"The Rise of Offshoring: It's Not Wine for Cloth Anymore" by Gene M. Grossman and Esteban Rossi-Hansberg

1 Introduction

1. Consider a model with two countries, Spain and Argentina, two sectors, textiles and financial services, and two factors, high skilled labor and low skilled labor. The production of each good requires the performance of a set of H-tasks (using high skilled labor) and L-tasks (using low skilled labor). Textiles are relatively intensive in low skilled labor and financial services are relatively intensive in high skilled labor.

2. L-tasks can be offshored, but not equally easily. L-tasks are indexed by i, with i between 0 and 1. A higher i corresponds to a task that is more difficult to offshore. Task i requires $\beta t(i) > 1$ units of foreign labor per unit of local labor if offshored. Because of the ordering, $t(i)$ is an increasing function of i. Lowering β can be interpreted as making offshoring easier.

3. A task i will be offshored if $\beta t(i) w^* \leq w$. The marginal task I that will be offshored satisfies the condition

$$w = \beta t(I) w^* \tag{1}$$

Note that I also corresponds to the fraction of L-tasks being offshored.

4. Cost to produce a good:

$$c = w \int_I^1 a_L di + w^* \beta \int_0^I a_L t(i) di + s a_H = w a_L (1 - I) + w^* a_L \beta T(I) + s a_H \tag{2}$$

where a_L is the amount of low skilled domestic labor needed to produce a typical task, and a_H is the amount of high skilled domestic labor needed to produce one unit of the good, and $T(I) = \int_0^I t(i)$. Substituting (1) into (2) gives us:

$$c = w \Omega a_L + s a_H \tag{3}$$

where $\Omega = 1 - I + T(I)/t(I)$. The relative amount of foreign labor required for the marginal task, $t(I)$, is greater than the average amount of foreign labor required for the inframarginal tasks, $T(I)/I$, so that $t(I) > T(I)/I$. This implies $\Omega < 1$. Therefore, offshoring has a similar effect to improving the productivity of low skilled workers!

2 Reducing the cost of offshoring

1. Reducing the cost of offshoring is interpreted as a decrease in β.

2. The effect on the domestic wage of low skilled workers can be shown to be

$$\hat{w} = -\hat{\Omega} - \alpha_1 \hat{p} - \alpha_2 \frac{dI}{1-I} \tag{4}$$

   where 'hats' refer to percentage changes, and p refers to the relative price of the high skills intensive good. The above expression has three components:

   (a) The first term is the *productivity effect*. As offshoring becomes easier, more tasks get offshored, and Ω drops. This is equivalent to low skilled becoming more productive, so that the demand for them increases. This *increases* wages of low skilled workers.

   (b) The second term is the *terms of trade effect*. Offshoring benefits both sectors, but in relative terms the effect is greater on the low skill intensive industry. The relative price of the low skill intensive good drops. This *lowers* wages of low skilled workers (Stolper-Samuelson).

   (c) The third term is the *labor supply effect*. As more jobs get offshored, there is an excess supply of low skilled workers in the domestic market. This *lowers* wages of the low skilled.

3. The effect on the domestic wage of high skilled workers can be shown to be

$$\hat{s} = \alpha_3 \hat{p} + \alpha_4 \frac{dI}{1-I} \tag{5}$$

   (a) There is no longer a productivity effect.

   (b) Stolper-Samuelson now has a positive effect.

   (c) The excess labor supply of low skilled makes skilled workers more scarce. This increases their wage.

4. Equations (4) and (5) can easily be applied to the Heckscher-Ohlin model.

   (a) *Case 1: Small economy.* In the small country case, $\hat{p} = 0$. Moreover, if factor price equalization holds, $\alpha_2 = 0$ and $\alpha_4 = 0$. Therefore, $\hat{w} = -\Omega$ and $\hat{s} = 0$. This implies that low skilled workers become better off (because of the productivity effect), whereas high skilled workers are not affected.

(b) *Case 2: Large economy.* In the large country case, $\hat{p} > 0$. If factor price equalization holds, $\alpha_2 = 0$ and $\alpha_4 = 0$. Therefore, $\hat{w} = -\Omega - \alpha_1\hat{p}$ and $\hat{s} = \alpha_3\hat{p}$. This implies that low skilled workers may become better or worse off, whereas high skilled workers become better off.