DISCUSSION PAPER SERIES

IZA DP No. 3083

Optimal Immigration Policy: Permanent, Guest-Worker, or Mode IV?

Maurice Schiff

September 2007

Forschungsinstitut
zur Zukunft der Arbeit
Institute for the Study
of Labor

Optimal Immigration Policy: Permanent, Guest-Worker, or Mode IV?

Maurice Schiff
World Bank, University of Chile and IZA

Discussion Paper No. 3083
September 2007

IZA

P.O. Box 7240
53072 Bonn
Germany

Phone: +49-228-3894-0
Fax: +49-228-3894-180
E-mail: iza@iza.org

IZA Discussion Paper No. 3083
September 2007

ABSTRACT

Optimal Immigration Policy: Permanent, Guest-Worker, or Mode IV?*

Immigration continues to be on the forefront of the policy debate on both sides of the Atlantic. A number of reforms of permanent and guest-worker (GW) immigration programs are being considered, and the temporary movement of service providers under Mode IV (GATS) is being negotiated at the Doha Round of the WTO. This paper contributes to the debate by examining these programs in a model where the host country government maximizes its objective function with respect to three policy instruments: the share of migrants' deferred income payment, the value of the bond employers must post and forfeit if GWs overstay, and the size of the program. Circular migration and illegal GWs' status regularization are considered. The paper shows that i) the optimal value of the bond is zero, ii) Mode IV is preferable to GW migration; iii) the optimal policy package consists of Mode IV and permanent migration, and iv) incorporating circular migration improves the policy package. Additional policy implications are also provided.

JEL Classification: F20, F22, J61

Keywords: immigration, guest-worker, Mode IV, permanent, overstaying

Corresponding author:

Maurice Schiff
Development Research Group
The World Bank
MSN MC3-303
1818 H Street NW
Washington, DC 20433
USA
E-mail: mschiff@worldbank.org

* I would like to thank Mohammad Amin, Aaditya Mattoo, Cagler Ozden, Martin Ruhs, Mirja Sjoblom, David Tarr, Pedro Videla, Alan Winters, Dean Yang, and participants at seminars at the Central Bank of Chile, Bar-Ilan University, University of Chile and the World Bank, for their useful comments on an early version of the paper. The views presented here are those of the author and do not necessarily reflect those of the World Bank, its Executive Directors or the governments they represent.

Optimal Immigration Policy: Permanent, Guest-Worker, or Mode IV?

1. Introduction

An important debate on migration reform has been taking place in the major host countries, with various forms of temporary migration programs under consideration. Recent reform proposals in the US have included some form of guest-worker (GW) program, and the EU is looking at return migration for temporary migrants as a potential answer to its migration problems.

Temporary migration schemes are also being considered at the multilateral level. Negotiations on the temporary cross-border movement of service suppliers under Mode IV of the GATS have been undertaken in the Doha Development Round of the WTO, though with little progress so far. Issues related to Mode IV are examined, among others, in Walmsley and Winters (2002) and Winters et al. (2002, 2003) – studies that show large gains from Mode IV liberalization – and by various authors in Hoekman et al. (2002) and Mattoo and Carzaniga (2003).

The dramatic growth in temporary migration to high-income countries since the 1990s may well reflect host countries' increasing reluctance to admit foreign workers on a more permanent basis, particularly unskilled ones. Recent surveys indicate that attitudes toward immigrants have worsened and support for reducing migration has increased. The benefit for host countries in such a political environment is that temporary migration enables them to obtain a permanent increase in the labor force without a permanent increase in population.[1]

[1]Another reason for such programs is to restrict the employment of migrant workers to certain sectors or occupations, something not possible in the case of permanent migration.

The debate has acquired increased urgency as host country labor shortages have increased in a number of sectors. For instance, a September 5, 2004 Washington Post article on labor shortages in US service industries states that "Employers are unable to find enough nurses, engineers, information technology workers, auto mechanics or machinists to fill positions available."

However, the results with past GW programs have been mixed at best as many GWs failed to return to their home country when the permissible period stipulated in their contract elapsed. Illegal overstaying occurred, for instance, in the Mexico-US Bracero (1942-1964) program and in Germany's Gastarbeiter program (1955-1973). This resulted in a decline in their popularity.[2]

A number of smaller-scale GW programs have been initiated in developed host countries in recent years because of greater shortages of skilled workers such as nurses and software engineers, as well as unskilled labor in agriculture, construction, hospitality services, and other. Canada and Mexico established a program whereby Mexicans screened by their government work in Canadian agriculture for part of the year and can be rehired if their performance is considered satisfactory. Other programs include a pilot scheme in the UK for the temporary employment of low-skilled migrants in hospitality and food processing, and bilateral agreements in Spain and Italy for temporary migration with North African and Latin American countries (Ruhs 2006). A number of proposals are also being debated, including a GW program for Mexican farm labor in the US and a radical reform of Germany's temporary and permanent migration policies.

[2] The extension of unemployment benefits in the latter program may also explain why many laid-off guest-workers remained in Germany after recruitment officially stopped in 1973.

This paper argues that suitably reformed temporary migration programs can play an important role as part of a sustainable migration strategy that benefits both sending and receiving countries. The remainder of the paper is organized as follows. Section 2 looks at GW policies that have been used and at some of the literature on temporary migration. Sections 3, 4 and 5 present the GW, Mode IV and permanent migration models, respectively. Section 6 examines a combination of temporary and permanent migration. Section 7 looks at circular migration and Section 8 at the regularization of illegal GWs. Section 9 concludes. The main findings and policy implications are presented in a series of propositions.

2. Guest-Worker Policy

Instruments designed to reduce GWs' illegal overstaying are examined in Section 2.1 and contributions to the temporary migration literature are discussed in Section 2.2.

2.1. Policy Instruments to Reduce Overstaying

Various types of policy measures designed to reduce temporary migrants' incentive to overstay have been implemented. Two such measures are described here. First, a number of countries defer payment of a share of GWs' income and pay it with interest at the end of the contract period if the GWs leave. Otherwise, GWs forfeit the deferred income share. This occurs, for instance, in Taiwan by companies recruiting foreign workers. Similar programs exist in the UK for migrants on three-month contracts whose salary is deposited in their home country's bank account – e.g., for migrants from

Baltic countries working in the hospitality industry (Black 2004) – and in the US where a similar policy applies to Jamaican workers.[3]

Second, some countries, including Greece and Israel, have implemented a policy where employers must post a bond which they forfeit if their GW employees overstay.[4] Singapore has such a program but with many restrictions on who can be admitted, on GWs' behavior and relationships while working in the country, and with strong penalties for illegal GWs and their employers.

Where penalties are severe and enforcement is rigorous, such as in Singapore, preventing GWs from becoming illegal is likely to be feasible. However, such policies would be unacceptable in liberal democracies. The question is whether illiberal enforcement is the only way to make GW programs work. This paper claims it is not. It presents temporary migration policies that reduce the incentive to overstay and considers an immigration strategy that includes both temporary and other migration policies.

As mentioned above, some countries have obliged employers to buy a government bond while others have opted for deferring payment of a share of guest-workers' income, though none has made use of both measures (Martin, 2003, p. 28). This paper formally examines a temporary migration policy package – for both guest-worker and Mode IV migration – that includes both measures, assesses whether either or both measures should be part of an optimal immigration policy package, and determines their implementation level and the size of the program.

[3]This also took place in the early years of the Bracero Program, with US employers required to deposit 10 percent of Mexican workers' earnings in a Mexican fund, and pay them upon their return to Mexico.
[4] Epstein et al. (1999) provide a more extensive discussion of this policy.

2.2. Selected Contributions to the Literature

A number of studies have greatly contributed to our understanding of migrant behavior. The decision to migrate, migration duration, savings and migrant flows are examined by Djajic and Milbourne (1988). They find, for instance, that an increase in the foreign wage rate raises migration (a result obtained in this paper as well), raises savings and the welfare of both migrant and source country workers, and has an ambiguous impact on migration duration. Dustmann studies migration duration and return migration in several papers. His 2003 study shows in a life-cycle model that the optimal migration duration may decrease as the wage differential increases. Dustmann and Kirchkam (2001) examine the choice of activity after return together with migration duration. They show in the case of Turkey that most employed returnees prefer self-employment over wage labor and that duration is negatively related to the level of education and family bounds.[5]

The topic of Epstein et al.'s (1999) paper is close to ours. They examine temporary migrants' decision to return or to overstay in a model where legal and illegal employers adjust wages optimally and skills are accumulated in the legal but not in the illegal job market. The decision is examined under two alternative policy instruments: i) employers must post a bond which they forfeit if the migrant overstays, or ii) a share of GWs' income is set aside and paid with interest when they leave. The present paper, on the other hand, only deals with unskilled migrants and the level of the two policy instruments and the size of the program are determined endogenously. Though their study differs substantially from ours, some of the findings are similar – e.g., that an increase in the source country wage rate reduces the size of the illegal job market.

[5] Dustmann (1997) provides another contribution to this literature by considering the simultaneous decision of return migration and consumption under uncertainty.

Ruhs and Martin (2006) examine migrants' rights and find that they are negatively related to the size of the migrant population. Their finding implies that migrants generate a negative externality for the other migrants. The model developed in this paper examines a similar negative externality in one of its formulations but does so from the host country's viewpoint, with new migrants raising not only the host country's overall social cost but also the social cost of existing migrants, an impact the host country government takes into account in its policy choices.[6]

In an enlightening paper, Amin and Mattoo (2007) examine a case where a government's commitment to temporary migration is not credible because of a time inconsistency problem. A firm that trains migrants loses its investment if they are temporary though not if they are permanent. On the other hand, the latter impose a greater social cost than the former. If training costs are higher than the difference in social cost, the optimal ex-post policy is to allow migrants to stay. Knowing that, firms train temporary migrants, resulting in permanent migration ex post. This argument helps explain the *legal* permanent migration of *skilled* workers.

As mentioned in Section 1, this paper focuses on unskilled migrants. The reason is that host countries are mostly concerned with unskilled rather than skilled migrants because they are more numerous, a larger share of them works in the illegal job market,[7] and they tend to impose a greater social cost because they do not integrate as easily into their new social and cultural environment as the skilled ones.

[6] Similarly, Schiff (2002) examines optimal trade and migration policies in a model where new migrants impose a negative externality on existing migrants by affecting natives' behavior towards migrants in general.

[7] Skilled workers exhibit a lower rate of overstaying because they have a better chance of extending their legal stay or becoming permanent residents, the demand for their skills in the illegal job market is more limited, and they have more to lose if caught.

3. The Guest-worker Model

Assume two countries, a developing source country and a developed host country, endowed with unskilled workers who live for two periods and produce an identical perishable good under perfect competition and CRS technology. This implies that the wage rate is constant and thus invariant to the level of migration. The host country benefits from a higher technology level than the source country, and labor's marginal product is therefore similarly higher. Labor in the source country has an incentive to migrate to the host country and earn the higher wage there.

Assume for simplicity, and without impact on the model's qualitative results, that individuals are risk neutral and have a zero subjective discount rate. Based on the large excess-supply of potential migrants from developing to developed countries, I assume the host country's GW quota is binding. People have an incentive to migrate in the first period of their two-period life because their benefit from migration is potentially greater as it provides them with the option of either returning home or overstaying at the end of that period. This option is not available for those migrating in the second period.[8] Note also that there would be no overstaying problem if people migrated in the second period.

3.1. Migrants

GWs' contracts pay a wage rate W per period. Those who enter the host country at the start of period 1 must decide whether to return to their home country at the end of that period or work in the illegal job market in period 2, earning a wage rate W^I in the second

[8] For this to hold, one must assume, as in Epstein et al. (1999), that people learn about the wage rate in the illegal job market *after* they migrate. This is plausible as the illegal job market is not as organized as the legal one and information is harder to obtain. If information on the wage rate in the illegal job market were available before migration, migrants would know ahead of time whether they would want to overstay or not (equation 1) and those that did not would be indifferent about migrating in the first or second period.

period (unless they are apprehended). GWs who decide to return home at the end of period 1 earn a source country wage rate W^S in period 2, with $W^S < W^I$. Rivera-Batiz (1999) shows that wages of illegal workers are lower than for similar legal workers.[9] Thus, we have $W^S < W^I < W$.[10]

The illegal GW's expected income in period 2 is $(1 - p)W^I$, where p is the probability of being caught, in which case they earn nothing. Given the reality about apprehension of illegal migrants, I assume $p = 0$.[11] Hence, the illegal GW income in period 2 is W^I.

Migrants are assumed to prefer to live and consume in their home country where they can enjoy familiar goods, culture and relationships. This is particularly true for unskilled migrants because they are typically more attached to their native culture and have a harder time integrating into the host country society. This results in more clustering, an outcome that makes integration even harder. The problem is more acute for

[9] For the US, Rivera-Batiz (1999) found that both male and female Mexican legal migrants earned over 40% more than undocumented ones, with more (less) than half the wage gap explained by the difference in status (characteristics). He also finds that undocumented immigrants who were legalized after the 1986 US immigration reform showed rapid wage growth in 1986-90, with the gains due mostly to the change in legal status and not to changes in migrant characteristics over time.

[10] With $W > W^I$, a question is why employers would be interested in hiring legal GWs rather than illegal ones. Illegal workers are typically found in smaller businesses, such as restaurants and other small-scale firms, because they have much to gain and little reputation to lose. On the other hand, large companies or corporations are less likely to employ illegal workers because of the costly loss of reputation or goodwill if found out. Though some well-known exceptions do exist, two separable labor markets are implicitly assumed, one of large companies that only hire legal GWs and one of smaller businesses hiring illegal ones.

[11] The share of illegal migrants deported by developed host democracies is negligible, both because a number of influential sectors benefit from their presence and because deporting them in large numbers is unacceptable in democratic societies. Former US Homeland Security Undersecretary Hutchinson has argued that it is unrealistic to believe that the authorities will reduce the number of illegal immigrants or that the public has the will to uproot them (Washington Times, September 10, 2004). Moreover, the number of US employers of illegal immigrants who were fined declined from 1063 in 1992 to 13 in 2002 or by close to 99% (Time Magazine, Sept. 20, 2004), though a tougher policy was approved in July 2007.

temporary migrants who typically cannot bring their immediate family with them. Thus, they are likely to suffer a psychic cost from living in the host country.

The cost of staying beyond the legal time period is the sum of three components: (i) the cost αW of forfeiting the deferred share α of the income W earned; (ii) the income W^S the guest-worker would have earned upon return to the source country at the end of period 1; and (iii) a heterogeneous psychic cost v_i (i = 1, 2, …, N_G) of living away from home and in an illegal status, with N_G being the guest-worker quota.

Thus, the cost of illegal overstaying is $\alpha W + W^S + v_i$. Denote the value of v_i equating cost and benefit by v_Ψ, i.e., $\alpha W + W^S + v_\Psi = W^I$. Define $X \equiv W^I - W^S$. Then:

$$v_\Psi = W^I - \alpha W - W^S = X - \alpha W. \qquad (1)$$

Assuming the psychic cost v_i is distributed uniformly over the unit interval [0, 1], equation (1) implies that a share v_Ψ overstays and a share 1 - v_Ψ returns home at the end of period 1. With the GW quota equal to N_G, the number of illegal GWs is $v_\Psi N_G$.

3.2. Employers

Given perfect competition and CRS technology, native workers earn their marginal product. Thus, forming a firm that employs them generates no profits and there is no incentive to do so. However, in order to obtain an entry visa, GWs must have a work contract with a host country firm. Thus, firms are created for the exclusive purpose

of capturing the profits that can be obtained from hiring GWs. Natives earn a wage rate $W^N > W$, the GW wage rate. Employers' per-GW profit $Y = W^N - W > 0$.[12]

As mentioned at the start of Section 3, given the CRS technology and perfect competition, Employers must also buy a government bond B which they forfeit if the guest-worker overstays. Given that the share of illegal GWs is v_Ψ, the cost to employers is $BN_G v_\Psi$. The total benefit for employers is:

$$EB = \left(W^N - W\right)N_G - BN_G v_\Psi = YN_G - BN_G v_\Psi . \quad (5)$$

3.3. Social Cost

Immigration results in a social cost SC for natives. Illegal migrants impose a greater social cost than legal temporary migrants, whether the latter are GWs or temporary service providers. The reason is that illegal migrants are likely to generate negative externalities such as a diminished compliance with labor and tax laws and diminished respect for the law in general, as well as those related with society's aversion to the creation of an underclass. Thus, the social cost μ generated by a temporary migrant is a fraction of the social cost η generated by the same number of illegal migrants, i.e., $0 < \mu < \eta$.

A plausible assumption is that the social cost increases at an increasing rate with the size of the migration quota. Based on this, the social cost SC is assumed to be a

[12] Given the large excess-demand, individuals interested in migrating as guest-workers have little or no bargaining power in setting their wage rate in the host country (Kremer and Watt, 2006) and would be willing to accept anything above W^S. With W^S unacceptably low in a developed democratic host country, its government sets a minimum acceptable wage rate equal to $W > W^S$.

function of N_G^2, i.e., $SC = SC(N_G^2)$. The social cost for legal temporary migrants is μN_G^2 and the social cost for illegal ones is $v_\Psi \eta N_G^2$. Thus, the total social cost is

$$SC = (\mu + v_\Psi \eta) N_G^2 . \quad (6)$$

3.4. Fiscal Revenue

Finally, the government obtains a share α of illegal GWs' income and the bonds employers forfeit for each illegal GW. Thus, the government's fiscal benefit *GB* is

$$GB = v_\Psi N_G (\alpha W + B) .^{13} \quad (7)$$

Since the government provides no public services, fiscal revenues are distributed to the native population.

3.5. Government Objective Function

The government maximizes its objective function which consists of a weighted sum of employers' profits, the native population's social cost of migration, and the benefit from the fiscal revenues the government distributes to it. I assume the government gives a higher *relative* weight $g > 1$ to employers' profits than to the native population's social cost or fiscal revenue benefit. Thus, the government's objective function is:

[13] Another benefit consists of the profits made by the employers of illegal migrants since they typically pay the latter less than the value of their marginal product. These are typically not considered to be a benefit by host countries because of the social cost of the illegal activities associated with these profits – at least in terms of employers' hiring practices – and they are not included in the model.

$$F_G = gEB + GB - SC = g(YN_G - v_\Psi N_G B) + v_\Psi N_G(\alpha W + B) - (\mu + \eta v_\Psi)N_G^2, g > 1. \quad (8)$$

3.6. Solution

The government maximizes F_G with respect to three policy measures: the share of income α whose payment is deferred, the value of the bond *B*, and the size of the quota N_G. Recalling that $g > 1$, it follows that $\partial F_G / \partial B = (1-g)v_\Psi N_G < 0, \ \forall \ B$ and the government does not use the bond as a policy instrument. The values of *B*, α and N_G that maximize F_G are (see Appendix):

$$B^* = 0,^{14} \ \alpha^* = \frac{4\mu + 5\eta X - Z}{6\eta W}, \ N_G^* = \frac{4\mu + 2\eta X - Z}{3\eta^2}, \text{ and}$$

$$Z = \left[(4\mu + 5\eta X)^2 - 12\eta^2 gY - 24\eta X(\mu + \eta X)\right]^{1/2}. \quad (9)$$

3.7. Comparative Statics

This section examines the impact of changes in parameter values on the policy instruments and the government's objective function, and draws policy implications. The results are based on equation (9) and are collected in several propositions.

An increase in the relative weight *g* of employers and in natives' wage rate W^N raises the impact GWs have on the per-GW weighted profits *gY*. This results in an expansion of the GW program N_G^*. Since an increase in *g* or in W^N have, ceteris paribus, no impact on the share v_Ψ of GWs who become illegal ($\partial v_\Psi / \partial g$ =

[14] If $g = 1$, the two terms in *B* cancel out and do not appear in the government objective function.

$\partial v_\Psi / \partial W^N = 0$), the expansion of the GW program means that $v_\Psi \; N_G^* \; W^N$, the impact of an increase in α on fiscal revenue, increases as well, and so does the beneficial impact of an increase in α in terms of reducing the social cost. This implies an increase in α*.

However, though a decrease in *W* has the same positive impact on $Y = W^N - W$ and N_G^* as an increase in W^N, it has the opposite effect on α*. In this case, α* is subject to one positive and two negative forces. Just as with the increase in W^N, the decrease in *W* results in an increase in N_G^* and thus in α's impact on fiscal revenue. However, the decrease in *W* itself reduces that impact as well as the beneficial impact α has on illegal overstaying and thus on social costs. As equation (9) shows, the net effect on α* is negative. Thus, the total number of illegal migrants unambiguously increases.

We have:

Proposition 1 - *An increase in the weight g or in* W^N *and a decrease in W result in an increase in* N_G^*. *Thus, raising GWs' minimum wage rate W reduces the size of the GW program, and an increase in natives' productivity* W^N *increases the size of the GW program.*

An increase in W^I, the wage rate in the illegal job market, as well as a reduction in W^S, the wage rate in the GWs' source country, raises – ceteris paribus – the monetary benefit $X = W^I - W^S$ of becoming illegal and thus raises the share $v_\Psi = X - \alpha W$ of GWs who do. This implies a contraction in the GW program, i.e., N_G^* falls, and an increase in α*. Thus, selecting a source country with a higher wage rate W^S reduces the share of GWs who become illegal and raises N_G^*.

These results seem confirmed by Bratsberg et al. (2007) who find that the share of temporary migrants to Norway who return home is largest for migrants from OECD countries, smaller for migrants from Eastern Europe and smallest for migrants from developing countries. They also find that an improvement in source countries' economy raises the share of migrants who return to their country of origin.

As was mentioned in Section 2, the extension of unemployment benefits to laid-off migrants in Germany's GW program after 1973 may help explain why many of them overstayed. In the framework of this model, unemployed workers who overstay earn $W^I = 0$ and none of them has an incentive to overstay (equation 1). Unemployment benefits equal to U raise W^I to $W^I = U$, in which case v_Ψ might well be positive and laid-off migrants with $v_i < v_\Psi$ would overstay.

We have:

Proposition 2 *– An increase in W^I or a decrease in W^S raises v_Ψ and α^* and reduces N_G^* and F_G^*. Thus, host country governments can reduce the incentive to join the illegal job market by accepting GWs from source countries that are better off or by making the illegal job market less attractive. On the other hand, host country benefits decline when public services are provided to overstaying GWs because of the greater incentive to overstay and because of the cost of providing the services.*

Following the 1973 oil embargo, Western Europe's growth rate fell and unemployment rose, and so did social tensions between natives and immigrants. With increased violence and acts of terrorism, anti-immigrant sentiments have reached new

heights in recent years.[15] As an article in The Economist (May 31, 2007) states: "Public opinion is in a distinctly toxic mood towards foreigners …" [16] [17]

The increase in social tensions can be represented by an increase in legal GWs' social cost μ and/or in illegal GWs' social cost η, both resulting in a decline in N_G^*. The decrease in N_G^* has two effects on α*. It decreases the impact of α on fiscal revenue and decreases its beneficial impact in reducing social cost. This implies that α* decreases.

Thus, we have:

Proposition 3 - *An increase in μ or η leads to a decrease in N_G^*. Thus, policies that help improve GW behavior -- for instance, by furthering their integration -- and/or that promote tolerance among natives would result in increased benefits from the GW policy.*

3. Mode IV

Section 3.1 discusses some of the pertinent differences between Mode IV and GW programs, and Section 3.2 solves the model.

3.1. Mode IV versus Guest-Worker Programs

GW programs entail a contract for temporary employment between a host country employer and a foreign *individual*, while Mode IV entails a contract for the temporary movement of service providers between a host country employer and a foreign *firm*.

[15] Violent acts have occurred in the Netherlands where a well-known filmmaker and prominent politician were murdered, and in France where riots by disgruntled immigrants and second-generation individuals have taken place. Acts of terrorism took place in the UK and Spain.

[16] Grether et al. (2000) examine attitudes towards immigration in a political-economy median-voter Ricardo-Viner open-economy model and find that they respond to policies' distributional impact as predicted by the model.

[17] For an excellent overview and analysis of European migration experience and problems in the post-war period, see Zimmerman (1995).

Hence, importing services under Mode IV should enable host countries to benefit from substantially lower defection rates compared to GW programs.

The fundamental difference between GW and Mode IV programs is that someone – namely foreign service exporting firms – can be held accountable for any defection that might occur under Mode IV, while this is not the case under GW programs.[18] In other words, host countries can impose penalties on foreign firms if any of their workers defects – or if defection takes place more than a specified number of times. Penalties might include large fines or the revocation of the foreign firm's permit to provide services in the host country.

A Mode IV migration program that includes such penalties would give foreign service providers a strong incentive to reduce their employees' defection rate. One way to achieve this is to thoroughly screen the firms' employees, ensuring that none has a high defection rate or criminal record.

Second, as Goette and Meier (2006) show, social cohesion helps motivate efficient behavior even when ordinary incentives fail. A higher level of social cohesion within a group raises the cost of defection because of the group's greater ability to impose and enforce sanctions and because the potential defectors' internalization of the cost imposed on other group members is greater. This suggests that, in order to further reduce the likelihood of defection, foreign service providers should select workers with shared attributes such as ethnicity, religion or community.

Third, it is likely that the employees of a penalized foreign service provider would bear part of the cost as the decline in demand for the firm's services would probably lead

[18] In both programs, temporary migrants can also be held accountable for overstaying if caught, though the probability of being caught is not very high (see footnote 11).

it to lay off some of its workers. Hence, they would have an incentive to monitor each other's behavior, making it harder to defect.

Fourth, foreign service providers could lower the rate of defection even further by making a community collectively responsible for the hired workers' behavior. Including a worker rotation system would involve a larger share of the community in the agreement and would help increase the community's commitment to the agreement and the likelihood of its success. This could be achieved, for instance, by letting the community know that hiring will cease if overstaying occurs.

3.2. Solving the Model

Based on the arguments presented above, I assume that $0 \leq v_{\Psi}^{M} < v_{\Psi}$, where v_{Ψ}^{M} is the overstaying rate under Mode IV. The total (monetary and psychic) cost of becoming illegal under the GW program is $\alpha W + W^{S} + v_{\Psi}$. The higher cost of defection under Mode IV can be written as $\alpha W + W^{S} + v_{\Psi} + \kappa$, where $\kappa > 0$ represents the additional costs described above. The probability of becoming illegal in this case is $v_{\Psi}^{M} = X - \alpha W - \kappa = v_{\Psi} - \kappa < v_{\Psi}$. Defining $X^{M} \equiv X - \kappa < X$, v_{Ψ}^{M} can be written as $v_{\Psi}^{M} = X^{M} - \alpha W$. Thus, the lower defection rate under Mode IV can be analyzed as a reduction in *X*.

Section 3.7 showed that an increase in *X* results in a decrease in N_{G}^{*} and an increase in α^{*}. Consequently, $N_{M}^{*} > N_{G}^{*}$, $\alpha_{M}^{*} < \alpha^{*}$ and $F_{M}^{*} > F_{G}^{*}$.[19]

Thus, we have:

[19] Natives might also prefer Mode IV to GW migrants because they are aware that a smaller share will overstay under Mode IV than under GW programs. Then, $\mu^{M} < \mu$, i.e., the weight of Mode IV migrants in the social cost function is smaller than for GWs. This implies a further increase in N_{M}^{*} and F_{M}^{*}.

Proposition 4 – *Because someone can be held accountable for migrants' behavior under Mode IV but not under GW migration,* $v_{\Psi}^{M} < v_{\Psi}$, $N_{M}^{*} > N_{G}^{*}$ *and* $F_{M}^{*} > F_{G}^{*}$. *Hence, policymakers should consider implementing Mode IV rather than GW migration policies.*

4. Permanent Migration

Guest country's natives tend to prefer temporary migrants to permanent ones and to prefer the latter to illegal migrants. In other words, the weight ϕ of permanent migrants in the social cost function is greater than the weight μ of temporary migrants, and is smaller than the weight η of illegal migrants. In other words, $0 < \mu < \phi < \eta$.

The number of permanent migrants in any period is $2N_P$, where N_P is the number of permanent migrants admitted every period. Denoting the permanent migrants' wage rate by W^P and assuming first that $W^P = W$, the government's objective function and its solution are:

$$F_P = 2(gYN_P - \phi N_P^2),\ N_P^* = \frac{gY}{2\phi}, F_P^* = \frac{g^2Y^2}{2\phi}. \qquad (10)$$

Whether F_P^* > or < F_G^* is ambiguous because, though the social cost is lower for legal GWs than for permanent migrants ($\mu < \phi$), it is lower for the latter than for illegal GWs ($\phi < \eta$).[20] Section 3 showed that v_{Ψ}^{M} is much smaller than v_{Ψ}. If $v_{\Psi}^{M} = 0$, $N_M^* = \frac{gY}{2\mu}$ and $F_M^* = \frac{g^2Y^2}{4\mu}$. Since $N_P^* = \frac{gY}{2\phi}$ and $F_P^* = \frac{g^2Y^2}{2\phi}$, $\mu < \phi$ implies N_M^* >

[20] The permanent migrant stock is $2N_P^*$ or twice the migrant flow, and this also generates greater benefits.

N_P^*. The permanent migrant stock is $2N_P^*$, and whether N_M^* > or < $2N_P^*$ -- and hence whether F_M^* > or < F_P^* -- depends on whether ϕ > or < 2μ. Thus, even in the absence of overstaying migrants, Mode IV need not be superior to permanent migration.

As mentioned earlier, host country natives' view of immigration has greatly deteriorated in recent years, particularly with respect to permanent immigration. Thus, ϕ increases and N_P^* and F_P^* fall, with $N_P^* \to 0$ as $\phi \to \infty$. So far, I have assumed that W^P = *W*. Since permanent migrants are typically in a stronger bargaining position, it is likely that $W^P > W$, with $Y^P \equiv W^N - W^P < Y$ and with a decrease in N_P^* and F_P^*. Thus, both the worsening mood with respect to permanent immigrants and the possibility that $W^P > W$ raise the likelihood that $N_M^* > 2N_P^*$ and $F_M^* > F_P^*$.

We have:

Proposition 5 – *The choice host countries must make when planning to put into place a Mode IV or a permanent immigration program -- but not both -- is complicated by the fact that it is unclear if* F_M^* > or < F_P^*. *However, a worsening in natives' mood with respect to permanent unskilled immigrants as well as a higher wage paid to permanent than to temporary immigrants raises the likelihood that Mode IV will be the preferred immigration policy.*

5. Combining Temporary and Permanent Migration

The issue considered here is whether a combination of temporary and permanent migration might be superior to implementation of one of the two policies. The issue is examined for a combination of Mode IV and permanent migration.

From equations (8) and (10), and with *B** = 0, we have

$$F_{MP} = gY(N_M + 2N_P) + v_\Psi N_M \alpha W - [(\mu + \eta v_\Psi)N_M^2 + 2\phi N_P^2]. \quad (12)$$

The first-order conditions for N_M, α_M and N_P are identical to those obtained for each policy separately, and therefore so are the optimal values N_M^*, α_M^* and N_P^*. Consequently, $F_{MP}^* = F_M^* + F_P^*$.

It is likely, though, that the social cost of migration is a function not only of the number of migrants in each program but also of the total number of migrants, e.g., $SC = (\mu + \eta v_\Psi^M)N_M^2 + 2\phi N_P^2 + (N_M + 2N_P)^2$. This implies that a change in the number of migrants in one program affects the marginal social cost of the other program.

Given the much smaller degree of overstaying under Mode IV than under GW programs (see Section 3.1), I assume for simplicity that $v_\Psi^M = 0$. This focuses the analysis on the interaction between Mode IV and permanent migration.[21] In this case:

$$F_{MP} = gY(N_M + 2N_P) - [\mu N_M^2 + 2\phi N_P^2 + (N_M + 2N_P)^2], \quad (13)$$

with $N_M^* = \frac{\phi gY}{A}$, $N_P^* = \frac{\mu gY}{A}$, where $A \equiv 2(2\mu + \phi + \mu\phi)$. As shown in the Appendix, an increase in the social cost of either program leads to a contraction of that program, an expansion of the other program, and a reduction in the total number of migrants.

Thus, we have:

[21] Assuming $v_\Psi^M > 0$, F_{MP} has no closed-form solutions for the policy variables α_M, N_M and N_P and are not interpretable (with equations with over twenty terms and with some of these variables raised to the third and fourth power).

Proposition 6 - *A policy that combines Mode IV and permanent migration programs is superior to implementing only one of the programs. The same holds for a combination of GW and permanent migration – though the former combination is superior to the latter. Host country governments should therefore consider an immigration strategy that consists of a combination of Mode IV and permanent migration programs.*

6. Circular Migration [22]

From equation (1), the level of overstaying under a GW policy is $v_\Psi = W^I - W^S$ - $\alpha W = X - \alpha W$. Under circular migration, there is a positive probability, denoted by *q*, that temporary migrants who return home at the end of period 1 migrate once again to the host country as GWs in period 2. In that case, the (expected) opportunity cost of illegal overstaying is $qW + (1-q)W^S$ rather than W^S, and the share of migrants who overstay is

$$v_\Psi^{GC} = v_\Psi - q(W - W^S) < v_\Psi . \qquad (14)$$

Equation (14) can be rewritten as $v_\Psi^{GC} = X - \alpha W - q(W - W^S) = X^{GC} - \alpha W$, where $X^{GC} \equiv X - q(W - W^S) < X$, i.e., circular migration can be analyzed as a reduction in *X*. Thus, a positive probability of circular migration reduces the share of illegal GWs and results in $N_{GC}^* > N_G^*$, $\alpha_{GC}^* < \alpha^*$, with $F_{GC}^* > F_G^*$. The same holds under Mode IV and circular migration, with $v_\Psi^{MC} = v_\Psi^M - q(W - W^S) = v_\Psi - \kappa - q(W - W^S) < v_\Psi^M < v_\Psi$, $F_{MC}^* > F_M^*$ and $F_{MC}^* > F_{GC}^*$.

Thus, we have:

[22] For a recent study of circular migration behavior and the determinants of the number of exits and the number of years away from the host country, see Constnt and Zimmerman (2007).

Proposition 7 – *Circular migration reduces the degree of overstaying, resulting in an increase in the size of the temporary migration program and benefits from it. Thus, host countries should consider an immigration strategy that adds circular migration to the combination of Mode IV and permanent migration policies.*

7. Regularization of Illegal Guest-workers

Regularization of illegal immigrants took place in the US in 1986, in Spain in 2006, and it was a key component of immigration reform proposals that were considered – and eventually rejected – by the US Congress in 2007. The issue is also part of the immigration debate in the EU.

In this section, I examine both the short-term and long-term impact of regularizing illegal GWs. Regularization is announced and takes place at the start of period $t = 1$. In other words, the announcement is made after GWs have decided whether or not to overstay. The announcement clearly stipulates that the regularization is a once-and-for-all occurrence. I assume that the social cost weight ε associated with regularized migrants is smaller than that of illegal ones ($\varepsilon < \eta$), and that the wage rate W^R earned by the former is lower than the native wage rate but higher than the illegal job market one. Thus, $W^I < W^R < W^N$.

Host countries benefit from regularization in the short run in two ways. First, $v_\Psi N_G$ illegal GWs become legal and add $(W^N - W^R) v_\Psi N_G$ to employers' profits and, second, because of the decline in the social cost. Regularized migrants benefit as well because they now earn a wage rate $W^R > W^I$.

The situation reverts to the pre-regularization one in $t = 2$, unless regularization in $t = 1$ results in a positive expectation of future regularization. Assume the probability of

future regularization is now $0 < r < 1$. Then, $v_{\Psi}^{R} = v_{\Psi} + r(W^{R} - W^{I}) > v_{\Psi}$, i.e., illegal overstaying increases, $N_{GR}^{*} < N_{G}^{*}$, $\alpha_{GR}^{*} > \alpha^{*}$, with $F_{GR}^{*} < F_{G}^{*}$. Thus, starting in period *t* = 2, the host country experiences a loss compared to an absence of regularization in *t* = 1. In the absence of any further regularization, the probability r_t at time *t* ($\forall t \geq 2$) and the loss associated with it are likely to diminish over time. A host country government considering a regularization of illegal GWs should compare the short-term benefits to the long-term cost $\sum_{t=2}^{\infty}[F_{G}^{*} - F_{GR}^{*}(r_t)]$ before deciding whether or not to do so.

Thus, we have:

Proposition 8 – *A policy of regularization of overstaying migrants provides short-term benefits but may result in losses over time. Thus, host countries should take the impact of such a policy on migrants' expectations of future regularizations and on future costs into account in their decision-making process regarding the regularization policy.*

8. Conclusion

An important debate on migration reform is taking place in the major host countries. This paper contributes to it by examining GW, Mode IV and permanent immigration policies in a model where a host country government maximizes its objective function with respect to three policy instruments: the share of migrants' deferred income payment, the value of the bond employers must post and forfeit if the GW overstays, and the size of the program. A combination of these policies as well as circular migration and illegal GWs' regularization are also considered.

A number of policy implications were derived from this paper. Host country governments intent on maximizing the benefits from immigration should:

i. implement a Mode IV rather than a GW immigration policy (in the case where only one policy is feasible);

ii. implement an immigration policy package that consists of a combination of Mode IV and permanent migration;

iii. include circular migration as part of the policy package;

iv. select better-off source countries;

v. not use the compulsory bond as a policy instrument; and

vi. help migrants integrate as well as promote tolerance among natives.

This paper focused on the design of an immigration policy package that maximizes host country governments' objective function. Future research will incorporate source countries' interests into the analysis.

References

Amin, Mohammad and Aaditya Mattoo. 2005. "Does Temporary Migration Have to Be Permanent?" World Bank Policy Working Paper 3582.

Black, Richard. 2004. "Making migration more 'development-friendly': temporary mobility schemes." Written evidence provided to the House of Commons International Development Committee (February 20).

Bratsberg, Bernt, Oddbjorn Raaum and Kjetil Sorlie. 2007. "Foreign-Born Migration to and from Norway." Chapter 9 in Caglar Ozden and Maurice Schiff (eds.). *International Migration, Economic Development & Policy*. New York: Palgrave Macmillan.

Constant, Amelie and Klaus F. Zimmermann. 2007. "Circular Migration: Counts of Exits and Years Away from the Host Country." IZA Discussion Paper 2999.

Djajic, Slobodan and R. Milbourne. 1988. "A General Equilibrium Model of Guest-Worker Migration." *Journal of International Economics* 2: 335-351.

Dustmann, Christian. 1997. "Return migration, uncertainty and precautionary savings." *Journal of Development Economics* 52: 295-316.

_____. 2003. "Return Migration, wage differentials, and the optimal migration duration." *European Economic Review* 47: 353-369.

_____ and Kirchkamp. 2001. "The Optimal Migration Duration and Activity Choice after Re-migration." IZA Discussion Paper No. 266, Bonn.

Epstein, Gil S., Arye L. Hillman and Avi Weiss. 1999. "Creating illegal immigrants." *Journal of Population Economics* 12: 3-21.

Goette, Lorenz and Stephan Meier. 2006. "The Impact of Group Membership on Cooperation and Norm Enforcement: Evidence using Random Assignment to Real Social Groups." IZA Discussion Paper No. 2020.

Grether, Jean-Marie, Jaime De Melo and Tobias Muller. 2000. "The Political Economy of International Migration in a Riccardo-Viner Model" (October). Mimeo. University of Geneva.

Grossman, Gene M. and Elhanan Helpman. 1994. "Protection for Sale." *American Economic Review* 84 (4): 833-50.

Hoekman, Bernard, Aaditya Mattoo and Philip English (eds.). 2002. *Development, Trade and the WTO. A Handbook*. The World Bank. Washington, D.C.

Holzmann, Robert and Rainer Muenz. 2004. "Challenge and Opportunities of International Migration for the EU, Its Member States, Neighboring Countries and

Regions: A Policy Note." Second Stockholm Workshop on Global Mobility Regimes, June 11-12. Institute for Future Studies: Stockholm.

International Organization for Migration (IOM). 2004. Memo to the House of Commons International Development Committee.

Kremer, Michael and Stanley Watt. 2006. "The Globalization of Household Production." Harvard University.

Martin, Philip L. 2003. "Managing Labor Migration: Temporary Worker Programs for the 21st Century." ILO International Institute for Labour Studies, Geneva.

Mattoo, Aaditya and Antonia Carzaniga (eds.). 2003. *Moving People to Deliver Services*. Oxford University Press (for the World Bank).

Rivera-Batiz, Francisco L. 1999. "Undocumented workers in the labor market: An analysis of earnings of legal and illegal Mexican immigrants to the United States." *Journal of Population Economics* 12: 91-116.

Ruhs, Martin. 2002. "Temporary Foreign Worker Programmes: Policies, Adverse Consequences, and the Need to Make Them Work." CCIS Working Paper No. 56.

_____ and Philip Martin. 2006. "Numbers vs. Rights: Trade-offs and guest-worker programmes." COMPAS Working Paper WP 06-40. Oxford University.

Schiff, Maurice. 2002. "Love Thy Neighbor: Social Capital, Trade and Optimal Migration Policy." *European Journal of Political Economy* (March).

Walmsley, Terrie L. and L. Alan Winters. 2002. "An Analysis of the Removal of Restrictions on the Temporary Movements of Natural Persons." CEPR Discussion Paper No. 3719.

Winters, L. Alan, Terrie L. Walmsley, Zhen Kun Wang and Roman Grynberg. 2002. "Negotiating the Liberalization of the Temporary Movement of Natural Persons." University of Sussex Discussion Paper 87 (October).

_____. 2003. "Liberalising the Temporary Movement of Natural Persons: An Agenda for the Development Round." *World Economy*: 1137-61.

Zimmerman, Klaus. 1995. "Tackling the European Migration Problem." *Journal of Economic Perspectives* 9: 45-62.

Appendix

1. Solution to the GW problem

Substituting $X-\alpha W$ for v_Ψ in equation (8), we have: $F_G = g[YN_G-(X-\alpha W)N_G B]+(X-\alpha W)N_G(\alpha W+B)-(\mu+X-\alpha W)N_G^2$. Recalling that $B^*=0$, the first- and second-order conditions for α and N_G are:

$$\frac{\partial F_G}{\partial N_G} = gY+\alpha W(X-\alpha W)-2(\mu+X-\alpha W)N_G = 0, \frac{\partial F_G^2}{\partial^2 N_G} = -2(\mu+X-\alpha W) < 0 \quad \text{(A1)}$$

and

$$\frac{\partial F_G}{\partial \alpha} = WXN_G - 2\alpha W^2 N_G + WN_G^2 = 0, \frac{\partial F_G^2}{\partial^2 N_G} = -2W^2 N_G < 0. \quad \text{(A2)}$$

The negative second derivatives indicate that the first-order conditions provide a maximum. Equation (A2) implies

$$N_G = 2\alpha W - X. \quad \text{(A3)}$$

Substituting (A3) into (A1), we have:

$$3\alpha^2 W^2 - \alpha W(4\mu+5X)+2X(\mu+X)+gY = 0, \quad \text{(A4)}$$

whose solution – with N_G^* obtained from equation (A3) – is

$$\alpha^* = \frac{4\mu+5X-Z}{6W}; N_G^* = \frac{4\mu+2X-Z}{3}; \text{ and } Z = \left[(4\mu+5X)^2-12gY-24X(\mu+X)\right]^{1/2}$$

(A5).

Because $\frac{\partial F_G}{\partial N_G} > 0$ at $N_G = 0$ and $\frac{\partial F_G^2}{\partial^2 N_G} = -2W^2 N_G < 0, \forall N_G > 0$, it follows that the optimum is the smaller of the two solutions, which explains the negative coefficient of Z in N_G^*. Similarly, because $\frac{\partial F_G}{\partial \alpha} > 0$ at $\alpha = 0$ and $\frac{\partial F_G^2}{\partial^2 N_G} = -2W^2 N_G < 0$, the coefficient of Z in α^* is negative as well.

2. Comparative Statics

I now show that $\frac{\partial N_G^*}{\partial \mu}, \frac{\partial \alpha^*}{\partial \mu} < 0$. From (A5), $6W\frac{\partial \alpha^*}{\partial \mu} = 3\frac{\partial N_G^*}{\partial \mu} = 4(1-\frac{4\mu+2X}{Z})$.

Assume $\frac{\partial \alpha^*}{\partial \mu} \geq 0$ or $\frac{\partial N_G^*}{\partial \mu} \geq 0$. This implies $1-\frac{4\mu+2X}{Z} \geq 0$ or $Z^2 \geq (4\mu+2X)^2$. This is equivalent to $0 < 3X^2 \leq -12gY < 0$, a contradiction. Thus, $\frac{\partial \alpha^*}{\partial \mu} < 0$ and $\frac{\partial N_G^*}{\partial \mu} < 0$, QED. It can similarly be shown that $\frac{\partial N_G^*}{\partial X} < 0$ and $\frac{\partial \alpha^*}{\partial X} > 0$, and it is easily verified that an increase in gY results in an increase in both N_G^* and α^*.

3. Combining Mode IV and permanent migration

From $F_{MP} = gY(N_M + 2N_P) - [\mu N_M^2 + 2\phi N_P^2 + (N_M + 2N_P)^2]$, the FOC is $\frac{\partial F_{MP}}{\partial N_M} = gY - 2[\mu N_M + (N_M + 2N_P)] = 0$ and $\frac{\partial F_{MP}}{\partial N_P} = 2gY - 4[\phi N_P + (N_M + 2N_P)] = 0$.

The solution is: $N_M^* = \frac{\phi gY}{2A}$, $N_P^* = \frac{\mu gY}{2A}$, $A \equiv 2\mu + \phi + \mu\phi$. Then, $\frac{\partial N_M^*}{\partial \mu} = \frac{-\phi(2+\phi)gY}{2A^2}$ and $\frac{\partial N_P^*}{\partial \mu} = \frac{\phi gY}{2A^2}$. Thus, $\frac{\partial N_{MP}^*}{\partial \mu} \equiv \frac{\partial (N_M^* + 2N_P^*)}{\partial \mu} = \frac{-\phi^2 gY}{2A^2} < 0$. Similarly, $\frac{\partial N_M^*}{\partial \phi} = \frac{\mu gY}{2A^2}$ and $\frac{\partial N_P^*}{\partial \phi} = \frac{-\mu(1+\mu)gY}{2A^2}$. Thus, $\frac{\partial N_{MP}^*}{\partial \mu} = \frac{-\mu^2 gY}{2A^2} < 0$. Finally, note that as $\phi \to \infty$, $N_M^* \to gY/2(1+\mu)$ and $N_P^* \to 0$.

Thus, in this case, an increase in the social cost of temporary (permanent) migrants raises the number of permanent (temporary) migrants, reduces the number of temporary (permanent) migrants, and reduces the total number of migrants.