

## Maids and mistresses : migrating maids and female labor force participation

Brishti Guha

*Singapore Management University*

### *Abstract*

We model the linkage between immigration of maids and intersectoral movements of female family labor in a small open economy with a competitive factory sector and a household sector which employs both immigrant maids and family labor. We show that relaxing immigration restrictions on maids will not necessarily increase participation by family labor in the formal workforce. We also show that reducing taxes on employment of maids will not necessarily increase labor force participation by local women – instead, imposing a tax (where there are none) may trigger such an increase depending on maids' and locals' relative propensities to consume household sector output. Our analysis sheds light on one facet of the penetration of the household sector by market forces and yields some unexpected policy implications.

---

Department of Economics, School of Economics and Social Sciences, Singapore Management University, 90 Stamford Road, Singapore 178903. E-mail : bguha@smu.edu.sg. I gratefully acknowledge financial support from the Lee Foundation. I thank Ashok Guha for many helpful suggestions.

**Citation:** Guha, Brishti, (2007) "Maids and mistresses : migrating maids and female labor force participation." *Economics Bulletin*, Vol. 10, No. 11 pp. 1-9

**Submitted:** April 7, 2007. **Accepted:** August 16, 2007.

**URL:** <http://economicsbulletin.vanderbilt.edu/2007/volume10/EB-07J20002A.pdf>

## 1. Introduction

Large scale movement of family labor, mainly female labor, from the household to the external labor market has been a feature of contemporary economic development<sup>1</sup>. Another common feature has been the migration of maids from less developed countries into the relatively advanced world for the performance of domestic chores<sup>2</sup>. Not surprisingly, it can be conjectured that the two phenomena are interlinked. This paper seeks to model this linkage.

Governments in host countries have sought to influence the migration process through a range of policy instruments, notably immigration restrictions and taxes on the employment of maids. In this paper, we assume that the supply of migrating maids is primarily policy-determined: their opportunity costs in their countries of origin are low enough to warrant this assumption over the relevant range. The questions we pose are:

1. How do changes in the supply of maids to the household sector due to immigration policy affect the flow of local female labor from the domestic to the factory sector?
2. How would changes in the tax on their employment affect this flow?

The answers to these questions would appear to be obvious. Surely the inflow of more maids to take care of house-work could only liberate their hitherto house-bound mistresses to participate in the external labor market – or so one thinks. And, just as surely, a reduction in the tax on their hiring should have the same consequences.

Not so, however. A definitive answer turns out to depend on the properties of household production functions and demand functions. Indeed, a reverse flow of local labor from factories to the household as a result of an increased supply of maids is not utterly implausible. As for a tax-cut, its impact is even more unpredictable, being closely linked to the relative values of specific demand parameters.

The rest of the paper is organized as follows. In section 2 we lay out our model and derive using comparative statics the impact of changes in immigration policy which affect the migration of maids. Section 3 deals with the impact of taxes on employers of maids. In section 4, we discuss policy implications, while section 5 concludes with a discussion of related themes.

## 2. The Model and Immigration Policy Changes

We model a small open economy that produces *two* tradable goods in a competitive factory sector, and *one* non-traded good “meals” in a household sector. The factory sector of the economy can be treated separately as a Heckscher-Ohlin-Samuelson economy: it produces two goods under CRS production functions using two factors capital and labor, which are both freely mobile within the factory sector. While capital  $K$  is not used outside the factory sector, it is not specific within the factory sector. Both factory goods are produced and traded at world prices, which therefore determine wages

---

<sup>1</sup> Young (1995) and Kim and Lau (1994) independently found that a major driving force in rapid East Asian growth was a large surge in formal, mainly female, labor force participation rates. Other researchers have documented the rise in female labor force participation in other countries (eg Greenwood et al (2005) for the US economy), sometimes after following a U shape (Goldin 1995).

<sup>2</sup> Cheo and Quah (2005) and Ghosh and Lien (2002), among others, document the widespread migration of domestic maids from relatively poor countries like the Philippines, Sri Lanka and Indonesia, to richer countries like Singapore, Hong Kong, Malaysia and the Middle East. Pisani and Yoskowitz (2002) document the cross-border migration of Mexican maids to Texas.

and rentals by the factor price equalization theorem. This fixes the return to capital and the wage of local labor which are fixed at  $\underline{r}$  and  $\underline{w}$  respectively. Further, these factor prices are unaffected by changes in factory labor input due to migration from the household sector (at least as long as the factory sector remains incompletely specialized).

Since the relative prices of the traded goods are fixed, they can be considered as a Hicksian *composite commodity* and will be so considered for the rest of this paper. The composite good is taken to be our numeraire.

The household sector produces a single good, meals, using female family labor and maids. The CRS household production function is

$$H = H(M, L_H) \quad (1)$$

where  $M$  is the input of maids and  $L_H$  that of family labor. This can be written

$$H = L_H h(m) \quad (1a)$$

where  $h$  is household output per unit of family labor and  $m$  the ratio of maid to family labor. While both  $H$  and  $L_H$  are endogenous to our model,  $M$  is policy determined for reasons already mentioned in the introduction, and can hence be treated as exogenous.

Local labor may be employed either in the household or in the factory sector. Labor employed in the factory sector is denoted by  $L_F$  – another endogenous variable. The labor market clearing condition is

$$L = L_F + L_H \quad (2)$$

Here  $L$  is the total local labor force, which is assumed to be constant : we abstract from population growth.

Locals are identical in all respects, in tastes as well as in the ownership of equal shares of the capital stock  $K$ . Their income per head comprises the fixed wage  $\underline{w}$  and the return to capital per head  $\underline{r}K/L$ . Maids too are identical; their income per head is simply their wage  $w_m$  – endogenous to our model.

Maids and locals have different demand functions, though demands are in both cases functions of income and price. The aggregate demand function for meals is the sum of the individual demand functions of maids and locals multiplied by their respective numbers:

$$D = Lf(\underline{w} + \frac{rK}{L}, p) + Mg(w_m, p) \quad (3)$$

where  $f$  and  $g$  are the demand functions for meals of locals and maids respectively, and  $p$  the price of meals. While  $D$  is endogenous, we recall that  $\underline{w}$  and  $\underline{r}$  are exogenously determined by factor price equalization as described above.

The value of the marginal products of the respective workers in the household is equated to their wages in equilibrium:

$$w_m = ph'(m). \quad (4)$$

$$\underline{w} = p[h(m) - mh'(m)]. \quad (5)$$

The meals market clearing condition gives us

$$H = D \quad (6)$$

Now equations (1) to (6) give us a system of six endogenous variables –  $H$ ,  $L_H$ ,  $L_F$ ,  $D$ ,  $w_m$  and  $p$  – in six equations.

We can eliminate  $p$  from equations (4) and (5) to express  $w_m$  in terms of  $\underline{w}$ :

$$w_m = \frac{\underline{w}h'(m)}{[h(m) - mh'(m)]} \quad (7)$$

Our purpose below is to use comparative statics to trace the impact of an increase in  $M$ . We do this by examining the benchmark possibility that this increase be absorbed without any intersectoral migration in equilibrium<sup>3</sup>. (We will see how the supply and demand for meals would be affected, were there no migration of local labor between sectors, and use this to draw inferences about the direction of migration necessary to restore equilibrium in the household sector). With no intersectoral migration, labor, as well as capital in the tradable goods sector, remain constant, as do relative commodity prices; so do output and income from this sector. In the household sector too, the allocation of family labor remains constant, and the only change is in the input of maid labor. By differentiating (5) and (7), we can trace the consequences for prices and wages. Differentiation of (7) yields

$$\frac{dw_m}{dm} = -\frac{w_m}{m\sigma}, \quad (8)$$

or

$$\frac{dw_m}{dM} = -\frac{w_m}{M\sigma} \quad (9)$$

where  $\sigma$  is the elasticity of substitution in household production, while (5) leads to

$$\frac{dp}{dm} = \frac{pmh''(m)}{h(m) - mh'(m)}, \quad (10)$$

$$\begin{aligned} \text{or } \frac{dp}{dM} &= \frac{pmh''(m)}{L_H[h(m) - mh'(m)]} \\ &= \frac{pmh''(m)}{s_l H} \end{aligned}$$

where  $s_l = \frac{L_H[h(m) - mh'(m)]}{H}$  is the share of family labor in household output. Then

$$\begin{aligned} \frac{dp}{dM} &= -\frac{ph'(m)}{\sigma H} \quad \text{since } \sigma = -\frac{s_l h'(m)}{mh''(m)} \\ &= -\frac{w_m}{\sigma H}. \end{aligned} \quad (11)$$

We can now figure out the effect of increased migration of maids on the demand for household products. Since the family's income is independent of the number of maids, there is only a price effect on the demand from locals. In considering the demand from maids, we make the assumption for now that maids spend their income locally (we will later consider the case where maids repatriate their earnings to their home countries). The maid's demand is subject to both a positive price effect and a negative income effect since  $w_m$  falls as  $M$  rises; in addition, of course, there is the increased demand due simply to an increased number of maids:

$$\begin{aligned} \frac{dD}{dM} &= g(w_m, p) + M[g_w \frac{dw_m}{dM} + g_p \frac{dp}{dM}] + Lf_p \frac{dp}{dM} \\ &= g[1 - \frac{Mg_w w_m}{gM\sigma} - \frac{Mg_p w_m}{\sigma gH}] - \frac{Lf_p w_m}{\sigma H} \end{aligned} \quad (12)$$

<sup>3</sup> That is, there should be no migration of family labor into or out of the household sector.

$$= g \left[ 1 - \frac{\varepsilon_m}{\sigma} - \frac{Mg_p p h'(m)}{\sigma g H} \right] - \frac{Lf_p p h'(m)}{\sigma H}$$

where  $\varepsilon_m$  is the maid's income-elasticity of demand for meals, implying

$$\frac{dD}{dM} = g \left[ 1 - \frac{\varepsilon_m}{\sigma} + \frac{M \eta_m h'(m)}{\sigma H} \right] + \frac{L f \eta_l h'(m)}{\sigma H} \quad (13)$$

where  $\eta_m$  and  $\eta_l$  are the Marshallian price-elasticities of demand for meals of maids and locals respectively.

Meanwhile, the inflow of maids increases the output of meals:

$$\frac{dH}{dM} = h'(m). \quad (14)$$

Market equilibrium would be preserved after immigration without intersectoral movement of family labor if and only if  $dD/dM = dH/dM$ . From (13) and (14), this implies

$$\sigma = \sigma^* = \frac{\left( \frac{Mg\eta_m + Lf\eta_l}{H} \right) h'(m) - g\varepsilon_m}{h'(m) - g} \quad (15)$$

The first term (in round brackets) in the numerator on the right hand side represents a price effect: it comprises the price elasticities of demand for meals of maids and locals weighted by their respective shares in the consumption of meals. The second term captures the maid's income elasticity of demand. The two terms have further weights. The price effect term is weighted by  $h'/(h' - g)$ , the ratio of the maid's wage to the surplus of this wage over her consumption of meals, the income effect term by  $-g/(h' - g)$ , the negative of the ratio of the maid's consumption of meals to the surplus of her income over this consumption.

Migrating maids affect female labor force participation through two conflicting effects. On the one hand, they increase the productivity of family labor in the household to an extent dependent on the complementarity between family labor and maids – a factor that attracts family labor back to the household. On the other, they add to household output, depressing its price and tending to drive labor out to the factory. The magnitude of the price change is inversely related to the price elasticity of demand. Where maids spend their income locally, there is a third, and ambivalent, factor: the increase in number of maids adds to their demand for meals, exerting upward pressure on their price, while the consequent decline in their incomes reduces their demand to an extent depending on their income-elasticity of demand.  $\sigma^*$  represents the balance of these conflicting forces.

If  $\sigma > \sigma^*$ , there would be excess supply of meals in the absence of intersectoral migration of family labor: and this would drive family labor out of the home and into outside employment. The distinct possibility persists however of  $\sigma < \sigma^*$  – which would in fact induce a reverse migration of family labor back from the factory into the household. This perverse situation could develop if maids and family labor are more complements than substitutes and if every one's price elasticity of demand for meals is high and the maid's income elasticity of demand low. Then the immigration of maids would sharply raise the marginal product of family labor in the household; price too would not fall much because relatively small price changes would induce large equilibrating changes in demand (while the reduction in maids' per capita demand due to

their falling wages is small). Thus the value of the marginal product of family labor in the household would rise above the wage rate, luring labor back from the factory.

We have assumed above that maids spend all their income locally. If we go to the other extreme and assume that they repatriate all their income and do not therefore contribute to local demand, the demand for meals reduces to

$$D = Lf\left(\underline{w} + \frac{rK}{L}, p\right)$$

and the condition for immigration of maids to stimulate an exodus of family labor to the factory boils down to<sup>4</sup>

$$\sigma > \eta_l$$

If maids do not contribute to demand, the only factor of change in demand is the price effect on local consumption of meals. Again, if the price elasticity of demand is large enough relative to the elasticity of substitution in household production, increased immigration could induce a reverse migration from the factory to the household sector<sup>5</sup>.

### 3. A Tax on Employers of Maids

Now suppose a tax is imposed on employers of maids. Let the tax rate  $\phi$  be such that

$$(1 - \phi)w_m > w_r \quad (16)$$

Here  $w_m$  is the pre-tax wage of maids, defined in “(4)”, while  $w_r$  is their reservation wage – the wage they could have earned in their own countries. As long as (16) holds, no maids will exit as a result of the tax. Moreover, since the supply of maids is perfectly inelastic, the employers of maids are able to pass on the full effects of the tax on to the maids by reducing the maids’ take-home pay by the full extent of the tax. Therefore, the cost to employers remains the same. The tax is borne by the maids and the tax revenue is paid back to locals in the form of a subsidy. Therefore the effect of the tax is to transfer income from maids to locals. This will impact the total demand for meals and therefore the relative price of meals  $p$  if the marginal propensities to consume food differ among maids and locals. The absolute change in demand for meals due to this transfer is then

$$dD = (c_l - c_m)\phi w_m M = (c_l - c_m)\phi(1 - s_l)pH \quad (17)$$

Here  $c_l$  and  $c_m$  represent the marginal propensities to consume food, for locals and maids respectively. Now if we take the case of no intersectoral migration of family labor, then the transfer cannot have any price effects. This is because no factors change in either the household or the factory sectors, therefore the relative price of food would also remain constant in a no-migration situation. However, (17) shows that the transfer has an income effect on the demand for food. If maids’ marginal propensity to consume food is higher than that of locals, then demand for meals decreases so that an excess supply of meals emerges under no migration. This will decrease  $p$ , pushing female family labor out of the household and into the factory sector. Therefore, if  $c_l < c_m$ , imposing a tax on

<sup>4</sup> In deriving this condition we use the fact that in equilibrium,  $Lf=H$ .

<sup>5</sup> When maids spend a fraction of their incomes locally and repatriate the rest, the term showing maids’ demand in (3) should be multiplied by that fraction.

employers of maids is another way of increasing female labor force participation rates. However this is subject to there being no minimum wage laws. Had there been a law which prevented maids' take-home pay from falling below the pre-tax level, for instance, employers would not be able to pass on the tax to maids and there would be no transfer from maids to locals.

If on the other hand, locals have a higher marginal propensity to consume food than do maids, imposing a tax would cause reverse migration and therefore should not be attempted by a government which wishes to increase female labor force participation rates. This will certainly be the case if maids repatriate all their income, because in that case they do not contribute to local demand at all.

#### **4. Policy Implications**

Our analysis has implications for governments which wish to increase (or otherwise affect) formal labor force participation rates, particularly women's participation in the workforce. If family labor and maids are more complements than substitutes in household production, if the price elasticity of demand for food (or other household services) is high and if maids' income elasticity of demand is low, then a *tightening* of immigration quotas on maids might actually trigger a migration of family labor out of their homes into the formal labor force. Otherwise, a relaxation of immigration quotas would achieve this. Imposing a tax on employers of maids could increase their (the employers') labor force participation rates if maids' propensity to consume food is higher than that of locals. If not, lowering such taxes would induce migration into the formal sector.

An issue of concern may be that maids are a "discrete" quantity, in the sense that immigration policy can allow one more maid to enter, but not, say, half a maid. We may then ask whether, for instance, relaxing immigration policy will work by allowing more households to import a maid, or by allowing one household to hire multiple maids. While both of these are possibilities, we can also talk about a third kind of policy, one in which the integer constraint does not create a problem. Suppose the government can choose to restrict the hours of work that a maid may supply. Restrictions on working hours are quite common. Relaxing these restrictions would then have a similar effect in the analysis as relaxing immigration quotas – by shifting the supply curve for maid labor to the right - while tightening them would have the same effects as a tightening of quotas.

#### **5. Conclusion : Related Themes and Possible Extensions**

Our focus in the present paper was on showing that changes in immigration policy or tax policy do not always affect female labor force participation in the direction which seems obvious a priori.

This is related to a broader theme of the connection between female labor force participation and increasing penetration of the household sector by market forces. The work that women traditionally perform in their homes can now be "sourced" to, or at least shared by, imported labor (immigrant maids) or reduced by the use of labor-saving household gadgets. Of the two forces mentioned above, the effect of labor-saving gadgets on female labor force participation in a small open labor-abundant economy has been theoretically modeled in Guha (2005) as well as empirically studied for a panel of East, South-east and South Asian countries in Guha (2006) while other authors have also modeled the role of labor-saving gadgets in freeing up women for work outside the home,

and performed simulations for the US economy (Greenwood et al (2005), Albanesi and Olivetti (2005)).

In this paper, we have used a model with a factory sector that behaves like a Heckscher-Ohlin economy (with two traded goods, two factors and factor price equalization). An alternative model might have a factory sector that exhibits complete specialization, in which case capital would become a specific factor and the factor price equalization theorem would not apply. Such a specification would entail modeling the factory sector to close the model. Similar methods – of studying the effect on supply of, and demand for, the household good of a change in the number of maids when there is no intersectoral movement of family labor, and of drawing inferences about the direction of migration that would bring about market equilibrium – could be applied to this model. Here too, in the benchmark case of no intersectoral labor migration, all variables in the factory sector, its capital, labor, output, factor prices and income, remain constant, and the only change in the household sector is in the input of maids. So we conjecture that the entire analysis of the present paper will carry through with identical results. A rigorous proof of this conjecture is however a matter for future research.

In the present paper, we have captured *all* the services traditionally performed in the household, in a single output, “meals”. Therefore, we do not explicitly consider effects on fertility and childcare. Two papers that are somewhat related in this respect are Ghosh and Lien (2002) and Cheo and Quah (2005). The focus in both these papers is on outcomes for children. Ghosh and Lien adapt the analysis in Galor and Weil (1996) to allow for the possibility of hiring immigrant maids. This analysis is based on couples choosing fertility and working hours, assuming that each child requires a fixed number of hours for childcare. Cheo and Quah (2005) concentrates on the impact on children’s educational outcomes of hiring domestic help. It would be interesting to extend our work in this direction in the future.

### References

- Albanesi, S. and C. Olivetti (2005) “Gender Roles and Technological Progress” Working paper, Columbia University.
- Cheo, R. and E. Quah (2005) “ Mothers, Maids and Tutors : An Empirical Evaluation of Their Effect on Children’s Academic Grades in Singapore” *Education Economics* **13**, 269-285.
- Ghosh, S. and D. Lien (2002) “ Fertility and Economic Growth : Do Immigrant Maids Play a Role?” *Pacific Economic Review* **7**, 245-257.
- Goldin, C.(1995) “The U-shaped Female Labour Force Function in Economic Development and Economic History” in *Investment in Women’s Human Capital* by T. Paul Schultz, Ed., University of Chicago Press: Chicago.
- Greenwood, J., A. Seshadri, and M. Yorukoglu (2005) “Engines of Liberation” *Review of Economic Studies* **72**, 109-133.
- Guha, B. (2005) “ Female Labor Force Participation and Labour-Saving Gadgets” *Journal of International Trade and Economic Development* **14**, 483-495.
- Guha, B. (2006) “Is a Woman’s Work Really Never Done? Gadget Use and Female Labor Participation in Open Asian Economies” Working paper, Singapore Management University.



Lau, L. and J. Kim (1994) “ The Sources of Economic Growth of the East Asian Newly Industrialized Countries” *Journal of the Japanese and International Economies* **8** ,235-271.

Pisani, M.J and D.W. Yoskowitz (2002) “ The Maid Trade : Cross-Border Work in South Texas” *Social Science Quarterly* **83**, 568-579.

Young, A. (1995) “ The tyranny of numbers : confronting the statistical realities of the East Asian growth experience” *Quarterly Journal of Economics* **110**, 641-6