

New Debates Over Service Outsourcing to China and India*

Kwok Tong SOO**
Lancaster University

Abstract. This paper surveys recent literature on service outsourcing from developed to less developed countries, focusing on the debate initiated by Paul Samuelson's 2004 *Journal of Economic Perspectives*' paper, and exploring both the theoretical literature and empirical evidence. We find that, while the theoretical literature and the public discourse are fraught with controversy, the empirical evidence is very clear: service outsourcing is (still) not a very large part of any country's economy, and appears to yield net gains to those countries that participate in it.

1. Introduction

In the 2004 US Presidential election, one of the election issues was the impact of service outsourcing on the US economy, especially on US jobs. The incumbent administration's view, as exemplified by Mankiw *et al.* (2004), was that outsourcing is a part of international trade, and that there are gains to the US of engaging in this form of trade. The challenger, John Kerry, took the opposite view, that this new phenomenon of service outsourcing has cost many US jobs, as firms closed down customer service centres in the US, and bought these services from firms located in developing countries such as India.

Service outsourcing was never the main determinant of the outcome of the election. Nevertheless, this debate between Bush and Kerry in large part mirrors the recent debate among economists on the impact of service outsourcing from developed to less developed countries. The objective of this paper is to evaluate this debate, first from a theoretical perspective, then from an empirical one.

Our main focus is on the recent debate initiated by Paul Samuelson's (2004) *Journal of Economic Perspectives*' paper. We therefore exclude large segments of the literature, which we note in passing here. Much of the literature on outsourcing has emphasised the fact that it involves a fragmentation of the production process. This in turn has been addressed from several different perspectives. Deardorff (2001; 2005), Jones (2000), and Jones and Kierzkowski (2005), among others, focus on the implications of technology which enable previously unified production processes, to be divided into different segments. Markusen (2002) develops models of imperfect competition which seek to capture observed patterns of multinationals' activities. Work by Antras (2003), Antras and Helpman (2004), Grossman and Helpman (2002; 2005), on the other hand, focuses on contract incompleteness as the motivation for firms to engage in FDI as opposed to outsourcing. Much of this literature is

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**Department of Economics, Management School, Lancaster University, Lancaster, LA1 4YX, United Kingdom.
Email: k.soo@lancaster.ac.uk

covered in the excellent book by Barba-Navaretti and Venables (2004).

There are other aspects of service outsourcing which we do not address here. Balasubramanyam (2005) puts the spotlight on the impact of service outsourcing on the host country, while Banga (2005) deals with the conceptual issues of services trade, including the definition of services trade and barriers to such trade.

2. Theory

The theoretical literature separates quite naturally into papers which focus on growth in China and India, and those which focus on outsourcing as the phenomenon of trading a previously nontraded service. We first discuss the former, then the latter, although it will be apparent that the second definition may also be interpreted as a form of technical progress, albeit in the importing country (i.e. the US).

2.1. Growth in China and India

The recent debates over outsourcing arose from a *Journal of Economic Perspectives* paper by Paul Samuelson in 2004 (although the basic argument was in Samuelson's earlier (2001) *Journal of Economic Literature* paper). Samuelson's objective in this paper was to show that it is possible to derive a theoretical model which shows potential losses from outsourcing. To do so, he set up a simple model, the implications of which are however much more general than the specific example which he develops. The model is as follows.

Suppose that we have an economy that is perfectly competitive in all sectors. This economy is divided into two countries, China and the US, and two goods, 1 and 2. Labour is the only factor of production, and the production function exhibits constant returns to scale, so that the model is the basic Ricardian model. The US is overall 10 times more productive than China, but more than 10 times more productive in good 1, and less than 10 times more productive in good 2. It is immediate that China therefore has a comparative advantage in good 2 relative to the US; in free trade, we would expect China to specialise in and export good 2 to the US, in exchange for imports of good 1 from the US. Then, relative demands and the relative sizes of the two countries will determine world relative prices for the two goods, resulting in either China or the US or both countries gaining from this trade as a result of expanded consumption possibilities.

Next, Samuelson considers technological improvement in China, in either one of the two goods. In Case 1, China's productivity in its comparative advantage good 2 increases. As a result of this change, the US unambiguously gains; world relative supply of good 2 will increase, leading to lower relative prices of this good and an improvement in US terms of trade. China also gains from this change, as higher productivity increases the wage rate that can be paid to workers while satisfying the zero profit assumption of perfect competition.

In Samuelson's Case 2, China's productivity in the US' comparative advantage good 1 increases. Samuelson's punchline is the following: if this improvement in China's productivity in good 1 is sufficient to reduce some of US output of good 1, then the US can lose from this change. The idea underlying this result is straightforward. In the simple Ricardian framework here, gains from trade arise from differences between free trade prices and autarkic prices. If China's productivity gain is such that US output of good 1 is reduced, this implies that the two countries have identical relative productivity in both sectors, so that

world relative prices are equal to autarkic relative prices in both countries, and hence that neither country gains from trade (China, of course, still gains from this change, because of its productivity improvement).

Well aware that criticism may be levelled at his simple framework, Samuelson (2004) includes in an appendix to his paper a more detailed model, with three goods but the same Ricardian framework and employing the same coincidence of relative opportunity costs to generate his result. The key insight of his paper was therefore somewhat obscured. In fact, Samuelson's paper is essentially one of relative supplies of different factor inputs in the world economy. One can develop a general model of trade with many goods and factors, that essentially gives the same result: that growth in China in the US's comparative advantage good(s), may lead to losses to the US. The reasoning is simply that such growth will raise world relative supply of these goods, hence reducing their relative prices, and thus harming US factors of production.

From this discussion it is clear that the thrust of Samuelson's argument is not that trade can be harmful to the US; indeed, in his model the US can never be worse off as a result of trade than it would be under autarky.¹ Samuelson's key point is that growth in China, if it occurs in industries which the US currently has a comparative advantage, may result in a reduced gain from trade; in the extreme case which he presents in his paper, the gains from trade are completely eliminated, and the US is no better under free trade than it would be under autarky. But his result, even in the simple setup which he chooses, is much more general than that; even without complete equality of relative opportunity costs between China and the US, the US will still experience a decreased gain from trade, because the gap in relative opportunity costs between the two countries has decreased.²

Recently two papers have appeared addressing the implications of economic growth in China on US welfare; this, as noted above, is the primary thrust of Samuelson's (2004) paper. The first paper, by Jones and Ruffin (2005), is very similar to Samuelson (2004) in its basic setup, but some of their results are not. Like Samuelson, they develop a simple Ricardian model of international trade with perfectly competitive markets, two countries, two goods, and one factor of production. Of the two countries, Home initially has an absolute advantage in both goods, but a comparative advantage in good 1. Under free trade, it is straightforward to see that there are the standard gains from trade through comparative advantage.

Next, Jones and Ruffin consider the effects of technology transfer from Home to Foreign. A technology transfer in the good that Home has a comparative disadvantage in, leads to even greater gains from trade for both countries, as Foreign becomes more productive in the good which it had the initial comparative advantage in. On the other hand, a transfer of all Home technology to Foreign, would make the two countries identical in terms of their opportunity costs, and thus wipe out the initial gains from trade to Home.

More interesting is the third case which Jones and Ruffin consider, which is technology transfer from Home to Foreign of the good which Home has the initial comparative

¹ This point has been forcefully noted by Dixit and Grossman (2005) and by Panagariya (2005).

² The free trade terms-of-trade must lie between the opportunity costs of the two trading partners. The smaller the gap between the two trading partners in their opportunity costs, *ceteris paribus*, the smaller will be the gains from trade in this setup.

advantage in. Because Home initially had an absolute advantage in both goods, this form of technology transfer reverses the comparative advantage of the two countries. Foreign now has a comparative advantage in producing good 1 and therefore will export good 1 in free trade, while Home will now export good 2. Jones and Ruffin (2005) show that we can obtain values for the labour productivity in each sector such that Home gains relative to the initial free trade position from this transfer of technology to Foreign, even if it does not get compensated for the transfer.

Intuitively, this is the same as a three-country model in which Country 1 initially trades with Country 2 but not with Country 3, then decides to stop trading with Country 2 and instead trade with Country 3. Does Country 1 gain from this change? Whether or not it does, will depend on the relative opportunity costs and the sizes of each of these three economies. One additional insight which Jones and Ruffin note, is that whilst it is possible for both countries to gain from such a technology transfer, it is likely that Foreign gains more than Home does. This raises the issue of whether countries would experience a loss of welfare if the relative gap in income levels between the two countries decreases; this seems to be part of the explanation for the recent US fears about economic growth in China and, more recently, India. However, what Jones and Ruffin (2005) do not take into account, is that when the pattern of comparative advantage changes in their model, countries move from being completely specialised in one industry, to being completely specialised in the other industry. The adjustment costs involved in this process are likely to be large in reality, and may outweigh the additional gains from the new pattern of comparative advantage.

The other paper that has recently appeared on trade and growth in China and India is Soo (2005). He develops a three-country model which includes elements of factor endowment differences across countries, Hicks-neutral technology differences, non homothetic preferences, and an increasing returns framework. The main thrust of the paper is to consider how general are the results of Samuelson (2004). He finds that in his framework, there are two additional channels through which changes in a country's trade partners can influence a country; these channels operate through the assumptions of non homothetic preferences and love-for-variety.

First, consider non homothetic preferences. Suppose that there are two factors of production, skilled and unskilled labour. High-wage, skilled labour is used in producing goods which have a high income-elasticity of demand, while low-wage, unskilled labour is used in producing goods which have a low income-elasticity of demand. Then the US, being relatively abundant in high-skill workers, will have a higher per-capita income than China and India, and hence will demand relatively more of the goods in which it has a comparative advantage. This leads to a home bias in demand,³ which insulates the US from adverse effects of any changes that happen in its trading partners.

Similarly, love-for-variety provides an additional source of gains from trade. As a country's trade partners grow, there will not only be expanded supply of goods available for consumption, but also expanded variety. This expanded variety leads to an increase in consumer utility, dampening any negative terms-of-trade effects of partner-country

³ Chung (2003) shows that the presence of non homothetic preferences also reduces the volume of trade relative to the case of homothetic preferences.

growth.

2.2 *Outsourcing of Previously Nontraded Services*

The three papers in the previous subsection have as their main focus the impact of growth of the less developed countries on the developed countries. Panagariya (2004) points out that, while this is an interesting question, it does not address directly the question of outsourcing. This is not really a problem for Jones and Ruffin (2005) or Soo (2005), whose main focus was on technology transfer and growth and welfare, respectively, but is problematic for Samuelson (2004), as its objective was to address the issue of outsourcing. Panagariya's (2004) basic point is that the recent phenomenon of service outsourcing represents trade in previously nontraded products. Therefore, the correct way to analyse the effect of outsourcing, is to consider a change from a situation of no trade in a service, to one in which trade is allowed in this service.

Nevertheless, one may still ask what will happen to the US if China and India become more efficient at producing outsourced services. Panagariya (2004) points out that this is an example of Samuelson's first case, where China becomes more productive in the good in which it initially exports. Samuelson's second case, where China becomes more productive in the US' comparative advantage industry, would be if China were to enter the market for commercial aircraft. In this case, Panagariya does not dispute that the US may lose from such a change, but equally, such a change does not constitute outsourcing.

In a related work, Bhagwati *et al.* (2004) develop a series of simple models which show the impact of outsourcing, defined as allowing for trade in a previously nontraded service. In Model 1, there is a single final good, two factors of production (capital and labour), and a small open economy. Here, outsourcing is equivalent to importing low-wage labour from the rest of the world. This leads to gains to the importing country overall, with the gains being distributed as a loss to the country's workers and an even bigger gain to its capital owners.

Model 2 is a two-good, three-factor specific factors model, with unskilled labour and capital being the two sector-specific factors, and skilled labour being the mobile factor. Outsourcing is equivalent to importing low-wage skilled labour. If the terms of trade are fixed, this leads to overall gains for the country, with gains to unskilled labour and capital, and a loss to skilled workers. But if the country is large, there may be adverse terms of trade effects if outsourcing expands the relative supply of the country's exports, so that the net welfare effect is ambiguous.⁴

Finally, model 3 is a three-good, two-factor model, in which one of the goods is an initially nontraded service. Now, allowing for low-cost imports in this service sector will reduce the price of this service, and hence raise the real income of all agents in the economy once they have adjusted to this change.

Bhagwati *et al.* (2004) next consider the implications of skill accumulation abroad, as has clearly been happening in China and India. In each of their models, this change enhances the initial impact of outsourcing, because skill accumulation abroad will reduce the skilled wage. In model 1, this will reduce the wage paid to imported labour, hence leading to greater

⁴ Although, equally, if outsourcing expands the relative supply of the country's imported good, then its terms of trade will improve, reinforcing the gains from outsourcing.

overall gains. Similarly, in Model 3, lower imported prices imply higher real incomes for all agents. And in Model 2, all gains or losses from outsourcing, including the implications for terms of trade, will be increased by the fall in the skilled wage abroad.

Therefore, Bhagwati *et al.* (2004) note that the overall welfare effect of outsourcing as defined in this way is ambiguous. Outsourcing, they note (following Mankiw *et al.* (2004)), is simply another form of international trade. If it involves trade in inputs into production, then it will act like input-saving technical change, while if it involves trade in services to consumers, then it adds directly to real income. Thinking about outsourcing in this way also makes it clear why there is a potential loss in Model 2 of Bhagwati *et al.* (2004) it represents a form of immiserising growth, if the negative terms of trade effect of growth in the export sector, outweigh the output gains from the technical change.

3. Evidence

Whilst there has been much media coverage of the whole issue of service outsourcing, and not an inconsiderable amount of theoretical reasoning, there remains the question of how much outsourcing there really is. This section presents some recent findings on the numbers of service outsourcing, dividing the literature into, first, the recent fears over job losses, and second, the trends and formal econometric work on job losses and outsourcing.

3.1. Fears Over Job Losses

It was the possible loss of jobs from outsourcing that was at the heart of the outsourcing debate in the 2004 US Presidential election. The most often quoted number for the estimated number of jobs outsourced from the US is from McCarthy (2002), which cites a figure of 3.3 million jobs by 2015. This translates to an annual flow of about 300000, and does not take into account jobs gained as a result of other countries importing services from the US. Bhagwati *et al.* (2004) point out that the US economy destroyed and created approximately 30 million jobs in 2003, so that McCarthy's estimate corresponds to a tiny 1 per cent of annual job creation/destruction. There is also evidence by Mann (2003), that between 1999 and 2003, employment in computer and mathematical occupations increased by 6 per cent, and in business and financial occupations by 9 per cent. These are occupations which have experienced significant outsourcing of their activities, and suggests that outsourcing has not had a large impact on employment.

Bhagwati *et al.* (2004) also point out that outsourcing may help to create jobs in the US, when the availability of low-wage skilled workers from abroad makes projects financially viable. Further, it is not even the case that the US is a net importer of services (see the discussion based on Amiti and Wei (2004)). Equally telling, as Agrawal and Farrell (2003) note, about 70 per cent of US jobs are in service industries such as retailing, catering, restaurants and hotels, tourism and personal care, that require the consumer and producer to be present in the same place and, therefore, cannot be outsourced. Thus, Bhagwati *et al.* (2004) conclude that the recent criticism of service outsourcing is associated more with the attempt to explain the slow US job growth at the start of the 21st century, than with any clear insight as to the reality and possible general equilibrium effects of outsourcing.

In fact, there is evidence that outsourcing may lead to productivity gains which are not captured by the theories discussed above (but which appear in some of the literature on

fragmentation noted in the introduction). Mann (2003) finds that globalised production had made IT hardware 10 to 30 per cent cheaper than it would have been otherwise. The reason for this is clear: the distribution of the production process in different countries according to their comparative advantage, leads to gains from cheaper production at every stage in the production process.

3.2. Trends in Outsourcing

There is in fact quite a lot of evidence regarding the observed trends in service outsourcing. Amiti and Wei (2004) calculate the share of service outsourcing from the IMF Balance of Payments Statistics Yearbooks. They find that imports of business services as a share of US GDP is quite small, but growing quite rapidly: 0.1 per cent in 1983, 0.2 per cent in 1993, and 0.4 per cent in 2003. The corresponding figures for the UK in 1983, 1993 and 2003, were 0.9, 0.7, and 1.2 per cent.

According to Amiti and Wei (2004), the biggest outsourcing countries (i.e. importers of business services) in 2002 were the US (USD41 billion) and Germany (USD39 billion), followed by Japan, the Netherlands, Italy, France, and the UK. China and India are also significant outsourcing countries: USD11 billion for India and USD8 billion for China. As a share of the economy, therefore, India imports more business services than the US or the UK, and China's imports of business services make up a larger share of its GDP than the US.

Similarly, Amiti and Wei (2004) report that the largest exporters of business services in 2002 were the US (USD59 billion) and the UK (USD37 billion), followed by Germany, France, and the Netherlands. India exported USD18.6 billion, and China USD10 billion. Hence, similarly to imports of business services, the largest exporters of business services are also the developed countries, although now China exports a larger share of its GDP in business services than does the US, and India a larger share than does the UK.

Taking the difference between exports and imports gives us the balance of payments in services trade. The US and the UK are the largest surplus countries in business services trade (i.e. exports exceeding imports), and while China and India also had a surplus in 2002, their surpluses were much smaller than those of the US and the UK. Therefore, if exports are associated with job creation and imports with job destruction (as the popular media seems to portray, but need not be the case), then countries such as the US and the UK, are gaining more jobs than they are losing as a result of business service outsourcing.

Amiti and Wei (2004; 2005) explore in greater detail whether or not service outsourcing leads to loss of jobs. On the one hand, every job that is outsourced abroad is a job lost to the domestic economy. However, if firms that outsource become more efficient, they can expand their output in production stages for which they have comparative advantage, leading to job creation, which may offset the direct job losses due to outsourcing. Amiti and Wei (2005), using US data disaggregated into 450 sectors, find that faster growth in outsourcing at a sector level is associated with a small negative growth in jobs in that sector. However, using less disaggregated data for 96 sectors, they find no correlation between job growth and growth of outsourcing at the sectoral level. Using data for the UK for 78 sectors, Amiti and Wei (2004) also find no evidence that sectors with higher growth of service outsourcing have a slower rate of job growth.

Amiti and Wei (2004) argue that their different results for the US at different levels of disaggregation reflects the two effects which they hypothesise. At very disaggregated levels, job growth and outsourcing may be negatively related because every job outsourced is a job lost. But at more aggregate levels, jobs lost in one sector of the economy may be replaced by job growth in other sectors, thus leading to no negative correlation between job growth and outsourcing.

4. Discussion and Conclusions

The recent media coverage of the outsourcing phenomenon is in some ways reminiscent of the previous literature of the relative decline of the manufacturing sector in especially the UK and the US. As technology progresses, the pattern of comparative advantage changes along with it, and in the process some sectors decline and others rise to replace them.⁵ Fears of large numbers of job losses are not supported either by theory or by the evidence. From a theoretical perspective, the advent of new technology which enhances productivity, leads to lower prices, and higher real wages which imply a greater demand for goods and services, leading to more jobs being created elsewhere in the economy. Empirically, Brainard and Litan (2004) point out that, since 1985, the US has added 30 million workers, along with an increase in median family income of 20 per cent. This is despite declining trade barriers and rapid technological progress, both of which, if the skeptics are right, ought to have caused massive unemployment.

Equally, the evidence thus far has been that the jobs outsourced from the US have generally been jobs which pay less than the average US wage (Kirkegaard 2003). He also points out that, while over 70,000 computer programmers have lost their jobs since 1999, more than 115,000 higher paid computer software engineers have got jobs since 1999, and that high-paying IT occupations have generally expanded since 1999. This is also reflected in the fact that the US is a net exporter of services: the US may be losing low-wage call centre jobs, but at the same time it is gaining high-wage jobs in medical, legal and other services which it exports to the rest of the world.

There do however remain two issues to discuss. The first is to do with product quality. Is the outsourced service as good as when it was produced in the originating country? For some services such as data entry, this is not an issue. But for other services such as call centres, this may be important. Anecdotal evidence suggests that often call centre employees in India are not given sufficient information and/or authority to perform their job adequately.⁶ This may be related to the June 2005 scandal involving a call centre worker in India who sold, bank account details of 1,000 Britons to an undercover reporter of a British tabloid, *The Sun*. The security issue raised by this and other incidents, may reduce the attractiveness of outsourcing these services for both companies and their customers. One possibility that may emerge is that the market for call centre services separates into two segments: a low-cost segment which is outsourced to low-wage countries, and a high-cost segment, paid for by

⁵ See for example Ngai and Pissarides (2004) for a model of growth and structural change.

⁶ This contrasts with manufacturing workers in low-wage countries who are often able to produce output of equal quality to that of workers in high-wage countries. See Agrawal *et al.* (2003).

⁷ This was reported in the article "Your life for sale: Exclusive" in *The Sun*, 23 June 2005.

customers, where the call centre is relocated back to the home country, providing premium services to those who are willing to pay for them.

The second issue is to do with job dislocation. While there may be long run gains from outsourcing, in the transition period many workers are likely to suffer through unemployment and displacement. Unemployment assistance is called for to reduce the costs to the unemployed, along with possible specific assistance programmes for those displaced by outsourcing. Kletzer and Litan (2003) propose a wage insurance scheme for all dislocated workers.

In conclusion, service outsourcing is a product of the communications revolution of the past decade, and is likely to become increasingly important in coming years. This paper has discussed the recent debate over the impact of outsourcing originating from Samuelson's (2004) paper. Our conclusion is that, contrary to fears highlighted in the media, such outsourcing, like other forms of international trade, is a likely source of gain to the developed countries.

References

- Agrawal, Vivek and Diana Farrell. 2003. Who wins in offshoring. *McKinsey Quarterly Special Edition: Global Directions*: 36-41.
- Agrawal, Vivek, Diana Farrell and Jaana K. Remes. 2003. Offshoring and beyond. *McKinsey Quarterly Special Edition: Global Directions*: 24-33.
- Amiti, Mary and Shang-Jin Wei. 2004. Fear of Service Outsourcing: Is It Justified. NBER Working Paper 10808.
- Amiti, Mary and Shang-Jin Wei. 2005. Service Outsourcing, Productivity and Employment. IMF Working Paper, forthcoming.
- Antras, Pol. 2003. Firms, contracts, and trade structure. *Quarterly Journal of Economics* **118(4)**: 1375-1418.
- Antras, Pol and Elhanan Helpman. 2004. Global sourcing. *Journal of Political Economy* **112(3)**: 552-580.
- Balasubramanyam, V. N. 2005. Outsourcing. Mimeo, Lancaster University.
- Banga, Rashmi. 2005. Trade in services: a review. *Global Economy Journal* **5(2)**: Article 3.
- Barba-Navaretti, Giorgio and Anthony J. Venables. 2004. *Multinational Firms in the World Economy*. Princeton, NJ: Princeton University Press.
- Bhagwati, Jagdish, Arvind Panagariya and T.N. Srinivasan. 2004. The muddles over outsourcing. *Journal of Economic Perspectives* **18(4)**: 93-114.
- Brainard, Lael and Robert E. Litan. 2004. Offshoring Service Jobs: Bane or Boon and What to Do? Policy Brief #132, Washington, DC, Brookings Institution.
- Chung, Chul. 2003. Factor Content of Trade: Non Homothetic Preferences and 'Missing Trade'. Mimeo, Georgia Institute of Technology.
- Deardorff, Alan V. 2001. Fragmentation in simple trade models. *North American Journal of Economics and Finance* **12**: 121-137.
- Deardorff, Alan V. 2005. A trade theorist's take on skilled-labour outsourcing. *International Review of Economics and Finance* **14**: 259-271.

- Dixit, Avinash and Gene M. Grossman. 2005. The limits of free trade. *Journal of Economic Perspectives* **19**(3): 241-242.
- Grossman, Gene M. and Elhanan Helpman 2002. Integration versus outsourcing in industry equilibrium. *Quarterly Journal of Economics* **117**(1): 85-120.
- Grossman, Gene M. and Elhanan Helpman. 2005. Outsourcing in a global economy. *Review of Economic Studies* **72**(1): 135-159.
- Jones, Ronald W. 2000. *Globalization and the Theory of Input Trade*. Cambridge, MA: MIT Press.
- Jones, Ronald W. and Henryk Kierzkowski. 2005. International fragmentation and the new economic geography. *North American Journal of Economics and Finance* **16**: 1-10.
- Jones, Ronald W. and Roy J. Ruffin. 2005. International technology transfer: who gains and who loses? Forthcoming. *Review of International Economics*.
- Kletzer, Lori and Robert Litan. 2001. A Prescription to Relieve Worker Anxiety. Policy Brief 01-2, Washington DC, Institute for International Economics.
- Kirkegaard, Jacob F. 2003. Outsourcing - Stains on the White Collar? Mimeo, Institute for International Economics.
- Mankiw, N. Gregory, Kristin J. Forbes and Harvey S. Rosen. 2004. Testimony before the Joint Economic Committee, US Congress: The Economic Report of the President. 10 February, 2004.
- Mann, Catherine L. 2003. Globalization of IT Services and White Collar Jobs: the Next Wave of Productivity Growth. Policy Brief 03-11, Institute for International Economics.
- Markusen, James R. 2002. *Multinational Firms and the Theory of International Trade*. Cambridge, MA: MIT Press.
- McCarthy, John. 2002. 3.3 Million US Jobs to Go Offshore. 11 November. Cambridge, MA: Forrester Research, Inc.
- Ngai, Rachel L. and Christopher A. Pissarides. 2004. Structural Change in a Multi-Sector Model of Growth. CEPR Discussion Paper 4763.
- Panagariya, Arvind. 2004. Why the Recent Samuelson Article is NOT About Offshore Outsourcing. Mimeo, Columbia University.
- Panagariya, Arvind. 2005. Defending the Case for Free Trade. Testimony to the U.S.-China Economic and Security Review Commission on the Economic Underpinnings of Globalisation.
- Samuelson, Paul A. 2001. A Ricardo-Sraffa paradigm comparing gains from trade in inputs and finished goods. *Journal of Economic Literature* **39**(4): 1204-1214.
- Samuelson, Paul A. 2004. Where Ricardo and Mill rebut and confirm arguments of mainstream economists supporting globalization. *Journal of Economic Perspectives* **18**(3): 135-146.
- Soo, Kwok Tong. 2005. What Does the Eclectic Trade Model Say About the Samuelson Conundrum? Mimeo, Lancaster University.