means that jobs with index greater than 92 were considered tradeable. Some additional information, like total employment, sales growth and foreign income, was taken from Compustat database.

**Results**

Initial correlation tests show that in 2006 offshoring firms perform much less tradable tasks in US compared to non-offshoring firms. This gap has been growing since 1995 when both types of companies performed about the same amount of tradeable tasks in US. Also it was seen that tradable task intensity was higher for hourly workers compared to full-time workers.

Multiple regression test were made to further test the hypothesis. It was seen that the difference in offshorable tasks done in US between offshoring and non-offshoring companies was about 8% and opening a captive center was associated with about a 1% yearly drop in tradable tasks done in US. It was noticed that IT-producing industries had a higher rate of offshoring than other, IT-using, industries, so additional test were made to see if results would be different between industries. Chow test did not show that effects of offshoring would be different across industries. Offshoring coefficient was also controlled for IT outsourcing, but the end results were relatively similar.

Based on 2006 data it was seen that offshoring firms hire 2-3% less hourly workers than non-offshoring. Additionally it was seen that offshoring affects the task content of hourly and full-time works similarly, so it was concluded that this change was happening primarily because hourly workers simply perform more tradable tasks. Because IT support workers are often hourly workers and offshored then results were also checked without support workers to make sure that the difference was not only because of them. Results were the same.

Additional robustness test were made to verify the first hypothesis. It was seen that this skills shift was mostly true in the case of offshoring to India. Results were also checked between different types of workers: technical, managerial and other. It was seen that skills shift was primarily happening in the case of technical workers. Also moving tradable tasks threshold did not significantly change the results.

**Conclusion**

It was found that share of IT workers in offshorable occupations has fallen about 8% in companies that offshore, while demand for such workers has risen about 3% in companies that do not offshore. Also it was found that hourly workers are more likely to perform offshorable tasks and that companies that offshore workers have about 2-3% less hourly workers in US.

Since less tradable tasks require more communication skills and business knowledge then this means that these “softer” skills are becoming more important for US based IT workers.