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Migropolis: migration networks and formation of ethnic clusters in cities

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Abstract:

In this paper we extend previous models of migration networks and ethnic cluster formation by considering migration as an ethnic-community wide phenomena where established migrants strategically provide support to newcomers. The incentive to provide support is associated with positive externalities which new waves of migrants might have on migrants already settled in the host location. Culturally-based tastes for particular goods and services generate an ethnic consumer demand and only individuals from the same ethnic community have the skills or the “insider’s information” required to provide these goods (protected market). If the ethnic population is large enough, an ethnic sector will emerge and eventually grow as the ethnic population expands further.

According to the degree of preferences toward ethnic consumption, the mobility costs of the source locality population and congestion costs (hostility externalities) in the host location, alternative scenarios may arise. These scenarios provide a possible explanation of why different groups of migrants show different migration dynamics.

Keywords: Consumption externalities, immigration, ethnic cluster, ethnic goods.

JEL classification: F22, J15, J61

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1. Introduction

Several theoretical contributions have attempted to explain the geographical concentration of migrants from the same source region which is a frequently observed pattern of migration experiences. While a large set of potential destinations exist, migration is often only channelled into a very limited number where migrants networks are established already. Carrington et al. (1996) and Chau (1997) both provide a dynamic model of labour migration in which moving costs decrease with the number of established migrants in a particular destination. They show that once started, migration flows from the same source area accelerate even while inter-regional income gaps are reduced. In addition, in many empirical studies of migration, the stock of established migrants from the same area/country is almost always found to be a positive and significant explanatory variable. Moving costs are endogenous and decreasing in the size of past migration flows and subsequent waves of migration benefit from information and support provided by established migrants.¹

While the passive aspect of this migration dynamic has been previously recognised in the literature, the active role of established migrants has been largely ignored. Why do established migrants give support to newcomers? Given the considerable amount of effort often involved in these actions of support, and given that support is not generally confined to family members but is often a community wide phenomenon, we have reason to believe that pure altruism is an important explanatory variable, but not the only one.²

In this paper we extend previous models of chain migration by considering migration as a community wide phenomenon where established migrants strategically provide support to newcomers. This active role of support provision is associated with positive externalities which new incoming migrants might have on migrants already settled in the host country.

To the best of our knowledge, the work by Stark and Wang (2002) is the only one which deals with the same issue. In their model, support to newcomers in a particular location is provided only by highly skilled established migrants motivated not by altruistic

¹ For empirical studies on migration networks which use micro-data level see Winters et al (2001), Munshi (2003), Chiswick and Miller (2002), Bauer et al (2002)

² Some recent contributions have emphasised the importance not only of “*strong ties*” such as households components or kin but also of “*weak ties*” as acquaintances and co-villagers. See Wilson (1998) on the importance of weak ties in Mexican migration networks in the US and Grannovetter (1973, 1982) on the importance of weak ties, in general, in locating employment opportunities. In their empirical study on Mexican

consideration but by pure self-interest. High-skilled migrants have an incentive to attract low-skilled migrants since working with a larger number of these individuals renders their skills relatively more scarce (and therefore more valuable), which in turn has a positive effect on their wages. Their approach postulates the existence of a “migrants production function” where high and low-skilled migrants are jointly employed. Once in the host location, low-skilled migrants become high skilled in the next period through an on-the-job skill enhancement process. In turn, they will provide support to a new wave of low skilled migrants giving rise to a migration chain. In our opinion, their approach has some shortcomings. Firstly, it is not obvious why established low-skilled migrants would not use remittance strategically in order to keep potential new-comers at home (as in Stark 1999 or Docquier and Rapoport 1998). In addition, migration chain is a phenomena which takes place within components of the same source location community. A model which tries to explain migration chain on the basis of production externalities, as Stark and Wang 2002, would not *a priori* exclude the possibility to observe natives or high-skilled migrants giving support to low-skilled migrants belonging to different ethnic groups. For instance Indian and Chinese high-skilled workers giving support to Mexican low-skilled workers. Such a proposition is not empirically supported in migration studies. Furthermore, support by established migrants is not confined to high-skilled migrants providing help to low-skilled ones. Support appears to go beyond differences in skills. Supports it is often more pronounced between low-skilled migrants directly competing in the host locality labour market, as was the case for Italians and Irish immigrants in the US at the beginning of the last century. In a recent study on the contribution of Chinese and Indians scientists and engineers to the Silicon Valley economy, Saxenian (1999) documents the existence of dense ethnic networks within these highly skilled immigrants.³

In this paper, we view migration networks not merely as an aseptic instrument to facilitate immediate settlement of individual migrants but as the manifestation of a long-term development of a new community (or reconstruction of the lost one). A citation from a study on migration chains of Italians in Australia conducted by Lever-Tracy and Holton (2001) is emblematic of the main idea of this paper:

migration networks in the US, Winters et al (2001) are able to disentangle the relative effects of strong (family) and weak (community) ties on migration propensity and migrants’ location decision.

³ Ethnic networks for these professionals are often institutionalised into professional associations. Virtually no overlap exists between different ethnic groups. These organisations combine elements of traditional immigrants

“...He (*an established migrant who helped many newcomers*) just wanted as many Italians as possible in Australia...The more Italians came out the less foreign one would feel.” (page 94)

We propose a model that explains both established migrants support to newcomers and the formation of ethnic communities on the basis of the existence of “ethnic consumption externalities”. Incoming migrants from the same ethnic community have an expansionistic effect on the number of ethnic-specific non-tradable goods and services available to established migrants in the host region. Culturally-based tastes for particular goods and services generate an ethnic consumer demand and only individuals from the same ethnic community have the skills or the “insider’s information” required to provide these goods (protected market). If the ethnic population is large enough, an ethnic sector will emerge and eventually grow as the population expands further. Migrant communities in almost every big city around the world provide a wide range of ethnic goods and services. Ethnic specific goods include for instance preparation of ethnic foods, banking and financial services, ethnic media such as magazines, radio, newspapers, religious services, organised unions, political groups and usually a vast array of migrant associations.

As the size of the ethnic community grows larger and larger, discrimination in the labour market, prejudice and hostility from the larger society generate negative externalities which might offset any positive effect. For instance, during the Great Migration, African Americans in northern US cities became increasingly visible and as a consequence racist acts and violence against them increased. Congestion costs as the community expands might also be linked to the existence of a limited stock of housing or to increased competition in the labour market, compressing wages.

The trade-off between these two opposing forces implies the existence of an optimal size of an ethnic community. In a recent contribution, Bauer et al. (2002) find evidence of an inverse U-shaped relationship between the number of Mexican migrants from the same village of origin to a particular US location and the probability that subsequent migrants from the same village will also choose that destination. Too many immigrants from the same village in a particular location decrease the probability of choosing that location.

Although migration chains and the formation of ethnic communities characterise immigration and emigration experiences of many countries (both developed and LDCs) across all periods of human history, not all migration flows follow this pattern. Even more

culture and professional networking and exchange of information. They play a key role in supporting new immigrants in their professional and social adjustment in the US.

interesting is the fact that in this regard ethnic groups sometimes have different migratory behaviour.⁴ In our model, according to the degree of preferences toward ethnic consumption, the mobility costs of the source country population and congestion costs (hostility externalities) in the host location, different scenarios arise. These scenarios provide a possible explanation for a variations in the observed migration dynamics of different ethnic communities.⁵

In section 2 we provide a brief review of recent empirical works on migration network. A discussion on the definition and nature of ethnic goods is presented in section 3. In section 4 we outline the basic structure of the model and analyse the interaction between the preference for ethnic consumption and the size of the ethnic community in a given host location. We derive the conditions under which strategic support by established migrants is observed and the implications on the size of the ethnic community. In the same section alternative scenarios are outlined. Section 5 concludes.

2. Migration networks, the role of established migrants and new immigrants' location decision

Established migrants often provide direct assistance to new migrants. They might help finance transportation costs, provide housing or pre-arrange jobs. In addition, established migrants in the network supply information, which allows recipients to assess more carefully the expected returns from migration. Nelson (1959) has classified information on which potential migrants form their expectations into two main categories: specific and generalised information. Specific information implies knowledge about particular opportunities, while generalised information concern the awareness about the attractiveness of opportunities in a location. Established migrants have a fundamental role in conveying both types of information. In particular, by providing specific information and direct assistance they considerably reduce migration costs for incoming migrants.

⁴ Ethnic concentration of migrants is not a phenomenon characterising only migration flows of low-skilled migrants from poor countries, as it is sometimes believed. For instance, a study by Glebe (1986) shows that the Japanese community in Dusseldorf is the most concentrated of all minorities in that city. White (1998) conducts a related study on the pattern of settlement of developed country migrants' in London. Jews communities around the world represent another emblematic example of ethnic concentration mainly aimed at preserving the community identity and an ethnic social capital.

⁵ For empirical evidence on the clustering patterns of immigrants by country of origin or ethnic group see Zavodny (1999) and Chiswick et al (2002) for the US and Australia respectively.

In his study of rural-to-urban migration in India, Banerjee (1984) finds that over one-half of the migrants left their place of origin because of a suggestion to migrate received by contacts (relatives of friends) settled in the urban area. A considerable share of these migrants had a pre-arranged job or received assurances of urban employment before leaving the rural area. Menjivar (1995) shows that for newly arrived Mexican migrants in California it is common to be hosted by kin (relatives but also members of their hometown), borrow money and receive other important form of assistance from them.

The availability of migration networks in certain host locations significantly affects individuals' migration decision. The probability of migration to the US is higher for Mexican households with prior migration experience and for households originating from communities with extensive migration history (Massey and Garcia Espana, 1987).⁶

Migration networks, and the resulting exchange of information and support, are not only the result of “**strong ties**” such as those within household or kins but also of “**weak ties**” such as acquaintances and co-villagers.⁷ In a recent article, Winters et al (2001) find strong support of the positive influence of migrants networks on (i) the decision to migrate; (ii) where to migrate and (iii) the number of migrants sent by a Mexican household. In their investigation, they are able to disentangle the separate effects on migration probability of strong (family) and weak (community) ties. They find that family and community networks are substitutes in the generation of information and general assistance. Households with weaker family ties derive more benefit from community networks than households with larger family networks.

Taylor (1986), in a model of household labour allocations under uncertainty emphasises the risk-reducing role of migration networks. Information, transmitted by established migrants, can improve the allocative efficiency of households' labour decisions. In fact, their perception of the distribution of returns (*subjective distribution*) will match more accurately the true distribution (*objective distribution*). The value of accurate information is higher in the context of international migration, which is characterised by a high-risk environment, larger sunk costs (transportation, adjustment costs, psychological costs etc.) and scarcity of information. Migration networks are expected to have a greater role in international than in internal migration. Econometric analysis using data collected in two Mexican villages confirm the author's model prediction.

⁶ On the consequences of migration networks in terms of labour market performance and immigrants adjustments see Munshi (2003), Chiswick and Miller (2002), Gonzales (1998), Borjas (1995).

An additional explanation to immigrants clustering is given by the existence of “herd behaviour” in migration. Epstein (2002) shows how potential migrants, who have some private information but are imperfectly informed about the attributes of alternative locations, might rationally decide to discount their private information and replicate the decision taken by previous migrants. In his model, individuals are able to observe previous emigrants’ decisions but not the information signal that was driving those decisions. Herd behaviour might result in inefficient equilibrium. Migrants may regret the choice taken and would have gained higher utility if they had not followed the herd and chosen a different destination. This theory based on “information cascades” between subsequent waves of migrants should not be considered as a completely different explanation for clustering. Herd behaviour and networks externalities might clearly coexist. In our opinion, information cascades in Epstein’s theory are equivalent to the notion of “generic information” flows as developed by Nelson (1959), to which we referred above. Generic information is often widespread without the active role or even the will of previous migrants. For instance, information about the locations chosen by people moving out of our village might be public knowledge. We might learn about it by talking with the butcher or barber of the village or sipping a coffee in the main square’s café. We can even form our suppositions on how successful a migrant is by looking, for instance, to his/her remittances at home (even if not directly observable, migrant’s riches can be assessed by observing consumption of remittances’ beneficiaries). This public knowledge about migrants’ economic performances in a given destination might certainly induce “herd behaviour” and therefore subsequent migration waves, which are not triggered by an active role of established migrants.

Our model is based on different premises. The information cascade theory explains immigrants clustering on the basis of the existence of imperfect information in a framework where established migrants have no active role in “recruiting” newcomers. In our theory established migrants might play a very important role and their strategic decision whether to provide or not support to newcomers is linked to the interplay between positive ethnic consumption externalities and negative congestion costs. We are able to depict a richer framework which explains not only the formation of ethnic concentration but also the development of an ethnic productive sector in a particular location. Production of a rich set of ethnic goods and services is a striking feature of the various Chinatown, Little Italy or Little Karachi around the world.

⁷ See Wilson (1998) on the importance of weak ties in Mexican migration networks in the US and Grannovetter (1973, 1982) on the importance of weak ties, in general, in locating employment opportunities.

3. On ethnic goods and services

Consumption preference is one of the dimensions in which migrants often differ more from the native population in the host locality. Immigrants from a particular ethnic group might have distinctive preferences toward a set of consumption varieties (which we define “ethnic goods and services”), not shared with the host population. Distinctiveness in consumption is particularly strong for ethnic migrants coming from source communities whose components share a strong cultural identity. Ethnic varieties are broadly defined to include both market and non-market goods and services. In the last category will fall, for instance, social interactions between member of the same community of origin as normal gatherings and celebration of certain specific religious festivals. The ethnic identity of these goods is linked to the fact that they address needs specific to the individual belonging to the ethnic community. In the consumption bundle of immigrants, ethnic goods and services might be of considerable importance. As a consequence, availability and prices of these goods in the host location might play an important role in shaping the location decision of ethnic migrants.

In order to understand how ethnic consumption might affect immigrants’ location decisions and the migration dynamics of an ethnic community, it is important to define first, the nature of ethnic commodities.

Some of these goods are **tradable**. Ethnic dress, particular ingredients essential for preparing ethnic meals, CDs of Italian, Norwegian or Pakistani singers and DVDs of Tibetan or Chinese movies might all be traded over long distances. Availability of these tradable goods in principle, is identical across potential localities in the host destination. Prices at different locations are however unlikely to be identical. Firstly, transportation costs might differ. Although for a single commodity transport costs might not be highly significant, the sum of these costs across the entire bundle of ethnic consumption might be considerable. If potential destinations are in different countries, duties and import taxes levied by national authorities, might contribute to price disparities. Secondly, and probably more significant, a certain amount of fixed costs are associated with the distribution of ethnic goods. Setting up a distribution channel is costly. As a consequence, the equilibrium price of an ethnic variety will be higher in locations with a smaller number of ethnic consumers. In addition, localities with a small number of ethnic consumers are likely to have only one or a limited number of

suppliers/retailers of a particular product. The lack of competition in the retailing sector is likely to translate into higher prices. For example, if parmesan cheese is sold only in one shop in town, the shopkeeper will be able to extract greater surplus by acting as a local monopoly than if competition was fierce. In summary, for the reasons outlined above, the price of a given bundle of consumption of tradable ethnic commodities might be decreasing in the size of the ethnic community in the host location.

A considerable share of ethnic goods and services are **non-tradable**. Demand for a type of religious service or the service of a doctor applying traditional Chinese medicine both fall into this category. When the degree of social and cultural distance between the ethnic group and the host population is high, goods and services which are not *per se* ethnic might be considered so, in virtue of the fact that they are provided by members of the same ethnic group of the consumer. For example the service offered by a lawyer appears in general to not have a distinctive ethnic component. Nevertheless, for a Mexican whether the lawyer is Mexican or not may be an important factor in their decision who to hire. The Mexican customer might have “special consumer demands” that a lawyer with an insider knowledge of the ethnic’s group culture may be able to provide more effectively. Consequently, even if the price charged and the final results of the service are identical, the Mexican customer will probably find himself more at ease with a member of his own community and hence more likely to use their services. Non-pecuniary transaction costs in the trade between the lawyer and his client, such as language barriers, might be considerably reduced when these individuals belong to the same community of origin. The number of ethnic non-tradable varieties available in a particular host location is largely dependent on the intensity of preferences for ethnic consumption and on the size of the ethnic group. If the group is sufficiently large, it may support the existence in the host location of a differentiated set of ethnic varieties. In many large cities across the world, immigration transforms some neighbourhoods into a replica of the town or community of the source country.⁸

If ethnic consumption has a high value, a migrant will prefer, *ceteris paribus*, a location which offers a wide selection of ethnic goods at a lower price, i.e. a location with a large concentration of migrants from the same ethnic community.

Given the intrinsic nature of ethnic commodities, individuals belonging to the same ethnic group as the consumers are best suited at producing them. In practice, insider’s knowledge of the ethnic community’s culture is essential in providing goods and services closer to

⁸ For an interesting sociological study on Hungarian immigrants in North America and their pattern of location/ethnic consumption during the first half of 20th century see Kosa (1956).

consumer tastes. Ethnic producers tend to have to a certain extent a protected market, i.e. a competitive edge over non-ethnic producers. In some cases, for certain goods and services, the market can be completely isolated and ethnic producers are not only more able than others to satisfy demand but are in fact the only ones who can actually supply the ethnic market. An emblematic example, illustrated by Boyd (1998), is that of religious services demanded by African-American immigrants from the American South in urban northern areas during the Great Black Migration in the US. What was “ethnic” about these religious services? African Americans “were accustomed to services accompanied by improvisational singing, shouting and other form of active participation and demonstrative enthusiasm”. Pioneer migrants were dissatisfied with “intellectual sermons” and cold and impersonal large congregations they found in the northern cities (Grossman, 1989). Large flows of southern migrants created the demand for churches and therefore, pastors travelling northward, who were better able to accommodate their special tastes.

From the above discussion it is clear that the number of both tradable and non-tradable varieties is highly likely to be positively affected by the size of the ethnic group in the host location. In what follows, we capture this idea in the simplest possible way by considering the existence of non-tradable varieties only.

4. *The model*

In order to analyse the relationship between individuals’ migration decisions, migration chains and preferences for non-tradable ethnic goods and services, we specify a simple model representing a single potential destination. This section is divided into three parts. In the first part the migration behaviour and consumption preferences are presented. The production structure of the economy is specified in the second part, while in the last part, migration pattern and the optimal size of the ethnic group are analysed.

4.1 Migrant’s utility

Migrant’s utility is defined over two types of goods and services, ethnic (E) and native (Y). In line with our discussion above, we assume that, production of ethnic goods requires the employment of individuals of the same ethnic group as the consumers (i.e. the same source location). We assume that the goods and services are non-tradable, this means that the

number of ethnic varieties available depends on the size of the ethnic group in a given locality.

Native goods are purely labour intensive (i.e. labour is the only input), where the labour pool consists of both migrants and natives. The two types of goods in the economy are produced in many differentiated varieties. We define n_E and n_Y as the number of respectively type E and type Y goods.

Utility of a representative migrant can be expressed by the following function:⁹

$$V = \int_{i=0}^{n_E} ((1 + \varepsilon)c_{Ei})^\theta di + \int_{j=0}^{n_Y} (c_{Yj})^\theta dj - \xi M \quad (1)$$

where $\varepsilon > 0$ indicates that ethnic migrants particularly enjoy consumption of ethnic varieties. This formulation of the utility function implies that ethnic and non-ethnic goods and services are substitutes. Ethnic producers have “insider information” and particular skills which enable them to provide products closer to the taste and needs of ethnic consumers. As highlighted above, this might include the cooking of a particular meal, provision of religious services or simply the ordering and display of goods the way it is done in the source country. The parameter $\theta \in (0,1)$ captures the intensity for the love-of-variety in the utility function; as $\theta \rightarrow 0$, consumers derive more utility from product variety and as $\theta \rightarrow 1$, they derive less utility from product variety. c_{Ei} and c_{Yj} represent respectively consumption of good i, j of type E and Y . The last term on the right-hand-side (ξM) captures the fact that as the size of the ethnic group in one location increases (M), i.e. as the ethnic community becomes more “visible”, migrants suffer from hostility and/or discrimination inflicted upon them by native inhabitants. For simplicity we assume a linear “hostility externality” measured by $\xi \geq 0$ times the size of the ethnic group M .¹⁰ More generally, the hostility externality captures congestion costs of different nature associated with a dimensional expansion of the ethnic community.

We assume that each migrant is endowed with one unit of labour which is inelastically supplied in the individual’s location of residence. The budget constrain of a representative migrant is given by:

⁹ In what follows we use a modelling strategy for the migrants’ preferences similar to that employed by Glazer et al. (2003) in a different context.

$$w = \int_{i=0}^{n_E} p_E(i) c_E(i) di + \int_{j=0}^{n_Y} p_Y(j) c_Y(j) dj \quad (2)$$

From equations (1) and (2) we obtain the following migrant's demand for a single E and Y variety (see Appendix I):

$$c_E = \frac{w}{n_E p_E + n_Y p_Y \varepsilon'}; \quad (3)$$

$$c_Y = \frac{w \varepsilon'}{n_E p_E + n_Y p_Y \varepsilon'}$$

where $\varepsilon' = (1/(1 + \varepsilon))^{\theta/(1-\theta)}$. Conversely, native individuals' demand for a single native variety might be expressed as:

$$c_Y^{nat} = \frac{w}{n_Y p_Y} \quad (4)$$

where subscript 'nat' identifies native variables. Native individuals do not benefit from ethnic varieties.

4.2 Production technology

The two sectors of our economy have the same production technology. The only difference consists of the fact that the ethnic sector employs a specific factor of production, 'ethnic labour'. Since all varieties, both of type E and type Y , are symmetric in what follows we consider production of a representative firm irrespective of the type of products. Each variety is produced at decreasing average costs. An initial effort (fixed costs) is needed to set up a new business, and then each unit is produced at constant marginal cost. The labour input requirement for each variety is given by:

$$l_i = \alpha + \beta x_i \quad (5)$$

¹⁰ For an interesting theoretical discussion concerning the "hostility externality" suffered by minority groups see

where α, β are respectively the fixed and the variable costs and x_i is the output level of the differentiated good or service. Love of variety and increasing returns at the firm level imply that each newcomer in the non-tradable sector will produce a new variety in order to capture some ‘monopolistic power’.

The profit-maximising price is a mark-up over the marginal costs (wage):

$$p_i = \frac{\beta w}{\theta} \quad (6)$$

As long as excess profits exist, firms will continue to enter the market until profits are driven to zero, that is $\pi_i = p_i x_i - (\alpha + \beta x_i) w = 0$. It follows that in equilibrium the optimal quantity produced by each firm is:

$$x_i^* = \frac{\alpha}{\beta} \left(\frac{\theta}{1-\theta} \right) \quad (7)$$

Substituting (7) into eq. (5) we obtain the optimal labour input requirement for each firm:

$$l_i^* = \alpha + \beta x_i^* = \alpha + \beta \frac{\alpha}{\beta} \left(\frac{\theta}{1-\theta} \right) = \frac{\alpha}{1-\theta} \quad (8)$$

4.3 Size of the ethnic group and number of ethnic varieties

Migrants can be employed in either Y or E sectors. In addition, they can move freely between sectors, equalising wages in equilibrium. The number of ethnic and native varieties produced in equilibrium is demand driven (given by the share of income spent on ethnic and native goods and services).

When will an ethnic sector emerge? The first ethnic variety will be produced in the host location only if there is sufficient demand for it. In other words, migrants demand (Mc_E) is sufficiently large to cover the break-even optimal quantity x_E^* as defined by eq. (7). If this

Carlton (1995). Another interesting reading on hostility and the size of a minority is Rapoport and Weiss (2003).

condition is not satisfied, i.e. the size of the migrants community is below a critical mass, migrants will be employed in the production of native varieties and consume only native products. In this case, migrants will have the following utility and their individual demand will be exactly as that of natives as defined by eq. (4):

$$V^{no_ethnic} = \int_{j=0}^{n_Y} c_Y(j)^\theta dj - \xi M \quad (9)$$

Equilibrium implies that goods and labour markets clear, that is, demand equals supply for any variety and all individuals are employed. When only the production of native varieties takes place equilibrium in the goods market is given by the following expression:

$$M \frac{w}{n_Y p_Y} + L \frac{w}{n_Y p_Y} = x_Y^* \Rightarrow \frac{(M+L)w}{n_Y p_Y} = \frac{\alpha}{\beta} \left(\frac{\theta}{1-\theta} \right) \quad (10)$$

where M, L represent the size of the ethnic and native populations. By replacing eq. (6) into (10) we find the equilibrium number of native varieties when an ethnic productive sector does not exist:

$$n_Y^{no_ethnic} = (M+L) \left(\frac{1-\theta}{\alpha} \right) \quad (11)$$

In a similar fashion, when the size of the ethnic community is large enough to sustain an ethnic productive sector, the equilibrium conditions in the goods markets for a representative ethnic (E) and native (Y) variety are as follows:

$$Mc_E = x_E \Rightarrow \frac{Mw}{n_E p_E + n_Y p_Y \varepsilon'} = \frac{\alpha}{\beta} \left(\frac{\theta}{1-\theta} \right) \quad (12)$$

$$Mc_Y + L \frac{w}{n_Y p_Y} = x_Y \Rightarrow \frac{Mw\varepsilon'}{n_E p_E + n_Y p_Y \varepsilon'} + \frac{Lw}{n_Y p_Y} = \frac{\alpha}{\beta} \left(\frac{\theta}{1-\theta} \right)$$

where we assume that natives' consumption of ethnic variety is equal to zero.

Substituting the equilibrium prices $p_E = p_Y = \beta w / \theta$ in (12) we obtain the following system:

$$\begin{cases} n_E = \frac{M(1-\theta)}{\alpha} - n_Y \varepsilon' \\ \frac{M\varepsilon'}{n_E + n_Y \varepsilon'} + \frac{L}{n_Y} = \frac{\alpha}{1-\theta} \end{cases}$$

Solving these two equations yields the equilibrium number of varieties:

$$n_E = \left(\frac{1-\theta}{\alpha} \right) \left[M - \frac{L\varepsilon'}{1-\varepsilon'} \right] \tag{13}$$

$$n_Y = \left(\frac{1-\theta}{\alpha} \right) \frac{L}{1-\varepsilon'}$$

An ethnic productive sector will emerge ($n_E > 0$) if and only if the following condition is satisfied:

Condition 1: *An ethnic sector exists if and only if the share of migrants from the same ethnic community with respect to the native population (M/L) is larger than $\varepsilon'/(1-\varepsilon')$.*

We define \widetilde{M} as this threshold size of the ethnic community:

$$\widetilde{M} = \frac{L\varepsilon'}{1-\varepsilon'} \tag{14}$$

where $\varepsilon' = (1/(1+\varepsilon))^{\theta/(1-\theta)}$. For a given level of the native population (L), the stronger migrants' preference toward ethnic variety *vis-à-vis* native ones ($\varepsilon \rightarrow large$), the lower the critical mass of the migrants' community for which an ethnic sector arises. In addition, the lower the intensity of the love-for-variety ($\theta \rightarrow 1$), the lower will be \widetilde{M} . The intuition behind this last result follows from the fact that the higher θ , the lower the gain in utility due to diversification of consumption. As a consequence, the ethnic migrant will shift expenditure toward consumption of the goods which provide him or her with the highest level of utility, i.e. ethnic varieties.

Proof: Ethnic and native variety use the same technology, i.e. the same labour input requirement l_i^* . Given the amount of total labour available in the host location economy ($M+L$), the following relationship holds: $n_Y^{no-ethnic} = n_Y + n_E = (M+L)/l_i^*$. As long as migrants in the host location will find more profitable to demand only native variety no ethnic goods will be produced ($V^{no-ethnic} > V$). Only when the marginal utility from having an ethnic variety is equal to that of having an extra native one the ethnic production will start. The critical mass of migrants necessary to sustain an ethnic productive sector is found by solving the following equality $V^{no-ethnic} = V$. Using eqs. (1), (9), (11) and (13) and solving for M , we obtain eq. (14). (see appendix II) ■

4.4 The pattern of migration and the optimal size of the ethnic group

4.4.1 The autonomous wave of migrants

All workers in the source location have the same level of skills and inelastically supply one unit of labour for which they are paid a wage rate (w_s), which is only a fraction of the wage offered in the host location (w_h). However, migration is costly. In the source location, each individual j in the population (P) faces a mobility cost a_j , which is broadly defined to include the full cost of relocating in the new destination such as psychological costs, travel expenditure and the considerable amount of information required in order to take the decision to migrate. Individuals face different mobility costs, which we assume to be continuously

distributed on the interval, $a_j \in [\underline{a}, \bar{a}]$, where \underline{a} and \bar{a} identify the most mobile and more immobile individual in the population respectively.¹¹ The fraction of population in the source

region with a mobility cost equal or lower than a_j is given by $F(a_j) = \int_{\underline{a}}^{a_j} f(a)Pda$, where

$f(a)$ is the probability density function for any particular level of migration cost a . $F(a)$ is, therefore, the cumulative distribution function and is strictly positive, increasing and differentiable.

A very simple and tractable case, which we will use in the following analysis, is when mobility costs are uniformly distributed, that is $f(a_j) = 1/[\bar{a} - \underline{a}]$ for any $a_j \in [\underline{a}, \bar{a}]$.

On the basis of available information on potential destinations, an individual will move toward the destination (if any) which maximises his/her utility net of migration costs. The first individual (or group of individuals) will migrate if utility in the host location net of migration costs is higher than utility at home. Formally, if $V_h - V_s > a_j$ individual j will migrate, where V_h and V_s are indirect utility levels in the host and source destinations respectively. Without loss of generality and only for analytical convenience, we assume that the availability of ethnic varieties in the source location is fixed at a given level and migration is relatively small so that it does not have any detrimental effect on the number of varieties produced at home. This implies that we can treat the utility associated with the source locality as fixed at a constant level \bar{V}_s .¹²

In our simple two locations model, the initial autonomous flow of migrants' (M_1) depends on the utility differential (explained by both the exogenous wage rate differential and the endogenous availability/composition of non-tradable varieties) and the distribution among the population of 'mobility costs' in the source location.¹³

For a given set of expected host/source utility levels, the *marginal migrant* of the initial migration flow (M_1), which is indifferent between migrating or staying at home has the following mobility cost:

¹¹ These captures the fact that some individuals are more mobile than others for factors such as personal and household characteristics (age, gender, homeowners etc.), the degree of involvement in community life in the origin region and exogenously given preferences over the home location.

¹² We acknowledge that migration flows sometimes might have detrimental effects on the source economy. That is particularly true if migration is highly selective towards more skilled individuals, as is often the case. In our model we rule out this consideration since we are exclusively interested in investigating the dynamics of migration flows rather than the consequences thereof on those left behind in the source location.

$$a_1 = V_h(M_1) - \bar{V}_s \quad (15)$$

The corresponding size of the initial ethnic migrant community is given by:

$$M_1 = \int_{\underline{a}}^{a_1} f(a) P da \quad (16)$$

A corner solution with no migration (complete de-population) arises when equation (15) is never satisfied and $a_j > V_h(M) - \bar{V}_s$ ($a_j < V_h(M) - \bar{V}_s$) for any $a_j \in [\underline{a}, \bar{a}]$. In what follows we concentrate our attention on the pattern of migration in the case of an internal solution, $0 < M_1 < P$, i.e. a positive and finite initial flow of migrants.

Since ethnic goods are initially not available in the host destination, a relatively large wage gap could be necessary to kick-start migration. The most mobile individuals of the source location (if migration takes place) will compose the first wave of migrants.

Equation (16) measures the size of the ethnic community in the host locality without strategic support from established migrants to potential incoming migrants.

In what follows, we analyse the effect of incoming migrants from the same source community on the utility of established migrants. In addition, we show how the active role of established migrants in supporting newcomers enables us to depict a rich set of possible scenarios in terms of patterns of migration and ethnic community size in the host locality.

4.4.2 The effect of newcomers on established migrants' utility and the optimal size of the ethnic community

Once in the new location, established migrants have an incentive to give support to newcomers only if new migrants have a positive effect on their utility. Potential gains from incoming migration in terms of utility are endogenous and depend on the size of the resulting ethnic community in the host location. In the context of our model, different scenarios may

¹³ While the setting of our model is fundamentally static, its interpretation is implicitly dynamic as it is

emerge according to the size of the initial, autonomous wave of migrants (M_1), the degree of migrants' preferences toward the ethnic goods and services (ε), and the reaction of natives to increasing immigration flows (hostility externality, ξM).

Ethnic varieties will be available in the host localities only if *condition 1* is satisfied, that is a critical mass \widetilde{M} of ethnic migrants is already settled in the host locality. The effects of incoming migrants will therefore differ according to the existence (or not) of an ethnic productive sector. Two cases emerge.

Case 1. No ethnic productive sector (size of the initial pool of migrants $\widetilde{M} \geq M_1$)

If the size of the initial ethnic community is smaller than the critical mass needed to establish an ethnic sector, migrants will initially consume only native non-tradable goods and services.

Indirect utility in this case is:

$$V_h^{**} = (L + M)^{1-\theta} \left(\frac{\theta}{\beta} \right)^\theta \left(\frac{1-\theta}{\alpha} \right)^{1-\theta} - \xi M \quad (17)$$

From the above equation it follows that the effect of further immigration on the utility of the established migrants depends on the trade-off between the positive *native variety expansion effect* and the negative effect due to increasing *ethnic discrimination/congestion costs*.

The optimal size of the migrant community is reached when the two opposite effects are balanced, i.e. $\partial V / \partial M = 0$. We call this threshold level M^{**} , which is given by the following expression:

$$M^{**} = \left(\frac{\theta}{\beta} \right) (1-\theta)^{\frac{2-\theta}{\theta}} \alpha^{-\frac{1-\theta}{\theta}} \xi^{-\frac{1}{\theta}} - L \quad (18)$$

This size of the ethnic community is realised when only all individuals with mobility cost $\underline{a} < a_j \leq a^{**}$ find it convenient to migrate, where a^{**} is the threshold level of mobility cost for

$$\text{which } M^{**} = \int_{\underline{a}}^{a^{**}} f(a) P da$$

frequently the case in the economic literature aimed at analysing the spatial structure of the economy.

Case 2. Ethnic productive sector (size of the initial pool of migrants $M_1 > \widetilde{M}$)

When the size of the community is larger than or equal to \widetilde{M} , an ethnic productive sector is set up. Indirect utility of the established migrants (and for incoming migrants) in this case is:

$$V_h^* = M^{1-\theta} \left(\frac{\theta(1+\varepsilon)}{\beta} \right)^\theta \left(\frac{1-\theta}{\alpha} \right)^{1-\theta} - \xi M \quad (19)$$

Also in this situation a trade-off associated with subsequent immigration exists. The only difference is in the nature of the positive externality, which in this second case is due to an *ethnic variety expansion effect*.

Also for this case, in which the initial autonomous flow of migrants is above \widetilde{M} , we compute the optimal size of the ethnic community:

$$M^* = \left(\frac{\theta(1+\varepsilon)}{\beta} \right) (1-\theta)^{\frac{2-\theta}{\theta}} \alpha^{\frac{1-\theta}{\theta}} \xi^{\frac{1}{\theta}} \quad (20)$$

We define a^* as the level of mobility cost associated with $M^* = \int_a^{a^*} f(a) P da$.

The optimal size of the ethnic community in **Case 1** is always smaller than in **Case 2**, i.e. $M^* < M^{**}$ (see Appendix III).

Figure 1 depicts the level of utility that migrants enjoy in the host location (net of the constant level enjoyed in the source country $V_{h-s} = V_h - \overline{V}_s$) as a function of the ethnic community size. When the ethnic community in the host location has a size below (above) the threshold size \widetilde{M} , $V_h^{**} > V_h^*$ ($V_h^{**} < V_h^*$). Migrants' utility is given by eq. (19) when $M \geq \widetilde{M}$, and by eq. (17) when $M \leq \widetilde{M}$. Three different cases are shown. Diagram (a) represents the situation in which $\widetilde{M} < M^{**} < M^*$. This case is characterised by relatively strong preferences for ethnic products, a low degree of love for variety and/or low hostility externalities. The

marginal migrant for which an ethnic sector is set up, \tilde{a} (where $\tilde{M} = \int_{\underline{a}}^{\tilde{a}} f(a)Pda$), has a mobility cost lower than a^{**} . An intermediate case, where $M^{**} < \tilde{M} < M^*$, is reported in diagram (b), while diagram (c) represents a case opposite to the first one where $M^{**} < M^* < \tilde{M}$.

The upward sloping line in the diagrams, $C(P)$, represents mobility costs across the population in the source locality when these are uniformly distributed. The relevant equation in this simple and tractable case is:

$$C(P) = \bar{a} + P/(\bar{a} - \underline{a}) \quad (21)$$

where the intercept \underline{a} is the mobility cost of the most mobile individual in the source region and the slope might be interpreted, for a given population P in the source locality, as a measure of mobility costs dispersion.

The relationships between \tilde{M} and the two optimal sizes, M^* and M^{**} , defined above are important in understanding the alternative scenarios depicted by our model which are investigated in the next section. In **table 1**, we report the sign of the derivatives of \tilde{M} , M^* and M^{**} with respect to the main variables of the model.

Table 1. The effects of model's parameters and variables on \tilde{M} , M^* and M^{**} (sign of first derivative)

	Ethnic preferences ε	Love of variety θ	Congestion costs ξ	Fixed costs of production α	Variable costs of production β	Size of native population L
\tilde{M}	—	—	0	0	0	0
M^*	+	+ / - *	—	—	—	0
M^{**}	0	+ / - *	—	—	—	—

* = both signs according to the size of other parameters

As already mentioned in *section 4.3*, the threshold level \widetilde{M} is decreasing in the intensity of preferences toward ethnic consumption vis-à-vis native consumption (ε) and is increasing in intensity of love for variety. The optimal size of the ethnic group when an ethnic sector already exists is increasing in ε . More migrants in the host localities expand the set of ethnic variety available to the whole ethnic community. When preferences for these goods are strong, this positive effect will dominate the negative effects over a larger size of the community. On the other hand, M^* is decreasing in congestion costs (ξ) and in labour costs of production (α, β). More ambiguous are the signs of both $\partial M^* / \partial \theta$ and $\partial M^{**} / \partial \theta$, which depend jointly on the size of other parameters in a non-linear way.

Note that an increase in the native population L , has a negative impact on M^{**} . This result is obvious from eq. (18) and is due to the fact that the bigger the native population, the higher is the number of varieties already available in the host locality. Therefore, the positive native expansion effect associated with incoming migrants could be more than offset by negative externalities. When negative externalities are particularly strong, both M^* and M^{**} might be negative, which means that the optimal size of the ethnic community is zero.

In **figure 2**, \widetilde{M} , M^* and M^{**} are plotted against ε keeping all other parameters fixed at a certain level. When preferences toward type E goods are only marginally higher than those for native varieties (in the figure: $0 < \varepsilon < A$), \widetilde{M} is bigger than M^* and M^{**} . This situation corresponds to diagram (c) in figure 1. Stronger ethnic preferences will lead to the alternative two cases depicted in figure 1.

4.4.3 Strategic support and the size of the ethnic community: alternative scenarios

After having outlined the general framework of our analysis, in this section we define the migration pattern under alternative scenarios. The main questions we want to address are the following:

- (i) When will established migrants provide support to newcomers?
- (ii) What is the resulting size of an ethnic group?
- (iii) Is the resulting size equal to the optimal size?
- (iv) When does an ethnic productive sector arise?

The set of possible scenarios predicted by the model is reported in **table 2**. In what follows we define the conditions under which each scenario arises and describe the underlying migration pattern.

By giving support to potential newcomers, whether sending them information on job opportunities in the host location or giving direct support in order to reduce initial difficulties and uncertainty, established migrants influence the size of the flows.¹⁴ Therefore, if positive externalities arise as a consequence of a larger size of the ethnic community in the host location, established migrants might strategically use ‘support’ as a way of internalising those externalities.

Definition 1: *The utility gain (or loss) experienced by a community of established migrants of size M_k as the ethnic community expands up to a size M_j is given by*

$$G(M_k, M_j) = M_k \left[V_{h-s}(M_j) - V_{h-s}(M_k) \right];^{15}$$

Proposition 1: *For a given size of the ethnic community already in the host location, M_k , established migrants strategically support newcomers if and only if the following condition is satisfied:*

$M_k < M^*$, i.e. the size of the ethnic community is initially smaller than the optimal size M^* ;

Proof: If the above condition is not satisfied and $M_k \geq M^*$, established migrants’ utility is decreasing in M since $\partial V_h / \partial M \leq 0$ for any $M \in [M^*, P]$. It follows that $G(M_k, M_j) < 0$. Migrants already settled in the host locality experience a utility loss as a consequence of incoming migrants, therefore no support will be provided. ■

When $M_k < M^*$, there exists a $M_j \in (M_k, M^*)$ such that $G(M_k, M_j) > \int_{M_k}^{M_j} C(M) dM - \int_{M_k}^{M_j} V_{h-s}(M) dM \geq 0$; i.e. the gain experienced by established migrants in terms of consumption externalities is larger than the support needed by a number

¹⁴ And in a multi-location framework the direction of the flows.

of incoming migrants of size $(M_j - M_k)$ in order to be indifferent between migrating or remaining in the home location.

The total optimal support S^* will be:

$$S^* = \int_{M_k}^{M_{K+1}} C(M) dM - \int_{M_k}^{M_{K+1}} V_{h-s}(M) dM \quad (22)$$

where M_{K+1} is the size of the ethnic community after the new migrants triggered by the support are settled in the host location. At M_{K+1} , the marginal gain of having a new migrant is equal to the marginal support that would be necessary to induce him/her to migrate:

$$\frac{\partial G(M_k, M_{K+1})}{\partial M} = \frac{\partial [C(M_{K+1}) - V_{h-s}(M_{K+1})]}{\partial M}$$

Before we proceed with depicting the different scenarios reported in table 2, it is convenient to define the equilibrium size of the ethnic community as follows:

Definition 2: *The size of an ethnic community in the host location reaches a stable equilibrium (M^E) when:*

- (i) $\partial G(M^E) / \partial M \leq \partial [C(M^E) - V_{h-s}(M^E)] / \partial M$ or $\partial G(M^E) / \partial M \leq 0$;
- (ii) for any individual with mobility cost $a_j \in (a^E, \bar{a})$, where $M^E = \int_a^{a^E} f(a) P da$, the cost of migrating is larger than the associated net gain in utility, formally $C_j(M(a_j)) > V_{h-s}(M(a_j))_j$.

The interpretation of this definition is straightforward. A stable equilibrium, M^E , is achieved at a point in which established migrants have no incentive to further support incoming migrants and all individuals left behind in the source location have no incentive to migrate due to their high mobility costs. Condition (i) is necessary but not sufficient. A new group of

¹⁵ For the autonomous initial “mass” of migrants, $M_K = M_1$ as defined by equation (16).

individuals in the source location might find it profitable to migrate without support since the ethnic community has expanded to a level which more than compensates for their mobility costs.¹⁶

For the community strategic support to be effective, we must assume that established migrants act like a ‘cohesive group’ and are able to control and prevent free riding behaviour within the group so that all components contribute to the supportive action. In general ethnic minorities show a high degree of co-operation and mutual support, which probably is due to their ability to sanction opportunistic behaviour and enforce trust. For instance, it is frequently observed that informal financing within an ethnic minority is often a common way of obtaining credit. As emphasised by the literature, informal financing is usually the preferred option within communities where monitoring is more intense, costs of information about a debtor are very low and enforcement mechanisms are more effective.

Established migrants’ support is fundamental in expanding the host locality ethnic community through subsequent *induced* migration flows. Their effort might lead to the formation of an ethnic productive sector.

Figure 3, scenario 1, illustrates the theoretical case characterised by (i) *established migrants support to newcomers*, (ii) *the emergence of an ethnic productive sector* and (iii) *an equilibrium size of the ethnic community equal to the optimal size $M^E = M^*$* . Individuals composing the initial pool of migrants, M_1 , have an incentive to support newcomers since in doing so they might achieve a higher level of utility for themselves. The optimal amount of support provided is given by the total area between $C(M)$ and $V_{h-s}(M)$ as defined by eq. (22). As reported in table 2, this scenario is likely to arise when:

- a) Migrants in the source locality have very strong preferences for ethnic goods and services vis-à-vis native ones. In this situation, the critical mass of migrants necessary to set up an ethnic sector is small. This is often the case for ethnic migrants with cultural, religious and social preferences very dissimilar from those of the host country. The migration cost in this case is generally higher since immigrants find it more difficult to assimilate into the mainstream society, and individuals will be willing to pay more in order to recreate the

¹⁶ This will happen when the size of the ethnic community in the host destination is still lower than the optimal size ($M_K < M^*$) and therefore utility of established and incoming migrants is increasing in the size of the community, $\partial V_{h-s} / \partial M > 0$. The migrants triggered by support (*induced migrants*) are followed by a new flow of *autonomous migrants* composed by individuals who previously had incentive to stay put. As a consequence of the expansion of the ethnic community, and therefore the availability of more ethnic varieties, these individuals subsequently found it profitable to migrate even without support from established migrants.

source country environment. A native language different from that of the host country will work in the same direction (see Bauer et al. 2002).

- b) Mobility costs of potential incoming migrants are not prohibitively high (but neither too small, see scenario 2). The support necessary to induce incoming migrants to join the “ethnic club” in the host location should not be too large. Established migrants’ support, in this case, will be positive until the ethnic community reaches the optimal size $M^E = M^*$. Above this size no support will be provided since, $\partial G(M^*)/\partial M < 0$, i.e. expansion of the community above this threshold will have detrimental effect on established migrants’ utility since the hostility externality dominates the positive consumption externality.
- c) Hostility externalities or congestion costs are low.

The optimal size of the community will differ from the optimal one in **scenario 2** (*established migrants support newcomers, an ethnic productive sector is set up and the ethnic community size is $M^E \neq M^*$*) under two circumstances. Firstly, when mobility costs for those left behind in the source population are high (i.e. $C(M)$ is steep). In this circumstance, established migrants find it profitable to support up to a level where the marginal gain of having an extra migrant is equal to its marginal cost. The resulting equilibrium size of the community is smaller than the optimal, $M^E < M^*$. Secondly, the equilibrium size will differ from the optimal size also in the case of low mobility costs in the population (i.e. $C(M)$ is flat). This case is depicted in figure 3. The ethnic variety expansion effect, caused by the settlement of new migrants, will exert an attraction force also for other individuals in the host location who, therefore, benefit indirectly from established migrants’ support. Joining the “migration club” becomes profitable also for them.¹⁷

For weak preferences toward the ethnic goods and relatively low hostility externalities, the likely outcomes are those represented in **figure 4 (scenarios 3 and 4)**. an ethnic productive sector is not set up in any of the cases but we still observe support by established migrants to newcomers. Equilibrium size of the ethnic community is $M^E = M^{**}$ in scenario 3 and $M^E \neq M^{**}$ in scenario 4.

¹⁷ A strategic use of remittances in the source location might in principle prevent further migration and act as a means of achieving the optimal size. Even by including strategic remittances in the analysis, **scenario (2)** is still a possible outcome for very low mobility costs since the strategic remittances required to induce individuals to stay put might be too large for $M^E = M^*$ to be a feasible equilibrium.

When preferences for ethnic consumption are strong but mobility costs in the source locality are rather low, the likely outcome is depicted in **figure 5 (scenario 5)**. Migrants have a strong preference for ethnic consumption and therefore an ethnic sector is likely to emerge. Established migrants have no incentive to support newcomers, and the mobility cost curve $C(M)$ cuts the utility curve $V_{h-s}(M)$ in a point where negative externalities dominate positive ones.

Finally, no support and no ethnic productive sector will characterise the migratory experience in the presence of relatively low preferences for ethnic goods associated with strong congestion costs when migration costs are low (**figure 5, scenario 6**). In these last two scenarios, the equilibrium size of the ethnic community is equal to the size of the initial autonomous flow of migrants $M_1 = M^E$.

5. Concluding remarks

In this paper we provide a theory of migration network and ethnic cluster formation based on the existence of migrants' preferences toward ethnic non-tradable goods and services which only individuals belonging to the same ethnic community can provide. In our model, established migrants play a key role in determining the migratory experience of the ethnic community through the strategic use of support to reduce mobility costs of subsequent migrants. The model is able to produce a rich set of scenarios, which we argue are in line with the heterogeneous migration dynamics showed by different ethnic groups.

The more different the cultural, political and economic environment the region of origin is from that of the region of destination, the higher the probability that ethnic migrants will cluster together in a selected number of communities. In addition, the larger will be the resulting size of the ethnic minority since established migrants will be willing to devote more effort to support newcomers in order to recreate, at least in part, the economic, religious and cultural environment they left behind at home.

Incoming migrants expand the set of ethnic non-tradable varieties which are produced in the host locality. This effect is undoubtedly positive on migrants already settled in the ethnic cluster. Nevertheless, migrants compete over scarce resources such as housing and job opportunities. In addition, as human history shows, as ethnic minority expands in the host destination the probability of hostile and discriminatory behaviour toward them from the

native population increases as well. In our model we show that coexistence of these positive and negative externalities determines an “optimal size” of the ethnic community. The actual size of the community may well be different from the optimal size.

The model’s predictions match some important findings observed in empirical studies. When a group of migrants has similar preferences to those of the native population in the host country, our model predicts more dispersed migration flows which are mainly driven by regional differences in economic fundamentals (real wages, unemployment rate etc.). This should be the case for internal migration which involves individuals characterised by relatively homogeneous preferences. In this regard, the model is in line with the different geographical patterns of internal versus international migration flows frequently found in empirical studies. Immigrants are generally more geographically concentrated than natives and reside in cities with a large population of the same ethnic group (see for instance Bartel 1989).

Often ethnic clusters tend to die with the ageing of the first generation of established migrants. On the basis of the premises of our model this phenomenon could be explained by decreasing attachment to “ethnic consumption” and increasing assimilation into native society by descendants of those individuals.

Interesting extensions of the model and alternative formulation are possible. First, it would be interesting to extend the model by considering a multi-location framework. The advantage would be one of analysing not only the size of the ethnic community but also the direction of migration in a richer set. Once a “migration club” has eroded its attractiveness, new destinations might emerge and the migratory dynamic is replicated in the new destination. Second, considering more explicitly the welfare of native population and endogenising the congestion/hostility externalities can considerably enrich the migration dynamic described above.

Table 2 – Migration dynamics: features of alternative scenarios

				Strategic support by established migrants	
				Yes	No
Ethnic Sector	Yes	Optimal size of the ethnic community (M^*)		Scenario (5) <ul style="list-style-type: none"> ▪ Strong preferences for ethnic goods and service ($\varepsilon \rightarrow high$); ▪ Small dispersion of mobility costs in the source location population (slope of $C(M)$, i.e. $1/(\bar{a}-\underline{a}) \rightarrow large$); ▪ High hostility externalities ($\xi \rightarrow low$). 	
		Yes	No		
		Scenario (1)	Scenario (2)		
		<ul style="list-style-type: none"> ▪ Strong preferences for ethnic goods and service ($\varepsilon \rightarrow high$); ▪ Large dispersion of mobility costs in the source location population. (slope of $C(M)$, i.e. $1/(\bar{a}-\underline{a}) \rightarrow relatively small$); ▪ Low hostility externalities ($\xi \rightarrow low$). 	<ul style="list-style-type: none"> ▪ Strong preferences for ethnic goods and service ($\varepsilon \rightarrow high$); ▪ Very large (<i>very small</i>) dispersion of mobility costs in the source location population (slope of $C(M)$, i.e. $1/(\bar{a}-\underline{a}) \rightarrow either very large or very small$); ▪ Low hostility externalities ($\xi \rightarrow low$). 		
Ethnic Sector	No	Optimal size of the ethnic community (M^{**})		Scenario (6) <ul style="list-style-type: none"> ▪ Weak preferences for ethnic goods and service ($\varepsilon \rightarrow 0$); ▪ Small dispersion of mobility costs in the source location population (slope of $C(M)$, i.e. $1/(\bar{a}-\underline{a}) \rightarrow large$); ▪ High hostility externalities ($\xi \rightarrow low$). 	
		Yes	No		
		Scenario (3)	Scenario (4)		
		<ul style="list-style-type: none"> ▪ Weak preferences for ethnic goods and service ($\varepsilon \rightarrow 0$); ▪ Large dispersion of mobility costs in the source location population. (slope of $C(M)$, i.e. $1/(\bar{a}-\underline{a}) \rightarrow relatively small$); ▪ Low hostility externalities ($\xi \rightarrow low$). 	<ul style="list-style-type: none"> ▪ Weak preferences for ethnic goods and service ($\varepsilon \rightarrow 0$); ▪ Very large (<i>very small</i>) dispersion of mobility cost in the source location population (slope of $C(M)$, i.e. $1/(\bar{a}-\underline{a}) \rightarrow either very large or very small$); ▪ Low hostility externalities ($\xi \rightarrow low$). 		

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Appendix I:

In the destination location, given a certain wage level (w), the migrant maximises utility (1) subject to the budget constraint (2), we set up the Lagrangian:

$$L = \int_{i=0}^{n_E} ((1+\varepsilon)c_{Ei})^\theta di + \int_{j=0}^{n_Y} ((1+\varepsilon)c_{Yj})^\theta dj - \xi M + \lambda \left[w - \int_{i=0}^{n_E} p_{Ei} c_{Ei} di - \int_{i=0}^{n_E} p_{Yj} c_{Yj} dj \right] \quad (\text{A.1})$$

the F.O.Cs. for (A.1) are the following:

$$\partial L / \partial c_{Ei} = \theta((1+\varepsilon)c_{Ei})^{\theta-1}(1+\varepsilon) - \lambda p_{Ei} = 0 \quad (\text{A.1.1})$$

$$\partial L / \partial c_{Yj} = \theta(c_{Yj})^{\theta-1} - \lambda p_{Yj} = 0 \quad (\text{A.1.2})$$

$$\partial L / \partial \lambda = w - \int_{i=0}^{n_E} p_{Ei} c_{Ei} di - \int_{i=0}^{n_E} p_{Yj} c_{Yj} dj = 0 \quad (\text{A.1.3})$$

re-arranging (A.1.1)- (A.1.3) we get:

$$c_{Ei} = \left(\frac{\theta}{p_{Ei}} \right)^{\frac{1}{1-\theta}} (1+\varepsilon)^{\frac{\theta}{1-\theta}}; \quad c_{Yj} = \left(\frac{\theta}{p_{Yj}} \right)^{\frac{1}{1-\theta}} \quad (\text{A.1.4})$$

Given that E and Y varieties are produced using the same IRS technology, $p_{Ei} = p_{Yj}$ and defining as in Glazer et al (2003) $\varepsilon' = (1/(1+\varepsilon))^{\theta/(1-\theta)}$, from (A.1.4) it follows:

$$c_{Yj} = c_{Ei} \varepsilon' \quad (\text{A.1.5})$$

It is worth noting that $0 \leq \varepsilon' \leq 1$, therefore eq. (A.1.5) indicates that the amount consumed of a Y good is only a fraction of that of an E good; this is obvious given that migrants attach more value to non-tradable ethnic varieties. Besides, as love-of-variety (θ) and migrants'

preference for ethnic variety (ε) increase, migrants will shift consumption from native to ethnic varieties ($\partial \varepsilon' / \partial \varepsilon < 0$ and $\partial \varepsilon' / \partial \varepsilon < 0$).

Using the budget constraint and (A.1.5) we can write the migrants' demand for a single E and Y variety as follows:

$$c_{Ei} = \frac{w}{n_E p_E + n_Y p_Y \varepsilon'} ; c_{Yj} = \frac{w \varepsilon'}{n_E p_E + n_Y p_Y \varepsilon'} \quad (\text{A.1.6})$$

Appendix II:

Using (3), (4) and (6) into (1) and (9), $V^{no-ethnic} = V$:

$$\begin{aligned} n_Y^{no-ethnic} \left(\frac{w\theta}{n_Y^{no-ethnic} \beta w} \right)^\theta - \xi M &= \\ = n_E \left((1+\varepsilon) \frac{w\theta}{n_E \beta w + n_Y \beta w \varepsilon'} \right)^\theta + n_Y \left(\frac{w\theta \varepsilon'}{n_E \beta w + n_Y \beta w \varepsilon'} \right)^\theta - \xi M \end{aligned}$$

substituting (11) and (13) into this last expression yields:

$$\begin{aligned} (M+L) \left(\frac{1-\theta}{\alpha} \right) \left(\frac{\theta}{(M+L) \left(\frac{1-\theta}{\alpha} \right) \beta} \right)^\theta &= \\ = \left(M - \frac{L\varepsilon'}{1-\varepsilon'} \right) \left(\frac{1-\theta}{\alpha} \right) \left((1+\varepsilon) \frac{\theta}{\left(M - \frac{L\varepsilon'}{1-\varepsilon'} \right) \left(\frac{1-\theta}{\alpha} \right) \beta + [L/(1-\varepsilon')] \left(\frac{1-\theta}{\alpha} \right) \beta \varepsilon'} \right)^\theta &+ \\ + \left(\frac{L}{1-\varepsilon'} \right) \left(\frac{1-\theta}{\alpha} \right) \left(\frac{\theta \varepsilon'}{\left(M - \frac{L\varepsilon'}{1-\varepsilon'} \right) \left(\frac{1-\theta}{\alpha} \right) \beta + [L/(1-\varepsilon')] \left(\frac{1-\theta}{\alpha} \right) \beta \varepsilon'} \right)^\theta \end{aligned}$$

If we substitute in the above expression, **condition 1** $\rightarrow \tilde{M} = \frac{L\varepsilon'}{1-\varepsilon'}$, we obtain:

$$\left(\frac{L}{1-\varepsilon'}\right)\left(\frac{1-\theta}{\alpha}\right)\left(\frac{\theta}{\left(\frac{L}{1-\varepsilon'}\right)\left(\frac{1-\theta}{\alpha}\right)\beta}\right)^\theta = \left(\frac{L}{1-\varepsilon'}\right)\left(\frac{1-\theta}{\alpha}\right)\left(\frac{\theta}{+\left(\frac{L}{1-\varepsilon'}\right)\left(\frac{1-\theta}{\alpha}\right)\beta}\right)^\theta$$

$V^{no_ethnic} = V$

Appendix III:

Comparing equations (18) and (20) it is easy to check that M^* is always larger than M^{**} :

$$M^* - M^{**} = \frac{\theta}{\beta}(1-\theta)^{\frac{2-\theta}{\theta}} \alpha^{-\frac{1-\theta}{\theta}} \xi^{-\frac{1}{\theta}} [\varepsilon + L] > 0 \quad (\text{A.3.1})$$

Analogously it can be shown that, for any $M > \underline{M} = L \frac{\varepsilon'}{1-\varepsilon'}$, utility in *case 2* is always higher than in *case 1*. Using (17) and (19) and given that there exists a $\psi \in]0,1[$ for which

$$M\psi = \underline{M} = L \frac{\varepsilon'}{1-\varepsilon'} \text{ we have:}$$

$$\begin{aligned} V_M^* - V_M^{**} &= \left(\frac{\theta}{\beta}\right)^\theta \left(\frac{1-\theta}{\alpha}\right)^\theta \left[M^{1-\theta} (1+\varepsilon)^\theta - (M+L)^{1-\theta} \right] = \\ &= \left(\frac{\theta}{\beta}\right)^\theta \left(\frac{1-\theta}{\alpha}\right)^\theta \left[M^{1-\theta} (1+\varepsilon)^\theta - \left(M + \frac{M\psi(1-\varepsilon')}{\varepsilon'} \right)^{1-\theta} \right] = \quad (\text{A.3.2}) \\ &= \left(\frac{\theta}{\beta}\right)^\theta \left(\frac{1-\theta}{\alpha}\right)^\theta M^{1-\theta} (1+\varepsilon)^\theta \left[1 - (\varepsilon' + \psi(1-\varepsilon'))^{1-\theta} \right] > 0 \end{aligned}$$

where the last term in square brackets is always positive (since $0 < \varepsilon' < 1$, $\forall \varepsilon > 0$ and $\forall \theta \in]0,1[$).

Figure 1

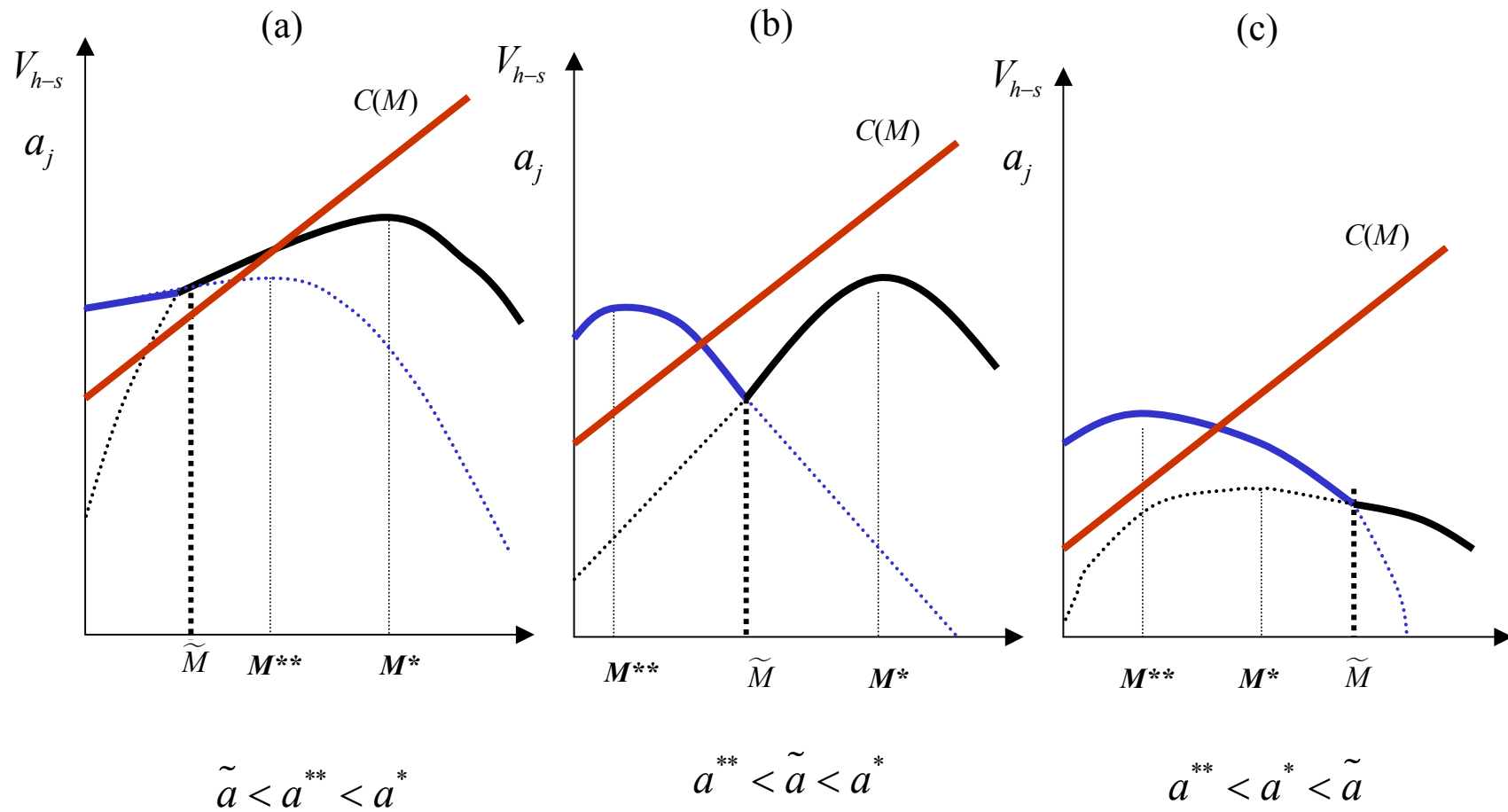
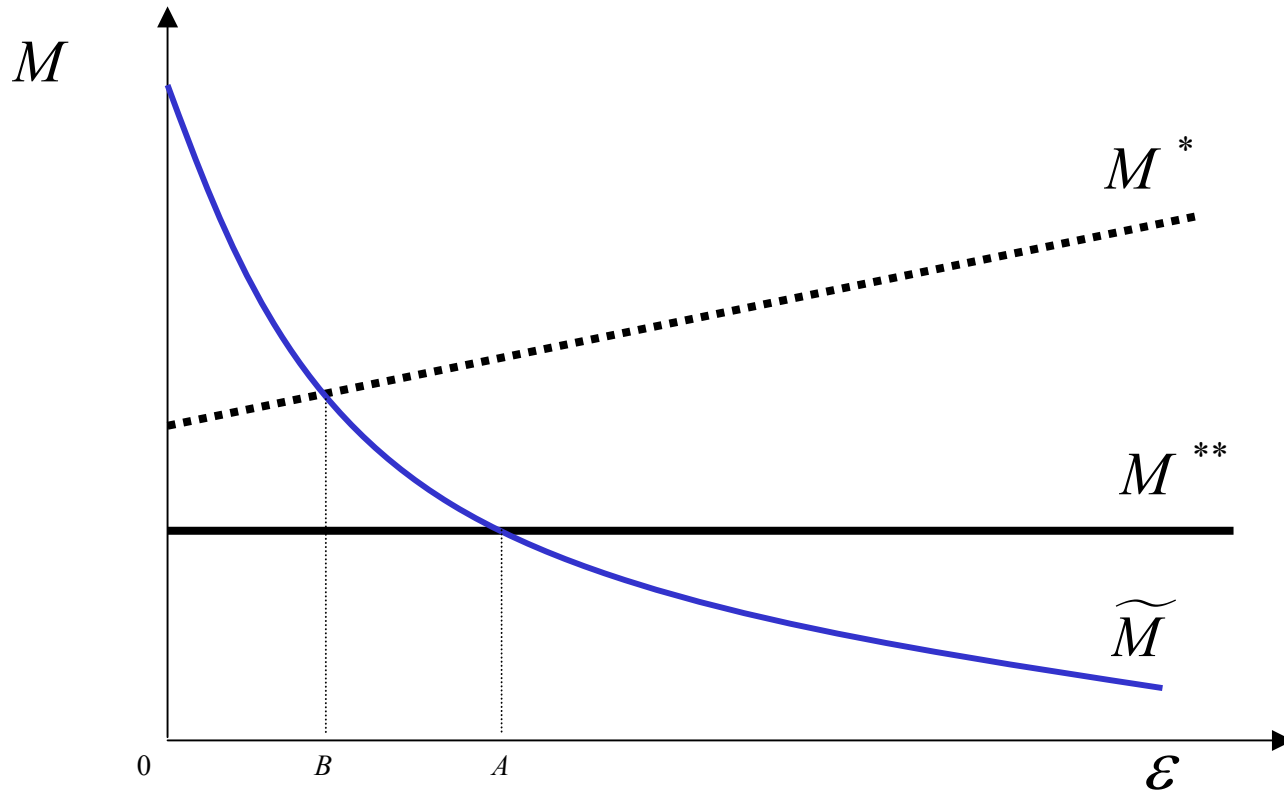


Figure 2



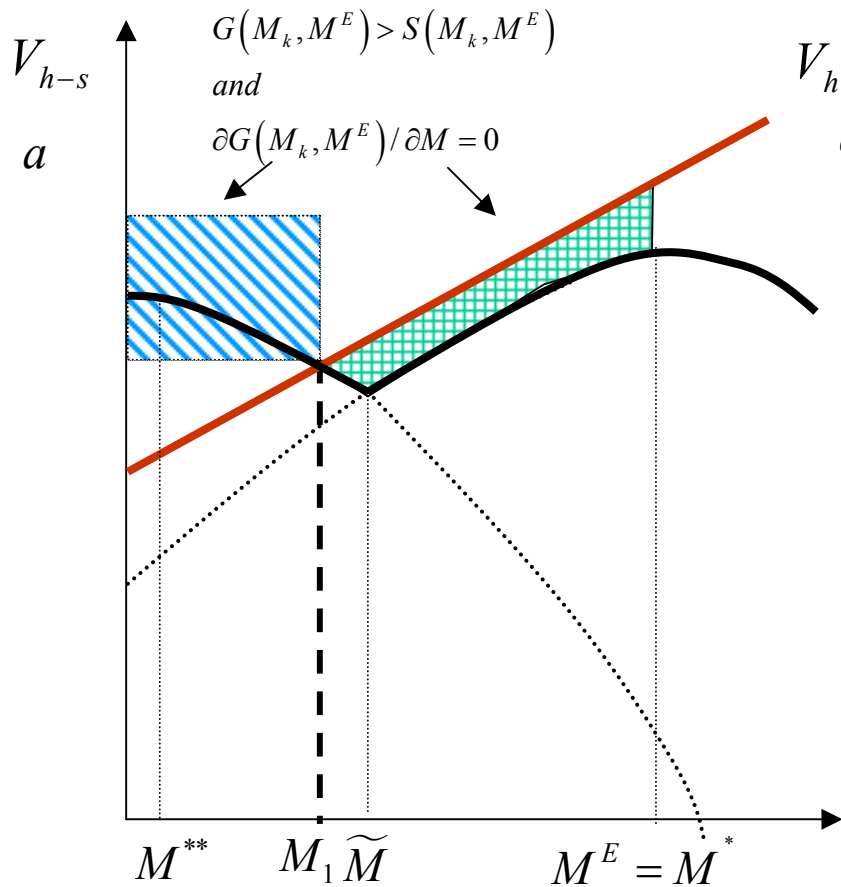
$$0 < \varepsilon < A \Rightarrow (M^{**} < M^* < \widetilde{M}) \quad \text{Figure 1- diagram (c)}$$

$$A < \varepsilon < B \Rightarrow (M^{**} < \widetilde{M} < M^*) \quad \text{Figure 1- diagram (b)}$$

$$\varepsilon > B \Rightarrow (\widetilde{M} < M^{**} < M^*) \quad \text{Figure 1- diagram (a)}$$

Figure 3

scenario (1)
 ethnic sector, support & $M^E = M^*$



scenario (2)
 ethnic sector, support & $M^E > M^*$

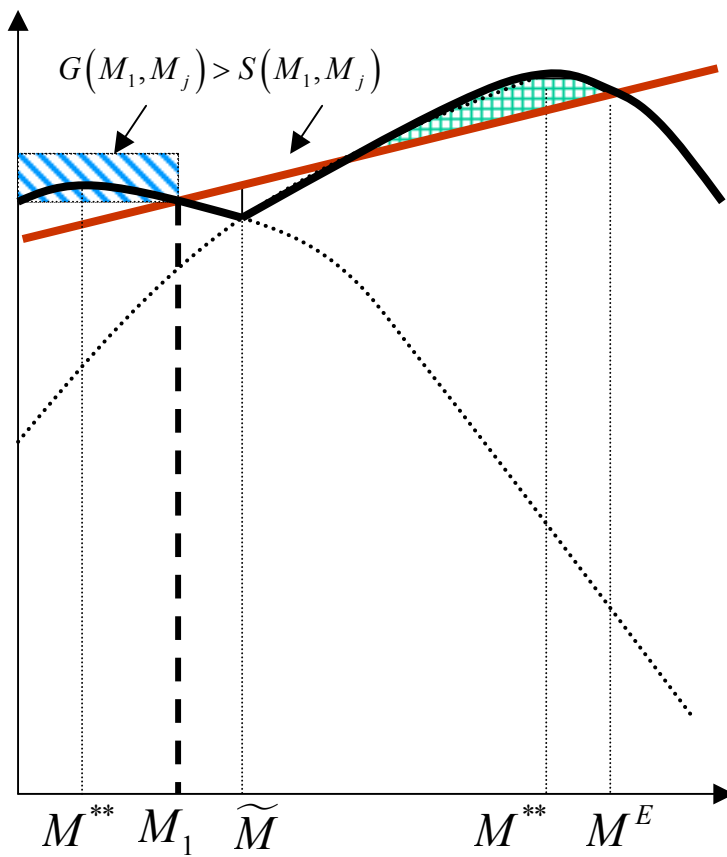
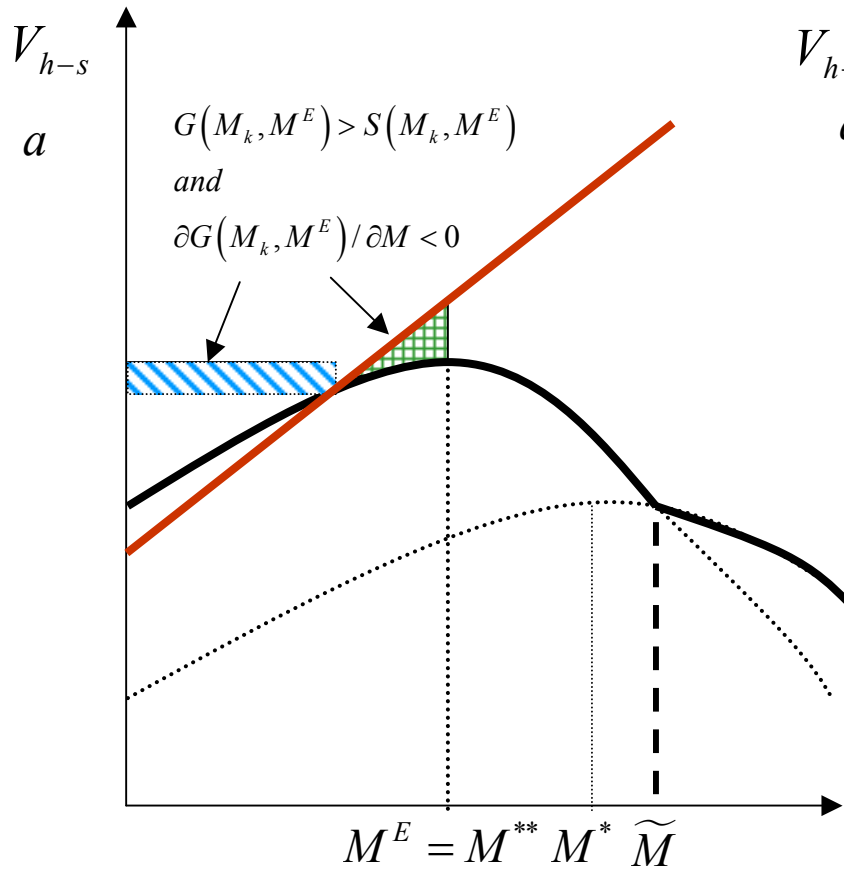


Figure 4

scenario (3)

no ethnic sector, support & $M^E = M^{**}$



scenario (4)

no ethnic sector, support & $M^E < M^{**}$

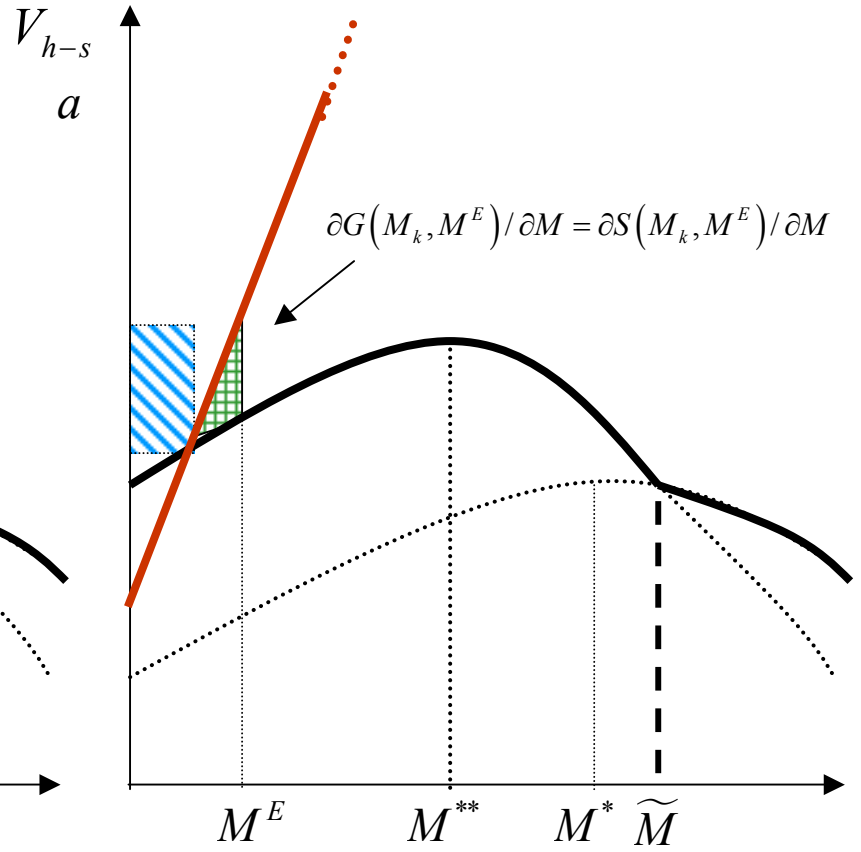
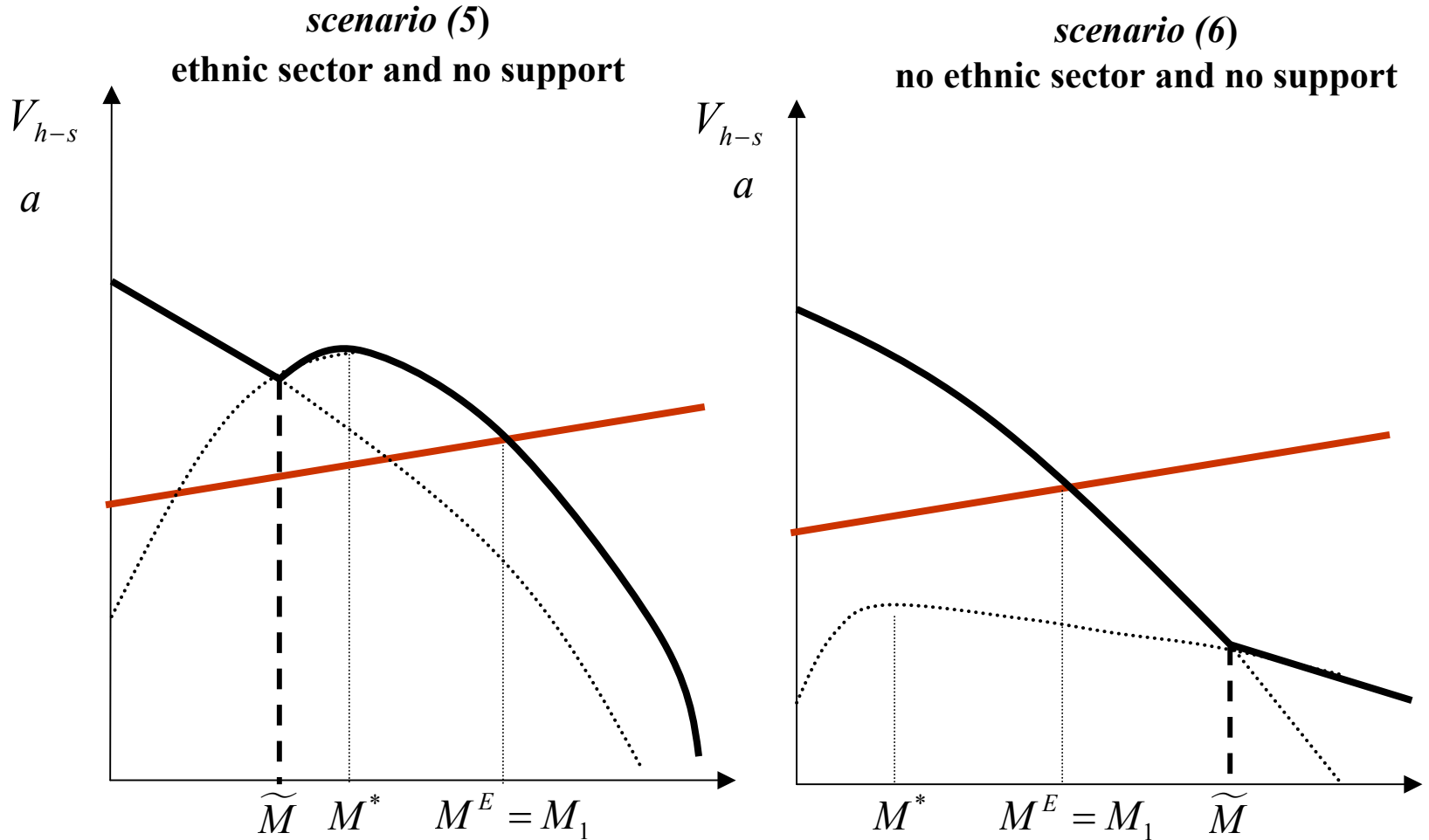


Figure 5



note: $M^{**} < 0$