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OUTSOURCING TO THE DEVELOPING ECONOMY: ITS IMPACTS ON  
GDP AND UNEMPLOYMENT.

A CASE STUDY OF INDIA AND THE UNITED STATES OF AMERICA.

BY

ABIDEMI AKINYEMI

A thesis in partial fulfillment of the requirements for the

Master of Science

Major in Economics

South Dakota State University

2016

OUTSOURCING TO THE DEVELOPING ECONOMY: ITS IMPACTS ON  
GDP AND UNEMPLOYMENT.

A CASE STUDY OF INDIA AND THE UNITED STATES OF AMERICA.

This thesis is approved as a creditable and independent investigation by a candidate for the Master of Science in Economics degree and is acceptable for meeting the thesis requirements for this degree. Acceptance of this does not imply that the conclusions by the candidates are necessarily the conclusions of the major department.

George Langelett, Ph.D.

Thesis Advisor

Date

Eluned Jones, Ph.D.

Head, Department of Economics

Date

Dean, Graduate School

Date

This thesis is dedicated to God Almighty, the author and finisher of my faith.

Also, to my lovely parents Mr. Taiwo Akinyemi, Mrs. Arinola Sulaimon Akinyemi, and Mrs. Olubunmi Johnston. Thanks for your love and support. Love you always.

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## ABSTRACT

OUTSOURCING TO THE DEVELOPING COUNTRIES: ITS IMPACT ON  
GDP AND UNEMPLOYMENT.

## A CASE STUDY OF INDIA AND THE UNITED STATES

ABIDEMI AKINYEMI

2016

Outsourcing of services from the U.S. to developing country like India has been importantly debated over the year on media and amongst Americans, also fears and discussions that increased imports of services will decrease employment and wages.

This paper estimates how the services exports from India have helped reduce unemployment and built a better India using a production equilibrium model. The analysis finds that these services exported had a positive effect on GDP, and unemployment in India.

Moving the analysis away from India to the U.S., the econometric analysis used a fixed effect panel dataset on the U.S. manufacturing industries from 2006-2013. Contrary to what Americans think, this study found that services imported into the U.S. or business activities shipped from abroad have a relatively small effect on the demand for experienced workers in the United States.

Based on the results from the India and the U.S. regression analysis, outsourcing is a win-win thing which is good for both exporting and importing countries on both the long and short run.

## CHAPTER 1: INTRODUCTION

### 1.1 BACKGROUND

Trade in goods and services between developed, developing, and less developed countries today is different from the 1900s when services could not be wired. Globalization and increased technology have played a vital role in this success story. Today, it is very easy for companies in developed countries to send part of their business activities abroad (to developing or less developed countries) in order to benefit from their factor endowments, which in most cases are cheap labor, and their natural resources. The focus of this study will only be on the service sector, which is responsible for a significant amount of most countries' gross domestic product. The main purpose of this study is to examine the impact of service outsourcing on developed and developing countries. The study will be looking at the Indian and the U.S. labor markets and also their economic growth.

There is a need to clearly analyze outsourcing since much has been written and said about it, but many misconceptions exist. Many studies like the City of Colorado Springs Sustainable Funding Committee (2009), and Baumanis and McGee (2008) gave different definitions of outsourcing but with the same end result. i.e. to save costs, and to gain access to new technology and outside expertise. An example is the U.S. firm outsourcing services from countries with lower wage services like China and India in order to cut costs.

There are a large number of reasons why outsourcing is being considered, but risks are also involved. Some reasons for outsourcing may include lack of abundant resources, the need for better skills and management, and also to save on costs when it is

properly implemented. These costs may include high taxes, high cost of energy, imprudent government regulation, production and labor costs.

The risks of outsourcing may include national risks (which include bad road, buildings, poor power supply and related issues relating to a particular country), reputation risk (which includes negative public opinions), operation risks and supply chain (include problems associated with services or product delivery), and credit risk (which includes obligor's failure to meet the terms of the contract with the monetary institution or to the otherwise perform as agreed) Blain, (2005).

On the demand side of outsourcing (the U.S.), Dobbs (2004) asserts that outsourcing hurts American workers and should thus be viewed as against American interests. This studies among others like Bardhan and Kroll (2003), suggest that increment in outsourcing will have negative effects on the U.S. labor such as decrease in employment and wages. McCarthy (2004) claims in 2015, 3.3 million United States jobs will be outsourced, and outsourcing will be responsible for 136 billion dollars in lost wages. McKinsey (2005) estimated that about 11 percent of employment in the global service private-sector is most likely to be outsourced to developing economies in the next five years.

However, the media and consulting reports provide estimates which are based on false characterization of outsourcing or systematic errors, such as not differentiating between job destruction from companies relocating physical plants or losses which may have contributed to reason why those jobs are being outsourced to another country. One

of the studies the media reported was the Forrester Research which projected about 3.3 million U.S. services jobs to be moved abroad by 2015 (Kirkegaard, 2004).

Also, not all jobs are affected by outsourcing, and not all services can be traded or outsourced. Services that need physical presence, which may include arguing a case in court, driving a taxi, waiting tables, hairdressing, barbering and other beauty services cannot be outsourced. Services that do not need personal contact and can be done electronically (either through the phone or over the internet) have potentials of being outsourced. These services may include data entry, and writing computer codes (Blinder 2006, 2007 and Jensen and Kletzer 2006, 2007).

Outsourcing is a growing phenomenon that affects both white and blue collar workers, but it's something that an economy can potentially gain from in the long run. People are used to goods being manufactured and shipped to different countries either by air or sea for final consumption, but not used to services manufactured abroad and being delivered through the phone or over the internet (Andrew, 2004).

However, despite the unlimited possibility for services imports to replace labor in the U.S., Jensen and Kletzer (2006) estimate that there is 28 percent chances of the U.S. jobs being lost to services import. In contrast to the popular perception of outsourcing being detrimental to the U.S. labor, Feenstra and Hanson (1996) find outsourcing to be responsible for 51.3% wage share increase of employees in the nonproduction companies from 1979-1990 in the United States.

On the supply side of outsourcing, India is known for exporting services such as information technology and the information technology service sectors are the important

drivers of the country's economic development. In the 90s, the average annual growth rate of the service sector in India grew at 9%, contributing greatly to the total growth rate of the economy. The country's association of software and services companies (NASSCOM) recently reports that salaries for India's IT and export-oriented service sectors are predicted to exceed 100 billion U.S. dollars this year, and will reach \$225 billion by 2020.

Outsourcing is growing fast in India, and has improved the Indian economy by creating job opportunities, better standard of living, building and maintenance of infrastructure. Business Process Outsourcing (BPO) is a subdivision of outsourcing that consist of contracting out activities and functions of a specific business process to a third-party service supplier. This subset of outsourcing has provided opportunities for women, and also promote feminist movement in India. The enormous growth in the BPO industry in India has created job opportunities with lots of benefit to their workers. Some of these benefits are provident funds, gratuity, corporate credit card, electronic devices, personal health care, educational benefits, subsidized food and transportation, maternity leave, and personal accident insurance scheme. With the existence of BPO, more women are now in the labor force, enabling them to cater for themselves and their career. A few analysis and studies shows that Increased outsourcing has helped reduce poverty by providing more employment and increase wages in India; but India has also lost some of her culture, belief, values, and social norms along the way, and also increased their cost of living.

## 1.2 RESEARCH OBJECTIVES

The main objective of this study is to estimate the impact of outsourcing on both the demanding and supplier country. The following are the research questions that this study answers in the subsequent chapters:

- How services exported from India affects the nation's economic growth?
- How services imported into the U.S. affects employment in the manufacturing industries?
- Is outsourcing as a whole good for both importing and exporting country?

## 1.3 THESIS OUTLINE

Chapter 2 provides literature background on outsourcing, the effects and changes outsourcing has on the Indian economy, the impact of outsourcing on the U.S. economy. Chapter 3 covers theories, data sources, and the methods of analysis. The results and discussion of both countries are in chapter 4. Chapter 5 provides summary, conclusion, and future agenda for this thesis.

## CHAPTER 2: LITERATURE REVIEW

This chapter provides the general overview of outsourcing, the effects and changes outsourcing has on the Indian economy, the impact of outsourcing on the United States economy, and briefly reviews the place of this thesis in the literature.

### 2.1. WHAT IS OUTSOURCING

Outsourcing is the distribution of some set of business processes to an external service provider expert. It is also the contracting out of both foreign and domestic business processes, which an organization may have formerly executed domestically to another private organization from which the procedure is brought back as a service. It may also include offshoring (Wikipedia). When dealing with services, the GAO (2004) describes outsourcing as the acquisition of services from a company that can either be another domestic company or an offshore supplier.

Baumanis and McGee (2008) describe outsourcing as the practice of free trade because free trade generates more jobs than it destroys. Outsourcing can be seen as Adam Smith's division of labor and also as David Ricardo's theory of comparative advantage. Outsourcing is the approach most companies use to reduce the cost of production, which is presented to consumers in the form of competitive prices.

Outsourcing has been reproached in the press for killing jobs domestically in the U.S., but there are two sides to this phenomenon. Therefore, this assumption is only one sided because it only considers the job loss part of the situation. Outsourcing creates jobs by enlarging economic productivity, and it also put little pressure on prices from which consumers tend to gain.



Outsourcing has made it possible for companies to divide their service and production processes into different elements which can be contracted and executed in the an organized and cost-effective way (Friedman, 2005).

Most developed and developing countries have great economies today mainly because of outsourcing. For instance, a country like Singapore participates in outsourcing. Even the former Prime Minister of Singapore -Lee Kuan Yew said “If your opponents outsource and you do not, then you are most likely to be out of business” (Correnti 2014). There are many numbers of reasons why firms outsource a function. These include lack of abundant resources, the need for better skills and management, and also to save costs when outsourcing is properly implemented. These costs may include high taxes, high cost of energy, imprudent government regulation, production and labor costs. The following are advantages of outsourcing: it helps improve standard of living in some countries, specifically for countries with lower income; and to gain access to outside expertise and effectiveness of renowned companies. These are some disadvantages: unseen expenses such as any additional charge not included in the contract will not be paid by the company getting the contract but by the other party giving out the contract; quality problems, since the price is fixed in the contract, the company getting the contract might decide to reduce the input factors as long as they meet the conditions of the contract with the aim of getting more profit (Blain, 2005).

## 2.2. OUTSOURCING AND THE INDIAN ECONOMY

When companies in developed countries like the U.S. outsource from developing countries like India, it encourages investment in India. These investments help boost the

Indian economy by enhancing their standard of living, and also help reduce the unemployment rate.

India is a country which developed countries like the U.S. import services mainly because of their large population and relatively cheap wage for skilled and experience workers. As a result, Indians have benefited economically but lost some of their norms, beliefs and culture.

### 2.2.1. POTENTIAL BENEFITS OF OUTSOURCING INDIAN ECONOMY

Outsourcing in India has helped create jobs; for example, more women are currently in the labor force ever since the advent of BPO. Also, the increased acceptance of technology has boost the performance and effectiveness in the domestic market as a result of foreign companies shipping part of their business processes to India.

Taking a look at the sudden economic growth in India over the years, outsourcing has played an integral role, and also created awareness about the external world (Ahmed, 2008). The table 2.1 below shows the GDP per capita (PPP) and GDP growth rate in India for over a decade.

Table 2.1 GDP Growth in India

Year	GDP – per Capita (PPP) in US\$	GDP – Real Growth Rate (%)
2001	2200	6
2002	2540	4.3
2003	2900	8.3
2004	3100	6.2
2005	3400	8.4
2006	3800	9.2
2007	2600	9
2008	2900	7.4
2009	3200	7.4
2010	3500	10.4

Source: Index Mundi 2010

Hewitt Associates states that 2008 marked the sixth year in a row Indian wages has increased from a single to double digit. Over the past decade, the export-oriented services industries have been known as key drivers of Indian growth. This prestige can be accredited to service industries like information technology (IT), which was responsible for up to 1.22% of the gross domestic product in 1997 through 1998, and 3.8% of GDP from 2003 through 2004, as announced by Thatchenkery et al (2005). India being a populated country, human resources are assets and India is also known to have skilled and qualified information technology professionals. India's large number of English speaking citizens, their ability to learn word for word was an instrument that was used for

establishing this competitive advantage in service outsourcing and quality education was the channel through which India as a country was able to attain this goal (Baumanis and McGee, 2008).

Studies like Stough et al (2003), and Bhatnagar (2003) assert that the growth in services sector such as information technology has encouraged a “leapfrogging” effect in Indian economy i.e. India puts the export oriented sector before agricultural and manufacturing industries mainly because of the growth and development export oriented sector brings to the nation.

The export oriented services sectors rely on the economies of scale connected with their presence in an urbanized cluster-city. Out of the sixteen campuses of the upper class Indian Institute of Technology, some are located in the cluster cities (Chennai, Delhi, Hyderabad, and Mumbai), making it easier to work together with high technology services industries. The benefits of export oriented services sectors located in these urban areas may include easy access to better telecommunications, financial institutions, and reliable electricity supply, and finally, access to human capital. This explains why the services sector is concentrated in a highly industrialized cities: Bangalore, Delhi, Chennai, Hyderabad, Pune, and Mumbai. So, in the absence of massive infrastructure investments, the benefits arising from services sector growth can be assumed to be concentrated in these urban centers (Ahmed, 2008). Furthermore, Ahmed (2008) finds that the services sector is the biggest sector in the Indian economy, which accounts for up to 46% of India’s aggregate production. 2.6 percent of this production sent abroad as services outsourcing is worth 10.12 billion U.S. dollars in the benchmark database.

### 2.2.2. POTENTIAL DRAWBACKS OF OUTSOURCING ON INDIAN SOCIETY

The impact of outsourcing is harmful as well as beneficial to the Indian society, but people only talk about how it benefits the Indian economy. Today, new generations are more materialistic, more brand conscious, and eat pizza for lunch as a result of outsourcing because their bosses train their workers on how to better serve their customers in a more educated and civilized way. This has changed the orientation of people in the labor force; and today western culture and western manner of promoting the interests of consumers has been intertwined into the Indian culture which supports the social reconstruction of new generations. Most parents are concerned that western culture is destroying their family norms and traditions, they are worried that these unforeseen changes are getting in the way of their family beliefs, which include the rituals that safeguard their culture (Baumanis and McGee, 2008).

There is little literature on the harmful aspect of outsourcing, and its effects on the Indian society. India is the second most populated country in the world, human resources are a boon by itself. IT companies are expanding in big cities and having positive effects on people. However, researchers do not focus on the villages and smaller cities in India. Outsourcing has opened a wide gap between the economic welfare of rural and urban setting after BPO (Business Process Outsourcing) came into existence. Employment in Information Technology sector in India has increased on a large scale and most skilled individuals are working in multinational companies. Due to this development, the employees have to adopt the westernized culture and lifestyle since the western culture is receptive. The traditional ways and thinking has been altered amongst youths because

they are more open minded, and ready to embrace the culture of western society (accent and language), new discipline, different way of life, thinking differently, and understanding a new way of communication. These changes are affecting the community or society they grew up in or were born into.

Better telecommunications, financial institutions, and reliable electricity supply, social infrastructures, job opportunities, among other variables have increased the cost of living in India, most especially in the metro cities. India as a nation before the arrival of the multinational companies (MNCs) had a relatively low standard of living, but since the arrival of MNCs, Indians now complain of high rent, among every other thing.

Ahmad (2014) claims everyone in India is aware of the change in culture, beliefs, values among other things and tries to imitate the same without considering if it would be beneficial or detrimental to their society. Ahmad (2014) said a culture does not just explode at once, but culture is a process which takes thousands of years and generations to build and perfected. Therefore, Indians should keep in mind the amount of work and how many generations it took to build these cultures and traditions before adopting the western lifestyle because once they are lost or forgotten, they would take years or generations for these cultures and traditions to be brought back, and also cultures and traditions are what differentiates one country from the other. Ahmad (2014) concluded by saying India and western countries do not share the same background therefore, people of India should only practice things which will be beneficial to them and help build their society stronger.

Lack of communication is a problem between the BPO employees and their family members. India is quite known for families and a society where every member of the family from different generations live together, depending on both immediate and extended families for financial assistance, and they also share their feelings and daily activities with each other after a long day or week of work. But since the arrival of BPO, this behavior has declined because they do not have time to communicate with family members as a result of their odd job hours. For instance, if the husband is a working day shift and the wife is working a night shift, they might not get to see themselves for a week, with virtually no communication because when the husband gets home from work, the wife is already on her way to work or is already on the job.

Holidays are also another concern. The U.S. companies giving Indians jobs are doing businesses on their terms and conditions, so they give holidays that only favor them. On the other hand, Indians claim they are losing their social and religious doctrines which calms their mind, body, and soul by being part of these festivals. Meanwhile Indians acknowledge American holidays (Ahmad, 2014).

Cultural differences manifest in other issues. Power distance is highly regarded in a country like India. They address their superiors as Sir or Ma'am but due to the Westernized lifestyles, the employees call their bosses by their first names because that is what they want to be called at work or outside work. Baumanis and McGee (2008) gave an example of the president of IMC Global Services Ltd, Prakash Gupta who is exposed to the American lifestyle, and also visits the U.S. regularly from Pune in India where his offices are located. During one of his business trips to his corporate office in Pune, as he steps into the building, all his workers stood up from their seat as a sign of respect for

him, he waived at them and told them to continue their work. And he also told them to stop addressing him as “Mr. Gupta” or “Sir” but as Prakash, as his workers in the U.S. addresses him.

Foreign direct investments have enhanced the economic welfare of Indian families, where poor or average Indians can afford to send their children to school, breaking societal obstacles. This situation creates problem amongst families, as parents with little or no education often see their kids relocate from the rural areas to metro cities where there are job opportunities and other benefits. This exposes the children to more western and civilized cultures, causing cultural conflict between families.

In summary, Haque, (2007) asserts that if Indians resist the intrusion of the values and keep their professional lives at distance from their personal lives, it will serve them better and help Indians in the long run.

## 2.3 OUTSOURCING AND THE U.S. LABOR MARKET

Changing the focus to the U.S. and away from India, there is a significant amount of literature on outsourcing from the U.S. perspective. Labor in the United States is not as cheap as labor in developing countries such as India and some other countries. But capital is abundant in the United States. The United States Companies ship part of their jobs abroad in order to take advantage of these resources. When parts of these processes are shipped, companies save more money and time allowing them to focus on other things.

The following sections talks about how the U.S. tend to benefit from outsourcing of services, public opinion on outsourcing and the drawbacks.



### 2.3.1. POTENTIAL BENEFITS OF OUTSOURCING ON THE U.S. ECONOMY

The outsourcing of services abroad by the U.S. companies comes with its own advantages. Firstly, it helps the United States companies keep lower costs, and secondly, it enables these companies to be more competitive in international markets, and finally, it allows the U.S. companies to reassign workers to more productive activities.

McKinsey Global Institute (2003) finds the United States' economy to have benefited greatly and significantly from outsourcing. The study explains that outsourcing helps reduce costs for IT and other services by 60% enabling the U.S. companies in international markets to become stronger and competitive, while shareholders and workers also benefits from this advantage. For instance, outsourcing increases the export demand for computers, and computer accessories packaged in the U.S., and other services which its revenue benefits the U.S.

In the United States, different jobs are outsourced for different reasons. Some are as a result of the description of the job: Some Americans are not willing to do some job particularly the skilled and educated ones because they believe they are overqualified or they believe its below their pay grade. For these reasons, those jobs are being moved abroad where they will be done efficiently, and at the same time save cost because they would have access to cheap labor when those jobs are being shipped abroad. For example, a lecturer in South Dakota State University asked his students who would like to work at Larson Manufacturing Company where they make doors; no one raised his or her hand. Such jobs could be shipped abroad for people who are willing and able to do

the job. This explains why most of the U.S. jobs are being outsourced because people do not want to fill those spots. Baumanis and McGee (2008) also supports this motion by saying the United States manufacturing industries outsource jobs that the U. S. citizens have refused to take on mainly because of the wages being offered, which make them employ outsiders who are willing to accept the wage some industries are offering within the United States. In this situation both the U.S. citizens and manufacturing industries win. Therefore, there would not be any gap to fill in the U.S. workforce.

The United States economy also benefits from the U.S. companies that outsource some of their activities abroad because the nation will have access to products from foreign countries at cheaper or affordable prices. This way the U.S. manufacturers and consumers both benefits from outsourcing. An example is a manufacturing company which purchases part of its computer components from another manufacturer abroad; but after production and assembling, the computer is being brought back to the U.S., and sold in both domestic and international markets. This helps domestic consumers gain access to goods and services at lower costs and also boost the U.S. economy. Outsourcing also helps many government agencies save millions of dollars, i.e. outsourcing part of their services, which helps the U.S. economy and federal spending (Correnti 2014).

Another supportive argument made by Hasan (2013) is outsourcing jobs to countries with low income helps boost those countries' economies. With a better economy and higher income, the sales of the U.S. goods in those countries will increase making it possible for those nations to pay back what they owe the United States.

Outsourcing helps some of the U.S. large, medium and small scale companies make higher profits through lower production and labor costs, and leads to high revenue for the economy. All these attributes enable the U.S. to participate in the international market, and also to create employment in the country. Outsourcing allows the U.S. to concentrate on the transformation and use of highly skilled labor. It is necessary to indicate that the reason for outsourcing is not as a result of lack of knowledge or confidence in the U.S. workforce, or to leave Americans without jobs, but an instrument to assist industries that provide jobs while providing consumers with affordable resources and services. Finally, outsourcing promotes globalization which is a new source of growth for the U.S. businesses (Correnti 2014).

### 2.3.2. POTENTIAL DRAWBACKS OF OUTSOURCING ON THE U.S. LABOR MARKET

Mankiw and Swagel (2006) start by pointing out the rising issue that occurred in 2004 over the effects of outsourcing on the U.S. labor market which was driven by the small reduction in the economy from 2000 through 2001. Despite high production growth rates, wages per hour grew by less than a percent between 1999 and 2003. Within the context of this depressed growth, public conversation on job losses treated outsourcing as a major contributor to the weak job market.

Milberg and Winkler (2013) estimates suggest that offshoring measured in over thirty manufacturing and service sectors from year 1998 to 2006 led to a decrease in employment of approximately full time equivalent jobs. By outsourcing, the U.S. do not only lose jobs, they lose financial gains too (Hasan 2013).

The council of Economic Advisors (CEA) talked about outsourcing in its February Economic Report of the President in 2004. The CEA argued that outsourcing was just another demonstration of what David Ricardo talked about in his theory of comparative advantage: i.e. purchasing more goods and services abroad if they are made cheaper than producing them domestically. Accepting this institutional indifference serves as a threat to the U.S. labor; the statement caused a lot of political debates on outsourcing in the congress, the press, and the presidential campaign (Ahmed, 2008).

After this incident, the media fed Americans anxiety and interests with information on outsourcing, and how many jobs have been lost to outsourcing with estimates from different private consulting firms. Examples are Gentle (2003), Deloitte Research of two million jobs lost by 2008, Goldman Sachs' estimate that up to 400,000 thousand jobs were moved abroad from the U.S. between 2002 and 2005, with 15,000 and 30,000 jobs to be moved abroad monthly in the future, and McCarthy (2002) estimated that by 2015, the number of jobs lost will be a disturbing amount of 3.3 million.

Mankiw and Swagel (2006) explain in their study using the BLS' (Bureau of Labor Statistics) Mass Layoff data (Brown, 2004) to clarify that relocations abroad were only accountable for 1.6% of job division in the general job dismissals which occurred between the first four months in 2004 and 2006, with the mass job losses not being attributable to job relocation. The study puts these job loss figures in the context of the BLS estimates that were projected to be created by 2015. However, due to the large magnitudes of these job loss figures by McCarthy (2002), Gentle (2003), and other studies, the economic effects of outsourcing are being overestimated in the United States.

Amiti and Wei (2005) also argued that the 3.3 million job loss estimate of McCarthy (2002) that was as a result of jobs being outsourced was overestimated.

Milberg and Winkler (2013) state that the recent New York Times poll of 951 Americans showed their view that evidently, outsourcing is responsible for the small number of jobs available domestically. And the public wants the U.S. businesses to take responsibility in keeping manufacturing jobs in the U.S. (Conelly, 2012). 75% of the U.S. citizens said shipping work abroad hurts the U.S. workers (Anderson and Gascon, 2007).

Blinder (2006) explains the present issue is not just with jobs that are currently being threatened by outsourcing, but also, jobs that can be lost to outsourcing in the nearest future as the set of business processes that can be outsourced increases. Some studies like Auto et al (2003) and Irwin (2003) support this idea, finding jobs and employees doing these jobs that can be potentially outsourced or that are already being shipped abroad changing as technology advances, and this affects employees across the range of skill levels. For instance, financial analysts and data processors can be considered to have different skill levels. However, with good communication device, the work of the United States financial analysts and data processors can be successfully and efficiently done by an Indian based data processors and analyst with the same ease (Ahmed, 2008).

Technological advancements which are difficult to predict, lies in the heart of determining what jobs will be replaced by machines, and finally what jobs lost will outsourcing be responsible for (Ahmed, 2008). Blinder (2006) and Blinder et al (2006) argue that no matter how much technology advances or changes, for an occupation to be

traded, its “tradability” depends on if it is being carried out physically or whether the occupation does not require any physical presence. Services that require physical presence may include arguing a case in court, driving a taxi, waiting tables, housekeeping, hairdressing, barbing and other beauty services. In contrast, services that do not require physical contact and that can be carried out electronically may include data entry, auditing, and writing computer codes.

Blinder (2007) gave a more accurate amount of the United States jobs that are potentially outsourceable in the next two decades. The study focuses on the potentially outsourceable jobs, as opposed to jobs which are actually outsourced. Using O\*Net database which has over 850 BLS SOC occupational codes job illustrations, the study finds between 22% and 29% of the U.S. employment to be potentially outsourceable in the next 20 years. Jensen and Kletzer (2006) explain that 27% - 28% of all the U.S. jobs can be traded. However, some occupations have high probability of being traded than others. For instance, when it comes to computer and mathematical occupations (SOC group 15), almost all employments are tradable, compare to the 1.5 percent of employment in building maintenance occupations (SOC group 37). In contrast to the Blinder (2007), Jensen and Kletzer (2006) came up with a creative policy based on spatial clusters to estimate the maximum possible job losses associated with outsourcing. The paper points out that if service suppliers are within close geographical vicinity, then trade must be done between industries within the United States. But in a different scenario (i.e. scattered around a wide geographical vicinity), then trade would become impossible. This means when a product or service is traded, production is concerted in a district so as to benefit from the economies of scale, e.g. city’s top attractions in New

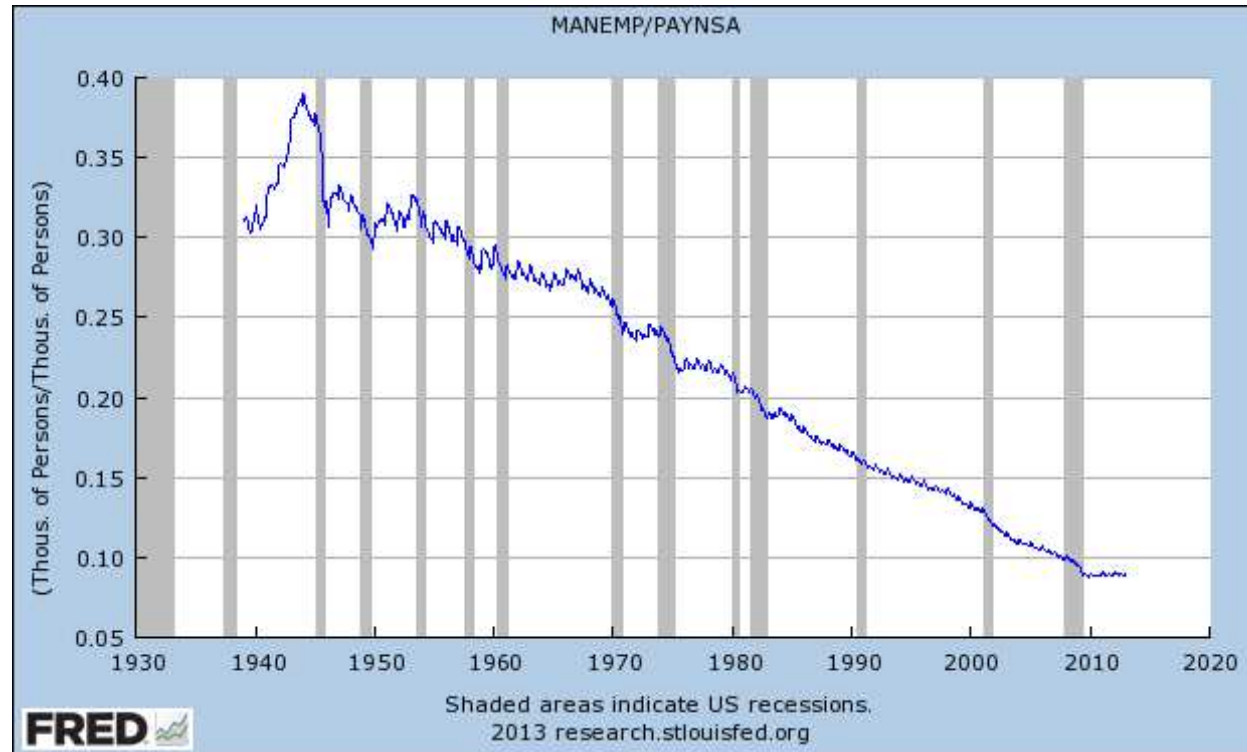
York, futures trading in Chicago, and entertainment products from Los Angeles. So, not every region will support domestic production, while some will contribute a larger share of resources to production of that good or service, and then trade the excess supply (Ahmed 2008).

Ahmed (2008) finds that the increase in the use of service outsourcing tradable occupations labor composite led to the Rybczynski-type effects on the U.S. industries. Rybczynski theorem displays how changes in a factor endowment affects the outputs of goods when full employment is sustained. Ahmed (2008) study finds industries that used the composite input intensively expanding, while other industries shrank. Other business services (automotive repair and maintenance, commercial and industrial machinery and equipment), Insurance, and Finance used the composite input most intensively, and they expanded the most. The Extraction, Utilities, Non-Electronic Manufacturing, Recreation, and Government-Education sectors also expanded. The remaining industries reduced their output. However, while the U.S. economy and some occupations that cannot be traded are likely to gain, and employees whose occupation can be traded are most likely to experience losses in their income. Furthermore, Ahmed (2008) states recent literature suggests that greater outsourcing will reduce the U.S. wages and employment, and also stating that as technology advances, it will affect some occupations or jobs that cannot be outsourced or traded presently.

In the manufacturing sector, since World War II, the proportion of workers in the U.S. manufacturing sector has decreased from almost 40 percent during the cold war to less than 10 percent in 2013. People blame outsourcing for this decrease, and there is no doubt that outsourcing has played its role in the United States manufacturing sector, but

producers also use machines as substitute for their workers i.e. exchanging labor for capital. The figure 2.1 below shows decreases in the manufacturing sector over the past years.

Figure 2.1 Proportions of Workers in the U.S. Manufacturing Industry



Source: Federal Reserve Economic Data 2013

A recent literature shows that developed countries do not outsource jobs to China but to less developed countries with a cheaper labor, and that eventually America and other rich countries will run out of places to get cheap labor or outsource to. Technological change is more important, especially in the long run and that offshoring is just a way station on the road to automation (Mims, 2013). He concluded by saying that



eventually, developed countries will have no choice but to “re-shore” production jobs that they have shipped abroad with the help of advanced technology.

Ahmed (2007) finds in the U.S. manufacturing industries that outsourcing of these services (communication, finance, computer science, insurance, and other business services) has not had a large labor market impact, except for outsourcing of Other Business Services which were found to have reduce the demand for that kind of labor in the U.S. manufacturing industries.

Mobility of labor can also increase a nation’s productivity, labor supply and unemployment rate, in the sense that if more workers are available than jobs then people will be without jobs. As for productivity, if the demand for labor is equivalent to labor supply or when skilled workers are hired, it increases the economy’s productivity. Costa (2014) states in an article that the remaining jobs in the U.S. are occupied by immigrant brought in on H-1b and L-1 visas who gets lower pay, the U.S. workers are dismissed after they are forced to train and drill these immigrants. Some United States companies after they outsource, they take their well-trained employee to whatever country they are offshoring to (India).

## 2.4. EMPIRICAL STUDIES AND RESULTS

A review of literature shows the development of many methodological tools used in the analysis of the labor market effects on outsourcing. The studies discussed in this section analyzes how outsourcing (as trade in services) affects employment in manufacturing industries, and the U.S. labor market as a whole.

The first study is Ahmed (2008). The paper examines the impact of outsourcing on 86 United States manufacturing industries from 1998 to 2004. The paper finds that in the U.S. manufacturing industries, service outsourcing has a small effect on the U.S. labor market. The results in this study are interesting in the sense that declines in the outsourcing of communications services were found to have caused increased demand for labor in manufacturing industries, while increases in the outsourcing of other business services were found to reduce the demand for that kind of labor, the most important contribution of this study are in its methodology and variables he used. The nonproduction worker wage share was regressed on the outsourcing variables which included the change in the outsourcing intensities, value added, and capital. Based on Feenstra and Hanson (1996), it was possible to calculate how much of the change in nonproduction workers' cost share is attributable to a change in the outsourcing intensity of a service.

Feenstra and Taylor (2008) examine the effect of outsourcing of materials, services and increased technological appliances on production which was calculated by value-added per employee. The following table shows the results from the study.

Table 2.2 Total Increase in Production Explained by Each Sector

Service Outsourcing	Materials Outsourcing	Increased-Technological Appliances
11%-13%	3%-6%	4%-7%

Source: Feenstra/Taylor, "International Economics", 2008

From the table above, Feenstra and Taylor (2008) concluded that service outsourcing altogether with the excess use of technology equipment accounts for one percent of output growth every year.

Amiti and Wei (2006) also examine the impact of outsourcing services on employment and productivity in the United States in the 1990s, after constructing a control variable referred to as the outsourcing intensity of services,  $OSS_i$ . The formula for the variable can be seen below:

$$\alpha_{ji} = \frac{\text{purchase of services } j \text{ by } i}{\text{total nonenergy inputs used by } i} \quad Eqn (2.1)$$

$$\beta_j = \frac{\text{import of services } j}{\text{production}_j + \text{imports}_j - \text{exports}_j} \quad Eqn (2.2)$$

$$OSS_i = \sum_j [\alpha_{ji} * \beta_j] \quad Eqn (2.3)$$

Where  $\alpha_{ji}$  is the amount of intermediate service input  $j$  is used in industry  $i$  as a portion of the entire industry inputs,  $\beta_j$  is the economy-wide import share of intermediate service input  $j$ , and  $OSS_i$  is the product of these two ( $\alpha_{ji} * \beta_j$ ) taken to determine inputs  $j$  used by industry  $i$  are imported. They assert that outsourcing has a little negative impact on employment when industries are completely scattered but if these industries are together, the small negative effect disappears even though there may be a loss of employment in certain sectors due to outsourcing, the newly unemployed find employment in other sectors.

In conclusion, Ahmed (2008), finds that through greater industrial output and higher wages, outsourcing offers both countries (the U.S. and India) great opportunities to improve the well-being of people working in different occupational groups and industries, and also, a possibility of trade in service outsourcing harming other sectors of these economies. He concluded by saying decision makers must be willing and able to take appropriate measures necessary to reduce any potential obstacle and make the most of opportunities for growth and development. But before these measure can be taken, policy makers need to understand how outsourcing really works, its benefits, and its drawbacks.

## 2.5. THE PLACE OF THIS THESIS IN THE LITERATURE

There are several holes found in the review of these previous studies, and this study is needed to fill in the gaps left by the previous studies. The solutions to the following research questions framed in Chapter 1 will be used to fill gaps in the literature review and it is important to clearly state the roles of each chapter in this study.

- How services exported from India affects the nation's economic growth?
- How services imported into the U.S. affects employment in the manufacturing industries?
- Is outsourcing as a whole good for both importing and exporting country?

From section 2.2 of this chapter, we have seen that despite the importance of outsourcing services to India, and how it has help increase their economic growth and all its impacts on the economy, it has also caused a lot of harm to the society. Chapter 4 helps fill this gap by examining how services exports from India affects unemployment

and the nation's growth rate, and how import of service outsourcing has affected the U.S. manufacturing industry.

In the literature review, a couple of studies examined the impacts of outsourcing on the U.S. labor market but there is no empirical analysis on the impact of outsourcing (as trade in services) for the U.S. labor market with a more recent timeframe (2007 onwards).

The analysis in Chapter 4, and conclusion in Chapter 5 will help answer the last research question. If outsourcing in general is beneficial or harmful to both Indian and the U.S. economies.

### CHAPTER 3: METHODOLOGY AND DATA

This chapter sets terms of reference for the analysis. It outlines how the basic variables are connected, and how the analyses are conducted. The global impact of outsourcing is an important contemporary topic with many unanswered questions. To answer these questions, quantitative studies must be framed and understood within the context of economic theory. This chapter may read as a guide to the rest of the study.

Chapter 2 described how services exports from India have helped develop the country over the past years. The Indian economic boom cannot be understood from purely theoretical approaches but through analytical approaches. However, a computable general equilibrium model of international trade based on a real data can occupy these gaps. This provides a quantitative explanation of how outsourcing has improved the Indian economy.

On the demand side, there is a great deal of concern in the U.S. that increases in demand for service outsourcing will lead to increase in unemployment domestically. I will be using panel data as an econometric tool to examine how outsourcing of services affects unemployment or changes in relative demand for experienced worker in the U.S. manufacturing industries from the period of 2006 to 2013. This will be done by estimating the impact of several variables like outsourcing, capital formation, and output on skilled workers. This approach will answer the second research question: How services imported into the U.S. affects employment in the manufacturing industries?

Several studies like Feenstra and Hanson (1996, 2004), Amiti and Wei (2005, 2006), Canals (2007), and Ahmed (2008) did similar empirical analyses. However, this

study differs from all these studies in the sense that it focuses on services outsourcing specifically and also uses a more recent time period.

The latter part of this chapter is concerned with the sources and the description of data.

### 3.1. THE GENERAL EQUILIBRIUM APPROACH

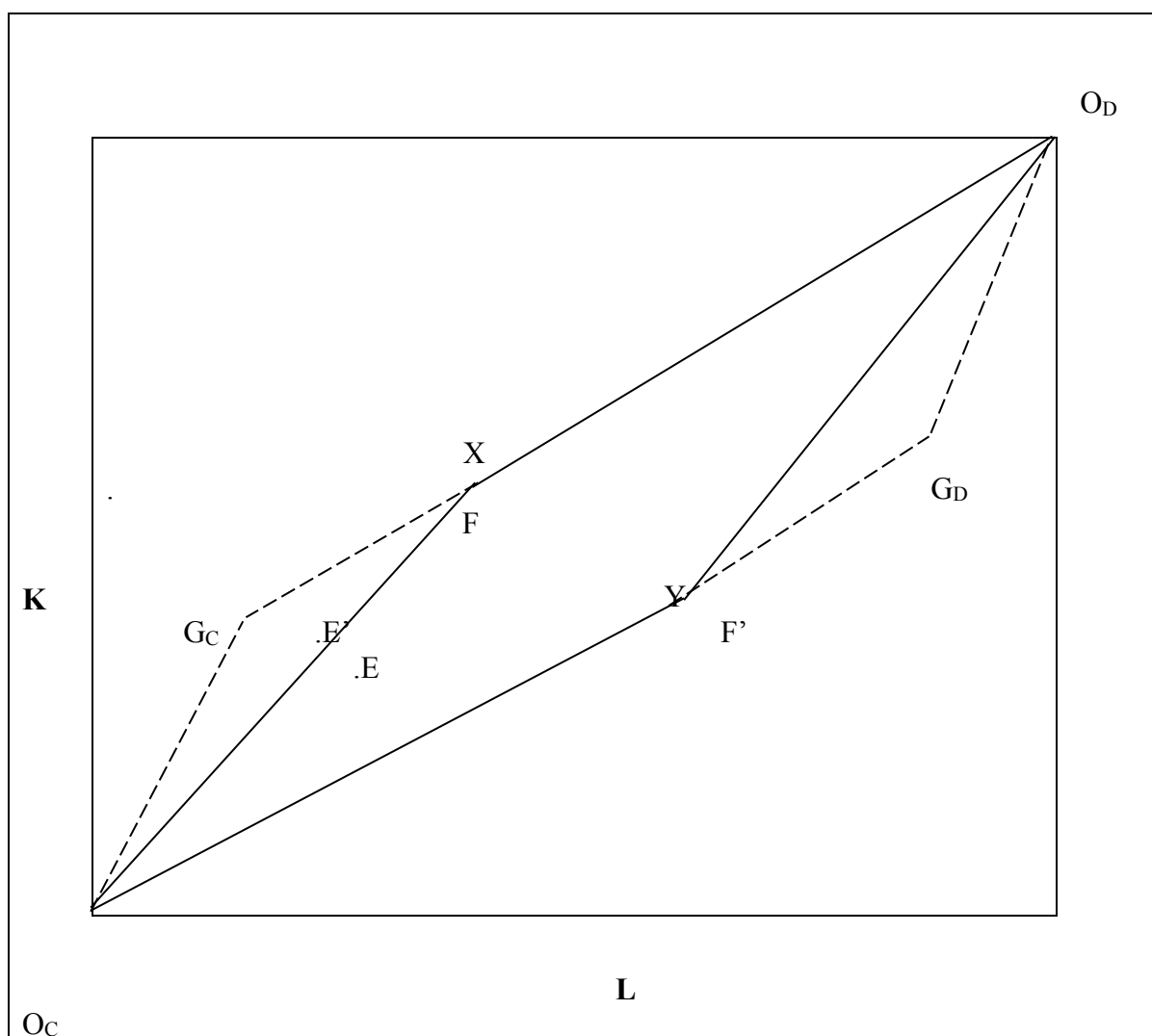
To answer the first and second research questions, a Heckscher-Ohlin (H-O) general equilibrium model is needed to make trade possible between two countries. This comparative static model was constructed from David Ricardo's theory of comparative advantage. Heckscher Ohlin model stresses on how countries with comparative advantages should consume or export more goods or services that they have in abundance, and should import goods that they cannot be produced efficiently.

#### 3.1.1. FRAGMENTATION

Vertical fragmentation of production is a term developed by Jones (2000), Arndt and Kierzkowski (2001). It is known as the cutting the value chain (Krugman, 1995). It is also described as splitting of one production technique into different production techniques that can appear in different stages and is similar to vertical specialization (Hummels, Ishii, Yi, 2001). Bhagwati et al (2004) explains how the present service exchange situation is subjectively different from goods trade because with the help of various technological improvement, services that were impossible to trade are presently being traded through the growth of the vertical fragmentation. To clearly understand some of the fundamental methods in which vertical specialization has resulted in trade or exchange of services, fragmentation in H-O model is the best way to start.

For instance, considering a simple Heckscher-Ohlin framework with two countries (India and the U.S.), countries with equal technologies, two factors of production (capital and skilled labor), one final good, and many homogeneous intermediate goods  $k = 1, 2, \dots, N$ . With no transportation costs, Americans are indifferent about the source of a particular good or service. The figure below shows the two region H-O model before and after fragmentation.

Figure 3.1 Two Region H-O Model Before and After Fragmentation





All the key assumptions of an H-O model are captured in the figure 3.1 above.

The following are Heckscher-Ohlin model assumptions:

- There is zero cost of transportation or other barriers to trade.
- All production functions are homogeneous of degree one.  $O_C F$  and  $O_D F'$  represents the production of good X, while  $O_C F'$  and  $O_D F$  represents the production of good Y. Where C and D are countries,  $O_C F$ ,  $O_D F'$ ,  $O_C F'$  and  $O_D F$  are factor vectors.
- Technologies for each good are the same in both countries. Production functions of the two goods are the same across countries. The implication of this is that the per-capita productivity is the same in both countries in the same technology with identical quantities of K or L.
- The differences in the slopes of  $O_C F$  and  $O_C F'$ , and  $O_D F$  from  $O_D F'$  show technologies used to produce both goods differ from each other.

Point E represents an endowment distribution between the two countries that fall within the factor use lens,  $O_C F O_D F'$ , and means that factor prices in countries C and D are the same. According to Deardorff (1994), if all countries factor endowment lens is completely within the factor use lens, factors price equalization will occur in an integrated world economy (IWE). A factor endowment lens is the set of vectors that can be formulated from the economy's possible factor endowment combinations, while the factor use lens is known as the set of vectors explained by factors usage (Ahmed, 2008). Given that the factor prices are the same, there is no incentive for fragmentation technology to be used. Point E' is endowment point outside the set of vectors explained by factors usage. Here there is absence of FPE and there is an incentive for the countries involved to take advantage of the cost differences between their factors to fragment

production. Fragmentation is only possible in this model if production of the K-intensive good X, represented by rays  $O_C F$  and  $O_D F'$ , is divided into production of an intermediate good Z, which is later used for the production of good X. Vectors  $O_C G_C$  and  $G_C F'$  and  $O_D G_D$  and  $G_D F'$  is used in representing the production of good X for both countries respectively. The endowment point  $E'$  is now within the factor use lens, since the latter has expanded to  $O_C G_C F O_D G_D F'$  allowing factor prices to adjust till they are equal in both countries. One of the advantages of fragmentation is that it enhances the factor use lens so one country can benefit from the other country's cheaper factor prices with equal factor returns.

Factor abundances are different in countries, and the prices of these factors indicates how richly blessed or deprived a country is in terms of factors of production, and how these factors are being used for production Deardorff (2001a). With capital and skilled labor distributed within the factor lens, factors being utilized in a specific method, and if exchange is granted, then factor prices and gains in India and United States are likely to be the same. But if that's not the case, and capital and skilled labor are distributed in a manner that they are not within the factor lens, then India and the United States factors gain will not be the same. If the endowment point in this situation is inside the vector sets explaining how India and the United States might use the factors. The winning prices are the potential prices of the IWE.

The Heckscher-Ohlin framework discussed above has made trade in service or outsourcing possible between these two countries. The two factors and countries being used are capital and skilled labor, India and the U.S. Fragmentation makes it possible for the U.S. to use Indian skilled labor through outsourcing of the labor intensive services

component until wages become the same in both countries. With the help of the H-O theoretical framework developed above and real world data will be used to obtain numerical results that can enable for a reliable examination of the first and second research questions: How services exported from India affects Indian economic growth? How services imported into the U.S. affects the manufacturing industries?

### 3.2. MODEL AND ESTIMATING FRAMEWORK FOR THE SERVICE INDUSTRY IN INDIAN

To properly analyze the effect of outsourcing on the Indian economy, a Cobb Douglas production function is required (Gorg et al., 2005).

$$Y_{it} = A_{it}^{\phi} (K_{it}^{\alpha} L_{it}^{\beta}) \quad Eqn (3.1)$$

Where Y is value added, K is capital, L is labor, A is technology shifter variable, i is industry, and t is time.

$$y_{it} = \phi a_{it} + \alpha k_{it} + \beta l_{it} \quad Eqn (3.2)$$

Equation 3.2 was derived by taking the natural logs of the variables.

The technology shifter is a function of outsourcing ( $a_{it} = a(oss_{it})$ ), outsourcing can influence production through these following instruments: (i) a fixed efficiency benefit; (ii) restricting; (iii) learning externalities; and (iv) change effect. Since the exact instrument through which production gains from outsourcing is unidentified, it is generally entered as  $a_{it}$  (Amiti and Wei, 2005).

$$y_{it} = \theta + \alpha k_{it} + \beta l_{it} + \delta oss_{it} + \gamma X_{it} + \mu_i + \varepsilon_{it} \quad Eqn (3.3)$$

Where  $\mu_i$  captures any unobserved variables which was not clearly accounted for in equation 3.2, and  $\varepsilon_{it}$  is the white noise.

From equation 3.3, outsourcing can now be estimated using econometric tools like Ordinary Least Square method (OLS). The OLS method will be used to estimate equation 3.3. Ordinary least squares estimation method is reducing the sum of squared approximation errors. The following are some of the Gauss Markov assumptions;

Assumption 1: The expected value of the error term is zero.

Assumption 2: X and error term are independent.

Assumption 3: All error terms have the same variance (Homoscedastic).

Assumption 4: Zero correlation between different error terms.

If these conditions mentioned above are met, OLS estimator is consistent and unbiased.

### 3.3. MODEL AND ESTIMATING FRAMEWORK FOR US MANUFACTURING AND SERVICE INDUSTRIES

Following Feenstra and Hanson (2004), Ahmed (2008), the econometric model that I will use to analyze the 27 U.S. manufacturing industries is Diewart (1974) translog cost function which ensure continuous correlation among factor prices. The translog cost function is gotten from a cost function, short run cost function to be specific. The short run cost function is an approach in which at least one factor of production is fixed, and variables have effects on production.

$$\begin{aligned}
\ln C_{Xt} = & \alpha_i + \sum_{i=1}^Q \alpha_i \ln w_{it} + \sum_{m=1}^O \beta_m \ln Y_{Xmt} + \beta_K \ln K_{Xt} + \frac{1}{2} \sum_{n=1}^O \sum_{m=1}^O \delta_{mn} \ln Y_{Xmt} \ln Y_{Xnt} \\
& + \frac{1}{2} \sum_{m=1}^O \delta_{mK} \ln Y_{Xmt} \ln K_{Xt} + \frac{1}{2} \sum_{i=1}^Q \sum_{j=1}^Q \gamma_{ij} \ln w_{it} \ln w_{jt} \\
& + \sum_{i=1}^Q \sum_{m=1}^O \eta_{im} \ln w_{it} \ln Y_{Xnt} \\
& + \sum_{i=1}^Q \eta_{iK} \ln w_{it} \ln K_{Xt}
\end{aligned} \tag{Eqn (3.4)}$$

$$\sum_{i=1}^Q \alpha_i = 1 \tag{Eqn (3.5)}$$

$$\sum_{i=1}^Q \gamma_{ij} = \sum_{j=1}^Q \gamma_{ij} = 0 \tag{Eqn (3.6)}$$

Where  $C_{Xt}$  is the cost function,  $X$  is the industry,  $t$  is time,  $Y$  is the output,  $K$  is the capital,  $w$  is wage,  $Q$  is labor types,  $O$  is a series of cost shifting variables.

This expression  $(\sum_{p=1}^P \sum_{i=1}^Q \eta_{ip} \ln w_{it} \ln OSS_{pXt})$  accounts for outsourcing, and it is added to the equation 3.4 to since this study examines the influence of service outsourcing ( $OSS_{pXt}$ ) on demand for experienced workers in the U.S. manufacturing industries. The null hypothesis is services outsourcing do not reduce unemployment in the manufacturing industries while the alternative hypothesis is services outsourcing reduces unemployment.

$$\Phi_{Xit} = \alpha_i + \eta_i \ln Y_{Xt} + \eta_K \ln K_{Xt} + \sum_{p=1}^P \eta_{is} \text{OSS}_{pXt} \quad \text{Eqn (3.7)}$$

After taking the cost function's first derivative with respect to  $\ln w_i$ ,  $\Phi_{Xit}$  and equation 3.7 was obtained. It is possible to drop the wage term from this equation because Feenstra and Hanson (2004) in their study points out that cross industry change in wages gives small helpful information when combining data across industries.

Following the empirical studies and results from the literature review, Amiti and Wei (2005, 2006), and Feenstra and Hanson (1996, 2005) constructed the outsourcing variable through the following equation:

$$\alpha_{pXt} = \frac{\text{purchase of services } P \text{ by } X}{\text{total nonenergy inputs used by } X} \quad \text{Eqn (3.8)}$$

$$\beta_{Pt} = \frac{\text{import of services } S}{\text{Shipments}_P + \text{imports}_P - \text{exports}_P} \quad \text{Eqn (3.9)}$$

$$\text{OSS}_{pXt} = \alpha_{pXt} * \beta_{Pt} \quad \text{Eqn (3.10)}$$

Where  $\alpha_{pXt}$  is the amount of intermediate service input  $P$  is used in industry  $X$  as a share of total industry inputs,  $\beta_{Pt}$  is the economy-wide import share of intermediate service input  $P$ , and  $\text{OSS}_{pXt}$  is the product of these two ( $\alpha_{pXt} * \beta_{Pt}$ ) taken to determine inputs  $P$  used by industry  $X$  are imported.

$$\Theta_{Xit} = \eta_i \ln Y_{Xt} + \eta_{iK} \ln K_{Xt} + \sum_{p=1}^P \eta_{ip} \text{OSS}_{pXt} + \lambda_X \text{IND}_X + \tau_t + v_t \quad \text{Eqn (3.11)}$$

A dummy variable ( $IND_x$ ) is added to capture qualitative differences among industries in equation 3.11 which can now be used to estimate the effect of service outsourcing in the U.S. manufacturing industries. The Feasible Generalized Least Squares approach will be used to remove any sign of serial correlation within each panel or heteroscedasticity across panels.

### 3.4. SOURCES AND DESCRIPTION OF THE DATA

The field of this study will be narrowed down to two sector (manufacturing and service), and two factors of production (capital, and skilled labor). Regions to be considered will be the U.S. and India.

The data come from a variety of different sources. The Indian labor data, capital formation, GDP, and Service data are gotten from the World Bank database for the period 1975 to 2014.

The U.S. wages, and capital stock data are from the Annual Survey of Manufacturers (ASM) database, and value added data for the period 2006 to 2013 is from Bureau of Labor Statistics (BLS). The 27 U.S. manufacturing industries at the three and four digit NAICS aggregate level from the period of 2006-2013 are considered and the services trade used to calculate the outsourcing intensities are from the IMF's Balance of Payment Statistics (2014). The Intermediate input use data for equation 3.8 are gotten from the input-output tables put together by Bureau of Labor Statistics (2014).

The table below shows the average of service outsourcing intensities for manufacturing industries by different service type from the period of 2006-2013. It can be seen that there is much variation between these services. The last column of the table

shows the total average of all the five services type, ranging from 0.308 for Financial Services to 4.573 for Other Business Services. These figures mean that Financial Services outsourcing imported into the U.S. are on average of 30.8% of the manufacturing industries' variable cost, while Other Business Services are 457.3 % of the cost.

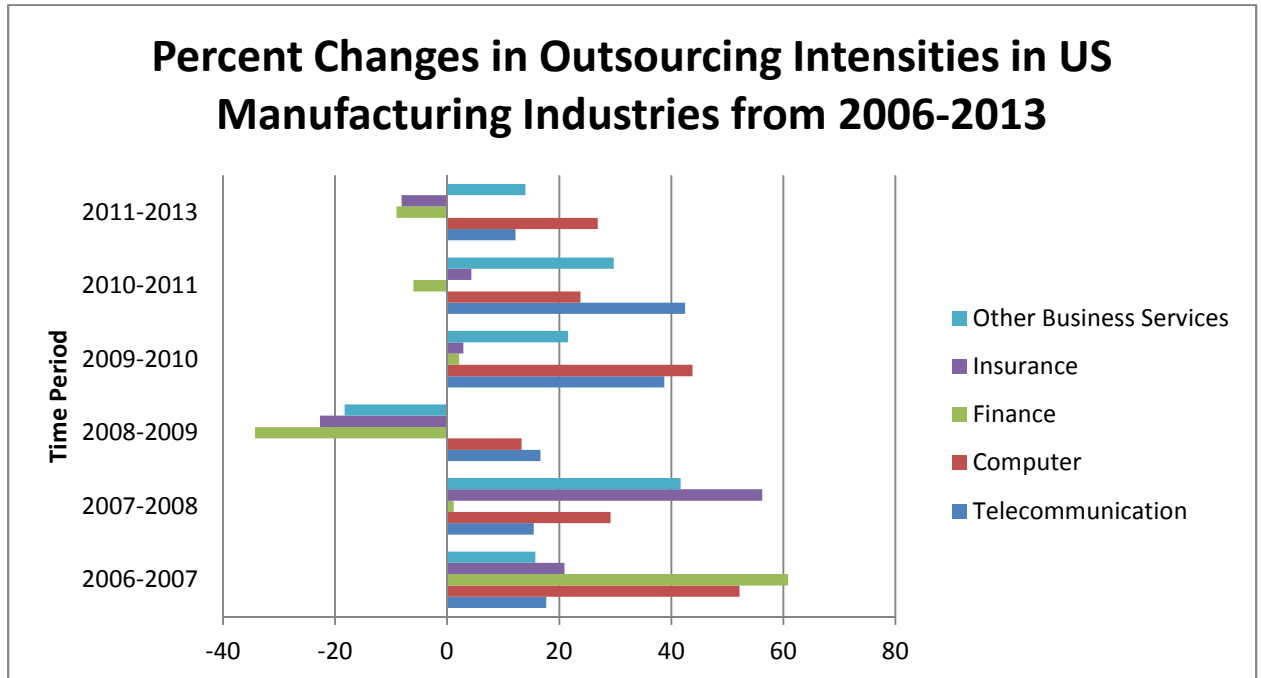
Table 3.1: Average Service Outsourcing intensities for the U.S. Manufacturing industries by Different Service Type

Year	Finance	Insurance	Computer	Telecommunications	Other Business Services
2006	0.258	0.306	0.230	0.804	2.836
2007	0.415	0.370	0.350	0.946	3.282
2008	0.420	0.578	0.452	1.092	4.650
2009	0.276	0.447	0.512	1.274	3.800
2010	0.282	0.460	0.736	1.768	4.619
2011	0.265	0.480	0.911	2.519	5.993
2013	0.241	0.441	1.156	2.827	6.829
<b>Average</b>	0.308	0.440	0.621	1.604	4.573

Source: IMF (2014), Balance of Payments Statistical Yearbook and BLS, Input-Output Tables (2014)



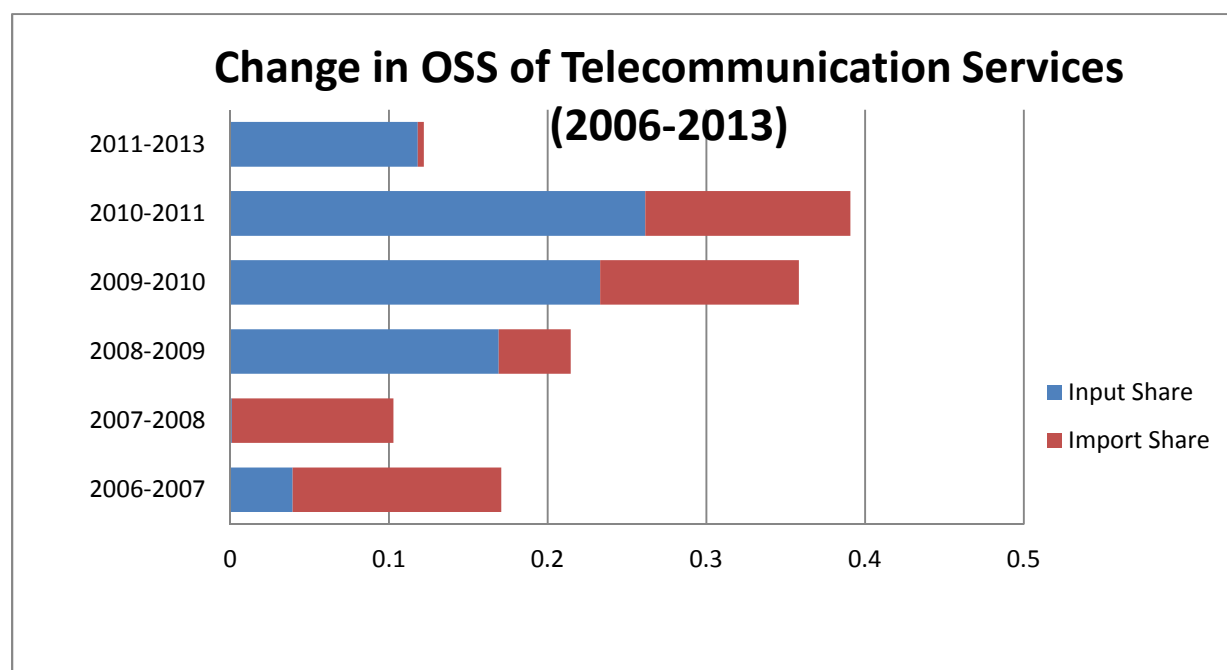
Figure 3.2 Percent Changes in Outsourcing Intensities in U.S. Manufacturing Industries  
from 2006-2013



Source: IMF (2014), Balance of Payments Statistical Yearbook and BLS, Input-Output Tables (2014)

Figure 3.2 above shows the percent changes in outsourcing intensities in the U.S. manufacturing industries from year 2006-2013. It can be seen that telecommunications, computer and information, and other business services increases every year except for finance and insurance which has been going back and forth over the years.

Figure 3.3 Change in Outsourcing Intensities of Service (OSS) of  
Telecommunication Services from 2006-2013

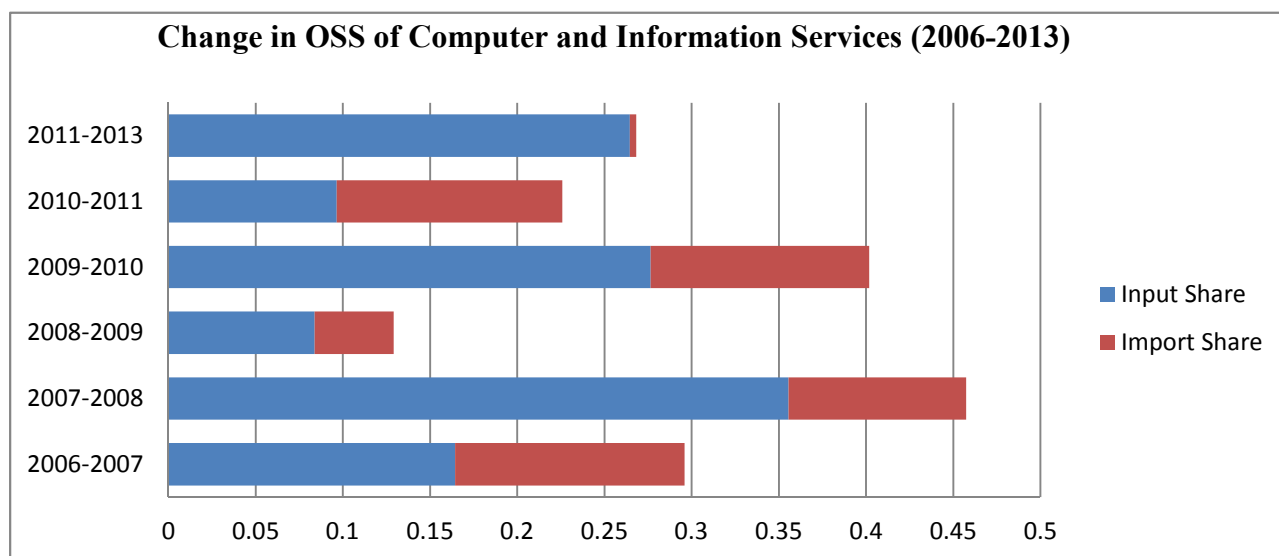


Source: IMF (2014), Balance of Payments Statistical Yearbook and BLS, Input-Output Tables (2014)

Figure 3.3 shows the contributions from changes in input share and changes in import shares into the change in outsourcing intensities of telecommunication. It can be seen that increase in the outsourcing intensities of telecommunication services from 2008-2011 is mostly because of the positive contribution of input shares. However, from 2011-2013, the decline in this outsourcing intensities is due to the negative or little contribution of the import shares and decreasing input shares.

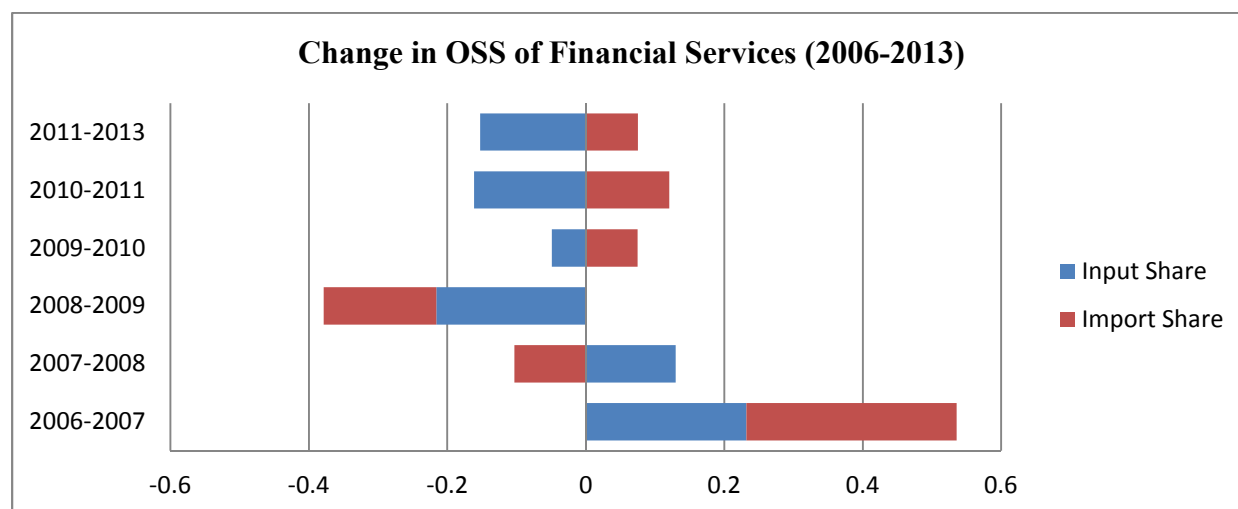
For computer and information (figure 3.4), the decline is due to low contribution of import share from 2011-2013. The input shares contributed mostly to this outsourcing intensities over the years while import shares has been decreasing.

Figure 3.4 Change in OSS of Computer and Information Services form 2006-2013



Source: IMF (2014), Balance of Payments Statistical Yearbook and BLS, Input-Output Tables (2014)

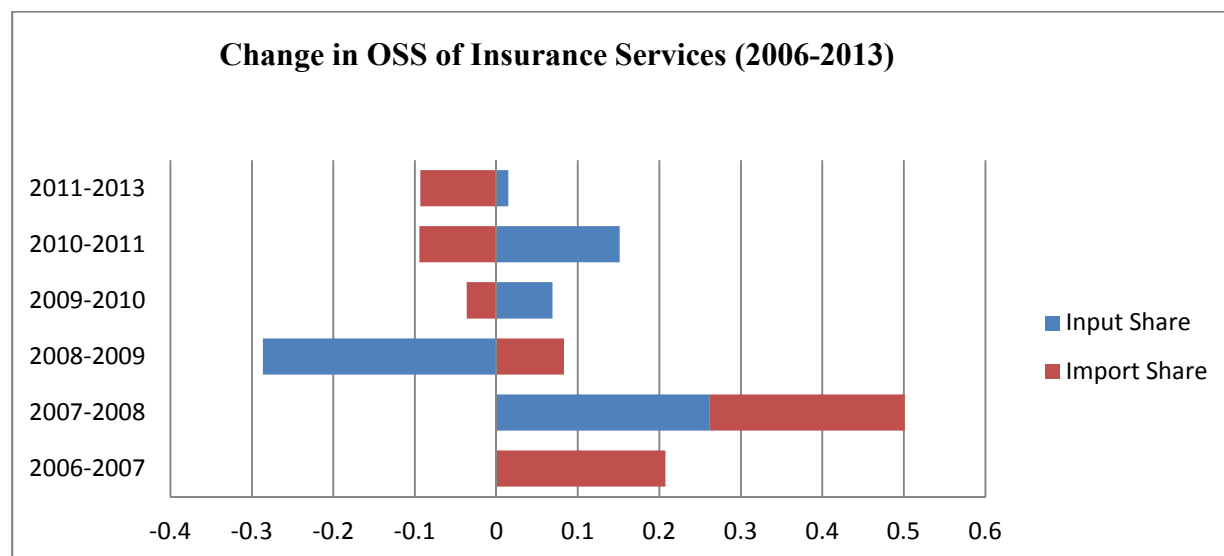
Figure 3.5 Change in OSS of Financial Services from 2006-2013



Source: IMF (2014), Balance of Payments Statistical Yearbook and BLS, Input-Output Tables (2014)

The fluctuation in the change in outsourcing of financial services (figure 3.5) is mostly as a result of negative contribution of input shares and low contribution of the import shares over the years.

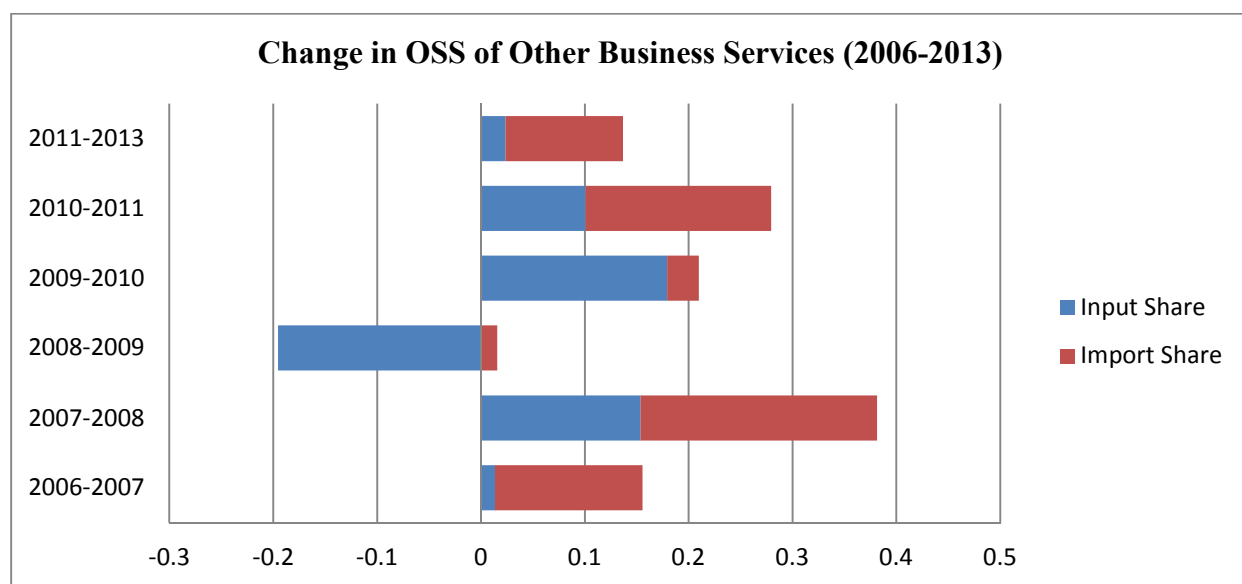
Figure 3.6 Change in OSS of Insurance Services from 2006-2013



Source: IMF (2014), Balance of Payments Statistical Yearbook and BLS, Input-Output Tables (2014)

The decrease in change in outsourcing of insurance services (figure 3.6) is due to the negative contribution of import shares from 2009-2013. From 2006-2008, import share of insurance has a positive impact on manufacturing industries.

Figure 3.7 Change in OSS of other Business Services from 2006-2013



Source: IMF (2014), Balance of Payments Statistical Yearbook and BLS, Input-Output Tables (2014)

The decrease in the figure 3.7 is as a result of negative and little contribution of the input share over the years.

## CHAPTER 4: DATA ANALYSIS

For India, two different estimates were made. The first estimation dependent variable is GDP and the independent variables are capital, labor, unemployment, and service export. The second set of estimation is employment as dependent variable and the independent variables are capital, labor, GDP, and service export. These estimations will be estimated into equation 3.4 and are done differently to clearly analyze the effect of service export on GDP, and unemployment. Also, Breusch-Pagan/Cook-Weisberg Test for Heteroskedasticity will be conducted, and if there seems to be evidence of heteroskedasticity in any of these variables, they would be corrected for by conducting white test standard errors,

For the United States, the telecommunication services, computer and information services, financial services, insurance services, and other business are the independent variables and were estimated into equation 3.11 at three and four digit levels of data aggregation. Following Ahmed (2008), the dependent variable is wages-a proxy for skilled labor was estimated against the independent variables at three and four digit NAICS level. This estimation will enable us to examine how employment has changed by industry, and the impact outsourcing of these services has on employment in these industries.

### 4.1 DATA ANALYSIS FOR INDIA

The tables below show the OLS regression analysis of Indian Gross Domestic Product and unemployment.

Table 4.1 OLS Estimation Results for GDP

Independent Variables	Estimates Dependent Variable-GDP	Standard Errors
InK	0.38* (1.64)	0.08
InL	0.53** (2.10)	0.25
Services export	0.29*** (3.63)	0.06
Unemployment	-1.22** (-2.56)	0.48
Number of observation	40	
R-Squared	0.97	
Prob > F	0.000	

\*P<0.1, \*\*P<0.05, \*\*\*P<0.01

Source: Author's Result

Note: K=Capital, L=Labor, and T test in parentheses.

It can be seen from the table 4.1 above that all other variables were positive and significant except for unemployment. For every unit increase in capital, labor, and services export will lead to a 0.38, 0.53, and 0.29-unit increase in GDP respectively holding all other variables constant (from year 1975-2014). For unemployment, it is

statistically significant and negative. This means for every unit decrease in unemployment will increase GDP by 1.22.

Table 4.2 Unemployment Regression Results for India (with White's Correction for Heteroskedasticity)

Independent Variables	Estimates Dependent Variable-GDP	Standard Errors
InK	0.10* (1.57)	0.067
InL	0.44*** (12.22)	0.036
Services export	-0.02 (-0.58)	0.025
GDP	-0.13*** (-3.24)	0.039
Number of observation	40	
R-Squared	0.98	
Prob > F	0.000	

\*P<0.1, \*\*P<0.05, \*\*\*P<0.01

Source: Author's Result

Note: L=Labor, K=Capital, and T test in parentheses.

It can be seen from the table 4.2 above that capital, and labor are positive and significant. This means for every unit increase in unemployment will increase capital and



labor by 0.10, and 0.44 respectively holding all other variables constant (from year 1975-2014). The intuition here is that as unemployment increases in India, Indian government or policy makers invests more in fixed assets to enable rapid economic growth because investment increases future production capacity. An increase in wages will cause workers turnover along with some other expenses such as hiring and training new workers to decrease, and also, highly paid workers increase productivity. As for services export, it is positive and insignificant. GDP is negative and statistical significant which means as GDP increases in India, unemployment reduces by 0.13.

Conclusively, following that these services were positive and significant at 99% confidence level. According to Juan M.Sanchez and Constanza Liborio (2012), an increase in GDP by two percent will decrease unemployment by one percent. Increase in economic growth means more people are in the labor force and working longer hours. It can be said that outsourcing of these services have helped increase the growth rate and also reduced unemployment in India.

#### 4.2 DATA ANALYSIS FOR THE U.S.

It can be seen from table 4.3 that there is evidence of serial correlation in the regression analysis, so we can't accept the null hypothesis of no first-order autocorrelation because the p-value is 0.04% which is less than 5%. So serial correlation was corrected by for by using Feasible Generalized Least Squares (FGLS) which also corrects heteroskedasticity if found within each panel.

The table below shows the estimation result of NAICS at three and four-digit level. Where lwages is the wages of employees in the manufacturing industries,

$lvalueadded$  is the value added for the U.S. manufacturing industries, and  $lcapitalstock$  is the capital stock of manufacturing industries.

For value added as seen in the table 4.4 below is significant and positive, so for a unit increase in value added, a 0.89-unit increase in skilled labor is predicted holding all other variables constant. Value added has a positive effect on the relative demand for skilled labor.

Capital was significant and positive which means as production in these manufacturing industries increases, skilled workers' share of variable cost increases by 23 percent. For example, as industries increases in size, wages and the demand for skilled workers also increases.

The estimates for the outsourcing intensities of telecommunication, and financial services are positive and significant, which means for a unit increase in these outsourcing intensities will cause the for demand skilled workers in the manufacturing industries to increase by 0.04, and 0.04 respectively. The implication of this is that increased import of these services increases demand for skilled workers in manufacturing industries.

The outsourcing intensities of computer and information services was negative and significant. This means for every unit increase in Computer and Information services, will reduce the demand for skilled workers in the U.S. manufacturing industries by 0.07.

The estimate for the outsourcing of Other Business Services is negative and insignificant, and outsourcing of insurance services is also insignificant but positive. These five services imported are not significant enough in explaining changes in employment in the United States manufacturing industries.

Table 4.3 Wooldridge Test for Autocorrelation in Panel Data

H0	no first-order autocorrelation
F( 1, 26)	16.497
Prob > F	0.0004

Source: Author's Result

Table 4.4 Regression Results for Wages in the U.S. Labor Market (2006-2013)

Independent Variables	Estimates Dependent Variable-Wages	Standard Errors
InY	0.83*** (38.24)	0.022
InK	0.23*** (11.29)	0.021
OSStelecomm	0.04*** (5.79)	0.006
OSScomp	-0.07*** (-10.78)	0.006
OSSfin	0.04*** (5.62)	0.006
OSSins	0.003 (0.60)	0.004
OSSobs	-0.001 (-0.15)	0.009
Number of Observation	189	
Number of Group	27	
Wald Chi 2 (7)	18674.80	
Prob > Chi 2	0.0000	

\*P&lt;0.1, \*\*P&lt;0.05, \*\*\*P&lt;0.01

Source: Author's Result

Note: telecomm= Telecommunications, ins= Insurance, fin= Finance, comp= Computer and information, obs= Other Business Services. T test in parentheses.

In conclusion, outsourcing of these services plays a small role in the U.S. manufacturing industries following the results in table 4.4. Outsourcing of these services except for computer and information services has brought positive pressure on the relative demand for experienced workers. Therefore, outsourcing is not entirely to be blame for job loss in the U.S. These job losses can also be attributed to other factors such as an increase in geographical labor.

## CHAPTER 5: CONCLUSION AND FUTURE WORK

This study presents the evidence describing the impact of outsourcing on Indian and the U.S. economy. The results from my analysis for India suggests that the Indian economy has gained a lot from outsourcing which has helped increase economic growth and reduce unemployment in India.

To check if service outsourcing has been an important determinant in the decline for skilled labor in the U.S. manufacturing industries, I used panel data from a period of 2006-2013 using five service independent variables (Insurance, Computer and Information, Telecommunication, Finance, and Other Business Services), Capital Stock, and Value Added. The study finds that outsourcing of these services have a small effect on job losses in the U.S. manufacturing industries.

### 5.1 INDIA

Firstly, outsourcing has been a topic of discussion for a long period of time, whether its main aim is to benefit from cheap labor or just to gain access to outside expertise and effectiveness of renowned companies. Whatever the reason may be, someone loses a job and someone else gets the job either within the country or sometimes overseas, this might be as a result of smaller or lower pay. This time the lucky country to have the job is India. Based on the significant results from chapter 4 from table 4.1, and 4.2, outsourcing of services in India is growing on a healthy rate, and also, it has a positive impact on the nations' economic growth and development. Increased export of these services over the years has created jobs. As export of these services expands, it

requires more workers in the service industry; therefore, more people are in the labor-force as a result of the increased export of these services.

Secondly, India has gained a lot from outsourcing, from its creation of job to improving the standard of living of Indians. A stronger economy in India has emerged due to the growth in outsourcing; the Indian government is providing all the support it can, i.e. lower interest rates and fewer foreign exchange restrictions to help move the outsourcing industry to the next level which will have a positive impact on the nation as a whole.

Finally, Indian organizations have become increasingly modernized with morals brought from western world (the U.S. and Europe), the inequalities in genders have been affected and tendencies of individualism are evident, and power distance is declining (Baumanis and McGee, 2008). From the economic perspective, I think these changes are good for India in the long run even if it causes rifts in societies and between families. If the rift in society is the price to pay for the benefit of globalization, then it's worth it because India will gain more and lose less in the long run.

## 5.2 THE UNITED STATES

As stated earlier, there is great concern for outsourcing and its impact on the U.S. employment. A process that started as a reasonable way of shipping some jobs overseas in order to gain specialized expertise and have access to cheap labor. But Americans believe it's putting them out of jobs (long-term structural unemployment).

Outsourcing of services is a mere expansion of the tale of exchanging and specializing which has been in practice ever since a rancher and farmer chose to

exchange a gallon of milk for a bushel of corn every last day of the week, whether it is being practice within in a village, state, country or overseas. The only difference now is companies are taking advantage of the economies of scale at the dawn of this industrial era (Pearlstein, 2012).

The results from the regression from chapter 4 in table 4.4 prove that outsourcing has not had a large impact on the U.S. labor market because five services that are examined are very small percentages of the manufacturing industries' total inputs. So the changes in the relative demand for experienced workers that can be associated to outsourcing of these services are very small, which doesn't explain the large decrease in manufacturing industries from 2006-2013.

In support of the regression analysis, some of the world's most successful and biggest companies today have been outsourcing some of their business processes. Companies like Adidas, which outsources most of its production from other countries so it can focus on other projects, IBM in information technology, UPS and FedEx, and finally, some of the computers we use today gets their hardware manufactured abroad and are being sent to the U.S. to be coupled together. When you put all these into consideration, the pleasure and benefits consumers, and the nation as a whole is deriving from it, I come to the conclusion that outsourcing is not as damaging as the media makes it look.

Over the years, there have been a large amount of studies that outsourcing has been creating jobs for the U.S. mainly because when jobs are being shipped abroad, it will open more doors for job creation domestically. For instance, for big scale companies

that depends on export for expansion, moving part of their processes overseas still creates a lot of new jobs in design, engineering, marketing, and finance. But for the small and medium size companies, they move work overseas to gain access to cheap labor in order to remain competitive, which helps save the jobs left in the U.S.

In addition to the above discussion, geographical labor is also another factor to consider because a rise in the labor mobility can lead to an increase in labor supply and unemployment rate, following that if more workers are available than employment, then residents of the U.S. will be without jobs.

Conclusively, the theoretical argument is in favor of moving work overseas is the theory of absolute advantage (specialization and exchange). To answer the last research question if outsourcing is good for both importing and exporting countries, based on the results from the regression analysis in chapter 4, both countries (the U.S. and India) involved gain from outsourcing. Once a country (the U.S. or India) starts importing services from different countries, these different countries will use their extra earnings to purchase the same quantity of services from that country (the U.S. or India). Exporting services from a country helps reduce unemployment of the exporting country and the income or revenue made from these activities can be used for other aspect in the country which helps boost the economy of that country. And finally, as incomes in India rise, demand for the U.S. exports also rises.

### 5.3 FUTURE WORK/ RESEARCH AGENDA

The previous chapters talked about how the export oriented sector has dominated India, and how the Indian government has spent and gained a lot from this sector. Future



iteration of this study seeks to address other sectors (such as agricultural, manufacturing sector) in India. Whether it's being abandoned, how much have India as a nation lost from other sectors since attention has moved away from these sectors and moved towards export oriented sector. For example, are the youths still in or willing to work the agricultural sector?

As for the United States, in the literature review, I discussed the amount of work which will be outsourceable or tradable in the nearest future. For further discussion, I will look at the group of occupation which will be potentially offshorable in the nearest future as technology advances, and how increased geographical mobility affects employment.

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## APPENDIX

## FOR INDIA

Table A- Breusch-Pagan/Cook-Weisberg Test for Heteroskedasticity

Ho: Ho	Constant variance
Variables	Capital, Labor, Service export, and Unemployment
Chi2 (4)	1.01
Prob > chi 2	0.9080

Source: Author's Result

Table B- OLS Estimation Results for Unemployment

Independent Variables	Estimates Dependent Variable-GDP	Standard Errors
InK	0.10 (1.36)	0.067
InL	0.44*** (9.63)	0.036
Services export	-0.02 (-0.48)	0.025
GDP	-0.13** (-2.56)	0.039
Number of observation	40	
R-Squared	0.98	
Prob > F	0.000	

\*P&lt;0.1, \*\*P&lt;0.05, \*\*\*P&lt;0.01

Source: Author's Result

Table C- Breusch-Pagan/Cook-Weisberg Test for Heteroskedasticity (Unemployment)

Ho: Ho	Constant variance
Variables	Capital, Labor, Service export, and GDP
Chi2 (4)	16.51
Prob > chi 2	0.0024

Source: Author's Result

It can be seen from Table C that there is evidence of heteroskedasticity in the regression analysis, so we can't accept the null hypothesis of constant variance because the p-value is 0.24% which is less than 5%. So heteroskedasticity was corrected for by using White test (an estimator for heteroskedasticity consistent standard errors).

## FOR UNITED STATES

Table D- Fixed Effect Estimation Results of U.S. Manufacturing Industries

(2006-2013)

Dependent variable-	Coefficient	Standard	t	P> t	[95% Confidence	
lwages		Error			Interval]	
lvalueadded	0.37	0.053	6.88	0.000	0.26	0.47
lcapitalstocks	0.20	0.028	8.86	0.000	0.16	0.25
ltelecommunications	-0.0031	0.036	-0.09	0.932	-0.07	0.068
linsurance	-0.03	0.018	-1.61	0.110	-0.07	0.01
lotherbusiness	-0.01	0.034	-0.25	0.804	-0.08	0.06
lcomputer	-0.04	0.024	-1.25	0.131	-0.09	0.01
lfinance	0.07	0.022	3.10	0.002	0.02	0.11

Source: Author's Result

Number of observation = 189, Number of groups = 27

F (7, 155) = 44.72, Prob &gt; F = 0.0000

R-squared: within = 0.6688, between = 0.6316, overall = 0.6315

The results here show that outsourcing of telecommunication and other business services are not significant in explaining the decline or increase in employment in the United States manufacturing industries. As for outsourcing financial services, they are positive and significant which means for a unit increase in these services will lead to 0.07 increase in employment in the U.S manufacturing industries. Outsourcing of insurance and computer services were found positive and significant at 95% confidence interval which means for a unit increase in these service will lead to 0.03, and 0.04 decrease in the relative demand for experienced workers in the U.S. manufacturing industries holding all other variables constant. In absence of serial correlation this result is unbiased and



efficient but according to table 4.3 Woolridge test for serial correlation shows that there is autocorrelation within each panel. Therefore, the result is inefficient but still unbiased.

Table E- Mapping Services in the Input-Output Table

Service Type	BLS Sector Code
Telecommunications	111, 112, 113
Computer and Information	114, 130
Finance	116, 117, 120
Insurance	118, 119
Other Business Services	170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181