Would Mexican Migrants be Willing to Guarantee Americans a Basic Income?

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Abstract

The paper simulates a double-sided competitive market in temporary work permits between the U.S. and Mexico. Eligible working-age Americans would have the option of renting out their implicit work permits while Mexican workers have remunerative new opportunities. With plausible allowances for migration costs, the market can support a self-financed and self-targeted basic income for Americans and lower their poverty rate. With sufficiently high tax rates on work permits, the scheme can be managed to avoid a large increase in the count of total migrants compared to now. The likely change in the skill composition of migrants would raise U.S. GDP.
Would Mexican Migrants be Willing to Guarantee Americans a Basic Income?

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1. Introduction

In making his case for nomination as the Republican candidate for U.S. President during the 2016 campaign, Donald Trump famously promised to build a wall along the U.S. border with Mexico to discourage migrants entering the U.S. The primary issue addressed (however imperfectly) by Trump’s proposed wall was managing migration. But there was clearly a sub-theme of social protection; Trump’s message of restricting migration from Mexico was appealing to many electors in the U.S. who felt that their jobs and living standards were threatened.

Four years later, Andrew Yang, in his effort to secure the nomination as the Democratic candidate for the U.S. Presidency, also made an appeal to electors regarding social protection. The main element of Yang’s (2018) platform was a proposal for a Universal Basic Income (UBI)—an unconditional payment of $1,000 per month to every U.S. citizen. Concerns about how to finance the UBI were prominent in the public debate.

Motivated by such examples, this paper explores the possibility that a regulated competitive market in temporary permits to work in the U.S. could help in managing migration in a way that would address the continuing concerns about the vulnerability of living standards among American citizens—concerns that are clearly among the motivations for supporters of both Trump and Yang. In a nutshell, the policy idea we study entails that any U.S. citizen of working age should be allowed to rent out her work permit (WP)—the right to take any job on offer (which is neither person nor occupation-specific)—for a preferred period of time. A citizen still owns her “right to work,” interpreted as an inalienable right that comes with citizenship. However, under this policy, that ownership is also seen to come with the right to rent it out, similarly to renting out (say) an owned dwelling. She gets her WP back at the end of a contracted period.

On the other side of the new market, time-bound WPs would be available for purchase to people who have no right to work in the U.S. Purchasing a WP would grant these people a right to work in the U.S. for the specific time period. The price of the WP is set to balance the two sides of the market, so that the total work time rented out by the U.S. citizens approximately equals the total work time purchased. The equilibrium price becomes the basic income available to any working-age U.S. citizen.
Thus, the policy provides what we will call a Basic Income Guarantee (BIG). This is not a UBI, as it is implicitly targeted through the choices made by citizens. While every working-age U.S. citizen would have an option to rent out their WPs, not all will find it preferable to do so. And the policy only makes sense for those citizens who are of legal working age, and thus have the right-to-work. That would still leave some of those not eligible living below the poverty line. It is an empirical question how much impact such a BIG would have on poverty.

The WP is taxable, and (as we will show) the tax rate levied by the U.S. government would be a key policy instrument for managing migration using a market. Within certain limits, the tax rate can be set to either assure a desired migration intake or to reach a desired basic income for U.S. residents; 2 either way, there will be a target price for WPs and the tax rate is chosen accordingly. The extra revenues from taxes on WPs (and stemming from any difference in the taxes paid by migrants and those who rent out their WP) can be used (among other things) to cover the administrative costs of the scheme, information campaigns, enforcement of migration laws, and support extra public services to help market participants. The latter could include services to help migrants in the transition (such as help with housing and language training) and support for secondary insurance for citizens renting out their WP, to allow them to rent it back at no higher price. 3 These efforts can also help reduce migration costs, thus making higher basic incomes feasible for the host country.

There are antecedents to the idea of a market for WPs. 4 One important difference to the past proposals is that the double-sided competitive market for WPs studied here directly provides social protection through a BIG in high-wage economies. A second difference is that the market is anonymous, with no matching of buyers and sellers; all that needs to be balanced is the aggregate demand in labor-time units and aggregate supply. In a previous paper (Lokshin and Ravallion, 2021), we outlined the theory and the policy issues including those related to implementation of this idea.

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2 Though it is not something we address empirically here, the tax can also be differentiated by occupation and/or industry to attain a desired composition of migrants, to support industrial policy in the host country (Lokshin and Ravallion, 2021).

3 Lokshin and Ravallion (2021) discuss these topics further.

This paper aims to assess whether there is a feasible design for a two-sided market-based solution to temporary migration that would attain a basic income in the U.S. similar to current UBI proposals, such as Yang’s $1,000 a month. The paper confines attention to migration from Mexico. We envisage a market that would essentially eliminate illegal (undocumented) migration, though existing channels for permanent residence of non-citizens (“green cards”) would remain. The number of illegal migrants in the U.S. is not known with certainty, with estimates (reviewed later) in the range 11-22 million, of which around half are from Mexico. The simulations assess whether mutually beneficial trades could simultaneously provide a BIG in the U.S. and earnings gains to Mexican migrants and increased remittances to their families in Mexico. To do this, we use national surveys for 2018 to predict the expected wages of Mexican workers in the U.S., based on Mincer-type earnings regressions estimated on the U.S. survey data and the characteristics of the Mexican worker. We simulate the market when adult citizens of the U.S. can rent out their WPs, and citizens of Mexico are allowed to purchase a yearlong WP in the U.S.

Our “benchmark” calculations restrict eligibility to those currently in the U.S. workforce. However, it can be argued that such a policy will attract citizens currently outside the workforce, to take advantage of the scope for selling their WP. We also study impacts at this extensive margin. Additionally, we consider a more restricted set of eligible Americans, namely those with dependent elderly and/or young (pre-school) children.

Armed with these data and methods, we assess whether, even when the policy is restricted to migrants from Mexico, it is possible to finance a reasonable basic income for Americans by tapping into the economic gains from migration. Costs of migrations and policy restrictions on migration create large wage gaps globally, as demonstrated by Clemens et al. (2019). But are they large enough to deliver such a level of social protection in the U.S.?

The following section summarizes the idea in theory. We then discuss the data and methods for the present paper (Section 3). The results are reported in Section 4, and section 5 concludes.

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5 Lokshin and Ravallion (2021) discuss this aspect of the policy design further. One can also insist that someone has to have been in the workforce for some minimum period before being allowed to rent out their WP.

6 Section 2 draws on Lokshin and Ravallion (2021), which also provides a literature review on antecedents to the idea.
2. The idea in theory

With adequate enforcement, a competitive market for WPs will drive out illegal migration. This does not require full enforcement, defined as a situation in which there is no chance that an illegal migrant will escape deportation by the authorities in the host country. Lokshin and Ravallion (2021) show that adequate partial enforcement, as measured by the probability of being caught and sent home, is sufficient to make legal migration the preferred choice. (The Wall might not be needed.) That is what we assume here.

The costs of migrating include the foregone earnings at the origin, the extra living costs incurred in the destination, out-of-pocket costs of moving, taxes imposed by the U.S. and any remittance demands made by the family and friends back in Mexico that would not have been made if the migrant had stayed home. The key implication of these costs of migration is that the distribution of labor earnings, net of the costs of migrating, facing potential Mexican migrants is not the same as the existing distribution of earnings in the high-wage country. Specifically, we assume that potential migrants expect to receive net earnings in the U.S. with a continuous cumulative distribution \(G(w)\), with \(G(.)\) strictly increasing as usual. Given the costs of moving, the migrant's net earnings distribution can be taken to be unambiguously “poorer” than the distribution found in the U.S., denoted \(F(w)\), which is also continuous in \(w \in [w_{min}, w_{max}]\) with \(F(.)\) strictly also increasing.7 In other words, we assume that \(G(w) > F(w)\) for all \(w \in [w_{min}, w_{max}]\). Demand for the WPs is \([1 - G(p)]n_{MX}\) where \(n_{MX}\) is the total workforce in Mexico, while \(n_{US}\) is the U.S. workforce, with \(n_{MX} + n_{US} = n\). We impose two restrictions on the \(G(.)\) distribution, namely that \(G(w_{min}) < n_{MX}/n\), and \(G(w_{max}) = 1\), which imply positive excess demand at \(w_{min}\) and an excess supply at \(w_{max}\). Invoking continuity and monotonicity, a (unique) equilibrium is given by:

\[
p = H^{-1}(n_{MX}/n) \tag{1}
\]

where \(H(w) \equiv [F(w)n_{US} + G(w)n_{MX}]/n\) is the weighted mean of the two distributions.

We can now introduce a tax on the WP as a policy instrument for managing the scheme—for determining the desired basic income and/or controlling migration flows. The tax is

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7 In the empirical work we allow for a replacement rate less than unity, such as due to disutility of labor.
denoted $\tau_{wp} \in [0, \tau_{wp}^{\text{max}}]$ and the net earnings distribution for potential migrants is now $G(w + \tau_{wp})$. The market equilibrium solves:

$$F(p)n_{US} = [1 - G(p + \tau_{wp})]n_{MX}$$

(2)

It is readily verified that the higher the value of $\tau_{wp}$ (up to $\tau_{wp}^{\text{max}}$) the lower is the value of $p$ solving (2). As usual, the tax is passed on in part through the equilibrium price.

The market for WPs described above would create a new binding floor to earnings in the US—a new lower bound, above the current floor, and potentially at or above the earnings from a full-time job at the minimum wage rate. Workers will rent out their WP if they earn less than $p$ (and some earning more than $p$ will also do so if they experience a disutility of work, which we allow for in the empirical analysis).

We can also solve the inverse problem. For this, we take it as given that the government wants to attain some specific price, denoted $\bar{p}$. The latter can be interpreted as either a desired BIG or the price needed to assure a given migration intake; in the latter case, $\bar{p} = F^{-1}(m/n_{US})$ where $m$ denotes the target count of migrants. With the market for WPs in place, the host government can now solve for the tax rate on WPs to assure that $p = \bar{p}$, namely:

$$\tau_{wp}^* = G^{-1}\left(1 - \frac{F(p)n_{US}}{n_{MX}} \right) - \bar{p}$$

(3)

If $\tau_{wp}^* \geq 0$ then the new market makes it feasible to implement the host country’s desired $\bar{p}$ using non-negative taxes on WPs.

3. Data and methods

We use data from the 2018 Annual Social and Economic Supplement of the U.S. Current Population Survey (CPS), U.S. Census Bureau (2019), and the Mexico National Survey of Occupation and Employment (ENOE) (INEGI 2021). The CPS is a monthly survey of approximately 60,000 U.S. households. The survey provides information on the labor force, employment, unemployment, persons not in the labor force, hours of work, earnings, and other demographic and labor force characteristics. The Supplement of the CPS includes detailed

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8 The value of $\tau_{wp}^{\text{max}}$ is determined by $w_{\text{min}}$; if $\tau$ is too high then it can be readily see that the equilibrium price will reach $w_{\text{min}}$ and the market will vanish for any higher value of $\tau > \tau_{wp}^{\text{max}}$.  

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questions on income received in the previous calendar year. We use the official poverty lines for
the US, which gives a poverty rate of 12.3% in 2018 (Semega et al., 2019).

For Mexico, we use the National Survey of Occupations and Employment (ENOE). This is a trimonthly survey applied to a representative household sample in Mexico. The survey aims at providing statistical information on the population’s occupational and substantive socio-demographic characteristics at the national level. We do the currency conversion at Purchasing Power Parity (PPP). However, we also allow for extra costs of living in the U.S. not fully reflected in the PPPs, such as higher housing costs.

Using these data, we can now explore the impact of creating a market for WPs through a series of simulations. Recognizing the parameter uncertainty (especially on migration costs) we consider a seemingly wide range of parameter values in our model, though with an “inner range” of what appear to be the most plausible values based on what we know. The aim is not exact calibration but rather to get an idea of the scale and economic feasibility of this policy. In particular, we ask whether the observed distributions of earnings in the two countries, and likely frictions to migrating, are such that Mexican workers would be willing to purchase temporary WPs at prices that would attain something like recent basic income proposals for the U.S.

U.S. worker $i$ rents out her work permit for a year if offered a price $p$ exceeding the product of the replacement rate ($r$) and her current yearly wage ($w_{US,i}^{US}$); the total number of U.S. citizens willing to rent out their work permit is then given by:

$$N_s = \sum_{i=1}^{n_{US}} 1[r.w_{US,i}^{US} < p]$$

(4)

In setting the replacement rate, we draw on the surveys that have been done to determine what share of pre-retirement income will make a retiree no worse off on a pension. Binswanger and Schunk (2012) report their estimates from such surveys for the U.S. The mean replacement rate is 80%, but they find that it is higher for lower-income workers (as one would expect). Based on their results, we set $r = 0.9$.

A Mexican migrant $j$ purchases a work permit if his expected earnings in the U.S. ($\tilde{w}_{MX}^{US}$) is higher than the price of the permit and additional fees and costs associated with moving to the U.S. The net earnings reflect the standard taxes on earnings levied by the U.S. government. An

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9 We use the Mexico PPP rate for 2018 of 9.38 (World Bank 2021).
allowance is also included for remittances to the family back home that would not be incurred without migration; we refer to this as the “remittance levy.” Thus, the number of buyers is:

\[ N_b = \sum_{i=1}^{n_{MX}} 1[(1 - \tau_r)(1 - \tau_w)w_{MX}^{US} > p(1 + \tau_{wp}) + C_{Mov} + C_{US} + w_{MX}^{US}] \]  

(5)

A potential migrant is assumed to base the decision on his net income in the U.S. In (5), \( \tau_r \geq 0 \) is the remittance levy, \( \tau_w \geq 0 \) is the tax on a migrant’s earnings in the U.S., \( \tau_{wp} \geq 0 \) is the tax a migrant pays on a purchase of the WP (Section 2), \( C_{Mov} \) is the out-of-pocket cost of moving to the US, that includes travel expenses to the U.S. and back and visa fees, \( C_{US} \) is the cost-of-living adjustment for the US, and \( w_{MX} \) is the migrant’s wage rate in Mexico.

The market-clearing price of the work permit (\( p^* \)) minimizes the difference between the numbers of sellers and buyers:

\[ p^* = \arg\min_{(p)} |N_s - N_b| \]  

(6)

We apply standard U.S. tax rates for the expected wages of a migrant (as given in the Appendix). There is more uncertainty about the remittance levy. Yang (2011) reports that Mexican migrants in the U.S. remit, on average, 31% of their U.S. earnings. Undoubtedly, some of this would have been incurred even if the migrant had not migrated, so these should not be counted as costs of migration. We will allow alternative values of \( \tau_r \) over a range up to 30% of post-tax earnings in the U.S. A reasonable assumption for the out-of-pocket cost of moving (and returning) is $4,000, covering costs of obtaining a visa as well as travel and relocation costs.\(^{10}\)

Clemens et al. (2019) provide a useful clue to the plausible inner range of values for migration costs by comparing the wages in the mainland U.S. of migrants from Puerto Rico and Guam with their wages back home. Since there are no governmental restrictions on migration, the implied wage differential (in equilibrium) reflects migration costs. Clemens et al. (2019) obtain predicted wage differentials for Puerto Rico and Guam in the region 1.3-1.5.

To predict expected wages of Mexican migrants in the US, we first estimate the coefficients (\( \beta_{US} \)) of a Mincer earning regression for the log yearly earnings of U.S. worker \( i \) on a set of their productive characteristics using the CPS data:

\[ \ln(w_{USi}) = \beta_{US} x_{USi} + \epsilon_i \]  

(7)

\(^{10}\) We took an approximate amount of $1,700 for processing of H1B visa.
where $\varepsilon_t$ is a standard error term with mean zero and variance $\sigma^2$. We predict the expected earnings of Mexican migrants ($\hat{w}_{MX}^{US}$) if they migrate to the U.S. using the estimated coefficients ($\hat{\beta}^{US}$) and characteristics of Mexican workers ($X_t^{MX}$) from the ENOE data. When predicting migrant wages in the US, we assume that Mexican migrants in the U.S. are employed in the private sector (not working for the federal, state, or local government, and not in the armed forces). We also assume that all migrants are Hispanic, single (for the purpose of work migration), and have no U.S. Citizenship or permanent residency status. The expected earnings in the U.S. of Mexican migrants ($\hat{w}_{MX}^{US}$) is then:

$$\ln \hat{w}_{MX}^{US} = \beta^{US} X_t^{MX} \quad \text{and} \quad \hat{w}_{MX}^{US} = \exp[\ln \hat{w}_{MX}^{US} + \sigma^2/2]$$

(8)

where $\sigma^2$ is the unbiased estimator of $\sigma^2$ from (7) (Wooldridge 2012).

We postulate that a migrant makes a migration decision assuming that his earnings in the U.S. are functions of his specific human capital characteristics and his occupation in Mexico. Here, the migration decision is also a function of migrant’s professional experience in his home country. A Mexican electrician plans to work in that occupation in the U.S., forming his wage expectations ($\hat{w}_{MX}^{US}$) based on information about wages of electricians in the U.S. The other explanatory variables ($X_t^{US}$) include information about age, gender, marital status, race, the highest level of education, citizen status, job classification, and whether a worker works full- or part-time. The detailed regression results for (8) can be found in the Appendix (Table A2).

We estimated a second specification that drops the worker’s occupation, on the grounds that this is endogenous. Causal inference is not the objective of the predictions, but it is nonetheless of interest to see if the results change much if we do not condition on occupation, which may well change in the U.S. The results are in the Appendix, and are very similar for this alternative restricted specification. The discussion in Section 4 focuses mainly on the full model.

The BIG may act like a reservation wage rate, a higher value of which will reduce labor supply (at any given wage rate) for workers earning above the basic income. Thus, their wage rates will rise in equilibrium. (This is similar to the expected spillover effects on other wage rates of a higher statutory minimum wage rate.\textsuperscript{11}) The impacts on the U.S. income distribution then depend on the wage elasticity of labor demand. Our calculations assume that the distribution of

\textsuperscript{11} See, for example, Neumark et al. (2004) and Dube (2018).
earnings (wage rate times employment) does not change above the BIG. This will hold if the wage elasticity of labor demand is -1. This seems to be a reasonable assumption for the average wage elasticity based on past research on labor demand in the U.S.\textsuperscript{12} However, there is undoubtedly variation around this mean elasticity, so we can expect (positive and negative) effects on earnings for many “non-BIG” workers not captured by our analysis.

It is of obvious interest to see how the size of this market compares with the current count of undocumented migrants. However, this count is uncertain, with current estimates in the (wide) range 11-22 million. The lower bound is derived from the Census Bureau’s survey-based estimates of the total migrant population (foreign-born people who have not become naturalized citizens) after deducting the count of legal migrants based on administrative data.\textsuperscript{13} There are naturally concerns that illegal migrants will be reticent to reveal this fact, and may instead report that they are citizens. (Some illegal migrants may also be outside the sample frame of the household surveys.) The upper bound of 22 million is based on Fazel-Zarandi et al. (2018) who used a time-series accounting of flows with demographic modelling. There is a continuing debate on the size of the undocumented migrant population in the U.S.\textsuperscript{14}

4. Results

When the option of renting out one’s WP is confined to those currently in the U.S. workforce, we obtain the results in Table 1, for various combinations of parameter values. (We have chosen the succession in pairs of scenarios to help assess the partial effect of the parameters and policy choices.) Column 1 is for no costs of moving (though official taxes on earnings in the U.S. remain). This is obviously implausible, and we only provide it as a benchmark. We then consider a range of values to reflect the potential frictions discussed above. Our parameter combinations in columns 4-6 that give a total cost of 20-30% of U.S. earnings (extra living costs in the U.S. plus the remittance levy) provide a fairly close match to the total migration costs implied by the estimated earnings differentials between the U.S. mainland and Puerto Rico and

\textsuperscript{12} See, for example, Beaudry et al. (2018), who find a wage elasticity of labor demand of -1 based on the variations across cities and industries over 40 years.

\textsuperscript{13} The methods and results using this method are described in Passel (2019).

\textsuperscript{14} Capps et al. (2018) question the Fazel-Zarandi et al. (2018) estimates, Rodilitz and Kaplan (2021) find similar results to Fazel-Zarandi et al. using data from Mexican surveys of prior illegal migrants to the U.S.
Guam, as reported in Clemens et al. (2019).\textsuperscript{15} We take this to be the most plausible range in Table 1. Nonetheless, we consider both lower and higher values, given the uncertainty about these costs, and the interest in seeing how this impacts the results.

Introducing migration costs greatly reduces the equilibrium price of WPs (comparing column 1 with other columns). Without any cost of migration, the price is $27,000 with almost 54 million workers participating in the market. Since more Mexicans can afford to purchase the WP, driving the price up, this scenario brings the largest gains to the host country, with net wage gains of over 8\% of U.S. GDP, and a poverty rate falling to 8\% (from 12.3\%). Simply adding a 10\% remittance levy brings the price of a WP down by $4,500 (Scenario 2). In the most plausible inner range of parameter values (scenarios 4-6), we find equilibrium prices of the WPs in the range of $18-19,000 (depending on the tax rate on WPs), with around 28-33 million market participants, well outside the aforementioned range of estimates for the count of illegal migrants of 11-22 million. The gain in earnings (earnings of migrants less forgone earnings of natives) is 6-7\% of U.S. GDP, though it should be noted that this is not the net gain as one would have to deduct the earnings gain from current migrants. Given that the market-based policy would tend to attract more skilled migrants, a net gain can be expected. The policy brings the poverty rate among citizens of the U.S. down to a little under 10\%. (The Appendix shows the impact on poverty for a wide range of possible poverty lines.)

Higher tax rates yield higher revenue from that tax, but lower revenue from taxes on the migrants’ earnings; on balance, higher tax rates yield higher total revenue (Table 1). The impacts on the GDP share and the poverty rate are small. Adding a 10 percentage point allowance for the extra cost of living in the U.S. (beyond what PPP rates allow for) brings the price down more substantially, by around $2-3,000. As expected, a higher remittance levy reduces the equilibrium price of a WP, though the effect is small after the first increment (from 0 to 10\%). This also slightly reduces both the GDP share and the poverty impact.

\textsuperscript{15} Notice that we express migration costs as a share of the US earnings while Clemens et al. write them as a share of earnings at the origin. Following Clemens et al., let the earnings differential (US relative to Mexico) needed to compensate for the migration cost be $1 + \pi$ for $\pi > 0$. Then the migration cost as a share of US earnings is $\pi/(1 + \pi)$. The values for $\pi$ of 0.3-0.5 found by Clemens et al. based on wage differentials between Puerto Rico/Guam and the U.S. mainland imply that migration costs as a share of U.S. earnings of 0.23-0.33. On also allowing for out-of-pocket travel costs and rounding to the same order of accuracy as Clemens et al., the implied range for the total of the extra cost of living and the remittance levy in our analysis is 0.2-0.3, as a share of U.S. earnings.
The eligibility criteria are, of course, a design choice. We consider two alternative sets of people deemed eligible, one larger in size and one smaller than in Table 1. In the first option, any U.S. adult of working age (18-64) is eligible. Table 2 repeats the simulations for this case, for selected parameter combinations from Table 1. We impute earnings using essentially the same method as for potential migrants, i.e., predicting their wages given the Mincer regression for the U.S., but inserting their own characteristics. (We are constrained to exclude occupation, which we also do so for Mexican workers.)

Without frictions to migration, letting those not currently in the workforce rent out their WP only adds 2.5 million to the number of participants in the market, in equilibrium, and only brings the equilibrium price down by $1,800 per year (Table 2). In scenario 10, with the highest migration costs, 5.7 million are added to the number of participants, though the equilibrium price only falls by about $700. In the most plausible range of parameter values for migration costs, we predict a price of around $18,000 and 35 million participants. As expected, the poverty impacts are somewhat larger when all working-age adults are eligible, whether or not they are currently in the workforce.

A second option is given in Table 2 for which the policy is only implemented to allow one working-age adult in any family with either dependent elderly or dependent (pre-school) children to rent out the WP. The idea here is that this policy would provide a new option to allow low-income families to care for dependents, and (in the case of children) to help promote early childhood development, which is known to be a challenge for poor and over-worked families, and one reason for the inter-generational transmission of poverty. Again, we give results for selected parameter combinations from Table 1. Naturally, the restriction on the supply of WPs entails a smaller market in this option, with 6-17 million participants in equilibrium (depending on the costs of migration), and a higher equilibrium price, which is now about 50% higher than for the first option of including all working-age adults. The benchmark of frictionless migration yields a basic income for families with dependent elderly or young children of just under $37,000, but this falls to $18,000 when we allow for significant migration costs (scenario 10). In the seemingly plausible range for migration costs, we expect a little less than 11 million participants and a WP price/basic income of about $25,000.

We turn now to the inverse problem of finding the tax rate that attains any desired price of the WP; as noted, this price can either be interpreted as a socially desirable minimum level of
earnings—the BIG—or it can be defined as the price that assures a desired migration flow. Our base case for this price is $12,000. This corresponds to the Yang basic income proposal of $1,000 per month and (as we will see) it also attains a migration count that is within the range of current estimates of the number of illegal migrants. We also provide simulations for two more generous BIGs, namely $15,000 and $18,000.

To make the $12,000 figure for a basic income more concrete, consider a two-earner family, with two (school-age) children. Both adults work (which is their only source of income), bringing in $26,500 per year (putting them slightly above the official poverty line for such a family, namely $25,500 in 2018). One of the adults works full-time, earning $14,500 (40 hours per week for 50 weeks at the Federal minimum wage of $7.25 an hour), while the other is only part-time, taking care of their children after school hours. Given the option of selling the WP, the part-time worker takes this option, while the other continues working full time. Their total income is unchanged in this example, but one of the two adults will now have the time to learn a new skill and spend more quality time with the children.

We only provide in Table 3 the solutions to the inverse problem for the most seemingly plausible levels of migration costs in Table 1. To attain the $1,000 a month BIG would require a tax rate on WPs of 60-100%, and 18 million people would take this option, which is now within the estimated range of the current count of illegal migrants in the U.S., though note that the 18 million is solely from Mexico.

Consistently with the model in Section 2, as we increase the desired basic income, the tax rate required on WPs falls ceteris paribus. With sufficiently high costs of migration, the desired basic income is not attainable in equilibrium. This is illustrated by scenario (9) in Table 3, for which the $18,000 basic income cannot be reached at any positive tax rate; instead, the maximum attainable basic income is $17,800. (In other words, there are no Mexicans who can afford to purchase the WP for more than $18,000 at these levels of taxes and levies.) Higher target values for basic income generate larger gains to U.S. GDP by attracting more migrants, and higher earners among the migrants. Higher BIGs also yield a lower national poverty rate in the U.S. For example, the poverty rate falls to 11.4% when the target BIG is $12,000, while it reaches a little under 10% when the BIG is $18,000.

Given that the price is taken as given in the case of the inverse problem, the outcome variables are affected rather little. There is some adjustment on the Mexican side in earnings and
tax revenue, which generates modest differences in the net earnings gain to the US, which represents 5-7% of GDP across various scenarios for the parameters of the inverse problem.

5. Conclusions

The paper has assessed the scope for financing a basic income for U.S. working-age citizens by creating a taxable market on work permits into the U.S. labor market. Essentially, a basic income is financed by creating a market that is currently missing. If the market turns out to be small, then this is not a promising route. The answer to this empirical question depends on the earning distributions, characteristics of the American and Mexican workers, and the costs of migration.

The main finding of the paper is that the missing market is large enough to support a basic income for Americans at a similar or higher level to recent policy discussions. Under seemingly reasonable allowances for migration costs, but low tax rates on the work permits, we expect something around 30 million participants in the market. An extra few million are attracted into the market if eligibility is expanded to all U.S. working-age citizens, including those not in the workforce. The size of the market contracts, of course, if restricted to Americans with dependent elderly or young children, though even then our calculations suggest that we would probably see around 10 million participants with reasonable allowances for migration costs. The size of the market reflects the large wage gaps seen between U.S. workers and Mexican workers with similar characteristics—gaps that reflect the extent of the current restrictions on migration, as well as the costs of migration.

There appears to be ample scope for managed migration as a means of financing better social protection for U.S. citizens, in the form of a basic income guarantee. For example, with a 10% host-country tax on the WPs and a 10-20% remittance levy on the U.S. wage earnings of the Mexican migrants, the equilibrium price of the WPs would be about $20,000 per year, and around 30 million workers would participate. The official poverty rate in the U.S. would fall to under 10%, reflecting the pro-poor feature of the new market’s implicit targeting mechanism.

However, it is evident from our calculations that the social protection provided by this new market for work permits would still leave a substantial count of poor people in the U.S., even when working-age adults not currently working are eligible. It appears to require
implausibly low migration costs to get the U.S. poverty rate much below 10% with this policy instrument. Other policies for fighting poverty would still be needed.

The paper has shown that, within limits, the tax rate can be set to attain any desired basic income in the U.S., or target migration intake. The tax rates required at modest basic income levels can be quite high. For example, if the U.S. wants to guarantee a basic income of $1,000 per month and the extra cost of living and the remittance levy are both 20%, then the required tax rate is about 60%. With the same parameter values for the migration costs, but a basic income of $15,000 per year, the tax rate falls to just under 20%. Limits to the feasible basic income arise with high costs of migration.

Our results point to the potentially important role for the tax rate on work permits in managing the market. The migration counts we predict with low tax rates would clearly put a strain on (among other things) the U.S. housing market and infrastructure. However, with a sufficiently high tax rate, the market-based policy studied here can come close to replicating the illegal migration counts under the current system, though acknowledging the uncertainty about the latter. With sufficiently high initial tax rates, probably falling over time, it seems likely that a reasonable basic income can be attained without a short-term increase in migration flows.

It is evident that this policy is not only social protection for low-income U.S. citizens. It comes with large first-order welfare gains to Mexican migrants who would not otherwise have the option of temporary entry into the higher-wage U.S. workforce. The scheme is mutually beneficial to the two workforces (and countries). And, the U.S. economy would gain skilled Mexican migrants, with earnings representing about 7% of U.S. GDP. Higher target basic incomes, when financed this way, bring larger net gains to the U.S. economy, and lower poverty rates among U.S. citizens.

We have only provided a partial equilibrium analysis. Aggregate employment is unchanged, since the total labor-time rented out balances that rented in. Also (as noted), the scheme can be managed to avoid a large increase in the total number of migrants. However, compositional effects on employment can be anticipated, with general equilibrium implications. While the partial equilibrium analysis reported here is the obvious place to start, a general equilibrium analysis may be warranted. Alternatively, one can interpret these calculations as indicating that one might not want to go to full scale too quickly. The government might start instead with a high tax rate on WPs and/or restrictions on eligibility (on either side of the
market), and expand the scale later, with fuller information, including the observed impacts during partial scaling up. The sensitivity of the precise empirical results to the extent of the frictions to international migration also points to the need for further research on the costs of migration.

Further exploration of these and other issues discussed in this paper appears to be warranted. While acknowledging the measurement uncertainties at this point, the calculations in this paper point to large potential benefits from a market-based immigration system.
References


Table 1: Policy simulations for a one-year work permit under various assumptions

<table>
<thead>
<tr>
<th>Parameters</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tbody>
<tr>
<td>(Most plausible range for migration costs)</td>
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<tr>
<td>Tax on purchase of Work Permit (%)</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>10</td>
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<td>20</td>
<td>20</td>
<td>20</td>
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<td>40</td>
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<tr>
<td>Extra cost of living in U.S. (% of U.S. earnings)</td>
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<td>0</td>
<td>0</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Remittance levy on net earnings in U.S. (%)</td>
<td>0</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>20</td>
<td>20</td>
<td>20</td>
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<td><strong>Simulation results</strong></td>
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<td></td>
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<tr>
<td>Price of Work Permit ($)</td>
<td>27,001</td>
<td>22,500</td>
<td>21,563</td>
<td>19,226</td>
<td>18,806</td>
<td>18,000</td>
<td>15,279</td>
<td>14,850</td>
<td>13,806</td>
<td>12,957</td>
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<tr>
<td>Average earnings of renters ($)</td>
<td>15,300</td>
<td>12,400</td>
<td>11,900</td>
<td>10,200</td>
<td>9,900</td>
<td>9,300</td>
<td>8,400</td>
<td>7,500</td>
<td>7,100</td>
<td>6,700</td>
</tr>
<tr>
<td>Expected earnings of buyers in the U.S. ($)</td>
<td>46,600</td>
<td>48,900</td>
<td>50,500</td>
<td>51,200</td>
<td>51,300</td>
<td>53,100</td>
<td>54,900</td>
<td>54,500</td>
<td>55,500</td>
<td>58,300</td>
</tr>
<tr>
<td>Number of renters (buyers) (M)</td>
<td>53.67</td>
<td>42.12</td>
<td>36.28</td>
<td>33.01</td>
<td>32.20</td>
<td>27.75</td>
<td>23.61</td>
<td>23.40</td>
<td>22.06</td>
<td>19.05</td>
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<tr>
<td>Total earnings of migrants ($B)</td>
<td>2,450</td>
<td>1,992</td>
<td>1,831</td>
<td>1,690</td>
<td>1,651</td>
<td>1,494</td>
<td>1,294</td>
<td>1,275</td>
<td>1,224</td>
<td>1,110</td>
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<tr>
<td>Total earnings of migrant's net of total earnings of natives as % of the U.S. GDP</td>
<td>8.6</td>
<td>7.6</td>
<td>7.0</td>
<td>6.9</td>
<td>6.8</td>
<td>6.2</td>
<td>5.4</td>
<td>5.5</td>
<td>5.3</td>
<td>4.9</td>
</tr>
<tr>
<td>Tax revenue from migrants' earnings ($B)</td>
<td>465</td>
<td>388</td>
<td>363</td>
<td>338</td>
<td>329</td>
<td>302</td>
<td>263</td>
<td>256</td>
<td>249</td>
<td>232</td>
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<tr>
<td>Revenue from taxes on WPs ($B)</td>
<td>0</td>
<td>0</td>
<td>78</td>
<td>63</td>
<td>61</td>
<td>100</td>
<td>72</td>
<td>69</td>
<td>91</td>
<td>99</td>
</tr>
<tr>
<td>Net gains for renters ($B)</td>
<td>529</td>
<td>351</td>
<td>319</td>
<td>248</td>
<td>236</td>
<td>215</td>
<td>151</td>
<td>142</td>
<td>122</td>
<td>107</td>
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<tr>
<td>The U.S. poverty rate (excluding migrants); base=12.3%</td>
<td>8.0</td>
<td>9.0</td>
<td>9.2</td>
<td>9.7</td>
<td>9.8</td>
<td>9.8</td>
<td>10.5</td>
<td>10.5</td>
<td>10.7</td>
<td>10.8</td>
</tr>
</tbody>
</table>

Notes: Extra cost of living in the U.S.: percent of the migrant's earnings in the U.S. he needs to spend to cover his living expenses (food, clothing, housing, etc.); Remittances levy on net earnings: percent of the migrant's earnings in the U.S. he sends Mexico; Tax on purchase of Work Permit: the tax rate imposed by the U.S. government on the purchased WP; Average earning of renters: average earning of the U.S. citizens who find it optimal to rent out their WPs; Expected earnings of buyers: earnings that an average Mexican migrant who purchased the WP might expect to earn in the U.S. (assuming a certainty of finding a job); Number of renters - number of the U.S. citizens who decide to rent out their WP under the tax regime of a given scenario; Total earnings of migrants: number of Mexican migrants who purchased a WP times the average yearly earnings of a migrant in the US; Total earnings of migrants net of total earnings of natives: as stated; Tax revenue from migrants' earnings: amount of tax revenue collected from migrants in the U.S. assuming that migrants pay the standard U.S. income taxes (Appendix, Table A1); Revenue from taxes on WP: amount of revenue collected by the U.S. government from Mexican migrants by taxing the purchase of WPs; Net gain for sellers: total amount of money the renters of WP gain from renting out their WPs, compared to their current income; The U.S. poverty rate (excluding migrants): the poverty rate in the U.S. that would result from the introduction of the market for the WPs under the particular scenario.
Table 2: Simulations for alternative sets of US citizens who are deemed eligible to rent out their work permit

<table>
<thead>
<tr>
<th>Parameters</th>
<th>US adults of working age (16-64)</th>
<th>Households with elderly (75+) &amp; children (0-6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tax on purchase of Work Permit (%)</td>
<td>1 4 5 6 10</td>
<td>1 4 5 6 10</td>
</tr>
<tr>
<td>Extra cost of living in U.S. (% of U.S. earnings)</td>
<td>0 10 10 20 40</td>
<td>0 10 10 10 20</td>
</tr>
<tr>
<td>Remittance levy on net earnings in U.S. (%)</td>
<td>0 10 20 20 30</td>
<td>0 10 20 20 30</td>
</tr>
</tbody>
</table>

**Simulation results**

<table>
<thead>
<tr>
<th>Price of Work Permit ($)</th>
<th>25,547 18,000 17,833 16,657 12,528 36,854 25,410 24,737 23,347 18,000</th>
</tr>
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<tbody>
<tr>
<td>Average earnings of renters ($)</td>
<td>13,500 8,500 8,500 8,100 6,100 20,500 14,900 13,800 13,200 9,600</td>
</tr>
<tr>
<td>Expected earnings of buyers in the U.S. ($)</td>
<td>45,500 49,900 50,100 50,500 53,500 65,200 70,800 71,300 72,400 78,200</td>
</tr>
<tr>
<td>Number of renters (buyers) (M)</td>
<td>56.37 35.62 35.56 34.32 24.95 16.97 10.99 10.61 9.95 6.35</td>
</tr>
<tr>
<td>Total earnings of migrants ($)</td>
<td>2,562 1,832 1,781 1,734 1,335 1,107 778 756 721 522</td>
</tr>
<tr>
<td>Total earnings of migrant's net of total earnings of natives as % of the U.S. GDP</td>
<td>9.1 7.6 7.3 7.2 5.8 3.9 3.1 3.1 3.0 2.3</td>
</tr>
<tr>
<td>Tax revenue from migrants' earnings ($)</td>
<td>478 360 350 343 266 248 175 171 163 119</td>
</tr>
<tr>
<td>Revenue from taxes on WPs (SB)</td>
<td>0 64 63 114 125 0 28 26 46 46</td>
</tr>
<tr>
<td>Net gains for renters (SB)</td>
<td>620 306 301 263 152 246 104 97 85 47</td>
</tr>
<tr>
<td>The U.S. poverty rate (excluding migrants)</td>
<td>7.2 9.0 9.0 9.4 10.7 9.6 10.6 10.9 11.0 11.4</td>
</tr>
</tbody>
</table>

Notes: See Table 1.
### Table 3: Tax rates required to attain various levels of a basic income

<table>
<thead>
<tr>
<th>Parameters</th>
<th>1</th>
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<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic income guarantee ($/year)</td>
<td>12,000</td>
<td>12,000</td>
<td>12,000</td>
<td>15,000</td>
<td>15,000</td>
<td>15,000</td>
<td>18,000</td>
<td>18,000</td>
<td>17,800</td>
</tr>
<tr>
<td>Extra cost of living in U.S. (% of earnings in the US)</td>
<td>10</td>
<td>10</td>
<td>20</td>
<td>10</td>
<td>10</td>
<td>20</td>
<td>10</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Remittance levy on net earnings in U.S.</td>
<td>10</td>
<td>20</td>
<td>20</td>
<td>10</td>
<td>20</td>
<td>20</td>
<td>10</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td><strong>Simulation results</strong></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tax on purchase of Work Permit (%)</td>
<td>101</td>
<td>94</td>
<td>58</td>
<td>51</td>
<td>47</td>
<td>22</td>
<td>19</td>
<td>16</td>
<td>0</td>
</tr>
<tr>
<td>Average earnings of renters ($)</td>
<td>6,600</td>
<td>6,600</td>
<td>6,600</td>
<td>8,400</td>
<td>8,400</td>
<td>8,400</td>
<td>9,800</td>
<td>9,800</td>
<td>9,300</td>
</tr>
<tr>
<td>Expected earnings of buyers in U.S. ($)</td>
<td>61,300</td>
<td>60,900</td>
<td>59,900</td>
<td>56,800</td>
<td>56,200</td>
<td>54,500</td>
<td>51,600</td>
<td>51,600</td>
<td>52,700</td>
</tr>
<tr>
<td>Number of renters(buyers) (M)</td>
<td>18.06</td>
<td>18.06</td>
<td>18.06</td>
<td>23.50</td>
<td>23.50</td>
<td>23.50</td>
<td>31.64</td>
<td>31.64</td>
<td>27.67</td>
</tr>
<tr>
<td>Total earnings of migrants ($B)</td>
<td>1,110</td>
<td>1,106</td>
<td>1,087</td>
<td>1,327</td>
<td>1,323</td>
<td>1,315</td>
<td>1,651</td>
<td>1,624</td>
<td>1,439</td>
</tr>
<tr>
<td>Total earnings of migrant's net of total earnings of natives as % of the U.S. GDP</td>
<td>4.9</td>
<td>4.9</td>
<td>4.8</td>
<td>5.6</td>
<td>5.6</td>
<td>5.5</td>
<td>6.8</td>
<td>6.7</td>
<td>5.9</td>
</tr>
<tr>
<td>Tax revenue from migrants’ earnings ($B)</td>
<td>242</td>
<td>239</td>
<td>232</td>
<td>282</td>
<td>276</td>
<td>266</td>
<td>331</td>
<td>324</td>
<td>287</td>
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<tr>
<td>Revenue from taxes on WPs ($B)</td>
<td>219</td>
<td>204</td>
<td>126</td>
<td>180</td>
<td>166</td>
<td>78</td>
<td>108</td>
<td>91</td>
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<tr>
<td>Net gains for renters ($B)</td>
<td>90</td>
<td>90</td>
<td>90</td>
<td>145</td>
<td>145</td>
<td>145</td>
<td>215</td>
<td>215</td>
<td>210</td>
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<tr>
<td>The U.S. poverty rate (excluding migrants); base=12.3%</td>
<td>11.4</td>
<td>11.4</td>
<td>11.4</td>
<td>10.5</td>
<td>10.5</td>
<td>10.5</td>
<td>9.8</td>
<td>9.8</td>
<td>9.9</td>
</tr>
</tbody>
</table>

Note: Non-negativity constrain on the tax rate is binging for Column 9. Basic income guarantee ($/year) is the desired amount of BIG; see Notes to Table 1.