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Dominique M. Gross, Nicolas Schmitt

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Do birds of a feather flock together?
The role of cultural clustering in attracting new immigrants*

by

Dominique M. Gross
International Labour Office, Geneva, Switzerland

and

Nicolas Schmitt**
Department of Economics
Simon Fraser University
Burnaby, B.C. V5A 1S6 Canada
Email: schmitt@sfu.ca. FAX: (604) 291 5944.

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** Corresponding author

Abstract: This paper develops a simple theoretical framework in which immigrants have a relative incentive to cluster in host countries where cultural characteristics and imperfect information sustain the segmentation of the labour market. The predictions of the theoretical framework are tested on a panel of immigration flows to OECD countries. The pull effect of cultural communities is supported and it is quite robust for various sub-sets of source/destination countries. Also consistent with the predictions of the model, is the result that the cultural community must reach a minimum size to attract new immigrants and the pull effect weakens as the community grows.

Keywords: International migrations, relative incomes, cultural cluster.

JEL Classification Numbers: F22, J61, O15.

I. Introduction

Until recently immigration to industrialized countries was skewed in favor of institutionally predetermined ethnic groups. The United States had formal rules for preferred nations of origins and Canada had similar but informal preferences in its immigration policy. As a result, from the 1920s until the 1950s, immigrants from Northwestern, Central and Eastern Europe represented more than half of all immigrants to both Canada and the United States (see Green 1995, and Borjas1992, for more details). In West European countries a very similar concentration could be observed with immigrants from Southern Europe even though the approach to immigration was different (see Zimmermann, 1996, for description). To compensate for their chronic shortage of labour, countries like Germany and Switzerland actively recruited foreign workers in Italy, Spain and Turkey. Finally, France and the United Kingdom had preferential treatment for citizens from their former colonies. Nevertheless, in all cases the ensuing skewness in the distribution of origins for immigrant populations was clearly demand-driven. In the mid-1960s, the United States and Canada abandoned the preferred origin criterion in favor of skill characteristics. In 1973, European countries abandoned their policies of active recruiting abroad. As a result, recent years have witnessed increased ethnic diversity in immigration flows toward Western European countries (see OECD 1995, 1997) despite the implementation of, sometimes, severe immigration restrictions. One of the important consequences of these changes is that the representation of source countries among foreign populations in host countries has become more diversified and more supply driven than it ever was.

Although the initial triggers for the shift in the composition of migration flows originate in exogenous factors such as changes in immigration laws or source-country specific events, the subsequent shaping of the distribution is likely to have been influenced by various systematic push and pull factors. In this paper we choose to focus on one particular pull factor, namely the role of the clustering of migrants by origins in receiving countries as a location determinant for the newcomers. We argue that the existence of a community of the same origin contributes to the segmentation of the labour market generating more attractive labour market options for new migrants. As a consequence, new immigrants tend to flock to countries where nationals of their country are already established.

The idea of migrant clustering is not new especially when linked to the traditional costs of migration. For example, in the theoretical literature, the disutility of leaving a community for

an alien culture has long been integrated in the determinants to emigrate. This non-monetary cost is introduced through a penalty factor applied to the expected wage in the receiving country (Harris and Todaro 1970). Recently, Layard et al. (1992) have used this model in their study of East-West migrations in Europe after the fall of the Berlin Wall. In the empirical literature, gravity models applied to migrations suggest that the distance between the source and destination countries is a proxy for the financial costs as well as the cultural costs incurred by migrating to an alien country (see for examples, Feder 1980, Foot and Milne 1984, for regional migrations and Helliwell 1997, for cross-border migrations).

However, most of the time, cultural costs are measured only indirectly. Furthermore, these studies do not take into account the fact that migration costs may be variable or even endogenous. This would be the case, for example, if the relative costs depend on the presence and on the size of the cultural community familiar to the potential immigrant. One way to integrate the role of communities of the same origin in the host country is to consider that the relative wages at home and in the destination country can be altered if a sizeable community from the same origin exists in the receiving country. Using this approach, Stark (1994) posits that it is cheaper for immigrants than for native-born individuals to identify whether other migrants are of the cooperative or of the non-cooperative type in trade relationships. Information costs among immigrants are, thus, lower and generate a higher proportion of the cooperative-type among immigrants than among non-immigrants (provided that each agent deals only with his/her own type). As a result, immigrants do better than native-born individuals independently of individual characteristics.

Our framework generates a similar outcome but is developed from different premises. We use a non-cooperative set-up of repeated interactions between employers and immigrants to show that common characteristics among immigrants help sustain a higher wage within cultural communities than in the rest of the economy. Moreover, the higher wage in immigrant communities is explained by the relative size of the communities and not by assuming lower information costs among immigrants. This allows for more straightforward empirical testing of the role of cultural communities as a determinant of immigration flows.

To justify a relatively higher reward in the ethnic community than outside it, the model is set up within an efficiency-wage framework. If the quality of information about workers' non-observable characteristics is endogenous to the size of the market, and thus, the incentive to shirk is endogenous, a high wage is sustainable in a small community while it is not in a large market. Within a given country such segmentation of the labour market can hold provided informal

barriers like cultural characteristics matter. As a consequence, everything else being equal, and without constraint on settlement location, migrants will have an incentive to cluster. A very important consequence of the efficiency-wage framework is the prediction that the incentive to cluster exists only when the size of these communities is within some range. This particular prediction differs from other explanations about clustering based simply on the cost of migrating.

This result is broadly supported by the analysis of a panel of migration flows to major OECD countries from the mid-1980s to the mid-1990s. In effect, the size of the cultural communities matters for the magnitude of migration flows and, moreover, the pulling role of cultural communities is significantly weaker in the case of migrations within the OECD. Both results are consistent with the predictions of the model. Moreover, cultural communities are more attractive for immigrants from non-OECD countries suggesting that between industrialized countries information advantage does not matter. Alternatively, the match between jobs' and workers' characteristics within the OECD is closer than between non-OECD source countries and industrialized markets. Interestingly, the pulling role of cultural communities is stronger in traditional immigration countries such as Australia, Canada and the United States than in Europe and Japan. Finally, the impact is shown to weaken when the resident community grows and 5% is estimated to be the minimum size.

The paper is organized in the following way: The next section presents the theoretical framework. Section 3 describes the dataset and some of its characteristics. Section 4 develops an empirical strategy and the results of the estimations are analyzed in section 5. Section 6 offers concluding comments and suggestions for further research.

II. A simple theoretical framework

The theoretical framework is based on a dynamic version of the efficiency-wage model[1] constrained by the quality of information available within labour sub-markets. More specifically, consider a new migrant facing two labour sub-markets in the host country. One sub-market is a relatively small and homogeneous market for migrants of close ethnic background and the other sub-market is relatively large and anonymous. We want to make the following point. In the context of the efficiency-wage model, migrants will, everything else being equal, cluster relatively in those countries where the labour segmentation is effective and, thus, when the

[1] See Akerlof and Yellen (1986) for various versions of the efficiency-wage model.

equilibrium wage is higher in the small labour market for migrants. This occurs when the size of the migrant community is within a limited range.

A difference between the equilibrium wages is sustainable because of two elements: job characteristics, which naturally segment the two markets (for instance, contacts with home country, language requirements), and the higher quality of the information on the smaller sub-market, which makes it worthwhile to offer a relatively higher wage in order to elicit higher productivity despite the risk of shirking by workers. For this to occur, the migrant community cannot be too small because, if it is, the market is unable to sustain specific businesses aimed at the migrant community and there is no market value for culturally specific characteristics. It cannot be too large either as the quality of the information within this sub-market deteriorates with size that, in turn, results in a lower efficiency-wage in this market. This non-linearity is an important distinction between the efficiency wage and other explanations about migrant clustering.[2]

To see more formally how this works, consider the following model with two labour markets for migrants in the host country. Migrants take the wages as given and choose only the level of effort. We denote the one-period payoff of a new migrant as

$$U(w_j, e_i) = w_j e_i, \qquad j = c, e; i = h, l, \tag{1}$$

where e_i is the level of effort by the migrant which can be high ($i=h$) or low (i=l), and w_j is the wage in sub-market j which can be competitive ($j=c$) or not ($j=e$) such that, $w_e \geq w_c$. We assume that $w_e - e_l > w_e - e_h > w_c - e_l > w_c - e_h$ [3] so that,

$$U(w_e, e_l) > U(w_e, e_h) \geq U(w_c, e_l) > U(w_c, e_h). \tag{2}$$

Migrants are risk neutral and the migrants' discount factor δ is assumed to be distributed uniformly over the support [0,1].

Potential employers in the host country can be divided into two groups corresponding to the two sub-markets, c and e. One group is composed of n employers with the same cultural background as the new migrant and the other group is composed of a large number of employers without defined cultural attributes. Suppose furthermore that $w_e \geq w_c$ is offered by the first group

[2] Indeed if the existence of a community simply decreases the fixed cost of migrating, a minimum size of such community would be needed to attract migrants. However, the incentive to migrate has no reason to be affected beyond this minimum size.

of employers and that w_c is the wage offered by the second group of employers.[4] Moreover, this second wage is independent of effort and it is simply the competitive wage in a large, anonymous labour market that acts as the migrant's reservation wage in the host country.[5]

The potential high wage in the small labour market comes from an infinitely repeated game interaction between migrants and employers of this group in the presence of private information. A new migrant can always find a job with an employer of the *n* group at wage w_e upon arrival in the host country. However, in subsequent periods, a migrant seeking a new job finds one at w_e with probability *p* or a job with the large anonymous group at wage w_c with probability *(1-p)*. An employer of the *n* group always pays w_e at the end of the first period of employment as the migrant's level of effort is not directly observable by the employer and the level of output is observable only after a lag.[6] If, during each subsequent period of employment, high output per worker, q_h, is observed then, this employer continues to pay w_e at the end of each period. If a low output per worker, q_l, is observed during any subsequent period, the worker is simply laid off. The laid off worker can still find a job at w_e with another employer of the *n* group with probability *p* or a job with the large anonymous group at wage w_c with probability *(1-p)*. We assume here that the probability *p* depends on the quality of information on the small labour sub-market. This quality of information depends in turn on the characteristics of the sub-market such as its size.

Given the above assumptions, the migrant chooses a high level of effort whenever

$$U(w_e, e_h)(1+\delta+\delta^2+...) > U(w_e, e_l) + u(w_e, w_c, e_l)(\delta+\delta^2+\ldots), \tag{3}$$

where $u(w_e, w_c, e_l) = [pU(w_e, e_l) + (1-p)U(w_c, e_l)]$. The left-hand side of (3) is the present discounted value of the migrant's payoff when the migrant chooses a high level of effort in every period. The first term on the right-hand side of (3) is the migrant's instantaneous payoff from shirking, while the second term is the present discounted value of the expected payoff from finding a new job in every subsequent period, either in the small labour sub-market or in the large

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[3] This assumption implies that the individual labour supply exhibits increasing returns with respect to effort. As a result, the aggregate supply of labour is not linear in wage but increasing and convex.

[4] Several studies (Chiswick 1986a, 1986b; Bloom and Gunderson 1991) find that migrants have a higher mean income than that of the non-migrating population, at least for some time in the host country, even when individual characteristics have been controlled for. Similarly, Beggs and Chapman (1991) find that several immigrant groups have a wage advantage over native workers in Australia.

[5] Without loss of generality, we assume below that w_c is not sensitive to immigration.

[6] For instance, it takes two periods to produce output. Importantly, wages cannot be made contingent on the ex- post level of output due to lack of enforcement mechanism.

anonymous sub-market. Thus, with (3), if the migrant shirks once, shirking occurs in every period (stationary strategy). The relationship in (3) simplifies into

$$\delta > \delta^* = \frac{U(w_e, e_l) - U(w_e, e_h)}{U(w_e, e_l) - u(w_e, w_c, e_l)}. \quad (4)$$

Since the two components of this ratio are positive but the numerator is smaller than the denominator (provided p is not too high), the right-hand side expression is smaller than one. Furthermore, it defines a critical discount factor (δ^*) above which the new migrant chooses to provide a high level of effort and below which the new migrant chooses to provide a low level of effort in every period. In other words, if the new migrant does not care about the future (low value of δ), a low level of effort is chosen whereas a high level of effort is chosen if the new migrant gives enough importance to the future (high value of δ). Since the discount factor is distributed uniformly over [0,1], δ^* also determines the proportion of migrants who shirk.

An equilibrium with an efficiency wage exists if, given the size of the sub-market and given p, n, e_h, e_l, there exist wages such that $w_e \geq w_c$ and the expected profit of each of the n employers is at least equal to the profit obtained by simply offering w_c.

Since workers never supply e_h while receiving w_c (see (2)), an equilibrium with w_e exists only if the employer's revenue effect of an efficiency wage (through higher productivity) more than compensates its cost effect. In the present model, there are two costs: the direct cost of a higher wage and the expected cost of shirking induced by the high wage. This has two crucial implications for the range of parameters under which such equilibrium holds.

First, the existence of an equilibrium with efficiency wage requires a minimum size of the sub-market where the high wage is offered. This can be seen by simply recognizing that, given n employers in this market, an equilibrium with high wages exists if no one has an incentive to switch from w_e to w_c and, thus, to reduce unilaterally its output. This requires a relatively elastic demand and a large enough market to avoid significant price effects associated with unilateral changes in output.

Second, an equilibrium with efficiency wage also requires a market size which is smaller than some maximum size. This is linked to the quality of diffusion of the information and the number of shirkers. Simply put, as the quality of diffusion of the information changes, p changes and so does the number of shirkers. To see this point, suppose the diffusion of information among the n employers is perfect such that all of them know after one period who is shirking among the new migrants. In this case, $p=0$ and (4) collapses to the standard condition,

$$\delta > \delta^* = \frac{U(w_e, e_l) - U(w_e, e_h)}{U(w_e, e_l) - U(w_c, e_l)}, \quad (5)$$

where the payoff with the penalty from shirking is now $U(w_c , e_l)$ since shirkers get punished forever after a single deviation from a high level of effort. Hence, the only job those migrants ultimately find is in the large outside group of anonymous employers at their reservation wage w_c. For given w_e and w_c, $p=0$ generates the lowest value of δ^* since $U(w_c, e_l) < u(w_e, w_c, e_l)$, and, thus, the smallest proportion of shirkers among migrants. As the size of the small sub-market increases, the quality of the diffusion of information deteriorates. This implies a higher probability p as employers can no longer perfectly identify first-period shirkers. Since δ^* increases with p, the proportion of shirkers among the new migrants increases with the size of the sub-market. This necessarily increases the expected cost of using an efficiency wage. Hence, for an equilibrium to exist, w_e must ultimately decrease with the size of the market. The probability p does not need to be equal to 1 for δ^* to converge to one and, thus, for all new migrants to shirk. More importantly, δ^* does not need to be equal to one for the employers to find too costly to use efficiency wages in which case w_c is the only equilibrium wage.

The previous discussion can be summarized in the following way: Migrants have an incentive to cluster relatively more in countries where labour markets are effectively segmented by informal barriers such as common cultural characteristics. The effectiveness of cultural characteristics in segmenting the markets depends on the size of the communities and holds only within a limited range.

This repeated game framework can be coupled with the traditional model of migration decision where domestic and foreign financial opportunities are major determinants of the decision to migrate (Harris and Todaro 1970, Layard et al. 1992). The decision to migrate depends then on the expected income in the source country (y_m) and destination country (y_k), the actual cost of migrating (C) and other factors (Z), which will be developed in the empirical section. Since now the migrant may earn more than the average wage in the destination country, depending on the existence of a community of the same origin and the level of effort on the job, the expected income in the country of immigration is the income from the large competitive market (y_k) plus a premium which varies with the size of the cultural community (s^m_k). Hence, the number of people deciding to migrate from a source country m to a destination country k, is the product of the probability to migrate (f) and the size of the population in the source country (POP_m),

$$f * POP_m = f[y_m, y_k, s_k^m, C, Z] * POP_m.$$

Only a proportion (g) is accepted by the destination country that is determined by a number of factors (V_k) among which the parameters of the immigration policy. Hence, the flow of migrants ($IFL_{m,k}$) from source country *m* to destination country *k*, is,

$$IFL_{m,k} = f * POP_m * g = f[y_m, y_k, s_k^m, C, Z] * POP_m * g(V_k),$$

or, in implicit form,

$$IFL_{m,k} = IFL_{m,k}[y_m, y_k, s_k^m, C, Z, POP_m, V_k]. \quad (6)$$

Thus, when the cultural community effect is coupled with the traditional migration decision framework, the migrants' choice of a destination is no longer simply a function of the differential in incomes between the source and destination countries but it is also a function of the size of the population of the same origin in any given destination country (s^m_k) which represents the possibility of earning a premium. It must be apparent that, by using an aggregate framework, our purpose in the empirical section of this paper is not to test the efficiency-wage model but its predictions on gross migration flows paying particular attention the role of cultural communities.

III. Data characteristics

The role of this section is to reconcile the available statistical observations with an empirical framework suitable to analyse the role of communities on the basis of (6). Since the mid-1980s, the composition of the foreign population has clearly shifted in host countries. Changes in international circumstances as well as in administrative constraints certainly initiated the shift but our argument is that the ensuing patterns of the migration flows have been in part determined by cultural clustering. Table 1 provides a few examples of changes in the size of cultural communities in some OECD destination countries between the mid-1980s and the mid-1990s.

Table 1: Size of some cultural communities in percentage of foreign population

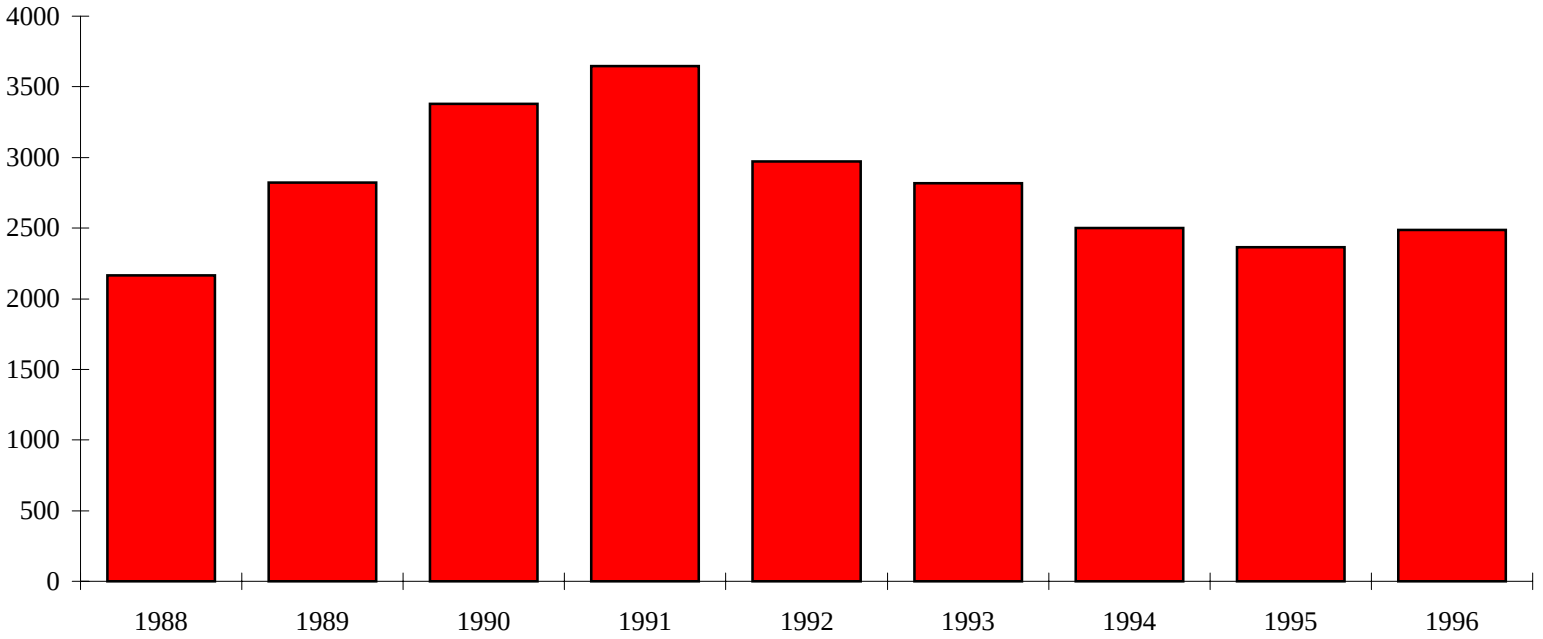
AUSTRALIA	1986	1996
Italy	8.1	6.1
Philippines	1.0	2.4
Poland	2.1	1.7
U.K.	33.4	27.4
Vietnam	2.6	3.9
BELGIUM	1985	1995
Italy	30.0	26.7
Morocco	14.6	15.4
The Netherlands	7.0	8.5
Portugal	1.1	2.6
Turkey	8.8	9.0
CANADA	1986	1996
China	3.1	4.7
India	3.3	4.8
Italy	9.4	6.7
Philippines	2.1	3.7
U.K	20.3	13.2
GERMANY	1985	1995
Greece	6.4	5.0
Italy	12.1	8.2
Poland	2.4	3.9
Turkey	32.0	28.1
former Yugoslavia	13.5	18.1
JAPAN	1985	1995
Brazil	0.2	13.0
China (including Taiwan)	8.8	16.4
Korea	80.3	48.9
Peru	0.1	2.7
U.S.A.	3.4	3.2
SWEDEN	1985	1995
Finland	35.7	19.7
Iraq	0.9	4.0
Iran	2.1	5.5
Poland	4.0	3.0
Turkey	5.5	3.8
USA	1986	1996
Canada	4.7	3.2
Cuba	4.0	3.2
Mexico	19.3	23.0
Poland	2.0	2.4
Vietnam	2.3	3.3

In Canada and Australia there has been an increase in migration flows from Asian sources at the expense of the more traditional immigration from Europe (U.K. and Italy, for example). Also, the Iranian community more than doubled its share in the foreign population of Sweden, and Portugal increased its presence in the foreign population of Belgium almost threefold. Meanwhile, some historically strong combinations of source and destination countries such as Finland/Sweden, Italy/Belgium and Turkey/Germany have weakened significantly.

In Figure 1, the top panel shows the total yearly flow of immigrants to the 12 destination countries of our sample during the period 1988-1996.[7]

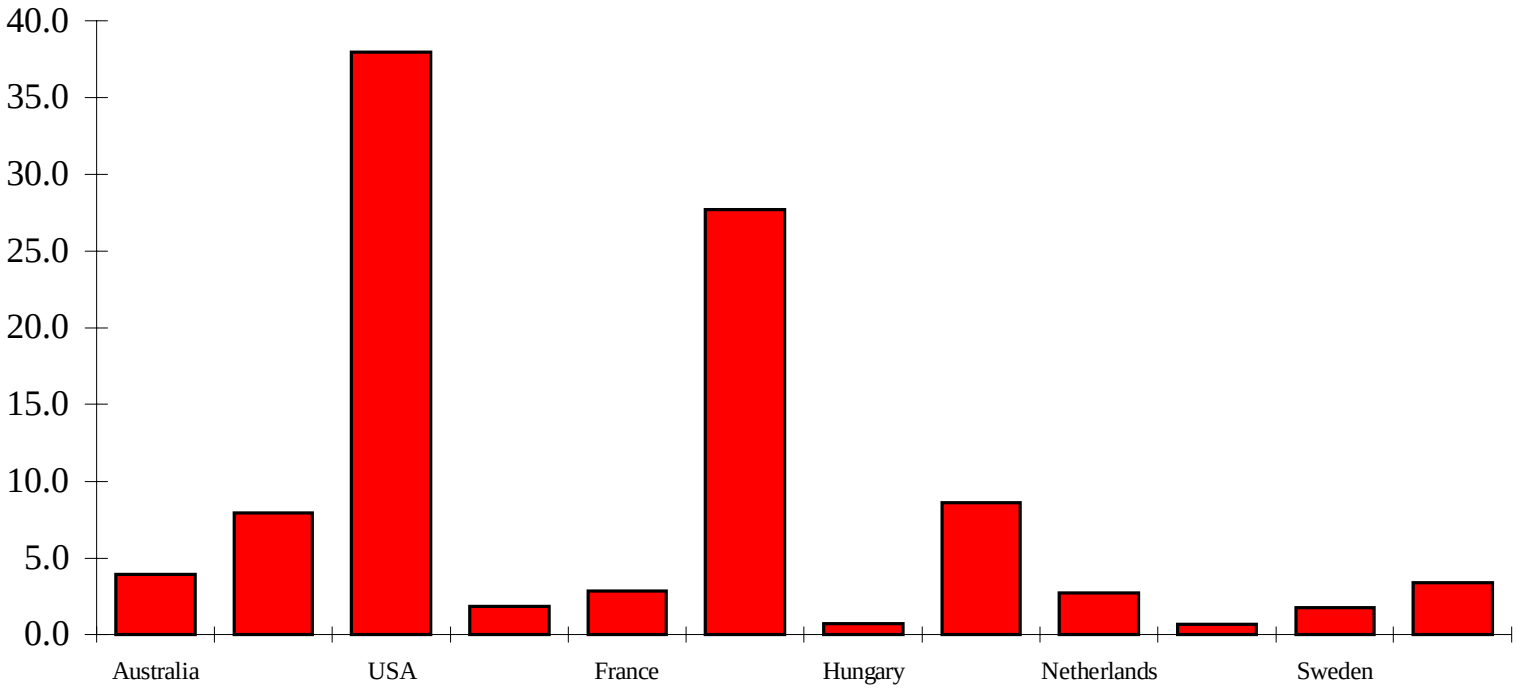
[7] See Appendix I for a complete list of source and destination countries. It is important to note that, in general, this data set excludes asylum seekers and temporary workers.

Total flow of immigrants to the sample destination countries
(in thousands)



Destination countries: Australia, Canada, USA, Belgium, France, Germany, Hungary, Japan, The Netherlands, Norway, Sweden, Switzerland.

Share of total immigration flow for each destination country



The yearly total flow for the countries under consideration is around 2.8 million migrants with a peak at 3.6 million in 1991. Also, there is a clear downward trend starting in 1991 which is likely to be due to the tightening of immigration regulations in most receiving countries (see OECD, 1998, Part C.1). The bottom panel in Figure 1 shows the average share of each receiving country for the whole period. Not surprisingly, the main destination country is the US with an average of 38% of the yearly flow. Germany is next (28%) and has a much larger share than a country of similar size like France, the intake of which is 2.8%.[8] Canada and Japan have each accepted 7.9% and 8.6% of the yearly flow respectively and all the remaining host countries' shares are below 4%. Moreover, the relative shares have changed over time. Between the mid-1980s and the mid-1990s, the share of the flows going to the US has gone from 30% in 1988, to 50% in 1991, to 37% in 1996. Australia's share has dropped from 6.6% to 4.0% and Canada, Germany, Japan saw their share increase significantly. Finally, when the flows are decomposed by source/destination country, they are highly variable. They vary from more than 100,000 Mexican immigrants yearly to the United States to hardly 100 migrants per year for several source/destination country combinations.

All the observations cover the number of people from a given source country who entered *legally* one of the OECD countries. One of the difficulties when looking at the inflow of legal immigrants is to disentangle the supply-driven effects embodied in the probability of leaving a country (f), from the demand factors entering the proportion of accepted applicants in a destination country (g). Regarding this latter point (vector V in (6)), and changes in immigration legislation in particular, two facts should be considered because they are not neutral to the clustering effect: first the move away from targeting source countries and second, the rising importance of the family reunion factor in most immigration policies. The move away from source-country specific immigration happened in the mid-1960s in Canada and the United States, and in the mid- to late 1970s in Europe while the emphasis on family reunion started in the early to mid-1990s in most countries. Our sample covers the period 1988 to 1996, thus, only the second policy change is relevant and its role in affecting the flows is tested.

[8] The inflow into Germany does not include ethnic German from Eastern Europe. Also, to compute the numbers used in Figure 1, the inflow from the former Yugoslavia into Germany has been corrected to

IV. Empirical Implementation

Two questions are addressed in the empirical analysis: First, are migration flows influenced by the presence of residents from the same origin in the host country? Second, does the size of these communities matter? In other words, is there a minimum size as well as a critical level for the cultural community beyond which the pull effect weakens?

The overall dataset consists of 134 immigration flows toward 12 destination countries for the period 1988 to 1996. The number of source countries per destination country varies between 6 and 16. The sample period has been divided into three equal sub-periods (1988-1990, 1991-1993, 1994-1996) over which the immigration flows are summed. Because the flows include all immigrants, not just workers, they tend to be serially correlated on an annual basis and this approach minimizes the problems related to the non-stationarity of variables that is not a trivial matter in panel set-ups. Aggregating over three years also increases the variability of the dependent variable and avoids potential simultaneity between the dependent and explanatory variables such as the cultural clustering measure which is based on the level of immigrants.

The variations across source-destination countries and through time suggest that the appropriate statistical set up is that of a panel of observations. The sample is, thus, made of 402 observations and each combination of source-destination country is considered independently with a 3-period dimension. The corresponding specification is of the following type,

$$y_{m,k,t} = \alpha + X_t'\beta + u_{m,k,t}, \qquad (7)$$
$$u_{m,k,t} = \mu_{m,k} + \nu_{m,k,t},$$

where t is the time script such that t=1 to 3. The dependent variable ($y_{m,k,t}$) is the number of people who migrated from country m to country k during sub-period t. Also, the second line in (7) characterizes a fixed effect model which postulates that $\mu_{m,k}$ is the unobservable individual effect for each combination of source and destination countries and is independent of time; $\nu_{m,k,t}$ is a random disturbance term with the usual properties. The validity of the fixed effect assumption is tested.

Applying the theoretical framework in (6) to the fixed effect model in (7), we can define matrix X_t. First, it includes income per capita in the source- and in the destination-country

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represent the average non-war period intake between 1991 and 1995 since many people were accepted on a

(*LYDES, LYSOU*) to capture the relative financial attractiveness of migrating. While an imperfect measure, income per capita presents the advantage of capturing historical trends such as chronically low standards of living as well as more temporary phenomena such as wars or famines.[9] The pull effect by the population of the same culture is measured by the share of residents from a given source country in the foreign population of the destination country in percentage points (*CULTSH*). Hence, income per capita captures the average opportunities and the cultural variable, the possibility of higher reward. Second, the level of population in the source country (*LPOPSOU*) captures the size effect. Third, the probability of being accepted in a given destination country is influenced by its size measured by population (*LPOPDES*). Fourth, changes in immigration policies in receiving countries are approximated by a time trend (*TIME*) and a trend squared ($TIME^2$). Note that, unfortunately, the fixed effect specification precludes the introduction of distance, the usual measure for the cost of migrating, as it varies for each set $\{m,k\}$ but is constant over time. It is therefore perfectly collinear with the fixed effect. Finally, since the observations for some European countries include the long-term but temporary immigration by people from the former Yugoslavia, a dummy (*BOSWAR*) is entered for the war period (1991 to 1995).

Note that this specification is an augmented, unconstrained gravity model for migration flows and is consistent with that in Helliwell (1997). All the explanatory variables are measured at the beginning of each 3-year sub-period to reflect the information available to potential immigrants. Using these variables, a basic log-linear specification for (7) can be written as,

$$LIFL_{m,k,t} = \alpha + \beta_1 LYDES_{k,t} + \beta_2 LYSOU_{m,t} + \beta_3 LPOPDES_{k,t} + \beta_4 LPOPSOU_{m,t}$$

$$+ \beta_5 CULTSH_{m,k,t} + \beta_6 TIME + \beta_7 TIME^2 + \beta_8 BOSWAR + \mu_{m,k} + \nu_{m,k,t},$$

with $LIFL_{m,k,t}$, the log of the migrant inflow from source country m to source country k during period t. The population and income variables are also in log and it is expected that β_1, β_3, β_4, $\beta_5>0$ and $\beta_2<0$. The main characteristics of the variables are given in Table 2.

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long term (i.e., more than 3 months) yet temporary basis because of the Bosnia war.

[9] A more complete specification could include, for each source/destination country {m,k}, a measure for the attractiveness of alternative choices of destination as in Feder (1980) and Foot and Milne (1984), for example.

Table 2: Characteristics of the variables

Variables	Mean[1]	Maximum	Minimum
IMMIG FLOW	38,953	875,500[2]	210
INC. DESTINATION[3]	17,407.5	29,335.8	2,165.2
INC. SOURCE[3]	5,999.9	23,475.2	99.3
POP. DESTINATION (mios)	55.0	260.6	4.2
POP. SOURCE (mios)	115.5	1,208.8	0.39
FORSH (%)	6.26	75.74	.001
Dummies			
SAME LANGUAGE	0.23	-	-
ADJACENT	0.12	-	-
EUROPEAN UNION	0.09	-	-
OECD	0.38	-	
AUS-CAN-USA	0.30	-	-
SHARE >5%	0.34	-	-
SHARE >10%	0.15	-	-
SHARE < 2%	0.38	-	-
2% ≤ SHARE < 5%	0.30	-	-
5% ≤ SHARE < 10%	0.17	-	-
SHARE ≤ 10%	0.15	-	-

[1] Calculated over 3-year periods.
[2] The maximum is 1,286,600 when the amnesty for Mexicans in the US is included.
[3] In constant1987-US$.

While it has already been mentioned that the variability of the immigration flows is quite large, the dispersion of the explanatory variables is also quite large even for income in the destination countries. [10]

[10] The smallest income per capita is that of Hungary and when that country is excluded from the sample, the minimum per capita income rises to 1987-US$12,480, still showing a large dispersion in the series.

Table 3 : Immigration flows and cultural ties

	$LIFL_{i,j,t}$ 1.	$LIFL_{i,j,t}$ 2.	$LIFL_{i,j,t}$ 3.	$LIFL_{i,j,t}$ 4	$LIFL_{i,j,t}$ 5.	$LIFL_{i,j,t}$ 6.	$LIFL_{i,j,t}$ 7.	$LIFL_{i,j,t}$ 8.	$LIFL_{i,j,t}$ 9.
LYDES[1/]	.333 (0.5)	.181 (0.3)	-1.078 (1.9)	.172 (0.3)	.092 (0.1)	.171 (0.3)	.207 (0.3)	.237 (0.4)	.193 (0.3)
LYSOU	-.497 (2.1)	-.408 (1.7)	-.470 (1.9)	-.409 (1.7)	-.404 (1.7)	-.410 (1.7)	-.401 (1.6)	-.445 (1.8)	-.408 (1.7)
LPOPDES	1.030 (1.6)	.924 (1.5)	1.072 (1.8)	.923 (1.5)	.889 (1.5)	.966 (1.6)	.923 (1.5)	.896 (1.5)	.921 (1.5)
LPOPSOU	-1.216 (1.9)	-1.076 (1.7)	-.706 (1.2)	-1.092 (1.7)	-1.150 (1.8)	-1.018 (1.6)	-.967 (1.5)	-1.140 (1.7)	-1.080 (1.7)
TIME	.471 (2.6)	.437 (2.5)	-	.439 (2.5)	.449 (2.5)	.442 (2.5)	.418 (2.4)	.416 (2.3)	.472 (2.3)
$TIME^2$	-.132 (3.3)	-.125 (3.2)	-	-.125 (3.2)	-.126 (3.2)	-.128 (3.3)	-.122 (3.1)	-.120 (3.1)	-.134 (2.8)
CULTSH.	.040 (2.2)	.037 (2.0)	.035 (1.8)	.036 (1.8)	.023 (1.3)	.039 (2.0)	.044 (2.1)	.032 (1.4)	.037 (2.0)
BOSWAR	-	.666 (2.5)	.757 (2.6)	.667 (2.5)	.700 (2.6)	.730 (2.6)	.663 (2.4)	.662 (2.4)	.665 (2.4)
UNEMP. RATE	-	-	-.061 (1.5)	-	-	-	-	-	-
$UNEMP. RATE^2$	-	-	.002 (0.8)	-	-	-	-	-	-
LANGUAGE[2/]	-	-	-	.010 (0.3)	-	-	-	-	-
ADJACENT[2/]	-	-	-	-	.046 (1.3)	-	-	-	-
EUROPEAN UNION[2/]	-	-	-	-	-	.014 (1.2)	-	-	-
OECD[2/]	-	-	-	-	-	-	-.030 (2.2)	.008 (0.3)	-
AUS-CAN-USA and OECD[2/]	-	-	-	-	-	-	-	-.059 (1.8)	-
AUS-CAN-USA[2/]	-	-	-	-	-	-	-	.147 (2.4)	-
FAMILY REUNION	-	-	-	-	-	-	-	-	-.001 (0.3)
Adj. R^2	.933	.934	.933	.934	.934	.934	.934	.935	.934
n	402	402	402	402	402	402	402	402	402
F-test (H_0:$\alpha_i=\alpha$)[3/]	12.8 (.00)	12. 7(.00)[4/]	12.5 (.00)	12.4 (.00)	12.7(.00)	12.6 (.00)	12.7 (.00)	11.4 (.00)	12.6 (.00)

[1/] Absolute t-values in parentheses. Calculated from heteroscedastic-consistent standard errors. The critical values are 1.28 and 1.65 at 10% and 5% significance respectively.
[2/] The dummy is interacted with the variable CULTSH [3/] P-values in parentheses. The hypothesis is that all intercept are equal vs fixed effect model. [4/] The Hausman test of H0:Random effect vs fixed effect is $\chi^2(5)= 6.52$ and the random effect model is rejected.

V. Results

Various results pertaining to the estimations of this specification are presented in Table 3.

From columns 1 and 2 it is clear that the corrective dummy for the unusually large flows of immigrants from the former Yugoslavia in the early 1990s plays its role. Also, as indicated by the F-values for equality of constant across $\{m,k\}$, the hypothesis of the fixed effect model cannot be rejected.[11]

The basic gravity model posits that the sizes of both population pools influence positively migration flows. In column 2, the coefficients on the population variables have opposite signs with the negative sign on source-country population. The sizes of two coefficients, however, are not significantly different from each other[12] and that suggests that the relative sizes of the destination and source countries matter rather than the two sizes independently. The implication is that a larger receiving country compared to the sending country attracts larger flows of immigrants. This effect can be related to some "absorption capacity" factor as smaller countries may be more weary of accepting immigrants from very large source countries. Alternatively, immigrants from the large source countries may feel that their chance of being accepted is better in other large countries.[13] The results also show that only the push-side of financial incentive matters as income in the source-country is significant and with the expected sign. Finally, the coefficients on the two trend variables show that there has been a steady increase in immigration flows but at a declining rate. [14]

Next, we investigate the robustness of the results in general, and of the cultural clustering in particular. Specifically, we analyze whether the role of cultural communities

[11] The choice of the fixed effect model rather than straight OLS or the random effect model was determined by the results of the Hausman test and the single versus multiple constant test. For the model in column 2, the Hausman test rejects this specification in favour of the fixed effect model (see footnote 3, Table 3). However, in all cases, the F-test cannot reject the fixed effect specification when tested against straight OLS.

[12] The t-value for equality of coefficients with opposite signs for the two population variables is 0.171 and therefore statistical equality cannot be rejected.

[13] It must be kept in mind that since the dependent variable is the number of immigrants accepted, the supply and demand factors matter. Of course, clearer results could be obtained from the number of applicants, but unfortunately no such information is available on the scale needed in this study.

[14] Many of the receiving countries tightened their immigration policies during the sample period and we also tried to approximate this tightening with the unemployment rate since most policies are linked to the position of the economy in the business cycle. The results in column 3 show that an increase in the unemployment rate would slow down immitraion. However, the unemployment rate is collinear with income per capita in the destination country and its interpretation is far from clear since it also enters immigrants' decision as a signal for job prospects.

varies with specific characteristics linking source and destination countries. Several cases are considered: First, we use dummies to represent special cases of bilateral relationships between the sets of countries that are likely to affect immigrants' choices and may weaken or enhance the role of country-specific cultural ties. Two obvious cases are when both countries are linked by colonial ties or speak the same language and geographical proximity. In both cases, the gain in reduced migration costs (due to administrative preference or to proximity) may lower the importance of moving to a country with a sizeable community of the same origin. In our sample, 23% of the observations involve countries with linguistic or colonial ties and 12%, are physically adjacent (see Table 2). Hence, a dummy is set to 1 when the two countries speak the same language or are linked by colonial history (*LANGUAGE)*) and another dummy is set to 1 when the two countries are adjacent (*ADJACENT*). Each dummy is interacted with the cultural tie variable. Results in columns 3 and 4 show that language is not relevant but in the case of geographical proximity the cultural effect becomes stronger. Even though the proximity effect is statistically weak, it does affect significantly the cultural effect by increasing its impact on the magnitude of the flows. So, proximity has a compounding effect with cultural preferences in the immigration choices.

Two other cases of privileged relationships between source and destination countries are also considered: First, the fact that both countries belong to the European Union (*EUR UNION*) and second, the fact that both countries are *OECD* members. In the first case, which represents 9% of the observations, the relative easiness with which citizens from countries members of the European Union are able to move across member countries may weaken the importance of cultural ties. Similarly, cultural ties may be less important for migrants between industrialized countries (i.e., OECD members) than for migrants from developing to industrialized countries because their labour markets are alike. In our sample, 38% of the observed flows occur within the OECD. The results in column 6 show that membership in the EU has no impact on the role of cultural communities. However, in column 7, the effect of the cultural tie variable is partially offset in the case where source and destination countries are both members of the OECD.[15] We, therefore, conclude that among economically developed countries, cultural ties do not matter. Based on our framework this can be interpreted as labour market information being more uniform and more readily available, so that the need for cultural communities to support newcomers in their initial entry into the

[15] The coefficient on the dummy interacting the cultural variable has the opposite sign and its absolute value is not different from the coefficient on the cultural variable itself (t-value=0.9).

labour market is lessened. Alternatively, jobs' and workers' characteristics are more homogenous across OECD countries and ethnic specificity provides a weaker information advantage.

Beyond the possible privilege relationships between source and destination countries another feature characterizes the data set: the goals of immigration policies by the receiving countries represented in the sample are very different. In particular, the approach to immigration: adopted by the three major traditional immigration countries (Australia, Canada and the United States) is vastly different from that of Europe and Japan. It is then of interest to determine whether these countries' different approach to immigration affects the role of cultural communities especially since the flows to the three countries are dominated by immigrants from developing countries.[16] Hence, we introduced a dummy for the case when the receiving country is Australia, Canada or the United States (AUS-CAN-USA) and used it interactively with the cultural variable.

In column 8, we combine the analysis of the 'OECD factor' with the separation of destination countries into two groups (AUS-CAN-USA and Europe, Japan) to avoid the omitted variable problem and the results are also summarized in the upper panel of Table 5. When, the countries are separated into two blocks, the cultural tie effect is not only much larger in the three countries for OECD members but it is even larger for immigrants from developing countries. In effect, in Australia, Canada and the United States, each 1% increase in a population cluster increases the flow of immigrants by 0.18% if the country of origin is a developing country and by 0.12% if the country of origin is an OECD member. For Europe and Japan, the impact is uniform at 0,03%. These results indicate that cultural communities matter in all destination countries but more in traditional immigration countries and particularly for migrants from non-OECD source countries, i.e., for developing countries. Hence, information advantage is more relevant for migrants from non-industrialized economies to industrialized economies to the three countries

Finally, we test whether the change in immigration policy with more emphasis on family reunion has affected the coefficient on the cultural variable. As migration authorities turned toward allowing more family reunion during the second sub-period (1991-1993), one would expect the cultural factor to be reinforced through some type of built-in hysteresis effect. The results, in column 9, actually show that the cultural effect remains unaffected by

[16] Only 23% of the source countries are members of the OECD in the case of Australia, Canada and the United States while 56.8% are in the rest of the sample.

the change in policy since the coefficient in the second sub-period is not significantly different from that of the other periods.

To summarize, the results regarding the role cultural communities play in the decision-making of immigrants are quite robust but they are not uniform across all combinations of source and destination countries. Two factors influence the magnitude of the effect: First, the fact that the receiving country is a country with a tradition of immigration. Second, the fact that the both the sending and the receiving countries are part of the industrialized world.

All the above results confirm that cultural communities influence immigration flows however, they do not, by themselves, allow for the discrimination between various hypotheses regarding cultural clustering. A key prediction of our theoretical framework concerns the shape of the relationship between the size of the community and the magnitude of immigration flows. In effect, the prediction that the size of the community must be above a minimum threshold and that the attractiveness for new migrants decreases with its size, is specific to our framework. To the extent that the sizes of cultural groups vary widely[17] we could test whether first, the effect decreases with size and second, some threshold value is relevant to influence immigration flows. We tested the possible non-linearities in two alternative ways: First, two threshold dummies have been defined; one for a minimum size equal to 5% and one for a minimum size of 10%. Secondly, in a finer approach, the range of sizes of communities has been split into several brackets. As indicated in Table 2, in 39% of the cases, the share of residents from the same culture is less than 2% and in 15% of the cases, it is more than 10%. In almost half the cases, the share is between 2 and 10%. We used these measures to identify whether there is an optimum size. The results for various hypotheses are given in Table 4.

[17] Mexican immigration to the United States is not recent and approximately one in five foreign-born person is from Mexico. Alternatively, migration from Iraq to Sweden is a recent phenomenon and the share of Iraqis in the Swedish foreign population is still small. Nevertheless, it rose from 1% to 4.3% within 8 years.

Table 4: Immigration flows and non-linearities in cultural effect

	$LIFL_{i,j,t}$ 1.	$LIFL_{i,j,t}$ 2.	$LIFL_{i,j,t}$ 3.	$LIFL_{i,j,t}$ 4.
LYDES[1]	.207 (0.3)	.159 (0.2)	.117 (0.2)	.277 (0.4)
LYSOU	-.401 (1.6)	-.396 (1.6)	-.361 (1.4)	-.413 (1.7)
LPOPDES	.923 (1.5)	.946 (1.5)	1.095 (1.8)	.888 (1.4)
LPOPSOU	-.967 (1.5)	-.961 (1.5)	-.940 (1.4)	-.952 (1.5)
TIME	.418 (2.4)	.413 (2.3)	.393 (2.2)	.389 (2.2)
$TIME^2$	-.122 (3.1)	-.122 (3.1)	-.119 (3.0)	-.116 (2.9)
CULTSH	.044 (2.1)	.066 (1.1)	.079 (2.1)	-
BOSWAR	.663 (2.4)	.644 (2.3)	.649 (2.4)	.669 (2.5)
OECD	-.030 (2.2)	-.029 (2.1)	-.028 (2.1)	-.029 (2.2)
share>5%	-	.117 (0.3)	-	-
[SHARE>5%]*CULTSH	-	-.024 (0.4)	-	-
SHARE>10%	-	-	.581 (1.2)	-
[SHARE>10%]*CULTSH	-	-	-.048 (1.1)	-
[SHARE<2%)]*CULTSH	-	-	-	.109 (1.2)
[2%≤SHARE< 5%]*CULTSH	-	-	-	.076 (1.5)
[5%≤SHARE< 10%]*CULTSH	-	-	-	.045 (1.6)
[SHARE≥10%]*CULTSH	-	-	-	.043 (2.0)
Adj. R^2	.934	.934	.935	.934
n	402	402	402	402

[1] Absolute t-values in parentheses. Calculated from heteroscedastic-consistent standard errors. The critical values are 1.28 and 1.65 at 10% and 5% significance respectively.

Column 1 (identical to column 7, in Table 3) is the reference specification with as single measure for cultural communities. The next two columns show that a fixed threshold whether at 5% or at 10% is not significant. Hence, a more refined approach to the non-linear

effect of cultural communities is given in column 4. The cultural tie variable is decomposed into several finer brackets: the share is less than 2%; between 2% and 5%; between 5% and 10%; and above 10%. The results show that the non-linear structure of the impact of cultural communities is more complex than just a single threshold. For a more insightful look into the results, a summary is given in the bottom panel of Table 5 where it is clear that the pulling effect of cultural communities peaks at a share of 2 to 5% of the foreign population in the destination country.

Table 5: Magnitude of the pulling effect by cultural communities

Total effect		
Receiving countries	**Sending countries**	
	OECD countries	***Non-OECD countries***
All countries	0	0.04
- Australia, Canada, U.S.	0.12	0.18
- Europe and Japan	0.03	0.03
Effect by sizes of the communities		
All receiving countries	**Sending countries**	
	OECD countries	***Non-OECD countries***
Share < 2%	-0.03	0
2% ≤ share < 5%	0.05	0.08
5% ≤share < 10%	0.02	0.05
share ≥ 10%	0.01	0.04

And this is valid for flows between OECD countries as well as from developing to OECD countries. Again the pulling effect is larger when sending countries are non-OECD members. Beyond 5% while still relevant, the attractiveness decreases greatly.

VI. Conclusion

It is often observed casually that new migrants cluster within countries and across countries in groups that are ethnically homogenous. In this paper we justify such behaviour with a theoretical framework based on efficiency-wages and imperfect information. We show that the existence of two markets of different sizes with a more attractive wage for new migrants in their cultural community than in the general labour market is sustainable. Using information on the major migration flows to OECD countries between the mid-1980s and the mid-1990s, we investigate the empirical relevance of such hypothesis. Our cross-country empirical analysis supports the role of cultural communities in attracting new migrants except when the source and destination countries are OECD members. Also, the clustering effect is much stronger in Australia, Canada and the United States than in Europe and Japan for non-OECD source countries reflecting the longstanding immigration objectives of these countries. We also find support for a necessary minimum size to trigger the effect, and for decreasing attractiveness as the community becomes larger. Overall the empirical results are consistent with our theoretical framework even though there is no direct testing of the existence of a higher wage in cultural communities. Hence, the argument that immigrants cluster because of the better information on skills and ability in communities of a certain size cannot be rejected.

Clearly, this paper is a first approach of cultural clustering and the analysis is carried across countries. So, work in this area could be expanded in several different directions. We shall mention only two of them. First, clustering is commonly observed at the regional level within a country. It would be interesting to investigate whether our results are robust within countries, namely whether regional cultural communities play a similar role as national communities in the location decision of migrants. Second, the very different clustering effect between migrants from industrialized countries and migrants from the rest of world suggests that clustering is a response to some migrant characteristics with respect to the job market. It would then be of interest to investigate the nature and the role of these characteristics (for example, individual skills) and then compare migrant with native workers to evaluate the value of clustering.

Appendix I

A. Sample destination and source countries

Destination Countries	Source Countries
Australia	China, Fidji, Hong-Kong, India, Malaysia, New Zealand[2], Philippines, South Africa, Taiwan, United Kingdom[2], United States[2], former USSR, Vietnam, former Yugoslavia.
Canada	China, Hong-Kong, India, Philippines, Poland[2], Sri Lanka, Taiwan, United Kingdom[2], United States[2], Vietnam.
United States	Canada[2], China, Columbia, Cuba, Dominican Republic, El Salvador, Haiti, India, Jamaica, Korea, Mexico[2], Philippines, Poland[2], former USSR, Vietnam.
Belgium	Democratic Republic of Congo, Italy[1,2], Morocco, Portugal[1,2], Spain[1,2], Turkey[2], former Yugoslavia.
France	Algeria, Morocco, Poland[2], Tunisia, Turkey[2], former Yugoslavia.
Germany	Greece[1,2], Hungary, Italy[1,2], Morocco, Portugal[1,2], Romania, Spain[1,2], Turkey[2], United States[2], former Yugoslavia.
Hungary	China, Germany[2], Greece[2], Israel, Poland[2], Romania, Russia, Slovakia, Ukraine, United Kingdom[2], Vietnam, former Yugoslavia.
Japan	Brazil, Canada[2], China, Germany[2], Korea[2], Peru, Philippines, Taiwan, Thailand, United Kingdom[2], United States[2].
The Netherlands	Belgium[1,2], France[1,2], Germany[1,2], Italy[1,2], Morocco, Poland[2], Suriname, Turkey[2], United Kingdom[1,2], United States[2].
Norway	Denmark[1,2], Germany[1,2], Iran, Pakistan, Philippines, Poland[2], Somalia, Sri Lanka, Sweden[1,2], Turkey[2], United Kingdom[1,2], United States[2], former Yugoslavia.
Sweden	Chile, Denmark[1,2], Ethiopia, Finland[1,2], Irak, Iran, Lebanon, Norway[1,2], Poland[2], Turkey[2], United Kingdom[1,2], United States[2], former Yugoslavia.
Switzerland	Austria[2], Canada[2], France[2], Germany[2], Italy,[2] The Netherlands[2], Portugal[2], Spain[2], Turkey[2], United Kingdom[2], United States[2], former Yugoslavia.

[1] Destination and source country are both EU members. Sweden since 1994. Norway is part of the European Space since 1994.[2] Destination and source country are both OECD members. Mexico, since 1994, Hungary, Korea and Poland, since 1996.

B. Definitions of the immigration flows

Destination Countries	**Definition**[1]
Australia	Permanent resident permits with dependents.
Canada	Permanent resident permits with dependents.
United States	Permanent resident permits with dependents.
Belgium	Registered foreigners with a residence permit for at least 3 months.
France	Permanent work permits and family reunification.
Germany	Registered foreigners with a residence permit for at least 3 months. Excludes inflow of ethnic Germans. Includes asylum seekers living in private households.
Hungary	Registered holders of a long-term residence permit (up to one year).
Japan	Registered foreigners in the country for more than 90 days.
The Netherlands	Registered holders of a residence permit for at least 6 months.
Norway	Registered holders of a residence permit for at least 6 months.
Sweden	Registered holders of a residence permit for at least 1 year.
Switzerland	Registered holders of a permanent or annual residence permit.

[1] Adapted from OECD (1998), Statistical Annex.

Appendix II: Definitions of the variables.

AUS-CAN-USA: Dummy which is 1 if the destination country is Australia, Canada or the United States and 0 otherwise.

ADJACENT: Dummy which is 1 if the source and destination countries are adjacent and 0 otherwise.

2<SHARE<5%: Dummy which is 1 if the share of a given country of origin in the foreign population is larger than or equal to 2% and strictly smaller than 5%.

5<SHARE<10%: Dummy which is 1 if the share of a given country of origin in the foreign population is larger than or equal to 5% and strictly smaller than 10%.

EUROPEAN UNION : Dummy which is 1 if the source and destination countries are both members of the European Union, 0 otherwise.

$CULTSH_{i,j,t}$: Share of residents from the same country of origin (i) in the foreign population of the destination country (j) at the beginning of the period of the period (t). (ABS, OECD, StatsCan, USBC). For countries with censuses (Australia and Canada, quinquennial, US, decennial, France, 1982 and 1990), linear extrapolations have been computed for years between censuses. For 1990s in the US, the forward-looking country-specific population series is calculated as the previous year population augmented by the inflow during the year.

LANGUAGE: Dummy which is 1 if the source and destination countries speak the same language or were linked by colony ties and 0 otherwise.

$LIFL_{i,j,t}$: Log of the sum of the yearly inflow of immigrants from a given source country (i) into a given destination country (j) over 3 years (t). (OECD).

$LPOPDES_{j,t}$ ($LPOPSOU_{i,t}$): Log of the population in the destination (j) /source (i) country at the beginning of the period, 1988, 1991, 1994. (IFM, WB).

$LYDES_{j,t}$ ($LYSOU_{i,t}$): Log of GNP per capita in the destination (j)/source (i) country, constant 1987-US dollars at the beginning of the period. (WB).

OECD : Dummy which is 1 if the source and destination countries are both members of the OECD and 0 otherwise.

SHARE<2%: Dummy which is 1 if the share of a given country of origin in the foreign population is strictly smaller than 2%.

SHARE<10% : Dummy which is 1 if the share of a given country of origin in the foreign population is larger than or equal to 10%.

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