Theory of Welfare Migration – supplement to the lectures ECON4921

Jon Fiva, November 2009

With decentralized responsibility for redistribution, sub-central governments face incentives to set taxes and transfers to influence the location of households. When mobility is high this may give a level of redistribution which is 'too low' seen from the country's point of view. To clarify this migration externality, I adapt Wildasin's (1991) model of income distribution in a common labor market, also discussed by Brueckner (2000) and Saavedra (2000).[1] Wildasin's benchmark model of interjurisdictional migration shows how decentralized responsibility for the 'redistribution branch' yields lower redistribution in equilibrium. The central mechanism is the mobility of welfare clients. In Wildasin's model it is the endogenous determination of wages that equilibrate migration flows and prevents a complete 'race to the bottom'. Wheaton (2000) presents an alternative framework where the equilibrating mechanism is idiosyncratic preferences for location among the poor.

Consider a country composed of I local governments, indexed from i= 1, … , I, with two kinds of households, 'rich' and 'poor'. Each poor household is endowed with 1 unit of labor and are assumed to be perfectly mobile across local governments at no migration costs. The rich households are endowed with other factors of production and are assumed to be immobile. The overall sizes of both groups are fixed. The wages of the poor are determined in a common competitive labor market and thus reflect the marginal productive of the poor. Each jurisdiction produces a numeraire good with similar production technology given by $f_i(l_i)$, which is a strictly increasing and concave function of the number of poor households, l_i, employed in jurisdiction i. The wage in a jurisdiction is hence equal to $w_i = f_i'(l_i)$ and rich households earn the remaining income $y_i = f_i(l_i) - f_i'(l_i)l_i$. The latter represents rents to rich households earned by other factors of production, possibly income from rich household's labor.

Redistribution from rich to poor is in this model driven by altruistic preferences. The rich households care for the poor living in their region and are willing to incur tax liabilities to support redistributive transfers. Every welfare client (poor households) in each jurisdiction does not only receive the same wage, but are also treated identically in the transfer system.

[1] For a textbook treatment of a similar model see Wellisch (2000), chapter 8.

Poor households in jurisdiction i receive a transfer of income denoted b_i, and each taxpayer (rich households) pays an equal share of the total transfers in the jurisdiction, $\frac{b_i l_i}{n_i}$, where n_i is the number of rich households in the jurisdiction. Let $u_i(y_i, z_i)$ denote the utility of the rich, where $z_i = w_i + b_i$ is the income of the poor households. The utility function is increasing and concave in both arguments. Because all welfare clients are able to costlessly migrate from one jurisdiction to another, z_i must be equal for all jurisdictions. Thus across all jurisdictions $z = w_i + b_i$ for some net income, z, and consequently we have the following relation securing migration equilibrium:

$$f_i'(l_i) + b_i = f_j'(l_j) + b_j, \ i \neq j. \tag{1}$$

It is the assumption of a common labor market which ensures that wages equilibrate migration flows. Let L denote the total number of poor households in the economy, then in equilibrium the following condition must hold:

$$\sum_{i=1}^{I} l_i = L. \tag{2}$$

Equation (1) and (2) determine the distribution of welfare clients across jurisdictions and their common net income, z, conditional on b_i, i=1, …, I. Differentiating (2) with respect to b_j yields

$$\sum_{i=1}^{I} \frac{\partial l_i}{\partial b_j} = 0, \tag{3}$$

and differentiating (1) with respect to b_j yields

$$\begin{aligned} \frac{\partial z}{\partial b_j} &= f_i''(l_i) \frac{\partial l_i}{\partial b_j} + 1, \text{ for } i = j \\ \frac{\partial z}{\partial b_j} &= f_i''(l_i) \frac{\partial l_i}{\partial b_j}, \text{ for } i \neq j \end{aligned}, \tag{4}$$

and rearranging

$$
\begin{aligned}
\frac{\partial l_i}{\partial b_j} &= \frac{\partial z}{\partial b_j} \cdot \frac{1}{f_i^{"}(l_i)} - \frac{1}{f_i^{"}(l_i)}, \text{for } i = j \\
\frac{\partial l_i}{\partial b_j} &= \frac{\partial z}{\partial b_j} \cdot \frac{1}{f_i^{"}(l_i)}, \text{ for } i \neq j
\end{aligned}
\tag{5}
$$

Substituting this into (3) to solve for z as a function of the parameters $(b_1,...,b_I)$ yields

$$
\frac{\partial z}{\partial b_j} = \sigma_j > 0,
\tag{6}
$$

where $\sigma_j = \dfrac{1}{f_j^{"}(l_j)} \Big/ \dfrac{1}{\sum\limits_{i=1}^{I} f_i^{"}(l_i)}$.[2] And (5) can be written:

$$
\begin{aligned}
\frac{\partial l_i}{\partial b_j} &= \frac{\sigma_j - 1}{f_i^{"}(l_i)} > 0, \text{for } i = j \\
\frac{\partial l_i}{\partial b_j} &= \frac{\sigma_j}{f_i^{"}(l_i)} < 0, \text{ for } i \neq j
\end{aligned}
\tag{7}
$$

When b_j increases, jurisdiction j is more attractive and poor households migrate from other jurisdictions into jurisdiction j. Without the common labor market which introduces offsetting wage movements, then all the poor would move to the jurisdiction with the highest benefits.

Moving on to the choice of benefit levels, I assume that the decision is taken by a representative rich household in each jurisdiction. Assuming that each rich household receives an equal fraction (1/n) of total non-poor income, then his utility is given by:

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[2] $\sigma_j \in [0,1]$. When welfare clients are evenly distributed across all local governments then $\sigma_j = \dfrac{1}{I}$.

$$u\left(y_i, z_i\right) = u\left(\frac{f_i\left(l_i\right) - f_i'\left(l_i\right)l_i}{n_i} - \frac{b_i l_i}{n_i}, f_i'\left(l_i\right) + b_i\right). \tag{8}$$

Each jurisdiction maximizes (8), taking into account the migration effect in (7) and viewing other jurisdictions benefit levels as fixed. Letting $MRS\left(y_i, z_i\right) = {u_z}\big/{u_y}$ denote the marginal rate of substitution between poor people's consumption and own consumption, then:

$$MRS\left(y_i, z_i\right) = -\frac{\partial y_i / \partial b_i}{\partial z_i / \partial b_i}. \tag{9}$$

Considering a symmetric Nash equilibrium where welfare clients are evenly distributed across all jurisdictions I can highlight the effect of mobility on the redistributive branch. Assuming a symmetric equilibrium, (6) and (7) can be written as:

$$\begin{aligned}
\frac{\partial z_i}{\partial b_i} &= \frac{1}{I} \\
\frac{\partial y_i}{\partial b_i} &= \frac{1}{n_i}\left(-\frac{1}{f_i''\left(l_i\right)} \cdot b_i(\frac{1}{I} - 1) - l_i \cdot \frac{1}{I}\right)
\end{aligned}, \tag{10}$$

and consequently the first order condition is given by:

$$n_i \cdot MRS\left(y_i, z_i\right) = l_i - \frac{b_i(I-1)}{f_i''\left(l_i\right)}. \tag{11}$$

The right hand side of (11) gives the private marginal social cost to taxpayers in jurisdiction i. This yields 'too low' provision of welfare benefits seen from the society's point of view. To understand this, consider the first order condition in the no-mobility case given by:

$$n_i \cdot MRS\left(y_i, z_i\right) = l_i. \tag{12}$$

In the no-mobility case, the marginal cost of increasing welfare benefits is simply the number of welfare clients living in the jurisdiction. However with mobility of welfare clients the representative rich tax payer has incentives to reduce support levels below those in the

immobility case. The marginal cost of increasing the welfare of the poor is larger in the mobility case than in the no-mobility case, as captured by the second term on the right hand side in (11). To see the intuition behind this result consider the representative tax payer's decision problem. He compares altruistic gains from helping the poor to an increase in the tax burden. If the poor do not move, then the tax burden rises only because each of a fixed number of poor recipients receives a larger benefit. However, when welfare migration occurs, the size of the jurisdiction's poor population grows as its welfare benefit becomes more generous. Generosity is more costly with welfare migration. Note that because the concern about welfare migration depress welfare benefits in all jurisdictions, no jurisdiction succeeds in repelling welfare clients and the equilibrium is characterized by all jurisdictions setting lower benefits than they would in the no-mobility case. The welfare benefits are therefore "too low" seen from the society's point of view (Brueckner, 2000).

The simple theoretical framework outlined above shows why Stigler (1957) came to the conclusion that "redistribution is intrinsically a national policy" (p. 217). The key point is that decentralized responsibility for redistribution without any corrections induces each jurisdiction to choose its policy in isolation, ignoring the positive external benefits it creates for other jurisdictions. When a jurisdiction increases its welfare benefits, it attracts mobile low-income households, implicitly reducing other jurisdictions redistributive burdens. Note that in a more realistic setting the inflow of poor to generous jurisdictions is only one part of the story. Rich households are also likely to respond to increased redistributive burdens, consequently amplifying the migration externality by moving out of the jurisdiction.

References

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