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Illegal migration and policy enforcement

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ABSTRACT

Workers from a source country consider whether or not to illegally migrate to a host country. This decision depends crucially on the proportion of workers who migrate and on whether or not the host country government decides to regularize them. When there is no uncertainty about economic conditions in the host country, there are multiple equilibria where workers may migrate or not and the government may regularize them or not. When uncertainty is introduced, we show that there exists a unique equilibrium where each state of the world gives rise to a unique outcome in terms of migration and regularization.

1. Introduction

More than a million migrants and refugees crossed into Europe in 2015, compared with just 280,000 the year before. The scale of the crisis continues, with more than 135,000 people arriving in the first two months of 2016. The vast majority of these migrants, who have predominantly fled the Middle East and Africa, are illegal. The reactions from European countries have been very different. Some countries, such as Germany and Sweden, initially promised to regularize them if they came from war-torn countries such as Syria. Other countries, such as Poland and Hungary, took a strong stance against such migrants and committed to never regularize them.

The aim of this paper is to analyze these issues using a simple framework where both illegal migration and the regularization policy of the host country are explicitly modeled.

In our model, workers from a source country first decide whether or not to migrate illegally to a host country. Next, the government of the host country decides whether to regularize all migrants or none. Before the migration decision, workers do not know whether they will be regularized or not. However, workers know they are more likely to be regularized when more workers migrate to the host country. In other words, from the potential migrant's viewpoint, we have a game with strategic complements since the optimal action of each worker (migrating or not) is increasing in the average action of the other workers.

We first consider the case where there is no uncertainty regarding the fundamentals of the host country's economy, which are captured by the state of the economy θ. We show that, if θ does not take extreme values, then there are multiple equilibria. Indeed, if all workers believe that other workers will migrate and therefore that they will be regularized, then these beliefs are self-fulfilling in equilibrium since the government finds it optimal to regularize them once they have migrated. On the other hand, if workers believe that nobody will migrate, then these beliefs are also self-fulfilling in equilibrium.

Given this multiplicity of equilibria, no definitive prediction can be made as to whether workers will migrate or not. Using the tools of global games (Carlsson and van Damme, 1993; Morris and Shin, 1998),[1] we introduce a small degree of uncertainty about the state of the economy θ in the host country. We show that common knowledge about this uncertainty leads to a unique equilibrium where each state of the world θ gives rise to a unique outcome in terms of migration and regularization.

There is a large empirical and theoretical literature on illegal migration that analyzes the impact of immigration (both legal and

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[1] For an overview on global games, see Morris and Shin (2003).

illegal) on employment outcomes in the host country, especially in the United States (see e.g. Ethier, 1986; Epstein and Weiss, 2011; Mayr et al., 2012; Chassamboulli and Peri, 2015; Miyagiwa and Sato, 2015). Western countries have spent significant resources on limiting the number of immigrants via both border controls and internal enforcement (such as employer penalties). Despite these efforts, however, many illegal immigrants have found a way to enter these countries. To deal with these issues, these countries have in return periodically granted amnesty to any worker who can demonstrate that he fulfills certain requirements. Epstein and Weiss (2011) show that the number of illegal workers regularized has been quite significant (see their Table 1).

In this paper, we propose a new and different perspective on illegal migration. We do not study the mechanisms under which a government reduces illegal migration but rather focus on how the individual's decision to illegally migrate is affected by the same decision from other workers from the same country and by the regularization policy of the host country.

The rest of the paper unfolds as follows. In the next section, we describe the model. Section 3 deals with the complete information case while Section 4 solves the incomplete information case. Section 5 concludes. All proofs can be found in the Appendix.

2. Model

We consider the strategic interaction between a set of potential migrants from a source country and the government of the host country. The set of potential migrants is a mass one of workers who must decide whether or not to migrate. This is a $\{0, 1\}$ decision. Their payoff if they migrate depends on the migration policy enforced by the host country government. This government has two options: she can choose to regularize all migrants or none.

A worker's payoff from migrating is $\omega^r(\theta)$ if he is regularized and $\omega^i(\theta)$ if he is not, where θ is a random variable that characterizes the economic conditions in the host country. For example, a high θ indicates positive economic conditions such as low unemployment and a high growth rate. We assume that θ is uniformly distributed over $[\underline{\theta}, \bar{\theta}]$. The utility of a worker in the source country is normalized to zero and hence the payoffs $\omega^r(\theta)$ and $\omega^i(\theta)$ represent net gains from migrating for a regularized and an illegal migrant, respectively. Since they incorporate both the costs and benefits of migration, they can be either positive or negative. We make the following assumptions on the payoffs of potential migrants.

Assumption 1. The functions $\omega^r(\theta)$ and $\omega^i(\theta)$ are continuous, increasing, and satisfy

1. For all θ, $\omega^r(\theta) > \omega^i(\theta)$, i.e. the payoff of a legal migrant is always higher than the payoff of an illegal migrant;
2. $\omega^r(\underline{\theta}) < 0 < \omega^i(\bar{\theta})$, i.e. it is never profitable to migrate when economic conditions are "worst", but it is always profitable to do so when economic conditions are "best"; and
3. The function $\Delta\omega(\theta) = \omega^r(\theta) - \omega^i(\theta)$ is weakly increasing.

The government in the host country reacts to the migration decisions of workers by deciding whether or not to regularize migrants. Again, this is a $\{0, 1\}$ decision. We assume that the government perfectly observes both the state of the economy θ and the fraction of potential migrants who decided to migrate illegally, denoted by $s \in [0, 1]$. The payoff for the government is $\gamma^r(\theta, s)$ if she regularizes all migrants and $\gamma^i(\theta, s)$ if she regularizes none. These payoffs reflect the interaction between various political economy factors such as the strength of syndicates, lobbies, the median voter's preferences, etc. For notational simplicity, we denote $\Delta\gamma(\theta, s) = \gamma^r(\theta, s) - \gamma^i(\theta, s)$. We make the following assumptions regarding the payoff of the government.

Assumption 2. The function $\Delta\gamma(\theta, s)$ is a continuous and differentiable function such that:

1. For all $\theta \in [\underline{\theta}, \bar{\theta}]$, $\Delta\gamma(\theta, 0) < 0 < \Delta\gamma(\theta, 1)$, i.e. it is never profitable to regularize when there are no migrants while it is always profitable when there are a mass 1 of migrants; and
2. For all θ, the function $\Delta\gamma(\theta, s)$ is increasing in s.

Assumption 2 implies that, for any given state of the economy θ, there exists a unique $a \in (0, 1)$ such that $\Delta\gamma(\theta, a) = 0$. We can therefore introduce a function $a(\theta)$ implicitly defined by $\Delta\gamma(\theta, a) = 0$. Intuitively, $a(\theta)$ is the mass of migrants for which the government is indifferent between regularizing or not regularizing when the state of the economy is θ.

Assumption 3. The function $a(\theta)$ is decreasing.

Timing: The timing of the game is as follows. First, potential migrants simultaneously decide whether or not to migrate. Second, the government observes the mass of migrants and decides whether or not to regularize them.

Observe that when a potential migrant decides whether or not to migrate, he does not know whether he will be regularized or not. Observe also that, from the potential migrant's viewpoint, we have a game with *strategic complements* since the optimal action (migrating or not migrating) of each worker is increasing in the average action of the other workers. The more other workers migrate, the more likely that a given worker migrates, which increases her utility because the chance that the government will regularize them increases.

We now consider two cases. In the complete information case, the potential migrant knows exactly the economic conditions θ of the host country before migrating. In the incomplete information case, he does not know the value of θ.

3. Complete information

Suppose that θ is perfectly observed by migrants. In order to characterize the subgame perfect equilibria of the migration game, we first define two threshold values for the parameter θ. The threshold θ^* is the value of θ such that a migrant who knows that he will be regularized is indifferent between migrating or not, i.e. $\omega^r(\theta^*) = 0$. The threshold θ^{**} is the value of θ such that a migrant who knows that he will not be regularized is indifferent between migrating or not, i.e. $\omega^i(\theta^{**}) = 0$. Assumption 1 ensures that $\underline{\theta} < \theta^* < \theta^{**} < \bar{\theta}$.

Proposition 1. *When $\theta < \theta^*$, the migration game possesses a unique subgame perfect equilibrium in which all potential migrants decide not to migrate. When $\theta > \theta^{**}$, the migration game possesses a unique subgame perfect equilibrium in which all potential migrants decide to migrate. When $\theta^* \leq \theta \leq \theta^{**}$, the migration game possesses two subgame perfect equilibria: one in which all workers migrate, the other in which no worker migrates.*

As stated above, when a worker decides whether or not to migrate, he does not know whether or not he will be regularized but he knows the state of the economy θ in the host country. If he observes that $\theta < \theta^*$, he will clearly not migrate since this means, by Assumption 1 and the definition of θ^*, that, even if he will be regularized in the host country, his utility will be lower than staying at home. Since all individuals make the same calculations, nobody will migrate. The opposite is true when $\theta > \theta^{**}$ since the economic conditions are sufficiently good in the host country that it is always profitable to migrate.

When $\theta^* \leq \theta \leq \theta^{**}$, then we have multiple (rational expectations) equilibria. If the workers anticipate that the government will regularize them, then they will all migrate and the government