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An Unnoted Effect of a Social Welfare Transfers Program on Unskilled Migration

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Abstract

We consider a link between a country's social welfare transfers program, SWTP, and the attractiveness of migration to the country by unskilled workers. The existing literature maintains that a SWTP attracts unskilled migrants, and explicitly or implicitly that excluding unskilled migrants from the SWTP neutralizes the effect of the program on unskilled migration. We reason differently. Even when unskilled migrants are excluded from a SWTP, for example because they are undocumented, the program still affects the said attractiveness, and it does so negatively. The explanation for that is that the program encourages native workers to choose unskilled work: for example, the program provides a cushion against unemployment, which otherwise could be guarded against by skill upgrading. The consequent increased supply of native unskilled workers translates into a lower wage for unskilled work. As a result, the lure of unskilled migration is dimmed. In sum then: in the presence of a SWTP there will be less unskilled migration than in the absence of an SWTP, even when unskilled migrants are excluded from the program. We conclude that the optimal SWTP involves less income redistribution when the relationship between the SWTP and unskilled migration is taken into account than when it is not.

Keywords: *Social welfare transfers program; Skill choice; Wage for unskilled work; Undocumented migration; Eligibility for welfare programs*

JEL classification: F22; H31; J24; J61

Introduction

There is a concern that a social welfare transfers program (SWTP) in a country attracts unskilled migrant workers who contribute to the program (via taxes) less than they receive from the program: the so called "fiscal burden hypothesis." Despite evidence refuting the hypothesis (Dustmann and Frattini, 2014; Martinsen and Rotger, 2017; and Hennessey and Hagen-Zanker, 2020, who provide a comprehensive review of the empirical literature that tests the hypothesis), restricting the access of migrants to a SWTP is observed or is contemplated in many countries.[2] For example, in Belgium a five-year period of residence of

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[2] In his campaign for the 2015 general election, the former UK Prime Minister David Cameron described restricting immigrants' access to welfare benefits in the UK to be "an absolute requirement in the renegotiation" of Britain's special status in the EU (BBC, 2014). David Cameron received support from the Danish Prime Minister at the time, Lars Rasmussen, who referred to Cameron's stance as "understandable and acceptable" (BBC, 2016). Following Brexit, the UK government announced plans to implement a point-based immigration policy designed to reduce the inflow of unskilled workers (BBC, 2020). Austria too considered cutting welfare benefits for immigrants (Reuters, 2018).

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non-EU migrants is required before becoming eligible for social provisions. Within the EU alone, similar restrictions are in place in Croatia, Lithuania, Slovenia, Cyprus, and Luxembourg (Vintila and Lafleur, 2020).

In fact, restricting the access of migrants to a SWTP seems to be an effective means of reducing the attractiveness of unskilled migration. When not able to tap into the program's benefits while contributing to financing the program, unskilled migrants view a SWTP as a deterrent. And when migrants are excluded both ways from a SWTP (as is the case when they enter a country illegally or when their wage earnings are lower than the level at which taxes are levied), the SWTP will not deter migration; from the migrants' perspective, the program's effect is neutralized. In this paper we question this line of reasoning. The gist of our argument is as follows.

The prevalence of the SWTP encourages native workers, who had there been no SWTP would have elected to become skilled, to remain unskilled. The program provides a cushion against unemployment, which otherwise could be avoided or be of lower likelihood upon skill upgrading. As a consequence of a higher supply of unskilled workers, the wage of unskilled workers is lower. As a result, the lure of unskilled migration is dimmed. Thus, the program has an indirect adverse effect on unskilled migration even when unskilled migrants do not contribute to the program and do not draw benefits from it.

The model

We take the perspective of a host country with a tight, no migration policy.[3] Consequently, the only migrants within its borders are undocumented migrants. The country is inhabited by N natives and M undocumented migrants. The country's inhabitants work either as skilled workers, denoted by S, or as unskilled workers, denoted by U, such that in total there are N_S native skilled workers and N_U native unskilled workers, thus $N = N_S + N_U$. All undocumented migrants work as unskilled workers. Each worker, native or migrant, supplies inelastically one unit of labor.

A large number of competitive firms combine skilled and unskilled work to produce the single consumption good, which is then sold at a unit price. Firm i produces the consumption good according to a Cobb-Douglas production technology

$$Y_i = A(N_{Si})^{\alpha}(N_{Ui} + M_i)^{1-\alpha}, \quad (1)$$

where Y_i is firm i's output, A is the country's total factor productivity; α and $1-\alpha$, $0 < \alpha < 1$, are the output elasticities of skilled work and of unskilled work, respectively; and N_{Si} and $N_{Ui} + M_i$ are the numbers of native skilled workers and native and migrant unskilled workers employed by firm i, respectively. Thus, $N_S = \sum_i N_{Si}$, $N_U = \sum_i N_{Ui}$, and $M = \sum_i M_i$. For their work, native skilled workers and native unskilled workers receive gross wages w_S and w_U, respectively. Migrant workers receive a gross wage w_M.

To become a skilled worker, a native inhabitant has to engage in costly skill formation. The cost of skill formation is a random variable θ distributed with respect to the host country's population of native inhabitants according to a probability density function $f(\cdot)$ and a cumulative distribution function $F(\cdot)$such that $f(z) = F'(z) > 0$ for all $z > 0$. Migrants

[3] The results of this paper carry through to a setting in which the host country admits a binding quota of migrants.

face a migration cost $m \in (0, +\infty)$, which is distributed according to a probability density function $g(\cdot)$, and a cumulative distribution function $G(\cdot)$ such that $g(z) = G'(z) > 0$ for all $z > 0$.

The host country imposes a linear tax, *t*, on each native inhabitant's wage earnings, which it then uses to finance the SWTP, which takes the form of a uniform transfer to each native inhabitant. The migrants are exempt from receiving the transfer and from financing its provision. We express the transfer per native inhabitant as a fraction *b* of the country's output per native inhabitant, $b\left(w_S \frac{N_S}{N} + w_U \frac{N_U}{N}\right)$. The host country runs a balanced budget, which requires that the revenue from the tax levied on wage earnings is equal to the SWTP disbursements

$$t(w_S N_S + w_U N_U) = b\left(w_S \frac{N_S}{N} + w_U \frac{N_U}{N}\right) N \tag{2}$$

or, in short, that $b = t$.[4]

All inhabitants, native and migrant, derive utility, *U*, from consumption, *C*, according to a function $U(C)$, which has the usual properties, namely $U'(\cdot) > 0$ and $U''(\cdot) < 0$. A native inhabitant *j* will elect to become a skilled worker if his utility as a skilled worker, $U\left(C_S^j\right)$, where

$$C_S^j = (1-t)w_S + b\left(w_S \frac{N_S}{N} + w_U \frac{N_U}{N}\right) - \theta^j, \tag{3}$$

is higher than his utility as an unskilled worker, $U(C_U)$, where

$$C_U = (1-t)w_U + b\left(w_S \frac{N_S}{N} + w_U \frac{N_U}{N}\right). \tag{4}$$

From equating (3) and (4), and solving for θ^j, we obtain the threshold level of the skill formation cost

$$\theta^j = (1-t)(w_S - w_U) \equiv \bar{\theta} \tag{5}$$

such that a native inhabitant of skill formation cost $\theta < \bar{\theta}$ chooses to become a skilled worker, whereas a native inhabitant of skill formation cost $\theta \geq \bar{\theta}$ chooses to remain unskilled. It follows from (5) that $w_S > w_U$. Given the distribution of skill formation cost with respect to the host country's native inhabitants, then there will be $N_S = F(\bar{\theta})N$ native skilled workers and $N_U = (1 - F(\bar{\theta}))N$ native unskilled workers.

A prospective migrant will choose to migrate to the host country if his utility under that choice, $U(C_M)$, where C_M denotes the prospective migrant's consumption in the host country, will be higher than his utility in his home country, $U(C_H)$, where C_H, the prospective migrant's consumption in his home country, is exogenously given. Denoting the consumption and the cost of migration of a prospective migrant who is indifferent between migrating and remaining

[4] When $w_S > w_U$, as it is the case in equilibrium, the SWTP is a means of transferring income from high-earning, skilled workers to low-earning, unskilled workers. This is consistent with the evidence: among several typologies of welfare states that were proposed in the literature, some redistribute income towards low-earners, some do not, yet none redistributes income towards high-earners (Esping-Andersen, 1990; Leibfried, 1992; Ferrera, 1996).

in his home country as $\bar{C}_M$ and $\bar{m}$, respectively, we have $U(\bar{C}_M) = U(C_H)$, where $\bar{C}_M = w_M - \bar{m}$. Solving $U(\bar{C}_M) = U(C_H)$ for $\bar{m}$, we get

$$\bar{m} = w_M - C_H. \tag{6}$$

Given the distribution of migration cost with respect to prospective migrants, the number of undocumented migrants is given by $M = G(\bar{m})\tilde{N}$ if $w_M > C_H$, where $\tilde{N} > 0$ is the (exogenous) stock of foreign workers, or $M = 0$ if $w_M \leq C_H$. In the remainder of this paper we assume that $w_M > C_H$.

Firms employ (native) skilled workers and (native and migrant) unskilled workers up to the point at which the marginal product of each type of work input is equal to the market wage per unit of that work, that is

$$A\alpha(N_{Si})^{\alpha-1}(N_{Ui} + M_i)^{1-\alpha} = w_S, \tag{7}$$

$$A(1-\alpha)(N_{Si})^{\alpha}(N_{Ui} + M_i)^{-\alpha} = w_U, \tag{8}$$

and

$$A(1-\alpha)(N_{Si})^{\alpha}(N_{Ui} + M_i)^{-\alpha} = w_M + d, \tag{9}$$

where $d > 0$ is the expected cost for a firm from employing an undocumented migrant other than his wage.[5] From a comparison of (8) and (9) we have $w_M = w_U - d$,[6] which, when utilized in (6), yields

$$\bar{m} = w_U - d - C_H. \tag{10}$$

Because firms are identical and they face the same market wages, we can drop the subscript *i* in (7) and (8) to get that

$$A\alpha(N_S)^{\alpha-1}(N_U + M)^{1-\alpha} = w_S \tag{11}$$

and

$$A(1-\alpha)(N_S)^{\alpha}(N_U + M)^{-\alpha} = w_U. \tag{12}$$

Substituting from (11) and (12) into (5) and (10), and then from $N_S = F(\bar{\theta})N$, $N_U = (1 - F(\bar{\theta}))N$, and $M = G(\bar{m})\tilde{N}$ into (5) and (10), we obtain a set of two equations,

$$\bar{\theta} = (1-t)A(F(\bar{\theta})N)^{\alpha}\left(\left(1 - F(\bar{\theta})\right)N + G(\bar{m})\tilde{N}\right)^{1-\alpha} \cdot \left(\frac{\alpha}{F(\bar{\theta})N} - \frac{1-\alpha}{(1-F(\bar{\theta}))N + G(\bar{m})\tilde{N}}\right) \tag{13}$$

and

$$\bar{m} = A(1-\alpha)(F(\bar{\theta})N)^{\alpha}\left((1 - F(\bar{\theta}))N + G(\bar{m})\tilde{N}\right)^{-\alpha} - d - C_H, \tag{14}$$

[5] The cost *d* can be, for example, the expected value of employer sanctions (per undocumented migrant), such as those introduced in the US in 1986 (Martin, 2012; Stark and Jakubek, 2012).

[6] Borjas (2017) shows that undocumented migrants in the US earn less than legal migrants and native workers with comparable socioeconomic characteristics.

with two unknowns: $\bar{\theta}$ and $\bar{m}$. We denote the values of $\bar{\theta}$ and $\bar{m}$ that jointly solve (13) and (14) as $\bar{\theta}^*$ and $\bar{m}^*$; an asterisk denotes the equilibrium level of a variable. We are now ready to state and prove a Claim.

Claim 1. Other things held the same, the higher the SWTP in the host country, the smaller the number of undocumented migrants in the country, that is, $\frac{dM^*}{db} < 0$.

Proof. Because from the balanced budget constraint (2) $b = t$, then calculating $\frac{dM^*}{db}$ is equivalent to calculating $\frac{dM^*}{dt}$. Recalling that $M = G(\bar{m})\tilde{N}$, then $\frac{dM^*}{dt} = g(\bar{m}^*)\tilde{N}\frac{d\bar{m}^*}{dt}$. Recalling next (13) and (14), we introduce

$$D_1(\bar{\theta}, \bar{m}, t) = (1-t)A(F(\bar{\theta})N)^{\alpha}\left(\left(1-F(\bar{\theta})\right)N + G(\bar{m})\tilde{N}\right)^{1-\alpha} \cdot\left(\frac{\alpha}{F(\bar{\theta})N} - \frac{1-\alpha}{(1-F(\bar{\theta}))N+G(\bar{m})\tilde{N}}\right) - \bar{\theta} \tag{15}$$

and

$$D_2(\bar{\theta}, \bar{m}, t) = A(1-\alpha)(F(\bar{\theta})N)^{\alpha}\left((1-F(\bar{\theta}))N + G(\bar{m})\tilde{N}\right)^{-\alpha} - d - C_H - \bar{m}. \tag{16}$$

Because $D_1(\bar{\theta}^*, \bar{m}^*, t) = 0$ and $D_2(\bar{\theta}^*, \bar{m}^*, t) = 0$, we can calculate $\frac{dM^*}{dt}$ by applying the implicit function theorem to $D_1(\bar{\theta}^*, \bar{m}^*, t) = 0$ and $D_2(\bar{\theta}^*, \bar{m}^*, t) = 0$. Specifically, $\frac{dM^*}{dt}$ can be obtained from the following linear system:

$$\begin{bmatrix} \frac{\partial D_1}{\partial \bar{\theta}^*} & \frac{\partial D_1}{\partial \bar{m}^*} \\ \frac{\partial D_2}{\partial \bar{\theta}^*} & \frac{\partial D_2}{\partial \bar{m}^*} \end{bmatrix} \times \begin{bmatrix} \frac{d\bar{\theta}^*}{dt} \\ \frac{d\bar{m}^*}{dt} \end{bmatrix} = \begin{bmatrix} -\frac{\partial D_1}{\partial t} \\ -\frac{\partial D_2}{\partial t} \end{bmatrix}, \tag{17}$$

where $\frac{\partial D_1}{\partial \bar{\theta}^*} = -(1-t)f(\bar{\theta}^*)N\left(\frac{1}{N_S^*} + \frac{1}{N_U^*+M^*}\right)[(1-\alpha)w_S^* + \alpha w_U^*] - 1 < 0$,

$\frac{\partial D_1}{\partial \bar{m}^*} = (1-t)[(1-\alpha)w_S^* + \alpha w_U^*]\frac{g(\bar{m}^*)\tilde{N}}{N_U^*+M^*} > 0$,

$\frac{\partial D_2}{\partial \bar{\theta}^*} = \alpha w_U^* f(\bar{\theta}^*)N\left(\frac{1}{N_S^*} + \frac{1}{N_U^*+M^*}\right) > 0$, $\frac{\partial D_2}{\partial \bar{m}^*} = -\alpha g(\bar{m}^*)\tilde{N}\frac{w_U^*}{N_U^*+M^*} - 1 < 0$,

$\frac{\partial D_1}{\partial t} = -(w_S^* - w_U^*) < 0$, and $\frac{\partial D_2}{\partial t} = 0$. Solving (17) for $\frac{d\bar{\theta}^*}{dt}$ and $\frac{d\bar{m}^*}{dt}$, we obtain

$$\frac{d\bar{\theta}^*}{dt} = -\frac{(w_S^* - w_U^*)\left(1+\alpha w_U^*\frac{g(\bar{m}^*)\tilde{N}}{N_U^*+M^*}\right)}{1+(1-t)f(\bar{\theta}^*)N\left(\frac{1}{N_S^*}+\frac{1}{N_U^*+M^*}\right)[(1-\alpha)w_S^*+\alpha w_U^*]+\alpha w_U^*\frac{g(\bar{m}^*)\tilde{N}}{N_U^*+M^*}} < 0, \tag{18}$$

and

$$\frac{d\bar{m}^*}{dt} = \frac{(w_S^* - w_U^*)\alpha w_U^* f(\bar{\theta}^*)\left(\frac{1}{N_S^*}+\frac{1}{N_U^*+M^*}\right)}{1+(1-t)f(\bar{\theta}^*)N\left(\frac{1}{N_S^*}+\frac{1}{N_U^*+M^*}\right)[(1-\alpha)w_S^*+\alpha w_U^*]+\alpha w_U^*\frac{g(\bar{m}^*)\tilde{N}}{N_U^*+M^*}} < 0. \tag{19}$$

Because $\frac{d\tilde{m}^*}{dt} < 0, \frac{dM^*}{dt} = g(\tilde{m}^*)\tilde{N}\frac{d\tilde{m}^*}{dt}$, and $b = t$, we conclude that $\frac{dM^*}{db} = \frac{dM^*}{dt} < 0$. Q.E.D.

A negative relationship between the generosity of the SWTP in a country and the country's attractiveness to undocumented migrants is a direct consequence of a decrease in the wage of unskilled workers which pulls down the reward from migration for undocumented migrants. The decrease in the wage of unskilled workers is caused by the SWTP, which encourages the country's native inhabitants to become unskilled workers, leading to an increase in the supply of these workers relative to the supply of skilled workers. That the wage earnings of unskilled workers are indeed negatively related to the generosity of the SWTP can be seen from totally differentiating (10) and dividing both sides by *db*: we obtain $\frac{dw_U^*}{db} = \frac{d\tilde{m}^*}{db} < 0$.

Consequences for the optimal SWTP

So far we have assumed that the level of the SWTP is fixed. However, in a general equilibrium framework, the SWTP should be set as the outcome of welfare maximization of the host country's native population by the country's government. Assuming that the objective function of the host country's government is a utilitarian social welfare function given by

$$W(t) = \int_0^{\bar{\theta}(t)} U(C_S(t))\, dF(\theta) + \int_{\bar{\theta}(t)}^{+\infty} U(C_U(t))\, dF(\theta), \qquad (20)$$

from the properties of $U(\cdot)$ together with $C_S(t) > C_U(t)$ it follows that when the number of undocumented migrants is relatively small, the socially optimal level of the social benefit is unambiguously positive.[7] For specific shapes of $U(\cdot)$, $F(\cdot)$, and $G(\cdot)$, the optimal level of the SWTP can be obtained numerically.

Our results indicate that because the SWTP is a disincentive from the perspective of undocumented migrants, it not only improves (up to a point) social welfare directly, by transferring income from more well-off native inhabitants to less well-off native inhabitants, but it also improves social welfare indirectly, by keeping away prospective undocumented migrants, who otherwise would compete in the host country's labor market with native unskilled workers (the less well-off group). Thus, the negative impact of the SWTP on the number of undocumented migrants can be seen as a positive welfare externality associated with the SWTP.

This carries consequences for the optimal level of the SWTP. When the host country's government is unaware of the impact of the SWTP on undocumented migration, it will treat the number of undocumented migrants as an exogenous value when maximizing (20). Therefore, it will fail to account for the fact that an increase in the SWTP will reduce the number of undocumented migrants, and, therefore, the negative impact of the SWTP on the wage of unskilled workers. In effect, the government will overshoot (it will set the SWTP at a too high level). Conversely, when the government takes into account the impact of the SWTP on undocumented migration, it will realize that it must not set the SWTP as high as

[7] When $M \to 0$, $b = t = 0$ yield maximum aggregate output net of the aggregate skill formation cost. Then, a marginal increase in *b* (and *t*) will have a first-order positive effect on *W*, via more efficient in terms of derived utility allocation of income, and only second-order negative effect on output.

when the SWTP and undocumented migration were unrelated; it will set the SWTP at the optimal, lower level.

Conclusions

Using a model of undocumented migration to a country which provides SWTP to its native inhabitants, we showed that even when migrants do not benefit from the SWTP nor participate in financing it, the program affects negatively the country's attractiveness to would be migrants. The reason is that the SWTP incentivizes native inhabitants to take up unskilled work, which reduces the wage earnings of unskilled workers, native and migrant alike. Faced with lower wage earnings, prospective migrants with relatively high migration costs choose not to migrate. The SWTP acts indirectly as a deterrent of undocumented unskilled migration. This has consequences for the optimal level of the SWTP: it is lower when the relationship between the SWTP and undocumented migration is taken into account than when it is not.

Our result of a negative relationship between the SWTP and undocumented migration draws on the assumptions that undocumented migrants do not benefit from the SWTP, and that they do not contribute to the SWTP. These assumptions can be modified. For example, in the US undocumented migrants have access to emergency medical aid under Medicaid and the Special Supplemental Nutrition Program for Women, Infants, and Children. Also in the US, undocumented migrants' tax compliance rates are estimated to be relatively high, at between 50 and 75 percent (CBO, 2007). In such cases, the paper's result continues to hold under less strict assumptions regarding undocumented migrants' access and contribution to a SWTP, as long as these migrants are not net beneficiaries of the SWTP, which is quite likely to be the case.

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