

Taxation, ethnic ties, and the location choice of highly-skilled immigrants

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Abstract

With the emerging international competition for highly-skilled migrants, the determinants of their choice of residential location are of increasing importance. Besides job opportunities and the subjective evaluation of a location, two other factors determine the expected net return from migration: taxes and network effects. Yet, empirical research on the effects of these two factors and their interaction on highly-skilled migration is lacking.

For several reasons, Switzerland provides a particularly interesting country study. Tax rates are primarily determined at the local level in Switzerland and thus enough variation exists in order to analyse their influence on migration. Furthermore, in contrast to other European countries, Switzerland has pursued a fairly liberal immigration policy and maintains a unique permit system, which became increasingly skills-focused: more than 35 per cent of all persons with a university degree are immigrants. With the 2000 Swiss census data, evidence for fiscally-induced migration of highly-skilled people within Switzerland can be found, although the effects are not very large. The results also show that ethnic networks matter less for highly skilled immigrants, but this effect is too small to have a significant impact at the aggregate level.

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I. Introduction

Highly-skilled migration has been rising in recent years, both on absolute and relative levels (see OECD, 2002). The increasing economic integration has lowered psychic and real migration costs, particularly for the highly-skilled. At the same time, competition for highly-skilled migrants is intensifying: the ongoing international division of labour and technological progress demands a more skilled workforce (Acemoglu, 2002), while demographic developments in industrialised countries will most probably reduce their overall domestic labour force. These processes are similar across most developed countries, and immigration is considered to be a way of addressing skills shortages. As a consequence, several countries have introduced schemes to attract highly-qualified foreigners, such as the United States, Canada, Great Britain, Switzerland and Germany. Tax incentives have also been used to attract highly-skilled migrants (see Schön, 2002 and Mahroum, 2001).¹ In the Netherlands, for example, highly-skilled foreigners may profit from an income-tax allowance of 30 per cent. Yet, until recently, research on the particular determinants of highly-skilled immigration (and therefore on the competition for highly-skilled migrants) has received relatively little attention (Iredale, 1999).²

An exception is the role of income taxation on migration, which - since the seminal contribution of Tiebout (1956) - has been extensively discussed in the literature. Despite numerous theoretical contributions, empirical studies on the effect of taxation on migration are still very rare. This applies especially to studies based on micro-data and with respect to the impact of the skills level on fiscally-induced migration. Such a deficiency can be attributed to a variety of factors. Firstly, tax considerations are not the sole determinants of migration, though they influence the net return on migration.³ They therefore cannot be easily isolated from other factors that also determine the net return, such as wages, local amenities, housing prices and migration costs. Furthermore, these factors intervene with locational preferences. In addition, labour is neither as homogeneous nor as mobile as capital.

¹ Furthermore, Liebig (2001) has argued that the taxation of stock options in the boom period of the so-called “new economy” was one of the indications of an emerging competition for highly-skilled migrants.

² For a discussion of the impact of qualification on the migration decision, see Liebig and Sousa-Poza (2004a).

³ According to the human capital theory of migration, which has been introduced by Sjastaad (1962), the migration decision is determined by its net discounted return. For an overview of migration models, see e.g. Massey et al. (1993).

Importantly, host countries place restrictions on the immigration of labour. This makes studies on the impact of tax considerations largely unfeasible in an international context. Moreover, internationally comparable data are lacking.

One way of overcoming such obstacles is by focusing on internal migration in countries which have a decentralised tax structure. There are many similarities between fiscal relations among countries, particularly across the European Union, and within an individual country (Joumard and Konsgrud, 2003: 20). However, only few OECD countries have decentralised tax structures. Among these countries, Switzerland stands out as the country with the largest variation of tax rates at the sub-central level.

In principle, one could also study internal migration of highly-skilled people within the European Union. Nationals from EU countries enjoy freedom of movement throughout the Union, and tax rates vary widely. To date, empirical studies on tax competition in the EU have concentrated on capital tax competition – which is fundamentally different from income tax competition, *inter alia* because mobility costs are considerably lower and preferences do not play a role. Altshuler and Goodspeed (2002) estimate reaction functions with respect to taxation in a Nash competition model between EU countries. While they provide evidence for a strategic setting of capital taxation, they find no support for strategic interaction with respect to the tax burden on labour. This is not surprising as within the European Union, structural and institutional differences among countries are generally too large to isolate the impact of a particular factor such as taxation on migration, particularly if based on aggregated data.

Some of the most prominent empirical studies on tax competition have been conducted with Swiss data, such as the important contributions of Feld (2000), Feld and Kirchgässner (2001), and Kirchgässner and Pommerehne (1996). Yet, these studies are based on aggregated data and do not distinguish between skill levels. An analysis with micro-data is, however, desirable, as it allows one to control for individual characteristics that determine the migration decision and avoids the endogeneity problems that are inherent in aggregated data in the context of tax competition.

Like taxes, ethnic links also tend to raise the expected gain from migration, but their effect is naturally limited to foreigners. Past research on ethnic migration networks has largely focused on the development of ethnic communities and neglected the particularities of highly-skilled immigration. Theoretically, one would expect that ethnic ties matter less for the highly-skilled, as they tend to be less dependent on the services that ethnic networks may provide, such as information and ethnic goods.

In the field of immigration, Switzerland offers a particularly interesting country study. It has had a fairly liberal immigration policy - in contrast to most other European countries - which has given rise to a foreigner share and immigration flow that is, after Luxemburg, the second highest in the OECD (see Liebig, 2003). Furthermore, and contrary to other European host countries, most immigrants come from other OECD countries. In 2000, nationals from the neighbouring countries Germany, Italy and France accounted for about one third of all foreigners and more than 40 per cent of labour immigrants since 1995.

This paper attempts to fill the gap of empirical research on the particular determinants of highly-skilled migration by focusing on the interaction of these two important factors, i.e. taxes and ethnic networks. Firstly, the study analyses the impact of differing tax burdens on the migration of highly-skilled persons. Secondly, it examines whether highly-skilled immigrants are more or less tax sensitive than the Swiss. On the one hand, they could be less emotionally tied to a certain location, which would imply an increase in the tax sensitivity. On the other hand, network links and information asymmetries tend to limit tax sensitivity. Thirdly, this paper analyses the relative importance of ethnic ties for highly-skilled vis-à-vis other immigrants.

The paper is structured as follows: Section II outlines the theoretical background. Section III briefly sketches selected prior research on migration, network migration and tax competition, with particular reference to the Swiss case. Some important particularities of the Swiss tax and immigration system are summarised in Section IV. The data and methodology of the empirical analysis are presented in Section V. The results of the study are discussed in Section VI. Section VII concludes.

II. Theoretical background

The impact of tax rates on an individual's migration decision is relatively straightforward. For John Hicks (1932: 76), the incentives for migration were clear: “[D]ifferences in net economic advantages, chiefly differences in wages, are the main causes of migration.” The concept of differences in net economic advantages, which became the starting point of the traditional economic migration literature, has been formalised by Todaro (1969) and Harris and Todaro (1970). The formulation with taxes is as follows:

$$V(0) = \int_{t=0}^n [p_D(t)(1 - \tau_D)Y_D(t) - p_S(t)(1 - \tau_S)Y_S(t)]e^{-rt} dt - C(0), \quad (1)$$

where $V(0)$ is the expected discounted net present value of the income gain from migration over the time horizon n ; r is the discount rate; $C(0)$ represents the migration costs; $Y_S(t), Y_D(t)$ are wages in the source (S) and destination (D) countries at time t , respectively; τ_S and τ_D are the effective tax rates; and $p_S(t), p_D(t)$ are the probabilities of being employed in either of the two countries.

If $V(0) > 0$, i.e., if the expected discounted income gain from migration exceeds the migration costs, then an individual will migrate. In a setting with multiple prospective destinations, migration takes place into the country j in which the expected income stream net of taxes, $V_j(0)$, is maximised ($j=0$ for the country of origin and $j=1, 2, \dots$ for the prospective destinations):⁴

$$j \in \arg \max_j V_j(0) = \int_{t=0}^n [p_j(t)(1-\tau_j)Y_j(t)]e^{-rt} dt - \{0 \text{ for } j=0; C_j(0) \text{ otherwise}\} \quad (1a)$$

Assuming a Mincerian earnings function in which income is partly determined by the qualification level q (see Mincer, 1974), then, in the presence of progressive taxation,

$$\frac{\partial \tau}{\partial q} = \frac{d\tau}{dY} \frac{\partial Y}{\partial q} > 0.$$

Thus, people with a higher qualification level face a higher tax burden, not only in absolute, but also in relative terms. These individuals should, *ceteris paribus*, be more inclined to migrate for fiscal reasons. Accordingly, communities with a lower tax burden should attract relatively more highly-qualified people.

In the tradition of Mincer's (1978) family migration theory, not each individual, but rather the entire household is the appropriate unit of analysis in the context of migration. In terms of Equation (1a), $V_j(0)$ now becomes a sum of $V_{ij}(0)$, with $i = 1, 2, \dots, m$ representing the various household members. The new maximisation problem for a household f of size m is therefore:

$$j \in \arg \max_j V_j(0) = \arg \max_j \sum_{i=1}^m V_{ij} \equiv V_f(0) \quad (1b)$$

The net (post-tax) household income, however, has to be transformed into location-specific utility, which is derived from the consumption of generally-available goods on the one hand and from tangible and intangible location-specific goods and services such as proximity to

⁴ In addition, net wages should be adjusted for purchasing power by multiplying the net terms with some purchasing power measurement.

relatives, area amenities, climate, security, quality of life, etc. on the other. Utility can thus be represented by a function U of the following form (Wallace et al., 1997: 40ff.):

$$U = U(X_1, X_2, \dots, X_k; Z_{k+1}, Z_{k+2}, \dots, Z_{k+l}), \quad (2)$$

with X_a ($a=1, 2, \dots, k$) denoting the goods and services that can be consumed independently from a specific location. Z_b ($b=k+1, k+2, \dots, k+l$) depicts location-specific goods (i.e., not all of the Z_b are available at every locality) – for each location j , only the available goods are included. The household's (static) choice is thus constrained by location-specific budget functions:

$$Y_j = \sum_{a=1}^k v_a X_a + \sum_{b=k+1}^{k+l} v_b Z_b \quad (3)$$

with v_a, v_b being the prices of the respective goods and services.

Substituting Equation (3) into (1a) leads us to the point of departure for the literature on tax competition. Tiebout (1956) argues that competing local governments offer differing tax and expenditure packages.⁵ If people are sufficiently mobile, they migrate to the community with the tax/expenditure package that corresponds to their preferences. In equilibrium, an efficient allocation of resources emerges - no individual can improve his utility by moving to another community. A Tiebout equilibrium without migration only arises if taxes are used to finance public goods and not aimed at redistributing income (see also Hansen and Kessler, 2001).⁶ Furthermore, the Tiebout-model should only apply to agglomerations, as it ignores the fact that most jobs are bound to a specific workplace. For a given job, Tiebout-type migration should only occur within a distance where commuting is possible (see Mieszowski and Zodrow, 1989). Notwithstanding these restrictions, the resulting Tiebout-equilibrium is consistent with jurisdictions that have different tax schemes - differing tax rates may reflect varying demands for certain public goods.⁷ Furthermore, Oates (1969) has argued that

⁵ The original model was non-formal, but has received formalisation and adaptation in the work of Oates (1972) and others. An overview of the Tiebout literature is provided in Dowding and John (1994).

⁶ Of course, if redistribution is part of an individual's utility function, (some) redistribution does not prevent a Tiebout equilibrium without fiscally-induced migration.

⁷ Another strand of literature has focused on horizontal fiscal externalities, i.e., whether the tax rate chosen by one local government affects the choice of other communities (see Wildasin 1988, 1989). In this case, the tax rate set by one jurisdiction influences other communities, as mobile tax bases may move to the jurisdiction with lower tax rates. This could then either lead to a reduction in government size (i.e., lower revenue and, correspondingly, lower expenditure, particularly lower redistribution) or to a shift in the tax mix from mobile to immobile bases. In general, the favourable aspects of fiscal federalism were emphasised in the Tiebout literature, whereas the tax competition literature (in the more stringent sense) focused on the distortionary effects of different tax rates on the efficiency of allocation (see Brueckner, 2004, for a comparison).

differences in taxes and local public goods should be capitalized in the community's property values. If changes in the community tax burden are instantaneously capitalized, this would inhibit tax-induced migration. However, there are both theoretical and empirical arguments for a less than full capitalisation of fiscal differences in housing and property values, particularly regarding income taxes (see Feld, 2000 for an overview).

In a Tiebout setting, migration only occurs under two circumstances: either the individual's preference structure changes (due to marriage, birth of a child, etc.) and/or the equilibrium is disrupted by changes in communities' fiscal policies. The latter point is of importance in Switzerland, as many communities adjust their fiscal policies in order to attract certain groups of migrants. Despite tax harmonisation efforts at the federal level, the dispersion of tax rates across cantons has increased (OECD, 1999a). Our own calculations, using data from the Federal Tax Administration, show that, between 1995 and 2000, the tax burden at the community level on average declined, and the standard deviation increased. Therefore, the observed migration in Switzerland cannot *a priori* simply be attributed to changes in individuals' preference structures. Thus, even if an equilibrium existed,⁸ it is ultimately an empirical issue establishing the extent to which these tax-policy induced disequilibria affect migration.

Like taxes, ethnic network links presumably also increase the expected gain from migration, but the argument is somewhat different and their relative impact on highly-skilled migration is therefore less apparent. For an individual who considers migrating, ethnic network links lower the costs associated with migration and therefore increase its likelihood (Carrington, Detragiache and Vishwanath, 1996; Bauer, Epstein and Gang, 2000): firstly, these networks may convey information about the potential host country, its labour market and earnings opportunities. This decreases the risks associated with migration. Secondly, previous immigrants might financially assist newcomers. Migrant networks provide positive network externalities for the respective ethnic group, e.g. by increasing the amount of ethnic goods available in the region of destination.⁹ In a broad sense, these ethnic goods comprise not only

⁸ As has been noted by Petchey and Shapiro (2003: 3), "[a]part from earlier papers by Westhoff (1977) and Bewley (1981) there has been little concern about the existence of equilibrium for fiscal competition models. This is a curious oversight for there is little purpose in examining the efficiency properties of equilibria that do not exist."

⁹ A basic question in the study of network links is the definition of the effective group (see Duleep and Wunnava (ed.), 1995). In the broadest sense, a migrant network can be defined as all people from the same source country, i.e., ethnic networks (see, for example, Chiswick and Miller, 1996). Narrower definitions confine the definition of networks to people from the same origin country, i.e., community networks (see, e.g., Winters, de Janvry and Sadoulet, 2001), or to family ties (e.g. Orrenius and

physical goods (e.g. newspapers in the native language) but also cultural links. Thirdly, during the settlement process, new immigrants may be assisted by existing immigrants (e.g. by providing accommodation or financial assistance). In the context of international migration, networks are especially important as information asymmetries are generally larger and there are more barriers to overcome, e.g. to obtain entry and work permits (see Faist, 1997: 193f.).

For a variety of reasons, network links can be expected to be less important for highly-skilled migrants. As network links lower migration costs, the same absolute value of network links (i.e., reduction in migration costs) will - *ceteris paribus* - have different effects on the migration of people with different qualification levels (see Chiswick, 2000). Secondly, the highly-skilled most probably adapt more easily to a new environment, for example by mastering the foreign language more quickly than others. Finally, in addition to network externalities, herd behaviour might also explain ethnic migration (Bauer, Epstein and Gang, 2002). These herd effects arise if immigrants adapt their destination choice to places with significant prior immigration from the same origin, assuming that these people are well informed. As it can be assumed that highly-skilled persons tend to have better access to other information channels and to be more efficient in obtaining and interpreting information (see Chiswick, 2000 and Schultz, 1975), they should be less affected by these herding effects.

Likewise, sociological research has drawn attention to the fact that access to migrant networks is generally not open to all members of a community, as it tends to be selective, e.g. restricted to more skilled people (Faist, 1997). This favourable selectivity is particularly pronounced in the early stages of the networking process, when only a very small part of a source country's population resides in the host country. One could therefore expect new immigrants to be more skilled if the stock of previous immigrants from the same source country is relatively small.

The choice of migration channels also provides additional support for the hypothesis that network links should be less pronounced in highly-skilled migration (Findlay and Garrick, 1989). Migration channels are defined as the "intermediaries" (channels) through which people migrate from source to destination countries. Three main channels of structured migration have been identified: the internal labour markets of multinational enterprises (MNEs), recruitment agencies; and finally personal and other networks (Findlay, 1990). These migration channels have a propensity to function selectively. Immigrants select the

Zavadny, 2001). We use the broadest measure of migrant network, defining a network as people coming from the same source country, acknowledging that these ties should be expected to be weaker than in the other two groups (see Wilson, 1998).

channels that best serve their objectives (Findlay and Li, 1998). In general, intra-company transfers and recruitment agencies are heavily biased towards highly-skilled migrants, whereas, lowly-skilled workers rather rely on migrant networks.

III. Prior empirical research on the influence of taxation and ethnic networks on migration

There is a host of studies on the determinants of migration, each of which focuses on particular aspects of the migration decision (see the survey by Ghatak, Levine and Price, 1996). Likewise, there is a substantial amount of both theoretical and empirical literature on the economic effects of tax competition for individuals and households (for recent overviews, see Feld, 2000 and Wilson, 1999). Nevertheless, empirical studies on tax competition between governments that focus on differences in tax rates are still rare. Only few OECD countries give substantial autonomy to local authorities regarding public expenditure, and only Switzerland also has very dispersed income tax rates at the sub-national level.¹⁰

Prior empirical studies on tax competition have primarily focused on its redistributive effects and on the provision of public goods at the sub-central level (see the various studies reviewed in Cremer et al., 1996 and Dowding and John, 1994). Most studies did find some empirical support for tax competition, but the results are not very conclusive. Goodspeed (1998) discusses the similarities between the fiscal federalism and international tax strands of the literature on tax competition. He argues that, given the substantial measurement difficulties and the theoretical ambiguity of the consequences of tax competition, one should not be surprised to find very mixed empirical evidence. Furthermore, studies on tax competition with respect to personal income tax rates, such as the cross-country analysis in Razin, Sadka and Swagel (2002), generally rely on aggregated data.

The earliest study on tax competition in the Swiss context dates back to Frey (1981), who studied migration in the region of Basle and did not find evidence for an impact of tax rates on migration. Feld (2000) analyses aggregate migration flows among Swiss cantons and

¹⁰ Several countries – including the US – have substantial variation in local property taxes. Thus, a variety of empirical studies are concerned with this kind of tax competition, such as Brett and Pinkse (2000), Brueckner and Saavedra (2001), and Revelli (2002). The analysis of tax competition via property taxes is, however, fundamentally different. As Oates (1969) has argued, differences in local property taxes may be capitalized in the price of land. For a recent overview, see Wilson (2003).

major cities and did not obtain strong support, with, for the hypothesis of fiscally-induced migration at that level.

In the related field of public expenditure, Schaltegger (2003) does not find robust evidence for an impact of cantonal public expenditure on migration. Tapin and Keller (2003) analyse whether different social expenditures across the French part of Switzerland induce migration, and conclude that family and job-related factors are the prime motives of migration, while social welfare does not seem to affect movements. In contrast, Joumard and Giorno (2002) conclude in their OECD survey on public expenditure in Switzerland that welfare claimants appear to locate to communities with generous social-assistance programmes.

Kirchgässner and Pommerehne (1996), regressing the shares of income groups across cantons on cantonal tax burden, industry and infrastructure, find evidence that tax rates have an influence on the distribution of high-income earners across cantons. Feld and Kirchgässner (2001) test Tiebout's club hypothesis in a Swiss context with aggregated data from the 137 largest Swiss communities by regressing the share of various income classes on income tax rate and find evidence for tax competition, i.e. high earners locate to communities where the upper tax brackets are relatively low. Schmidheiny (2003), however, criticises these approaches as they neglect the inherent endogeneity problem in aggregated data, as the community characteristics are influenced by the choices of the inhabitants. Only from the perspective of the individual household can community characteristics be taken as given. This is a strong argument in favour of using micro-data in analyses of tax competition. Schmidheiny (2003) uses household-level data on migration in the urban agglomeration of Basle in 1997. His findings suggest that rich households are significantly more likely to move to low-tax communities than poor households. Liebig and Sousa-Poza (2004b) analyse internal migration in Switzerland with the first three waves of the Swiss Household Panel. They conclude that tax burdens do not have a significant impact on the migration decision and that housing-related factors primarily determine the migration decision.

There are, to the authors knowledge, no empirical studies on the impact of different income tax rates on migration that focus on highly-skilled immigrants. Given the fact that only Switzerland has sufficient variation in income tax rates to motivate fiscally-induced migration, this is not surprising. Furthermore, large samples are required as highly-skilled migrants comprise only very few actual cases in most data sets. With the 2000 census, a sufficiently large data set is available to allow for an in-depth study of the migration of

highly-skilled natives and immigrants - in a country where taxes vary widely across communities and more than 35 per cent of all highly-skilled persons are immigrants.

With regards to network migration, there also exists a vast empirical literature - although with an almost exclusive focus on two factors: the impact of family and ethnic ties on the economic situation of immigrants on the one hand, and the importance of network ties for overall migration flows and ethnic geographical segregation on the other hand.¹¹ Regarding the second strand, Rotte and Vogler (2000) find strong network effects when considering immigration from Least Developed Countries into Germany. Likewise, Bauer and Zimmermann (1997) note the importance of network ties in the migration of ethnic Germans. Both studies, however, do not take the educational level into account. A variety of studies analysed the importance of network ties in migration from Mexico to the United States. Given the large numbers of migrants involved, these studies are able to use a more disaggregate approach, defining networks as the proportion of the Mexican communities at the destination in the US (e.g. Munshi, 2003). Winters, de Janvy and Sadoulet (2001) find evidence that strong network effects diminish the importance of household characteristics in migration, favouring the immigration of people that would not have migrated otherwise. Orrenius and Zavodny (2001), in a study of illegal migration from Mexico to the US, find no evidence for an impact of family networks on the selectivity of migrants. Chiswick, Lee and Miller (2001) show that the extent of geographical concentration of immigrants in Australia is negatively related to the proportion of their ethnic group that is fluent in English.

The other main strand of network migration research tried to explain why some ethnic groups perform better on the labour market than others, mainly with reference to second-generation immigrants. Borjas (1994, 1995) provides evidence that the socioeconomic performance of foreign workers depends on the average skills of the ethnic group of the parents, that is ethnicity, has an external effect. In his studies, ethnic spillovers are particularly important at the extremes of the skill distribution. Attention has also been paid to wage differentials between natives and immigrants and among different ethnic foreigner groups (e.g. Reimers, 1983 and Kee, 1995). In the Swiss context, de Coulon (2001) studies wage gaps between natives and various groups of foreigners in Switzerland. He found that immigrants from more culturally distant countries face larger wage gaps.

¹¹ For an overview of this literature, see Duleep and Wunnava (1995).

None of the available empirical research is concerned with the relative importance of ethnic ties for highly-skilled migration. This is not surprising, as most of the empirical studies rely on data from labour force or household surveys. The number of highly-skilled foreigners in such surveys is generally too small to allow for a study of the location choice of highly-skilled foreigners, particularly with regard to ethnic ties. Reliable analyses can most probably only be undertaken with census data and in countries that have experienced substantial highly-skilled immigration from a variety of countries, such as Switzerland.

IV. Institutional background

Tax competition can be well analysed in Switzerland, since its tax system reflects the country's federal structure and is special in several regards. Of the countries surveyed in OECD (1999b), Switzerland has the highest share of sub-central government taxes in total tax revenues of general government. Only Canada (which was not surveyed in OECD, 1999b) has a higher share of subnational governments in tax receipts. However, although in Canada income taxes are mainly set at the provincial level - they account for less than ten per cent of local government's tax revenues (see Joumard and Kongsrud, 2003). In Switzerland, the main local tax sources are personal income taxes - as opposed to other decentralised countries such as the US, where property taxes are the most prominent local source. It stands out among other OECD countries as the nation in which local governments use their tax-setting autonomy most effectively, that is, income tax rates are the most important fiscal parameter at the local level and vary widely between communities. In the US, which also has a decentralised tax structure, less than ten per cent of local communities levy income taxes, and the rates are generally low (see Wallace and Edwards, 1999). In the Nordic countries, local governments have large *de jure* discretion to set tax rates, but they do not make effective use of this autonomy. These local governments may avoid aggressive tax competition in order not to jeopardize co-operation in other areas and vertical government transfers, which often exhibit discretionary features (Joumard and Kongsrud, 2003). This does not appear to be the case in Switzerland. The cantons are largely autonomous in setting their income taxes, both regarding the base and the rates. Local communities can set their own tax rates within the respective cantonal framework. Though some harmonization of cantonal tax structures was achieved in 2000 and 2001, the harmonisation mainly covered tax bases and the time of

taxation.¹² Thus, for each of the almost 3,000 communities different tax rates apply and dispersion is large.

For a non-married individual with no children who earns CHF 100'000 per year, the combined cantonal and local tax burden across Switzerland in communities with more than 2000 inhabitants varied from CHF 8'954 in Freienbach (Canton Schwyz) to CHF 22'784 in La-Chaux-de-Fonds (Canton Neuchâtel) in the year 2000. At the top income levels, differences in *marginal* rates are even more pronounced. Total marginal rates (including all government levels) at an annual income of CHF 500'000 ranged from about 21 per cent (again in Freienbach, Canton Schwyz) to more than 46 per cent (in Lauterbrunn, Canton Berne).¹³ Even between communities within a distance of less than 20 km apart, differences in average and marginal tax rates of more than 5 per cent are quite common. This unique situation makes Switzerland a particularly interesting country study for analysing the impact of different tax rates on migration: people may migrate *solely* for tax reasons and later commute without having to change their employment as well – in contrast to other areas with different tax rates and internal freedom of movement, such as in the US or the EU. In other words: if tax competition matters in the context of migration, it should show a measurable impact in Switzerland.

One objective of this study is to analyse whether two groups of inhabitants are particularly tax-sensitive, namely, people with a high income and foreigners. To better understand the incentive structure for the latter group, some particularities of the Swiss immigration system should be noted.¹⁴ Firstly, contrary to other European nations, Switzerland has had a fairly liberal immigration policy. Due to a traditionally tight domestic labour market, Switzerland has relied heavily on the recruitment of foreign labour, leading to a the second-highest foreigner share in the OECD (after Luxemburg). Labour immigrants first enter Switzerland by means of an annual permit, the so-called B-permit. Individuals with a B-permit have only limited mobility in Switzerland: a change of employment or canton of residence needs to be approved.¹⁵ Settlement permits (C-permits) are given to people who have resided in

¹² For a comprehensive overview of the Swiss tax structure and its implications for tax competition, see Waldburger (2003).

¹³ These rates include all government levels.

¹⁴ For comparative description of Switzerland's immigration policy, see Liebig (2003).

¹⁵ Since the 1st of June 2002, nationals of the European Economic Area (EEA) enjoy full mobility within Switzerland. Furthermore, their "annual" permit has a duration of five years. This analysis, however, relies on data that was collected prior to this liberalisation.

Switzerland for five (EAA and US nationals) or ten years (all other nationals) without interruption. Foreigners with a settlement permit are treated like Swiss nationals on the labour market and enjoy full mobility. Many second-generation immigrants are also included in this permit category. These people do not automatically become Swiss citizens, as Switzerland adheres to the *ius sanguinis* principle.¹⁶ Therefore, it is particularly important in the Swiss context to distinguish between immigrants and foreigners. The former group encompasses all individuals that were born abroad and who did not have Swiss citizenship at the time of birth. The latter group includes all people which do not have a Swiss passport, i.e., covers also second- and third-generation foreigners.

Until the 1990s, Switzerland's immigration policy favoured lowly-skilled immigration. Since 1991, immigration became gradually restricted to highly-qualified individuals and favoured immigration from countries belonging to the European Economic Area (EEA).

Holders of an annual permit are taxed at source (i.e., taxed at special rates that are uniform across all cantons and generally less preferential than ordinary taxation), whereas foreigners with a settlement permit are taxed like Swiss nationals. Therefore, tax competition among different communities should not matter for individuals with a B-permit. However, these persons may opt for an ex-post re-taxation – which results in a tax treatment like the Swiss – if they earn more than CHF 120'000. Thus, tax competition should only have an impact on B-foreigners earning more than CHF 120'000 and C-foreigners.

V. Data and methodology

Measuring the effectiveness of the widely-practised tax-policy measures by communities aimed at attracting highly-skilled migrants is an empirical issue. The focus of this paper is therefore to analyse the impact of community tax rates, ethnic ties and other location factors on the migration choice.

The analysis is primarily conducted with data from the 2000 Swiss census, which covered the entire population of Switzerland – both foreigners and natives, i.e. contains data on all 7.5 million residents in Switzerland, including almost 1.5 million immigrants. Although census data generally contains only limited information on individual migration behaviour, the 2000

¹⁶ Countries that adhere to the *ius sanguinis* principle, such as Germany and Switzerland, assign citizenship according to descent. Countries whose nationality is *ius soli*-based, like the United States, grant citizenship according to the place of birth.

census contains very rich information for the purposes of this study. It includes information on the current location and the location five years ago, the educational level, the nationality and the category of a foreigner's permit. The information on the place of residence five years ago allows for an analysis of actual migration behaviour with micro-data. The entire empirical analysis of the location factors for highly-skilled immigrants below is limited to individuals above the age of 20.

Of particular interest is the impact of tax rates on highly-skilled migration, i.e., whether communities with low rates have attracted people with a relatively high education level. As is generally done in empirical studies, highly-skilled people are defined by their qualification level, i.e., individuals having a university degree or equivalent (i.e., people who attended a vocational college).¹⁷ According to the Swiss Labour Force Survey, the mean income of highly-qualified foreigners in 2000 was 180'000 CHF. Therefore, it can be reasonably assumed that most of them earn at least 120'000 CHF or expect to do so in the foreseeable future. This is an important point as the Swiss census data does not include income data. Thus, even if they have only a B-permit (see Section IV), they could profit from tax differences within cantons.

The tax burden for the highly-skilled can be measured in a variety of ways.¹⁸ The approach taken here uses the average tax rate at a presumably "representative" income level for highly-skilled persons, i.e. at 150'000 CHF, as this level corresponds closely to the average household income of this group.

The 2000 census does not explicitly depict information on immigrant's length of stay in Switzerland. However, there is information on the different permit categories, the place of residency five years ago and the place of birth. With this information, labour immigrants can be categorised, proxying for duration. Ordered by the length of stay, there are C-foreigners that were born in Switzerland, C-foreigners that were not born in Switzerland, B-foreigners that entered Switzerland prior to 1995, and B-foreigners that entered Switzerland after 1995.¹⁹ This information also allows us to study the impact of the marked shift in Switzerland's

¹⁷ Correctly, "skilled" refers to the ability of performing certain tasks, while "qualified" stands for educational attainment. As "abilities" are difficult to measure, most empirical studies assume that the highly-skilled are also highly-qualified and use qualification as a proxy for skills (see e.g. Winkelmann, 2002; Auriol and Sexton, 2002).

¹⁸ For an overview of various measures, see OECD (2000) and de Haan, Sturm and Volkering (2003)

¹⁹ Note that the first group mentioned here, the C-foreigners that were born in Switzerland, are not included in the immigrant group as defined above.

immigration policy that occurred in the early 90s, i.e., a focus both on immigration from EEA countries and on immigration of relatively skilled people.

Federal statistics on the tax burden are taken from Eidgenössische Steuerverwaltung (various years) and covers all communities with more than 2000 inhabitants.²⁰

As in other studies (e.g. Feld and Kirchgässner, 2001), the analysis is augmented by the quality-of-life measurements from Walter-Busch (1997). These measurements are based on a survey among all Swiss recruits (i.e. males aged about 18). The new economics of migration (Stark, 1991) has drawn attention to the importance of subjective perceptions in the migration process. Likewise, social science research has indicated that quality-of-life is best measured by subjective evaluations (Walter-Busch, 1983, 2000).

The empirical analysis is conducted as follows: it starts with some descriptive information on highly-skilled immigrants, including information on the countries of origin, their destination choices, and the industrial sectors in which they work. To avoid biases that may occur with family migration flows (see Mincer, 1978), unless stated otherwise, the regression analysis is limited to the household head, which is defined as the person that works the most hours per week. The regressions provide answers to the following research questions:

1. What determines the migration decision?

The regression analysis starts with several binomial logit regressions of internal migration in Switzerland. The model to be estimated is as follows:

$$Y_i = \alpha_i + \beta'X_i + \varepsilon_i,$$

where the dependent variable Y_i has a value equal to "1" for people who migrated between 1995 and 2000 and "0" otherwise. The independent variables X_i in the various models include changes in the civil status, the educational level, the foreigner status, the tax burden in the origin community, the quality-of-life in the origin community, the community size, as well as cantonal and agglomeration dummies for the origin communities.²¹ This allows one to

²⁰ Furthermore, not all cantons collect information on the tax rates of their respective communities.

²¹ As has been noted by Feld and Kirchgässner (2001: 192), "[t]he quality of life indexes proxy to some extent for housing prices differences since these variables would presumably be capitalized into the price of housing. They thus partly compensate for the lack of housing variables in the model.

determine the socio-demographic characteristics of migrants and the push-factors for migration.

17 local industry structure variables are included, which enables one to control for purely job-related destination choices. The definitions of these variables are presented in Table A1 in the Appendix.

2. Do taxes and/or ethnic ties matter for new highly-skilled immigrants?

In a second step, a series of multinomial logit (MNL) regressions for immigrants which entered Switzerland between 1995 and 2000 is conducted. The MNL regression allows for the analysis of the determinants of the community choice of immigrants. The models to be estimated look as follows:

$$Z_i = \alpha_i + \beta'X_i + \varepsilon_i.$$

where Z_i is the community choice of individual i . This choice is explained by various socio-demographic characteristics X_i and cantonal dummy variables. The analysis is being limited to the ten most important countries of origin for labour immigration (defined as people with a B-permit) into Switzerland from 1995 to 2000. The dependent variable can take on 4 possible values, depending on the locational choice of the respondent: "1" if the respondent moved to a community with a low tax burden and a small ethnic network; "2" to a community with low tax burden and a large ethnic network, "3" to a community with high taxes and a small ethnic network, and, finally, "4" to a community with a low tax burden and a large ethnic network. The reference category is "4".

"High tax" communities are defined as communities that have a sub-national tax burden at an annual income of CHF 150'000 that is above the (un-weighted) Swiss average of 17.90 per cent, whereas "low tax" communities are defined as those with a tax burden up to this mean. The same classification procedure applies for ethnic networks. The ethnic network is measured as the local deviation from a supposedly equal distribution of the particular ethnic group across Switzerland. This is similar to the approach taken by Chiswick, Lee and Miller (2001).

The MNL analysis allows one to study the relative importance of network ties *vis-à-vis* the tax burden in the community choice of the highly-skilled immigrants. The distribution of the immigrants into the four categories is depicted in Table 1.

(Table 1 around here)

3. What determines aggregate flows of highly-skilled immigration?

The last part of the study investigates whether networks and taxes influence the inflow of new highly-skilled immigrants on an aggregated basis. The dependent variable in this final set of regressions depicts the respective shares of highly-skilled among the new immigrants for each community. In order to analyse the impact of ethnic ties, community shares are calculated separately for each of the ten largest ethnic groups of immigration from 1995 to 2000. The independent variables include the tax burden measure, and dummy variables for agglomerations and industry structure. On the one hand, compared to the MNL regression, this setting has the disadvantage of relying on aggregated data; on the other hand, it uses all information on the tax burden and the size of the ethnic network instead of having to classify communities into "high" and "low".

The empirical model that explains the relative share of new highly-skilled immigrants (Y) from country i into community j is therefore as follows:

$$Y_{ij} = \alpha_{ij} + \beta'V_i + \gamma'X_{ij} + \gamma'Z_j + \varepsilon_{ij},$$

where V_i depicts the dummy variables for the source countries, X_{ij} the stocks of each foreigner group in the communities and Z_j the characteristics of the host communities (tax rates, the value of the quality-of-life indicator, the local industry structure, as well as dummy variables for agglomerations and the respective cantons).

As each community enters several times into the regression, standard errors could be heteroskedastic. Therefore, the regressions are corrected for robust community clusters, which follows the correction proposed by White (1980). Furthermore, as there are many observations with a share of zero, a Tobit specification is used. As the dependent variable consists of the share of highly-skilled migrants from each country group, the observations are weighted by the underlying absolute numbers, i.e. the inflow of each nationality group into each community.

VI. Empirical analysis

With the 2000 census, rich descriptive information on the characteristics of the immigrants is available. This is particularly noteworthy as there is generally very limited information on the characteristics of skilled immigrants, both on a national and international level. The Central

Foreigners' Register in Switzerland, for example, does not contain information on the education level of immigrants, and the size of the foreign population in other surveys (such as the Swiss Household Panel or the Swiss Labour Force Survey) is relatively small. Thus, it has not been possible to reliably describe the socio-demographic characteristics of the foreign population in Switzerland. The analysis therefore begins with a comprehensive overview of the characteristics of the highly-skilled immigrants in Switzerland. The most important origin countries are depicted in Table 2.

(Table 2 around here)

As can be seen, highly-skilled immigrants come mainly from OECD countries, particularly Germany, France, the United Kingdom, Italy and the USA. Germany alone accounts for more than 25 per cent of all highly-skilled immigrants, the top five countries together comprise more than half of all 107'552 highly-skilled immigrants. In contrast, total immigration is concentrated towards southern European countries, i.e., Italy, Yugoslavia, Portugal and Spain - with neighbouring Germany being a notable exception. These five countries account for almost 60 per cent of the 1'311'795 immigrants older than 20. What is noteworthy is the variation in the share of highly-skilled immigrants depicted in Table 2. Whereas immigrants from Northern European countries tend to be very skilled, the share of highly-skilled individuals from Southern European nations is significantly lower. This seems to be a result of the former policy that implicitly favoured lowly-skilled immigration by means of seasons permits until the early 1990s.²² These seasonal permits were mainly granted to people from Southern European countries.

The gradual focusing on Europe and skilled immigration that has taken place in Switzerland's immigration policy since the early 1990s has not had a profound impact on the composition of the origin countries of immigration. Table 3 shows the most important origin countries of labour immigration (i.e., new immigrants with a B-permit) since 1995.

(Table 3 around here)

²² Until the early 90s, the so-called seasonal permit promoted a substantial influx of labour immigration into the low-skilled "seasonal" sectors. It became gradually restricted to EEA nationals and was finally abolished in 2003. See Liebig (2003) for a discussion.

However, the shift in Switzerland's immigration policy that occurred in the early 1990s is quite pronounced in the share of the highly-skilled among the new immigrants. Among the 141'406 new immigrants with a B-permit since 1995, the share of highly-skilled is almost one third, whereas for people who immigrated prior to that date, the share of highly-skilled was only about ten per cent.²³ Yet, immigrants from Southern European countries continue to be relatively lowly-skilled. On the other hand, immigrants from Central and Eastern Europe, where pre-1995 stocks were very low, had a very favourable skills level. In general, there is no significant correlation between the previous stock of nationals and the share of highly-qualified among the immigration flows. A simple correlation analysis for the 183 origin countries of immigration from 1995-2000 revealed no significant results (Pearson correlation coefficient: -0.036; significance level: 0.63).

A second observation concerns the occupations of highly-skilled immigrants, which tend to cluster in certain business sectors. Table 4 illustrates the sectors with the highest shares of highly-skilled immigrants - both relative to total employment and to all highly-skilled employed in the respective sector. The classification of business sectors is done with the NOGA nomenclature ("*nomenclature générale des activités économiques*").

(Table 4 around here)

Besides the apparently skill-intensive internationally-oriented sectors (research and development, consulting, universities), Switzerland's banking and health sector are also very dependent on highly-skilled immigrants. Note that there is a strong correlation between absolute and relative importance of highly-skilled immigration in the business sectors listed in Table 4. Remarkable is furthermore, the fact that in some sectors, namely software development and consulting, university education, business consulting and hospitals, more than one out of three employees is a highly-qualified immigrant.

A concentration of highly-skilled foreigners can also be observed in certain communities. Whereas the highest absolute numbers are - not surprisingly - encountered in the big cities, it is more interesting to have a look at those communities which have the highest share of highly-skilled individuals among the immigrant population (see Table 5).

²³ Note that even this latter figure is above the corresponding share for the total population (8 per cent), i.e., immigrants are over-represented at the top end of the qualification scale.

(Table 5 around here)

It is interesting to note that, firstly, communities around the Lake Geneva region figure prominently among those with the highest share of highly-skilled among the foreign population. Secondly, many of these communities do not have tax rates that are significantly below the national average. However, this is not surprising, as the cantons of Geneva and Vaud, which account for 15 out of these 20 communities, have tax rates well above the national average. Within these cantons, however, a negative correlation between the share of highly-skilled immigrants and the tax burden in the respective community can be observed. This is a first indicator of a sequential nature of the location choice, i.e. taxes might not influence the selection of a certain region, but may affect the community choice within that region. In other words, there may be little or no competition among cantons, but notable competition within a canton. These descriptive results cast some doubts on the validity of studies that are restricted to differences in cantonal rates, such as Kirchgässner and Pommerehne (1996).

1. What determines the migration decision?

The regression analysis first studies internal migration within Switzerland. The results of the binomial regressions are depicted below in Table 6, summary statistics can be found in Table A2 in the Appendix.

(Table 6 around here)

A first observation is the fact that the main predictions of migration theory can be confirmed: migrants are younger and typically singles. Highly-skilled individuals are also more inclined to migrate. The migration propensity declines with the number of children and the community size, i.e. people living in large cities have a lower tendency to change their community. Somewhat surprising is the fact that females tend to migrate more than males, though the effect is small. Note, however, that the study is limited to the household head, which is defined as the person working the most hours. There is thus *a priori* no reason to believe that women should be less mobile. At first sight, one might also be surprised that immigrants are substantially less mobile. However, for most immigrants, a change in the canton of residence

is subject to permission. Accordingly, the effect of the immigrant status is greatly reduced as soon as the canton is controlled for.

The main interest in this analysis is the impact of taxation on migration. Clearly, there is a positive relation between the tax differential and the migration probability, i.e. highly-skilled people move to low-tax regions. In models 2 to 4, there is no evidence that highly-qualified foreigners are more sensitive to tax differences than the Swiss. Controlling for cantonal effects, the coefficient for the interaction between tax difference and highly-qualified foreigners changes its sign and, after controlling for local industry structure, even becomes significant. Hence, there is some indication that foreign highly-skilled people are relatively more sensitive to differences in taxation. That this impact only arises after controlling for cantonal effects can again be explained by the fact that immigrants are restricted in their mobility: as noted above, a change in the canton of residence requires authorisation by the authorities, i.e. full freedom of residence choice for foreigners only applies within a given canton.

In the logistic regression, one can also determine the relation between the tax burden and the probabilities of moving for the four groups that are of particular interest for this study, namely less-skilled immigrants, highly-skilled immigrants, total less-skilled population (i.e. including the Swiss and all foreigners who were born in Switzerland) and the highly-skilled native-born population. Figure 1 depicts the values for the relation between moving probability and the difference in tax rates for a single, 30-year old male based on model 5. The x-Axis represents the range of the 90 per cent interval of the community tax differences between 1995 and 2000 for all individuals.

(Figure 1 around here)

Though the tax effects are significant, they are not very large. For a highly-skilled native, the probability of migrating to a community with a tax burden that is 1 percentage point *lower* than the origin community is only about 6 percentage points higher than a move to a community that has a 0.7 percentage point *higher* tax burden than in the community of origin (i.e., a probability of migrating of 24.5 per cent versus 18.5 per cent). The impact on natives and immigrants is roughly the same, but - as can be expected under progressive taxation - smaller for people without a university degree. The relatively small size of the tax effect

becomes clear when considering that the sole effect of being married lowers the probability of migration by almost 7 per cent.

2. Where do new immigrants go to?

The analysis now turns to the MNL models to investigate the community choice of new immigrants from the ten most important origin countries of labour immigration between 1995 and 2000 as depicted in Table 3. These ten countries account for almost two thirds of all labour immigration into Switzerland in that period. As discussed above, for the highly-skilled one would assume a tendency to move to communities with lower taxes. Furthermore, network ties can be supposed to matter less for the highly-skilled. However, both of these effects should mainly materialise within a given canton, as new immigrants are restricted in their community choice by the fact that their permit is generally tied to a certain canton. Since the coefficients of the other variables are not of interest in this context, Table 7 only depicts the coefficients of the dummy variable for the highly-qualified. Summary statistics are presented in Table A3 in the Appendix.

(Table 7 around here)

The first and most important result is that in no specification are the coefficients significantly negative. As any category should be preferred over the reference category for the highly-skilled, this confirms the predictions. Apparently, highly-skilled immigrants favour low tax communities: in all four models, they are significantly over-represented in the low-tax communities. Category two (low taxes, large ethnic networks) is no longer significant as soon as cantonal effects are controlled for (model 4). Given the limited inter-cantonal mobility of foreigners in Switzerland and the fact that immigration into a canton is demand-determined, model 4 is apparently the most valid one the purpose of this study. The analysis of model 4 shows that the highly-skilled are relatively more attracted to communities with low taxes and small ethnic networks than their fellow nationals.

How large is this effect? The exponent reveals that the odds of a person falling into the first rather than the fourth category are 1.23 times higher if this person is highly-skilled. These odds can be transformed into probabilities as follows: $\text{probability} = \text{odds}/(1+\text{odds})$, i.e. being highly-qualified increases the probability of choosing a low tax, small ethnic network community instead of high tax, large ethnic network community by 55 per cent. Though

considerable, this does not imply a very large degree of selectivity.²⁴ The MNL analysis thus confirms the result that taxes have an impact, but it is not very large. It also indicates that ethnic ties matter less for the highly-skilled, i.e. there is an attenuating effect of ethnic networks on the selectivity of migrants. Again, however, the effect is rather small.

3. What determines the share of highly-skilled among new immigrants?

The last set of regressions studies the locational characteristics that determine the share of highly-skilled among the new immigrants. Again, the analysis is restricted to the ten most important source countries of labour immigration between 1995 and 2000. Each nationality in each community is treated as one observation. Table 8 below shows the results of the Tobit regressions. Summary statistics are depicted in Table A4 of the Appendix.

(Table 8 around here)

A very robust influence of the tax burden on the share of highly-skilled immigrants can be observed. Note that the coefficients in the Tobit model cannot always be easily interpreted.²⁵ However, running Weighted Least Squares regressions, where the coefficients can be directly interpreted, leads to results which are quantitatively identical, and gives a good indication of the magnitude of the effect. In models 3 and 4, for example, a 1 per cent decrease in the community tax rate leads to a corresponding increase in the share of highly-skilled people among new immigrants of 0.7 per cent. In contrast, being located in an agglomeration leads to an increase of more than 11 per cent in model 3. Thus, the effect of the tax burden on the composition of the flows of immigrants is not large. The Tobit analysis also reveals that large communities are associated with a higher qualification level of the immigrants, but the effects are not robust. The share of highly-skilled is not influenced by the quality-of-life indicator. Although the sign of the network-size coefficient is mostly negative (which would imply that

²⁴ Assume for convenience that 100 less-qualified immigrants were spread evenly among categories 1 and 4, i.e. 50 immigrants locate in each community. A 50 per cent higher probability of the highly-skilled selecting category 1, whereas 40 should still choose category 4.

²⁵ The Tobit model assumes non-observabilities in the dependent variable which result in values of zero. Accordingly, it is implied that the dependent variable could take on values below zero. The model estimates the coefficients under this assumption. Therefore, Maddala (1990) argues that the Tobit model is inappropriate in applications where the values of the dependent variable are zero due to other factors than non-observability. He proposes the sample-selection correction of Heckmann (1974) as an alternative. This, however, is not possible here due to the aggregated nature of the data.

network ties matter less for the highly-skilled), it is not significant at conventional levels. This is primarily due to the aggregate nature of the analysis. It therefore seems to confirm the result of the MNL regressions

VII. Conclusions

Even prior to the emerging competition for highly-skilled foreigners, the impact of taxation on migration attracted much interest among economists and policy makers alike. On the one hand, it is acknowledged that fiscal federalism may be efficiency-enhancing, as it allows fiscal policy to adjust to local preferences, and many OECD countries are discussing the issue of tax decentralisation. As Oates (1999: 1120) remarks: “[f]iscal decentralisation is in vogue”. In Germany, a reform of fiscal federalism is currently being discussed, which aims at providing more taxation autonomy to the *Länder*.²⁶ One important objection against such policies is related to the potential negative spillovers from tax competition among local governments, specifically, local governments may engage in a wasteful competition for taxpayers which may lead to sub-optimally low rates.

However, tax competition will only materialize if actual migration is tax-induced. Yet, prior empirical studies on the impact of tax competition on migration behaviour have been limited by a lack of comparable data in an international context and a lack of variation in tax rates internally. Only in Switzerland, with its unique tax system where income taxes are primarily determined at the local level, can the effect of income taxation on migration be studied. Earlier studies on tax competition in Switzerland had to rely on aggregated data and were generally supportive of the notion of tax competition. Yet, these aggregated data may be associated with endogeneity problems and cannot adequately analyse the individual determinants of migrants’ location choices.

The first and main result is that, although fiscally-induced migration in general cannot be observed, the community tax burden has a significant impact on the migration of highly-skilled people. This result is very robust, and holds even after controlling for several factors, including quality-of-life measures. Yet, the effect is quite small.

These results cast some doubts on the effectiveness of tax incentives as a means of attracting highly-skilled immigrants, as has been attempted in, among other countries, Sweden and the Netherlands. The analysis has shown that - by and large - fiscally-induced migration of the

²⁶ See the German Federal Minister of Finance, Hans Eichel, in *Frankfurter Allgemeine Zeitung* (2003).

highly-skilled is not present in Switzerland. If the tax burden does not affect the community choice at the sub-national level in a country where tax rate differences of 10 per cent within a distance of 100 km are common, it is unlikely to have a large impact on international migration flows.

The results also indicate that ethnic networks matter less for highly- than lowly-skilled immigrants, but the effects are too small to have an impact on the aggregate skills composition of the immigration flows into each community. The smaller impact of networks on the highly-skilled can be explained by the lower migration costs of these individuals, including their better ability to assimilate and access information.

Tables:

Category	Distribution (cases)	Share of highly-skilled (number)
Low tax and small network	12.1% (5'069)	41.9% (2'125)
Low tax and large network	40.8% (17'087)	49.2% (8'409)
High tax and small network	12.1% (5'053)	41.3% (2'087)
High tax and large network	35.0% (14'620)	40.8% (5'963)
<i>Total</i> (total share)	41'829	18'584 (44.4%)

Table 1: The distribution of new immigrants into the community classes

Rank	Highly-skilled immigrants		Total immigrants	
	Country of origin	Number (share out of total)	Country of origin	Number (share of highly skilled)
1	Germany	29'768 (32.36%)	Italy	193'676 (3.61%)
2	France	11'734 (24.07%)	Yugoslavia	117'803 (2.92%)
3	UK	8'099 (48.52%)	Portugal	96'199 (0.78%)
4	Italy	6'996 (3.61%)	Germany	91'988 (32.36%)
5	USA	6'270 (65.51%)	Spain	54'925 (3.63%)
6	Netherlands	3'679 (32.15%)	France	48'758 (24.07%)
7	Yugoslavia	3'435 (2.92%)	Turkey	47'449 (3.37%)
8	Austria	2'946 (12.40%)	Macedonia	31'263 (2.04%)
9	Belgium	2'718 (46.06%)	Bosnia and Herzegovina	28'548 (2.60%)
10	Sweden	2'196 (49.22%)	Croatia	26'888 (4.21%)

Note: The figures refer to the number of persons above the age of 20 residing in Switzerland in 2000. The percentage points in parentheses indicate the share of highly-skilled people among each nationality's foreigner stock.

**Table 2: The most important origin countries
of highly-skilled and total immigration into Switzerland**

Rank	Highly-skilled immigrants		Total immigrants	
	Country of origin	Number (share out of total)	Country of origin	Number (share of highly-skilled)
1	Germany	12'665 (52%)	Germany	24'415 (52%)
2	France	4'829 (42%)	Yugoslavia	11'615 (4%)
3	UK	3'141 (60%)	France	11'568 (42%)
4	USA	2'775 (69%)	Italy	8'699 (27%)
5	Italy	2'370 (27%)	Portugal	5'858 (4%)
6	Netherlands	1'141 (51%)	UK	5'205 (60%)
7	Russia	1'064 (55%)	Turkey	4'888 (11%)
8	Canada	992 (59%)	USA	4'000 (69%)
9	Belgium	855 (60%)	Macedonia	3'966 (3%)
10	Austria	846 (28%)	Brazil	3'384 (16%)

Note: The figures refer to the number of immigrants above the age of 20 who entered Switzerland with a B permit between 1995 and 2000. The percentages in parentheses indicate the share of highly-skilled people among each nationality's foreigner stock.

Table 3: The most important origin countries of highly-skilled and total immigration of foreigners with a B-permit into Switzerland, 1995-2000

Rank	Sectors with highest number highly-skilled immigrants		Sectors with highest share of highly-skilled immigrants out of total employment		Sectors with highest share of highly-skilled immigrants out of total highly-skilled	
	Sector ^a	Number	Sector ^b	Share	Sector ^{a,c}	Share
1	Universities and colleges	6'296	Software development and consulting	42%	Production of motors and generators	74%
2	Hospitals	3'933	Universities and colleges	41%	Wholesale (chemical or unspecified)	69%
3	Software development and consulting	3'900	Business consulting	37%	Services of investment companies	58%
4	Business consulting	3'534	Hospitals	34%	Foreign banks	56%
5	Major Swiss banks	2'335	Major Swiss banks	31%	Physic therapies	56%
6	R&D (natural sciences)	2'164	Religious associations	30%	Production of electronic components	55%
7	Medical practitioners	2'155	Auditing, tax consulting and trustees	28%	Catering	50%
8	Financial institutions (unspecified)	1'987	Architecture firms	19%	Production of medical and surgical devices	50%
9	Foreign banks	1'906	Medical practitioners	19%	Production of pharmaceuticals	49%
10	Auditing, tax consulting and trustees	1'759	Higher vocational schools	18%	R&D (natural sciences)	47%

^a Excluding embassies.

^b Only sectors with more than 5000 total employees were taken into account.

^c Only sectors with more than 5000 total employees and a share of highly-skilled employees above 10% were taken into account.

Table 4: Sectors with the highest shares of highly-skilled foreigners

Rank	Canton	Community ^a	Share of highly-qualified immigrants (number of all immigrants)	Deviation from weighted national tax average (deviation from cantonal average) ^b
1	Vaud	Commugny	0.49 (723)	-2.08 (-3.13)
2	Geneva	Cologny	0.47 (1'595)	+0.12 (-1.57)
3	Vaud	Founex	0.45 (826)	-1.7 (-2.75)
4	Geneva	Pregny-Chambésy	0.43 (943)	+0.23 (-1.46)
5	Geneva	Vandoeuvres	0.43 (664)	+0.39 (-1.3)
6	Vaud	Saint-Sulpice	0.41 (721)	-2.92 (-3.97)
7	Geneva	Genthod	0.40 (614)	+0.3 (-1.39)
8	Geneva	Bellevue	0.40 (514)	+1.42 (-0.27)
9	Vaud	Coppet	0.39 (729)	-2.08 (-3.13)
10	Geneva	Collonge-Bellerive	0.38 (1'775)	+0.01 (-1.68)
11	Zug	Walchwil	0.38 (730)	-7.46 (+0.20)
12	Zurich	Herrliberg	0.35 (859)	-5.62 (-2.55)
13	Geneva	Confignon	0.35 (571)	+1.9 (+0.21)
14	Geneva	Chêne-Bougeries	0.33 (2'940)	+0.67 (-1.02)
15	Geneva	Veyrier	0.33 (2'132)	+1.34 (-0.35)
16	Zurich	Maur	0.33 (1'483)	-5.37 (-2.3)
17	Zug	Oberägeri	0.33 (625)	-7.58 (+0.08)
18	Geneva	Le Grand-Saconnex	0.32 (2'777)	+1.56 (-0.13)
19	Vaud	Lutry	0.32 (1'711)	-0.82 (-1.87)
20	Zürich	Kilchberg	0.32 (1'453)	-4.55 (-1.48)

^aOnly communities with more than 500 immigrants taken into account.

^bThe respective cantonal averages deviate from the weighted national tax average as follows:
Geneva: 1.69; Vaud: 1.05; Zug: -7.66; Zurich: -3.07.

Table 5: Communities with the highest shares of highly-skilled among the immigrant population

	model 1	model 2	model 3	model 4 ^d	model 5 ^e
Constant	-0.428** (0.010)	-0.453** (0.011)	-0.518** (0.011)	-0.190** (0.036)	0.571** (0.053)
highly-qualified ^a	0.713** (0.007)	0.684** (0.009)	0.715** (0.010)	0.849** (0.010)	0.791** (0.010)
age	-0.044** (0.000)	-0.049** (0.000)	-0.049** (0.000)	-0.048** (0.000)	-0.047** (0.000)
married ^b	-0.395** (0.007)	-0.452** (0.008)	-0.458** (0.009)	-0.477** (0.009)	-0.448** (0.009)
male ^a	-0.103** (0.006)	-0.130** (0.006)	-0.133** (0.006)	-0.175** (0.007)	-0.146** (0.007)
immigrant ^a	-0.216** (0.007)	-0.171** (0.008)	-0.172** (0.008)	-0.075** (0.008)	-0.103** (0.008)
number of children ^b	-0.084** (0.003)	-0.094** (0.004)	-0.098** (0.004)	-0.119** (0.004)	-0.108** (0.004)
tax difference ^c		0.086** (0.002)	0.141** (0.002)	0.220** (0.003)	0.204** (0.003)
tax difference ^c × highly-qualified		0.059** (0.005)	0.034** (0.005)	0.015** (0.005)	0.012* (0.005)
tax difference ^c × highly-qualified × immigrant		-0.008 (0.009)	-0.015 (0.009)	0.015 (0.009)	0.023* (0.010)
quality-of-life difference ^c			-0.717** (0.022)	-0.801** (0.023)	-0.352** (0.024)
quality-of-life difference ^c × highly-qualified			0.254** (0.053)	0.257** (0.055)	0.603** (0.056)
quality-of-life difference ^c × highly-qualified × immigrant			0.428** (0.105)	0.327** (0.110)	0.182 (0.112)
agglomeration ^{a, b}				0.052** (0.009)	-0.083** (0.010)
community size ^b × 10 ⁻⁶				-0.327** (0.052)	-2.860** (0.063)
N	2'220'294	2'134'625	2'110'698	2'109'763	2'109'763
Pseudo-R ²	0.116 ^f	0.133 ^f	0.141 ^f	0.177 ^f	0.189 ^f

Note: standard errors in parentheses

^adummy variable

^brefers to status in 1995

^crefers to the difference between 1995 and 2000

^dincluding dummy variables for each canton

^eincluding dummy variables for each canton and for local industry structure

^fthe pseudo-R² is that of Nagelkerke (1991)

*/** significant at the 5%/1% level, respectively

Table 6: Determinants of internal migration - binomial logit regression

	model 1		model 2		model 3		model 4	
	coefficient (std. error)	exponent	coefficient (std. error)	exponent	coefficient (std. error)	exponent	coefficient (std. error)	exponent
low taxes, small ethnic network	0.047 (0.033)	1.048	0.076* (0.035)	1.079	0.102** (0.039)	1.107	0.207** (0.048)	1.230
low taxes, large ethnic network	0.341** (0.023)	1.407	0.329** (0.024)	1.390	0.101** (0.028)	1.106	0.056 (0.037)	1.057
high taxes, small ethnic network	0.021 (0.033)	1.022	0.061 (0.036)	1.063	0.019 (0.040)	1.019	0.070 (0.044)	1.108
log likelihood (unrestricted model)	327.939		14'320.780		36'999.038		87,692.219	
log likelihood (restricted model)	58.296		13'877.657		32'617.501		54,560.020	
N	41'829		39'101		39'101		38'981	

Notes: the reference category comprises high-tax communities with high stocks of the respective nationality.

Model 1 includes only the dummy variable for the highly-qualified.

Model 2 also includes basic socio-demographic characteristics (age, marriage, gender and number of children).

Model 3 adds dummy variables for the origin countries to model 2.

Model 4 adds dummy variables for agglomerations and cantons to model 3.

*/** significant at the 5%/1% level, respectively

Table 7: Location choice of new immigrants - multinomial logit regression

	model 1	model 2 ^b	model 3 ^b	model 4 ^c	model 5 ^d
constant	0.642** (0.100)	0.790** (0.093)	0.589** (0.073)	0.612** (0.089)	0.639** (0.115)
tax burden	-0.034** (0.006)	-0.010* (0.005)	-0.007** (0.002)	-0.007** (0.002)	-0.015* (0.006)
network size		0.045 (0.528)	-0.011 (0.528)	-0.264 (0.389)	-0.266 (0.434)
agglomeration ^a			0.111** (0.014)	0.035* (0.016)	0.026 (0.016)
community size × 10 ⁻⁶			0.409** (0.078)	-0.053 (0.119)	-0.018 (0.131)
quality-of-life			0.010 (0.031)	0.045 (0.026)	0.049 (0.243)
sigma	0.828** (0.188)	0.184** (0.0145)	0.175** (0.016)	0.168** (0.016)	0.165** (0.0156)
N			3601		
observations with a value of 0			1748		
log (pseudo-)likelihood (unrestricted model)	-3'496.234	-15'539.176	-15'539.176	-15'539.176	-15'539.176
log (pseudo-)likelihood (restricted model)	-3'478.289	3'010.461	4'814.244	6'157.537	6'665.435

Note: standard errors in parentheses (controlling for robust clusters). Each observation is weighted by the inflow of new immigrants from the respective nationality.

^adummy variable

^bincluding dummy variables for the nationalities

^cincluding dummy variables for the nationalities and local industry structure

^dincluding dummy variables for the nationalities, local industry structure and the cantons

*/** significant at the 5%/1% level, respectively

Table 8: Location choice of new immigrants - weighted Tobit regressions

Figures:

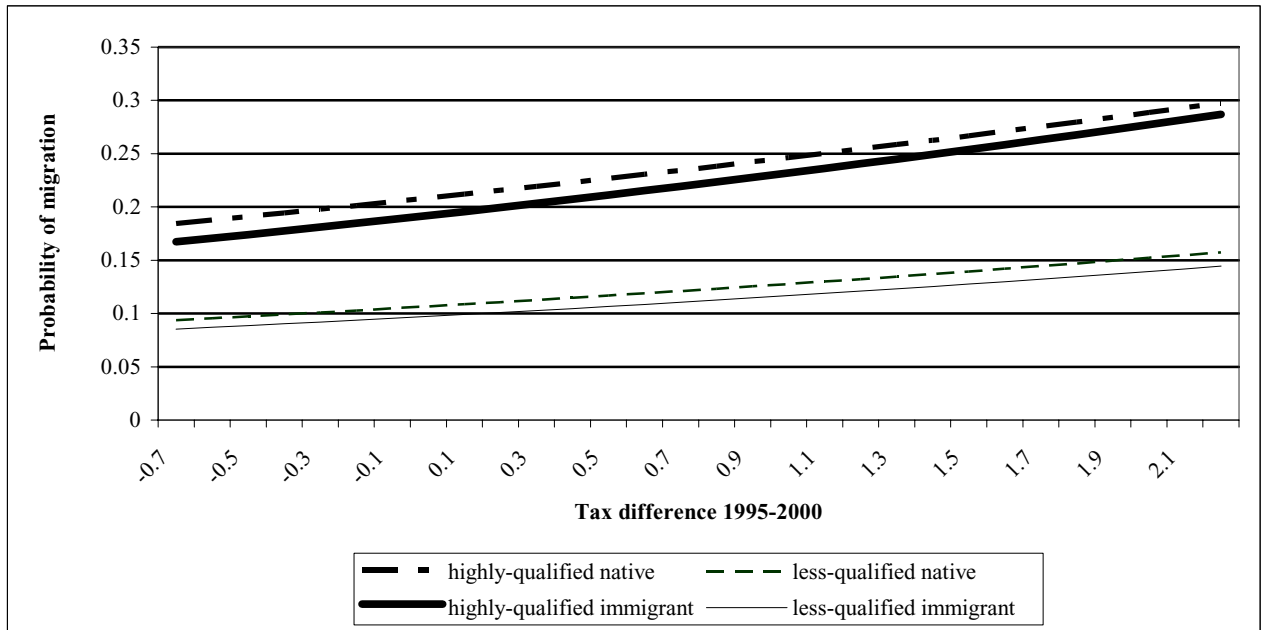


Figure 1: The effect of the tax difference on the probability of migration

Appendix:

Table A1: definitions of variables and terms used in the analysis

variable / term	definition
household head	person above 20 working the most hours per week in the household. If this applies to more than two persons, the respondent with the highest age was chosen. If this still applied to more than one person, the respondent with the highest qualification level within this group was chosen.
internal migration	equal to 1 if respondent has changed community of residence between 1995 and 2000
highly-qualified	equal to 1 if respondent has a university degree or a degree from a vocational college; 0 otherwise
tax burden	average tax rates of sub-national taxes for a single earner with no children, earning a gross labour income of CHF 150'000 in the community of residence, according to Eidgenössische Steuerverwaltung (various years)
immigrant	equal to 1 if respondent is not born in Switzerland and did not have Swiss citizenship at the time of birth; 0 otherwise
tax difference	tax burden in the community of residence in 1995 minus tax burden in the community of residence in 2000 (see definition of tax burden above)
quality-of-life	community averages of the summary quality-of-life indicator from Walter-Busch (1997)
quality-of-life difference	value of the quality-of-life indicator in the community of residence in 1995 minus value of the quality-of-life indicator in the community of residence in 2000 (see definition of the quality-of-life indicator above)
agglomeration	equal to 1 if the community is classified as part of an agglomeration area by Bundesamt für Statistik (2003).
community size	total number of people living in the community
network size	local deviation of the respective nationality's population share from a supposedly equal distribution across Switzerland
local industry structure	17 local industry structure dummy variables, defined as number of non-commuters working in the respective industry in the community divided by total population in the community: primary sector (1, 2, 5, 10, 11, 12, 13, 14); food industry (15, 16); textiles industry (17, 18, 19); chemical industry (24) machines industry (29); precision engineering (30, 31, 32, 33); construction (45); trade services (51, 52); hotel and catering (55); financial services (65, 66, 67); information technology services (72); research and development (73); corporate services (741, 742, 743, 744, 745, 746, 748); public service (75); university (803); health-related services (85); international organisations (99). The respective NOGA (<i>nomenclature générale des activités économiques</i>) classifications according to Bundesamt für Statistik (2003) are depicted in parentheses.

Table A2: summary statistics for the binomial regression

	mean	standard error
internal migration ^a	0.071	0.256
highly-qualified ^a	0.103	0.304
age	49.250	17.535
married ^{a,b}	0.492	0.500
male ^a	0.641	0.480
immigrant ^a	0.215	0.411
number of children ^b	1.193	1.355
tax difference	0.640	1.131
difference in quality-of-life	0.002	0.131
agglomeration ^a	0.824	0.381
community size'	48'798	84'296
Zurich ^a	0.215	0.411
Berne ^a	0.132	0.339
Lucerne ^a	0.049	0.216
Uri ^a	0.004	0.065
Schwyz ^a	0.019	0.138
Obwald ^a	0.005	0.072
Nidwald ^a	0.005	0.071
Glarus ^a	0.002	0.049
Zug ^a	0.016	0.127
Fribourg ^a	0.017	0.131
Solothurn ^a	0.030	0.171
Basle-City ^a	0.041	0.197
Basle-Country ^a	0.039	0.193
Schaffhausen ^a	0.010	0.099
Appenzell Outer Rhodes ^a	0.006	0.079
Appenzell Inner Rhodes ^a	0.002	0.043
St. Gall ^a	0.070	0.256
Grisons ^a	0.017	0.130
Argovia ^a	0.064	0.245
Thurgovia ^a	0.016	0.125
Ticino ^a	0.031	0.175
Vaud ^a	0.082	0.274
Valais ^a	0.030	0.170
Neuchâtel ^a	0.025	0.156
Geneva ^a	0.064	0.245
Jura ^a	0.006	0.079
primary sector	0.049	0.068
food industry	0.012	0.022
Textiles industry	0.006	0.015
chemical industry	0.009	0.020

	mean (cont.)	standard error (cont.)
machines industry	0.019	0.031
precision engineering	0.024	0.039
construction	0.069	0.030
trade services	0.111	0.035
hotel and catering	0.056	0.038
financial services	0.037	0.034
information technology services	0.011	0.009
research and development	0.003	0.007
corporate services	0.063	0.029
public service	0.037	0.020
university	0.009	0.015
health-related services	0.085	0.046
international organisations	0.003	0.009
N	2'109'763	

Notes: restricted to household heads as defined above.

^adummy variable

^brefers to status in 1995

Table A3: summary statistics for the multinomial regression

	mean	standard error
highly-qualified ^a	0.444	0.497
age	35.150	10.439
male ^a	0.731	0.443
married ^a	0.601	0.490
number of children	0.799	1.120
agglomeration ^a	0.823	0.382
community size	64'201	98'735
Germany ^a	0.360	0.480
France ^a	0.158	0.365
Italy ^a	0.110	0.313
Portugal ^a	0.053	0.224
Yugoslavia ^a	0.092	0.290
United Kingdom ^a	0.077	0.267
United States ^a	0.051	0.220
Brazil ^a	0.019	0.137
Turkey ^a	0.050	0.218
Macedonia ^a	0.029	0.168
Zurich ^a	0.226	0.418
Berne ^a	0.069	0.254
Lucerne ^a	0.030	0.169
Uri ^a	0.002	0.044
Schwyz ^a	0.011	0.104
Obwald ^a	0.003	0.055
Nidwald ^a	0.004	0.065
Glarus ^a	0.003	0.058
Zug ^a	0.019	0.135
Fribourg ^a	0.025	0.157
Solothurn ^a	0.020	0.139
Basle-City ^a	0.049	0.216
Basle-Country ^a	0.025	0.157
Schaffhausen ^a	0.011	0.103
Appenzell Outer Rhodes ^a	0.006	0.078
Appenzell Inner Rhodes ^a	0.002	0.041
St. Gall ^a	0.053	0.224
Grisons ^a	0.019	0.137
Argovia ^a	0.060	0.238
Thurgovia ^a	0.027	0.161
Ticino ^a	0.054	0.226
Vaud ^a	0.124	0.330
Valais ^a	0.022	0.145

	mean (cont.)	standard error (cont.)
Neuchâtel ^a	0.026	0.159
Geneva ^a	0.105	0.307
Jura ^a	0.006	0.075
primary sector	0.048	0.077
food industry	0.010	0.022
textiles industry	0.005	0.015
chemical industry	0.008	0.020
machines industry	0.014	0.026
precision engineering	0.021	0.036
construction	0.062	0.031
trade services	0.106	0.035
hotel and catering	0.061	0.043
financial services	0.045	0.040
information technology services	0.012	0.009
research and development	0.003	0.008
corporate services	0.069	0.032
public service	0.038	0.019
university	0.013	0.018
health-related services	0.085	0.050
international organisations	0.004	0.012
N	38'981	

Notes: restricted to immigrants with a B-permit in 2000 that were not residing in Switzerland in 1995, considering only household heads as defined above. Due to the listwise deletion of variables, the number of observations does not correspond to those in Tables 1 and 7.

^adummy variable

Table A4: summary statistics for the Tobit-regressions

	mean	standard error
tax burden	17.851	2.675
quality-of-life	2.153	0.229
agglomeration ^a	0.648	0.478
community size	7'444	17'976
network size	0.009	0.016
Germany ^a	0.119	0.323
France ^a	0.098	0.298
Portugal ^a	0.111	0.314
Yugoslavia ^a	0.119	0.323
Italy ^a	0.118	0.323
United Kingdom ^a	0.093	0.291
United States ^a	0.073	0.261
Brazil ^a	0.067	0.249
Turkey ^a	0.101	0.301
Macedonia ^a	0.101	0.302
international organisations	0.000	0.003
health-related services	0.069	0.049
university	0.002	0.006
public service	0.030	0.017
corporate services	0.050	0.026
research and development	0.002	0.008
information technology services	0.010	0.009
financial services	0.020	0.016
hotel and catering	0.055	0.050
trade services	0.112	0.040
precision engineering	0.024	0.042
construction	0.080	0.032
machines industry	0.022	0.037
chemical industry	0.008	0.023
textiles industry	0.008	0.019
food industry	0.015	0.028
primary sector	0.074	0.069
Zurich ^a	0.156	0.363
Berne ^a	0.130	0.336
Lucerne ^a	0.050	0.218
Uri ^a	0.006	0.075
Schwyz ^a	0.027	0.161
Obwald ^a	0.009	0.095
Nidwald ^a	0.010	0.097
Glarus ^a	0.006	0.076
Zug ^a	0.018	0.132

	mean (cont.)	standard error (cont.)
Fribourg ^a	0.023	0.151
Solothurn ^a	0.043	0.202
Basle-City ^a	0.004	0.061
Basle-Country ^a	0.039	0.193
Schaffhausen ^a	0.006	0.078
Appenzell Outer Rhodes ^a	0.009	0.094
Appenzell Inner Rhodes ^a	0.005	0.068
St. Gall ^a	0.083	0.275
Grisons ^a	0.022	0.148
Argovia ^a	0.103	0.303
Thurgovia ^a	0.022	0.148
Ticino ^a	0.045	0.208
Vaud ^a	0.078	0.268
Valais ^a	0.040	0.197
Neuchâtel ^a	0.024	0.154
Geneva ^a	0.032	0.176
Jura ^a	0.011	0.104
N	5'344	

Notes: restricted to immigrants with a B-permit in 2000 that were not residing in Switzerland in 1995, considering only household heads as defined above for the aggregation. As observations with zero flows were excluded in the regression analysis, the number of observations does not correspond to that of the regressions in Table 8.

^adummy variable

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