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On the taxing of migrants' earnings while retaining a migrant workforce

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Abstract

We study policies that are aimed at retaining a migrant workforce in a Gulf State while introducing a tax on migrant earnings. We single out Qatar as a case study. We consider two types of migrants: target migrants, and non-target migrants. If migrants are target migrants, we show that in order to neutralize the effect of a tax on their earnings, Qatar needs to extend the length of time migrants are allowed to stay. Such a scheme can work even when the migrants experience utility loss from staying longer in Qatar. If migrants are non-target migrants, we show that implementation of a lottery scheme in which the prizes are life-long residency in Qatar can "compensate" for the imposition of the tax. In both cases, we present numerical examples that illustrate the magnitudes involved.

Keywords: Migration, Taxing migrants, Target migrants, Non-target migrants

JEL Classification: C6, F22, J33, J41

1. Motivation

Last year, the idea of taxing migrants' earnings in the Gulf region in general, and in Qatar in particular, was raised with one of the authors of this note. The specific question posed was: can taxation of migrants' earnings be implemented in a way that preserves their incentive to work in Qatar? Presumably, what prompted this question was the considerable pressure on the six Gulf States (GCC countries) to cut public spending in the wake of the sharp decline in oil prices in the second half of 2014. The aim of this note is to outline a response to this question.

In 2012-2015, oil revenues in the GCC countries accounted for about 50-90 percent of total government revenues. From 2014 to 2015, government revenues from oil dropped from 33.9 percent of GDP to 21.8 percent of GDP (IMF, 2016). Lower oil prices are also likely to reduce the GDP and slow the pace of economic growth in the GCC countries (Nusair, 2016). For these reasons, the GCC countries started to search for policies that could increase government revenue while retaining the countries' economic model and its supportive labor force architecture. In this area, several reforms were proposed, such as the introduction of a five percent Value Added Tax in all GCC countries, an increase in corporation tax from 12 percent to 15 percent in Oman, and an increase in gasoline prices in Qatar. Here we study another possibility, namely taxation of migrants' earnings.

We distinguish between two categories of migrants. First, we list considerations based on the assumption that migrants are target migrants, namely that the purpose of migration is to accumulate a specified quantity of funds (the target), and then return home. Second, we consider a policy response when the target does not apply, as when, for example, the migrants do not have any need or desire to go back home. We examine how the identification of migrants as target migrants or as non-target migrants can inform public policy, here - the taxing of migrant earnings.

We focus on Qatar as a reference case study, assuming (if there were no tension between GCC countries) that taxation of migrants' incomes, if enacted, will be synchronized across the GCC countries, thus excluding the possibility of selecting a low-tax country within the GCC region, when such a selection is possible.

2. The case of target migrants

Suppose that migrants seek to accumulate *x* income units, and then return to their home country. The migrants want to accumulate savings that will enable them to buy a truck, a tractor, start a business, build a house, make it possible for a child to go to college, marry well at home, and so on. We refer to such migrants as target migrants. Suppose that in order to amass *x* income units, migrants need to work *n* years, and that their permit for work in the host country is specified for *n* years. Assuming a zero rate of interest, savings per year is x/n income units. Suppose now that the host country imposes income tax at the rate of τ, $0<\tau<1$. The amount saved in *n* years will therefore be only $x(1-\tau)$ income units. If when introducing the tax the host country extends the migrants' permitted stay to $n/(1-\tau)$ years, then the migrants will end up accumulating their target *x* income units. (An underlying requirement for this scheme to work is that the migrants do not experience severe utility loss from staying longer in the host country; see below). Thus, a concrete policy of taxing migrants while retaining the migrant workforce in the host country will, simultaneously with the imposition of the tax, correspondingly extend the length of the migrants' work permit. When this duration is synchronized with the tax rate (neatly configured as an increasing function of it), migrants will still want to stay.

2.1 A modeling framework

The preceding considerations can be summarized in the following utility function. (Later on in this sub-section we comment on the robustness of the results presented in this section to an alternative utility specification.)

Let the utility function of an individual as a would-be migrant be:

$$U = \max\left\{\sum_{k=0}^{n-1}\left(y\left(1+\rho\right)^{k}\right)-x,0\right\}, \tag{1}$$

where *x* are the target savings that the individual seeks to accumulate in the course of his migration, *y* is the individual's annual income as a migrant, and $\rho\in[0,1)$ is a discount factor. If the individual's utility as a migrant is 0, then the individual does not migrate. To illustrate our argument, we use a linear specification, while aware that the particular

functional form to apply is an empirical issue, which we do not explore here. Denoting $\rho^* = \sum_{k=0}^{n-1}(1+\rho)^k = \frac{(1+\rho)^n - 1}{\rho}$ ($\rho^* \in [n, 2^n - 1)$), an individual will consider migrating only if $y\rho^* \geq x$, namely only if his discounted accumulated income is as high as or higher than his target savings. An implicit assumption is that work at home cannot yield *x*.[1] For given *y* and *x*, we can calculate the minimal length of stay at destination that will render it worthwhile for an individual to migrate. To this end, we need to solve the equation

$$\frac{(1+\rho)^{n^*} - 1}{\rho} = \frac{x}{y},$$

which can be rewritten as

$$(1+\rho)^{n^*} = \frac{x}{y}\rho + 1 . \tag{2}$$

Taking the logarithm of the two sides of (2) yields

$$n^* = \frac{\log\left(\frac{x}{y}\rho + 1\right)}{\log(1+\rho)} . \tag{3}$$

Therefore, if an individual is allowed to stay for a duration that is equal to or is longer than n^*, then migration will be attractive.

Suppose now that migrants' earnings are subjected to income tax τ. Then, the utility function (1) will need to be reformulated to become

[1] For example, income at home is sufficient for basic needs, but is not high enough to permit accumulating savings for a given target in a reasonable time span.

$$U = \max\left\{\sum_{k=0}^{n-1}\left(y(1-\tau)(1+\rho)^k\right) - x, 0\right\},$$

and the minimal length of stay that will render it worthwhile for an individual to migrate will be

$$n^{**} = \frac{\log\left(\frac{x}{y(1-\tau)}\rho + 1\right)}{\log(1+\rho)}. \qquad (4)$$

From inspection of (3) and (4) it follows that $n^{**} > n^{*}$.

We can next calculate by how much the minimal permitted length of stay will have to increase following the levying of an income tax, so that the individual will still find it worthwhile to migrate. The required extension is given by the difference

$$n^{**} - n^{*} = \frac{\log\left(\frac{x}{y(1-\tau)}\rho + 1\right)}{\log(1+\rho)} - \frac{\log\left(\frac{x}{y}\rho + 1\right)}{\log(1+\rho)} = \frac{\log\left(\frac{x\rho + y(1-\tau)}{(x\rho + y)(1-\tau)}\right)}{\log(1+\rho)}.$$

If an extended stay involves a utility loss, then we would need to incorporate in the utility function a cost term for the length of stay. To this end, we rewrite the utility function (1) as

$$U = \max\left\{\sum_{k=0}^{n-1}\left(y(1+\rho)^k\right) - x - \alpha g(n), 0\right\}, \qquad (1')$$

where $g(n)$, such that $g'(n) > 0$, is the cost to an individual of being separated from family and home, which increases with the length of stay at an increasing rate,

$g''(n) > \frac{y}{\alpha\rho}(1+\rho)^n \left(\log(1+\rho)\right)^2 > 0$,[2] and where $\alpha > 0$ is a coefficient in the individual's utility function that represents (measures) the weight accorded to this cost. In this case, then, the individual will favor migration only if $y\rho^* \geq x + \alpha g(n)$. We assume, that $h_y(n) = y\rho^* - \alpha g(n)$ is a concave, inverse U-shaped function. The reasoning for making this assumption is that although, initially, an increase in the permitted length of stay renders migration more attractive, at some point, the utility loss from a longer stay takes over so that further increases in the permitted length of stay make migration no longer desirable. Then, two solutions to the equation

$$h_y(n) = x \tag{5}$$

can exist, expressed as $\hat{n}_1^*$, and $\hat{n}_2^*$ (where $\hat{n}_1^* < \hat{n}_2^*$) such that $\hat{n}_1^*$ is the minimum length of stay allowed at destination that will render it worthwhile for an individual to migrate, and $\hat{n}_2^*$ is the maximum length of stay that the individual will consider. We are interested in analyzing $\hat{n}_1^*$. In the proximity of $\hat{n}_1^*$, $h_y(n)$ is a monotonic, increasing function of the length of stay, n, so it can be locally inverted, which yields

$$\hat{n}_1^* = h_y^{-1}(x). \tag{6}$$

When an income tax, τ, is imposed, the minimal length of stay is given by

$$\hat{n}_1^{**} = h_{(1-\tau)y}^{-1}(x).$$

[2] The condition $g''(n) > \frac{y}{\alpha\rho}(1+\rho)^n \left(\log(1+\rho)\right)^2 > 0$ is necessary for $h_y(n) = y\rho^* - \alpha g(n)$ to be a concave function.

Because (at least in the neighborhood of $\hat{n}_1^*$) $h_y(n)$ is an increasing function of both y and n, it is easy to see that $\hat{n}_1^{**} > \hat{n}_1^*$. The exact difference $\hat{n}_1^{**} - \hat{n}_1^*$ depends on the specific functional form of $g(n)$.

2.2 A numerical illustration

We present a numerical illustration of our model, drawing on the Qatari migrant scene. In Qatar, migrants are permitted to stay for one to three years. Permission can be extended for further three years. Usually, migrants receive 600 riyals a month, plus 200 riyals for food and related expenditures. In order to obtain a job in Qatar, migrants typically spend about 4,000 riyals. We therefore assume that the annual income of a migrant is $y = 600 \cdot 12 = 7,200$ riyals. We do not include the sums allotted for food and related expenditures because they do not contribute to the target savings. In addition, we assume a discount rate of 1%.[3] Data concerning target savings are not available to us. Nevertheless, we know that they are constrained by the income that as a target migrant, an individual accumulates over his stay because otherwise he would not migrate in the first place. Upper bounds of target savings are listed in column (ii) of Table 1. In our calculations, we do not include the 4,000 riyals that migrant workers have to spend in order to obtain a job in Qatar because this amount reduces both the target savings and the accumulated income and therefore does not change anything in the utility function (1). For the numbers displayed in column (ii), treated as estimates of x, we calculate the minimum length of stay after tax is levied by using (4). The calculations for three alternative tax rates are displayed in columns (iii) - (v) of Table 1.

[3]Consult http://www.cbq.qa/en/advice-and-information/information-library/rates-indices-and-charges/pages/deposit-rates.aspx

(i)	(ii)	Minimum desired length of stay when the tax rate is: (iii)	(iv)	(v)
Current permission to stay is for:	**Target savings are lower than:**	**5%**	**10%**	**20%**
1 year	7,200.00	1.05	1.11	1.25
2 years	14,472.00	2.10	2.22	2.49
3 years	21,816.72	3.16	3.33	3.74
4 years	29,234.89	4.21	4.43	4.98
5 years	36,727.24	5.26	5.54	6.21
6 years	44,294.51	6.31	6.65	7.45

Table 1: A numerical illustration of the effect of a tax on migrant earnings on the migrants' minimum desired length of stay.

For example, for a target migrant who is currently permitted to stay in Qatar for three years, we obtain that on introducing a 10% income tax, the possibility of a stay of 3.33 years should also be introduced (Table 1, column (iv)).

3. And what if the migrants are non-target migrants?

3.1 A tax compatibility condition

When migrants are non-target migrants, a "tax compatibility" scheme could be implemented such that in conjunction with the introduction of an income tax on migrants' earnings, migrants are allowed to participate in a lottery where the prizes are life-long residency in Qatar. The underlying idea here is that like others, migrants seek to improve the quality of their lives. Because the quality of life in Qatar is so much higher than in India, Nepal, Philippines, and Bangladesh (the main countries of origin of migrants), it is not unrealistic to assume that a prospect of life-long residency in Qatar will be prized highly. The distinction here between target and non-target migrants is that the latter do not place a high value on living in their home country but, rather, are content to move to other countries (alone or together with close family) when doing so increase substantially the quality of their life. With many people around the world who are happy

to move permanently to richer countries, there is no reason to assume that the same does not apply to at least some of the individuals who consider migrating to Qatar.

In such a setting, we seek to compare the utility exhibited by the function

$$U_1 = \sum_{k=0}^{n-1}\left(y\left(1+\rho\right)^k\right), \tag{7}$$

with the utility exhibited by the function

$$U_2 = \left(1-p\right)\sum_{k=0}^{n-1}\left(y\left(1-\tau\right)\left(1+\rho\right)^k\right) + pV\,, \tag{8}$$

Where p is the probability of winning the lottery, V is the value that a migrant assigns to life-long residency in Qatar, and y, τ, and ρ are as defined in Section 2. We can now formulate a condition under which migrants will be indifferent between a regime of no income tax and a regime in which a tax is imposed in conjunction with a lottery. Comparing (7) with (8), this condition is

$$\left(1-p\right)\left(1-\tau\right)y\rho^* + pV = y\rho^*,$$

which, simplified, can be expressed as

$$p = \frac{\tau y\rho^*}{\tau y\rho^* + \left(V - y\rho^*\right)}. \tag{9}$$

In order for p to be smaller than 1, it has to hold that $V > y\rho^*$, which is quite likely, especially as life-long residency in Qatar includes the possibility of working there for n years. Indeed, and quite intuitively, (9) implies that the higher the tax rate, τ, the higher the probability of winning the lottery, p, needs to be.

3.2 A numerical illustration

As with Section 2, here too we provide a numerical example. In Table 2, columns (iii) - (xi) present probabilities of winning the lottery which render migrants indifferent between the utility exhibited in (7) and the utility exhibited in (8). We consider three different tax rates, three different values of V, and six different levels of earnings, depending on the current length of migrants' permitted stay (analogously to Table 1, column (i)). Thus, for example, for a migrant who is currently allowed to stay in Qatar for three years, and who values life-long residency in Qatar at 200,000 riyals, we see that in conjunction with the introduction of a 10% income tax, a lottery with a probability of winning of 1.21% should be introduced (column (iv) in Table 2) in order to keep the utility levels of the migrants constant. Whether or not having, say, 12,100 migrants out of 1,000,000 migrants becoming permanent residents is valued by Qatar more than taxing the earnings of all 1,000,000 migrants by 10 percent is a decision that is not for us to take. But the numbers involved are clearly defined.

		Value assigned to life-long residency in Qatar:								
		200,000.00			**400,000.00**			**600,000.00**		
(i)	**(ii)**	**(iii)**	**(iv)**	**(v)**	**(vi)**	**(vii)**	**(viii)**	**(ix)**	**(x)**	**(xi)**
Current permission to stay is for:	**Earnings**	**Tax rate**			**Tax rate**			**Tax rate**		
		5%	**10%**	**20%**	**5%**	**10%**	**20%**	**5%**	**10%**	**20%**
1 year	7,200.00	0.19%	0.37%	0.74%	0.09%	0.18%	0.37%	0.06%	0.12%	0.24%
2 years	14,472.00	0.39%	0.77%	1.54%	0.19%	0.37%	0.75%	0.12%	0.25%	0.49%
3 years	21,816.72	0.61%	1.21%	2.39%	0.29%	0.57%	1.14%	0.19%	0.38%	0.75%
4 years	29,234.89	0.85%	1.68%	3.31%	0.39%	0.78%	1.55%	0.26%	0.51%	1.01%
5 years	36,727.24	1.11%	2.20%	4.31%	0.50%	1.00%	1.98%	0.32%	0.65%	1.29%
6 years	44,294.51	1.40%	2.77%	5.38%	0.62%	1.23%	2.43%	0.40%	0.79%	1.57%

Table 2: A numerical illustration of the effect of a tax of migrants' earnings on the probability of winning the lottery for non-target migrants.

4. Conclusions

We have shown how it is possible to retain a migrant workforce while imposing a tax on migrants' incomes. The specific policy to be implemented will depend on the nature of

the migrants: in the case of target migrants, the option of a well-defined extension of stay will incentivize them to stay in Qatar even when their income is taxed there. In the case of non-target migrants, a lottery where the prizes are life-long residency in Qatar will have the same effect.

The numerical examples presented in Sections 2 and 3 provide illustrations of the magnitudes involved. For concrete, realistic estimates, however, a survey study could be undertaken in order to collect information about target savings, the utility loss associated with an extended stay by target migrants, and the value that non-target migrants assign to life-long residency in Qatar.

The question as to what type of migrants (for example, low-skill or high-skill) Qatar should take is beyond the scope of this note. The purpose of the note is to illustrate how once the optimal number of migrants (possibly of different skill levels) is decided, a taxation scheme can be implemented that, consequently, will not reduce the migrant workforce.

Furthermore, the terms of reference of this note are not to engage in a comparative analysis of alternative taxation policies aimed at contributing to the coffers of the country's treasury. If a decision is to be made to tax migrants' incomes, we have shown how simple analytical considerations could be brought to bear on the choice of the respective amounts. We hasten to add that because it is unlikely that the revenue obtained from the proposed tax will be sufficient to cover the bulk of the budget shortfall or the budget needs of the government, the proposed scheme will have to be implemented in conjunction with other tax policies.

An inference to be drawn from this note is that depending on context and circumstance, to prevent a remedial action from inflicting harm, taxes need to be configured in such a way that, in conjunction with their imposition, incentive-preserving steps will also be implemented.

References

International Monetary Fund (2016). “Diversifying Government Revenue in the GCC: Next Steps” *Annual Meeting of Ministers of Finance and Central Bank Governors*.

Nusair, Salah A. (2016). “The effects of oil price shocks on the economies of the Gulf Co-operation Council countries: Nonlinear analysis.” *Energy Polic*y 91: 256-267.