



International outsourcing of skill intensive tasks and wage inequality



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ABSTRACT

Within the context of a product variety model, this paper examines the impact of international outsourcing of some skill intensive tasks on wage inequality. We consider four possibilities: long-run equilibrium where varieties of producer services are non-traded, long-run equilibrium where varieties of producer services are traded, short-run equilibrium where varieties of producer services are non-traded and short-run equilibrium where varieties of producer services are traded. It is shown that in each case, under certain conditions, international outsourcing can increase skilled–unskilled wage inequality. In the first three cases, outsourcing affects wage inequality directly as well as indirectly. In the short-run equilibrium, where varieties of producer services are traded, international outsourcing increases skilled–unskilled wage inequality only through an indirect channel. In the short-run equilibrium, where all goods are traded, the impact of outsourcing on wage inequality depends solely on the relative size of the income share of capital. Furthermore, in the long-run equilibrium, outsourcing increases the productivity of the industrial sector.

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1. Introduction

A number of studies have attempted to identify the determinants of rising skilled–unskilled wage inequality in both developed and developing countries. Most existing studies focus on the role of trade liberalisation and skill-biased technological progress. Technological progress and worker skills are found to be complementary. Accordingly, improvement in technology has resulted in a relatively large increase in the skilled wage, thereby increasing the skilled–unskilled wage inequality (Acemoglu, 2002a,b; Epifani and Gancia, 2008; Van Reenen, 2011). Trade liberalisation is closely related to the rapid increase in the pace of globalisation. Increase in international trade has been found to increase skilled–unskilled wage inequality (Dinopoulos et al., 2011; Unel, 2010). The availability of cheaper imports can also be attributed to shutting down of a number of relatively less capital intensive import competing industries in developed countries. Bloom et al. (2011) argue that trade with China has contributed to an increase in the probability of firm exit in developed countries, which has contributed to a decrease in employment growth mainly in low skilled industries. Based on Bloom, et al., it can be argued that due to the availability of cheaper imports from countries like China, skilled workers in developed countries are now mostly involved in the production of relatively more advanced capital intensive

products where wages are higher whereas unskilled workers have not greatly benefitted from either technological improvement or increased international trade.³

Improvements in communications technology and a decrease in transportation costs, combined with an increase in competitive pressures arising from globalisation, have resulted in a greater use of international outsourcing. The empirical work of Jones (2005) suggests that economic growth promotes outsourcing. Ethier (2005) showed that, in the presence outsourcing, globalisation can lead to an increase in skilled–unskilled wage inequality. However, Ethier focuses on outsourcing of unskilled labour tasks. Deardorff (2005) argued that due to superior technology, wages of both skilled and unskilled workers in developed countries are higher compared to

³ Other explanations for increase in skilled–unskilled wage inequality include economic restructuring and increased international competition (see Blum, 2008; Breau and Rigby, 2010). The empirical work of Taylor and Driffield (2005) suggests that foreign direct investment can contribute to wage inequality. Zhu and Trefler (2005) focus on the role of the technology gap between developed and developing countries. They argue that the technology gap is steadily declining. As the technology gap shrinks, the comparative advantage in the production of relatively less advanced products shifts from developed to developing countries, which has resulted in an increase in skilled–unskilled wage gap in both developed and developing countries. Chaudhuri and Yabuuchi (2007) showed that, in the presence of labour market imperfections, a reduction in import tariffs can result in an unambiguous increase in wage inequality. Wang, Fang and Huang (2009) suggest that knowledge spillover effects can account for the rising level of wage inequality. Beladi, Chaudhuri and Yabuuchi (2008), Chaudhuri (2008), Anwar (2006), Marjit and Kar (2005), Verhoogen (2008), Wälde and Weiß (2007), Yabuuchi and Chaudhuri (2007), among others, have considered other aspects of skilled–unskilled wage inequality.

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their counterparts in developing countries, which explains the outsourcing of both skilled and unskilled tasks to developing countries. While comparing foreign direct investment with international outsourcing, Stähler (2007) argues that outsourcing, which is often viewed as a cost saving strategy, also involves training of workers located in foreign locations. Complete outsourcing is possible only when the training cost is sufficiently low. Stähler's work also highlights the potential positive spillover effects from outsourcing.⁴ Using three digit manufacturing data from the UK over the period 1993–98, Hijzen (2007) examines the link between international outsourcing and wage inequality. This study is based on the assumption that cheaper labour in developing countries encourages international outsourcing. Chowdhury (2010) considers the issue of outsourcing and wage inequality when outsourcing is endogenous. Outsourcing can also be viewed as skill-biased technical change. While examining the link between international outsourcing and the skilled–unskilled wage inequality, Chakrabarti and Mitra (2010) highlight the role of the asymmetric adjustment costs.

Batra and Beladi (2010a) incorporate outsourcing of skill intensive tasks in the Heckscher–Ohlin model. They argue that outsourcing of skill intensive tasks to developing countries reduces the demand for skilled labour in developed countries and hence its effect on domestic wages is negative.⁵ Chongvilaivan and Thangavelu (2012) empirically examined the impact of outsourcing provision on wage inequality in Thailand. They find that provision of outsourcing increases both skilled and unskilled wages but, in overall terms, its impact on skilled–unskilled wage inequality is positive.⁶ While some studies have empirically examined the link between outsourcing and wage inequality, few studies have attempted to provide a theoretical foundation of the link, especially the link between outsourcing of skill intensive tasks and the skilled–unskilled wage inequality.⁷

Unlike most existing studies, this paper focuses on the impact of international outsourcing of skill intensive tasks on wage inequality. It has been suggested that a significant amount of international outsourcing involves intermediate goods (Stähler, 2007). Therefore, this paper considers skill intensive outsourcing in intermediate goods. The existing literature suggests that, in the presence of non-traded goods, the impact of factor mobility on wage inequality is likely to be different from its effect when all goods are traded (Gupta and Dutta, 2010). In addition, short-run results may be different from long-run results (Anwar, 2010; Zhang, 2012). Accordingly, this paper considers the impact of international outsourcing of some skill intensive tasks on skilled–unskilled wage inequality in four cases: (i) the long-run when varieties of producer services are non-traded, (ii) the long-run when all goods are traded, (iii) the short-run when varieties of producer services are non-traded, and (iv) the short-run when all goods are traded. The results presented in this paper highlight some important differences in short-run and long-run results.

The rest of this paper is organised as follows. A simple general equilibrium model of a small open economy involving outsourcing in skill intensive intermediate goods is presented in Section 2. The model is used to consider the link between international outsourcing and the skilled–unskilled wage gap in the short-run and the long-run in Section 3. The last section offers some concluding remarks.

2. A simple model involving outsourcing

Batra and Beladi (2010a) developed a model where outsourcing is incorporated into the production function. The model presented in this section is inspired by their approach. A small open economy produces an exportable industrial good (Y) and an importable agricultural good (Z). Skilled labour, capital and varieties of producer services (x_i) enter into the production of the industrial good. Varieties of producer services are produced by means of skilled labour and capital, whereas the importable agricultural good is produced by unskilled labour and capital. In order to focus on the role of outsourcing in the intermediate goods sector, it is assumed that only the producer services sector is involved in outsourcing, which involves subcontracting part of the labour work. Subcontracting of the labour work is akin to the use of call centres that are based in countries such as India, Thailand, Philippines, etc. Amiti and Wei (2006) and Stähler (2007), among others, have highlighted the importance of outsourcing in the intermediate goods and services. International outsourcing, following Hijzen (2007) and Batra and Beladi (2010a), is assumed to be exogenous. The production function for the exportable good is as follows:

$$Y = \Theta L_{ys}^{(1-\alpha)(1-\beta)} K_y^{\beta(1-\alpha)} \left(\sum_{i=1}^n x_i^\delta \right)^{\frac{\alpha}{\delta}}$$

$$\Theta = \frac{(1-\alpha)^{-(1-\alpha)} (1-\beta)^{-(1-\alpha)(1-\beta)}}{\alpha^\alpha \beta^{\beta(1-\alpha)}}$$

where L_{ys} and K_y respectively are skilled labour and capital used in the production of the industrial good; x_i is the i th variety of producer services used in the production of the industrial good; n is the number of varieties produced; α, β , and δ are positive but less than 1; and Θ is positive.

The services sector, which is involved in international outsourcing, produces a large number of varieties. The cost function for the i th variety of producer services is as follows:

$$c^{x_i}(w_s, r, x_i; \lambda, \mu) = [\mu + \lambda x_i] \left(\frac{w_s}{v} \right)^{1-\gamma} r^\gamma$$

where v is an index of outsourcing, which (following Batra and Beladi, 2010a) initially equals 1; w_s and r respectively are the skilled wage and the reward for capital; and γ is positive but less than 1.

An increase in v starting from an initial value of 1 amounts to international outsourcing, which reduces the cost of production of each variety through a decrease in the cost of skilled labour. More specifically, as some skilled labour tasks are performed by workers located in a foreign country, international outsourcing reduces the effective wage of skilled labour; i.e., $\left(\frac{w_s}{v}\right)$.⁸

The production function for good Z , which uses unskilled labour and capital, is as follows:

$$Z = \Psi L_{zu}^{(1-\theta)} K_z^\theta$$

$$\Psi = \left[\theta^\theta + (1-\theta)^{1-\theta} \right]^{-1}$$

where L_{zu} and K_z respectively are the unskilled labour and capital used in the production of Z ; θ is positive but less than 1; and Ψ is positive.

Following the existing literature, this paper focuses on a symmetric equilibrium where all varieties of producer services are equally priced.⁹ As the production of each variety is subject to internal economies of scale, the production of the industrial good Y , where producer services are used as an input, is subject to external economies of

⁴ The spillover effects from outsourcing were also highlighted by Van Long (2005).

⁵ Batra and Beladi (2010b) argue that even though outsourcing can hurt domestic workers, its effect on national welfare can be positive.

⁶ Other aspects of outsourcing have been considered by Hijzen, Görg and Hine (2005), Jones (2005), Jones and Kierzkowski (2005a,b), Kierzkowski (2005), Egger and Egger (2006), Grossman and Rossi-Hansberg (2008), Geishecker and Görg (2008) and Brecher and Chen (2010).

⁷ Within the context of the long-run equilibrium, Anwar (2013) has considered the impact of outsourcing on wage inequality when all goods are traded. This paper extends this research in a number of directions.

⁸ See Batra and Beladi (2010a) for further explanation.

⁹ See Gupta and Dutta (2012) and references therein.

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