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TAXATION, ETHNIC TIES AND THE LOCATION CHOICE OF HIGHLY SKILLED IMMIGRANTS

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EXECUTIVE SUMMARY

With the emerging international competition to attract highly skilled migrants, the determinants of their choice of residential location are increasing in importance. Besides expected wages and job opportunities, the costs of migration and the subjective evaluation of a location, two other factors help 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. The aim of this paper is to throw some empirical light on the role of these two factors via a case study of Switzerland.

For several reasons, Switzerland is a particularly interesting case study for this task. Tax rates are primarily determined at the local level and thus enough variation exists 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 that has become increasingly skills-focused: more than 35% of all persons with a university degree resident in Switzerland are immigrants.

Analysis of the 2000 Swiss census data provides evidence for fiscally-induced migration within Switzerland, particularly with respect to a location choice of highly skilled immigrants.

RESUME

Avec l'émergence d'une compétition internationale pour attirer les migrants hautement qualifiés, les déterminants des choix de lieu de résidence de ces derniers gagnent en importance. En plus des perspectives de salaires et d'emploi, du coût de migration et des appréciations subjectives portées sur ces lieux, deux autres facteurs semblent jouer sur le rendement net attendu de la migration : les impôts et les effets de réseaux. Ceci étant, l'étude de l'impact de ces deux facteurs, ainsi que des effets de leurs interactions, manquent dans les analyses empiriques. Le but de ce papier est d'analyser le rôle de ces deux facteurs à travers l'étude du cas de la Suisse.

Pour plusieurs raisons, la Suisse s'avère un pays particulièrement intéressant à étudier à cet égard. Les taux d'imposition sont principalement déterminés au niveau local; d'où l'existence de variations suffisantes pour analyser leur impact sur la migration. De plus, contrairement à d'autres pays européens, la Suisse a poursuivi une politique assez libérale en matière d'immigration et maintient un système unique de permis, qui est devenu de plus en plus ciblé sur les qualifications : plus de 35 % de toutes les personnes détenant un diplôme universitaire qui résident en Suisse sont des immigrés.

L'analyse des données du recensement Suisse de 2000 met en évidence la migration intra-Suisse engendrée par des raisons fiscales, concernant plus particulièrement le choix des lieux de résidence des immigrés hautement qualifiés.

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TAXATION, ETHNIC TIES AND THE LOCATION CHOICE OF HIGHLY SKILLED IMMIGRANTS

1. Introduction

1. Highly skilled migration has been on a rising trend in recent years, both in absolute and relative levels (OECD, 2002). The increasing economic integration has lowered migration costs, particularly for the highly skilled. At the same time, competition to attract highly skilled migrants to specific countries is intensifying: the ongoing international division of labour and technological progress is demanding a more skilled workforce (Acemoglu, 2002), while demographic developments in industrialised countries are reducing domestic labour supplies. These processes are similar across most developed countries and immigration is one possible solution to skill shortages. As a consequence, several countries – including Canada, Germany, Switzerland, the United States and the United Kingdom – have introduced schemes to attract highly qualified foreigners. Tax incentives have also been used to attract highly skilled migrants (Schön, 2003; Mahroum, 2001). In the Netherlands, for example, highly skilled foreigners may profit from an income tax allowance of 30%. Favourable tax schemes for immigrants also apply in Belgium, Denmark, Finland, Norway and Sweden (see Liebig, 2004, for an overview). Yet, until recently, the specific determinants of highly skilled immigration (and therefore the competition for highly skilled migrants) have received relatively little research attention (Iredale, 1999).¹

2. Even though the role of income taxation on migration behaviour in general has been extensively discussed in the theoretical literature since the seminal contribution of Tiebout (1956), empirical studies on the effects of taxation on migration are still rare. This paucity applies especially to studies based on micro-data and with respect to the impact of skill level on fiscally-induced migration. Such a deficiency can be attributed to a variety of factors. First, tax considerations are not the sole determinants of migration, even though they do influence the net return on migration.² They cannot, therefore, be easily isolated from other factors that also determine the net return, such as wages, local amenities, prices and migration costs. Furthermore, these other factors intervene in location preferences. In addition, labour is neither as homogeneous nor as mobile as capital. More important, host countries place restrictions on the immigration of labour, which makes studies on the impact of tax considerations largely impossible in an international context.

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1. For a discussion of the impact of qualifications on the migration decision, see Liebig and Sousa-Poza (2004a).
 2. According to the human capital theory of migration introduced by Sjaastad (1962), the migration decision is determined by its net discounted return. For an overview of migration models, see for example, Massey *et al.* (1993).

3. One way of overcoming such obstacles is to focus on internal migration in countries that have a decentralised tax structure. Many similarities in fiscal relations exist both among countries, particularly across the European Union (EU), and within individual countries (Joumard and Konsgrud, 2003:20). However, only a few OECD countries have decentralised tax structures. Among these, Switzerland stands out as the nation with the largest variation of income tax rates at the sub-central level.

4. In principle, it should also be possible to study the internal migration of highly skilled people within the European Union, because nationals from EU countries enjoy freedom of movement throughout the union and tax rates vary widely. To date, however, 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 may play a lesser role, although there appears to be a home-country bias in capital flows as well. Altshuler and Goodspeed (2002) estimate reaction functions with respect to taxation differences between EU countries using a Nash bargaining model. While their empirical tests indicate that the EU countries strategically interact in setting their tax rates on capital, they find no support for strategic interaction with respect to the tax burden on labour. This finding is not surprising, as even within the European Union, cultural, linguistic and other differences among countries are generally too large for the impact of a particular factor like taxation on migration to be isolated, particularly if based on aggregated data.

5. Some of the most prominent empirical studies on tax competition have been conducted using Swiss data, including the contributions of Feld (2000), Feld and Kirchgässner (2001) and Kirchgässner and Pommerehne (1996). But these two studies are based on aggregated data and do not distinguish between skill levels. An analysis using micro-data would, therefore, be desirable, as it would allow control for individual characteristics that determine the migration decision and avoid the endogeneity problems inherent in aggregated data in the context of tax competition.

6. Like taxes, ethnic links also tend to raise the expected gain from migration, but their effect is largely limited to foreigners. Past research on ethnic migration networks has focused largely on the development of ethnic communities and has neglected the particularities of highly skilled immigration. Theoretically, it might be expected that ethnic ties matter less for highly skilled than for lower skilled workers, as the former tend to be less dependent on the services that ethnic networks may provide, such as information and goods of ethnic origin (*e.g.* food and newspapers from their home country).

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

8. Therefore, Swiss data is a promising point of departure to fill the gap in empirical research on the particular determinants of highly skilled migration. This paper focuses on the interaction of two important factors – taxes and ethnic networks. First, the research analyses the impact of different tax burdens on migration in general, and on highly skilled immigrants in particular. Second, it analyses the relative importance of ethnic ties for highly skilled *vis-à-vis* other immigrants.

9. The paper is structured as follows: section two outlines the theoretical background; section three sketches selected prior research on migration, network migration and tax competition, with particular reference to the Swiss case; section four summarises some important specificities of the Swiss tax and

immigration system; section five presents the data and methodology of the empirical analysis; section six discusses the results; and section seven concludes the paper.

2. Theoretical background

10. The starting point in the standard economic-theoretic approach to the determinants of migration is the concept of differences in net economic advantages. It dates back to Hicks (1932) and has been formalised by Todaro (1969) and Harris and Todaro (1970). The formulation for 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) 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 locations.

11. If $V(0) > 0$, that is, 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 location j in which the expected income stream net of taxes, $V_j(0)$, is maximised ($j=0$ for the origin and $j=1, 2, \dots$ for the prospective destinations):³

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

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

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

13. Thus, people with higher qualification levels 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.

14. In the tradition of Mincer's (1978) family migration theory, it is not the individual, but rather the entire household which 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

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

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

15. The net (post-tax) household income, however, has to be transformed into a location-specific utility, which is derived from the consumption of generally available goods and services on the one hand, and from tangible and intangible location-specific goods and services, like proximity to relatives, area amenities, climate, security and quality-of-life, 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), and 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.

16. Substituting Equation (3) into (1a) leads us to the point of departure for the literature on tax competition. Tiebout (1956) has argued that competing local governments will offer differing tax and expenditure packages.⁴ 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: therefore, no individual can improve his or her utility by moving to another community. However, a Tiebout equilibrium may only arise if taxes are used to finance public goods and are not aimed at redistributing income (see also Hansen and Kessler, 2001).⁵ 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 in which commuting is possible (Mieszowski and Zodrow, 1989).

17. Oates (1969) has argued that differences in taxes and local public goods should be capitalised in the community's property values. If changes in the community tax burden are instantaneously capitalised into property prices, it 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).

18. In a Tiebout setting, migration only occurs under two circumstances: either the individual's preference structure changes (*e.g.* due to marriage or birth of a child) and/or the equilibrium is disrupted by changes in community fiscal policies. The latter point is of importance in Switzerland, as many communities adjust their fiscal policies to attract certain groups of migrants. Thus, despite tax harmonisation efforts at the federal level, the dispersion of tax rates across cantons has increased (OECD, 1999a). The authors' 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, but the standard deviation increased. Thus, it is conceivable that the growing dispersion in cantonal tax rates has had an impact on migration flows between cantons.

4. 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).

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

19. 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). First, these networks may convey information about the potential host country, its labour market and earnings opportunities. Access to this information decreases the risks associated with migration. Second, migrant networks may also provide positive network externalities for the respective ethnic group; for example, by increasing the amount of ethnic goods available in the region of destination.⁶ In a broad sense, these ethnic goods comprise not only physical goods (*e.g.* newspapers in the native language), but also cultural links. Third, during the settlement process, new immigrants may be assisted by existing immigrants (*e.g.* by the provision of accommodation or financial assistance). In the context of international migration, networks are especially important, as information asymmetries are generally larger and more barriers must be overcome, *e.g.* to obtain entry and work permits (Faist, 1997:193f.).

20. 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 (Chiswick, 2000). Additionally, the highly skilled probably adapt more easily to a new environment; *e.g.* by mastering the foreign language more quickly than others. Finally, in addition to network externalities, so-called “herd behaviour” might also explain ethnic migration (Bauer, Epstein and Gang, 2002). These herd effects arise if immigrants limit their destination choices to places with significant prior immigration from the same origin. As it can be assumed that highly skilled persons tend to have better access to information channels, and be more efficient in obtaining and interpreting information than the lesser skilled (Chiswick, 2000; Schultz, 1975), they should be less affected by potential herding effects.

21. The choice of migration channels also provides additional support for the hypothesis that network links should be less pronounced in determining 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 personal and other networks (Findlay, 1990). Nonetheless, these migration channels have a propensity to function selectively, as immigrants select the 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 low-skilled workers rely rather on friends, relatives and community networks.

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

22. There are myriad 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 overviews, see Feld, 2000; Wilson, 1999).⁷ Nonetheless, empirical

6. A basic question in the study of network links is the definition of the effective group [Duleep and Wunnava (eds.), 1995]. In the broadest sense, a migrant network can be defined as all people from the same source country; that is, ethnic networks (see, *e.g.* Chiswick and Miller, 1996). Narrower definitions include people from a specific locality; that is, community networks (see, *e.g.* Winters, de Janvry and Sadoulet, 2001), or people linked by family ties (*e.g.* Orrenius and Zavodny, 2001). In this paper, the authors 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.

7. The following section is partly based on Liebig and Sousa-Poza (2004b).

studies on tax competition between governments that focus on differences in income tax rates are still rare. Only a few OECD countries give substantial autonomy to local authorities regarding public expenditure, and only Switzerland adds to this autonomy very dispersed income tax rates at the sub-national level.⁸

23. Prior empirical studies on fiscally-induced migration have focused primarily on the redistributive effects of tax competition and the effect on the provision of public goods at the sub-central level (see the various studies reviewed in Cremer, *et al.*, 1996; Dowding and John, 1994). Most of these 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, it should not be surprising to find very mixed empirical evidence. One exception to this lack of research on the links between personal income taxes and international migration is the cross-country analysis of Razin, Sadka and Swagel (2002), who arrive at the result that a higher share of immigrants in the population leads to a lower tax rate on labour income. Their study, however, relies on aggregated data.

24. The earliest study on tax competition in the Swiss context dates back to Frey (1981), whose study of migration in the region of Basle produced no evidence for an impact of tax rates on migration. Feld (2000) analyses aggregate migration flows among Swiss cantons and major cities, and also fails to obtain strong support for the hypothesis of fiscally-induced migration at that level.

25. In the related field of public expenditure, Schaltegger (2003) finds no robust evidence for an impact of cantonal public expenditure on migration. Tabin and Keller (2003) analyse whether different social expenditures across the French-speaking cantons 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.

26. Kirchgässner and Pommerehne (1996), regressing the shares of income groups across cantons on cantonal tax burdens, 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 the income tax rate, and find evidence for tax competition; *i.e.* high earners locate to communities in which the average effective tax rates on high incomes are relatively low. Schmidheiny (2003), however, criticises these approaches for neglecting the inherent endogeneity problem in aggregated data. Since the community characteristics are themselves influenced by the choices of the inhabitants, only from the perspective of the individual household can community characteristics be taken as given. This inherent problem 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 using the first three waves of the Swiss Household Panel. They conclude that tax burdens do not have a significant impact on the migration decision, but rather that the decision to migrate is primarily determined by housing-related factors.

8. Several countries – including the United States – have substantial variations in local property taxes. Thus, a variety of empirical studies are concerned with this kind of tax competition, including Brett and Pinkse (2000); Brueckner and Saavedra (2001); 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 capitalised in the price of land. For a recent overview, see Wilson (2003).

27. There are, to the authors' knowledge, no empirical studies on the impact of different income tax rates on migration that focus on highly skilled migrants. Given that only Switzerland has sufficient variation in income tax rates to motivate fiscally-induced migration, this void is not surprising. Furthermore, large samples would be required for such research because highly skilled migrants comprise only very few actual cases in most datasets. The Swiss 2000 census, however, makes available a dataset that is sufficiently large 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% of all highly skilled persons are immigrants.

28. There also exists a vast body of empirical literature on network migration, although one with an almost exclusive focus on two factors: (a) the importance of network ties for overall migration flows and ethnic geographical segregation, and (b) the impact of family and ethnic ties on the economic situation of immigrants.⁹ Regarding the first strand, Rotte and Vogler (2000) find strong network effects when examining immigration from the least developed countries into Germany. Likewise, Bauer and Zimmermann (1997) note the importance of network ties in the migration of ethnic Germans. A variety of studies analyse the importance of network ties in migration from Mexico to the United States. Given the large numbers of migrants involved, these latter studies are able to use a more disaggregate approach, defining networks as the proportion of the Mexican communities in the US destinations (see, for example, Munshi, 2003). Winters, de Janvy and Sadoulet (2001) find evidence that strong network effects diminish the importance of household characteristics in migration, thereby favouring the immigration of people who would not have migrated otherwise. Orrenius and Zavodny (2001), in a study of illegal migration from Mexico to the United States, find no evidence for an impact of family networks on the selectivity of migrants. Chiswick, Lee and Miller (2001) show that the extent of the geographical concentration of immigrants in Australia is negatively related to the proportion of the corresponding ethnic group that is fluent in English.

29. The other main strand of network migration research tries 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 socio-economic performance of foreign workers depends on the average skills of the ethnic group of the parents; *i.e.* ethnicity has an external effect. In his studies, ethnic spill-overs 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 (see, for example, Reimers, 1983; Kee, 1995). In the Swiss context, de Coulon (2001), in his study of wage gaps between natives and various groups of foreigners in Switzerland, finds that immigrants from more culturally distant countries face larger wage gaps.

30. None of the available empirical research addresses the relative importance of ethnic ties for highly skilled migration, which is not surprising, given that most 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 a study of their location choices, particularly with regard to ethnic ties. Reliable analyses can probably only be undertaken using census data, and in countries that have experienced substantial highly skilled immigration from a variety of other countries. Such is the case of Switzerland.

4. Institutional background

31. The impact of tax competition on migration behaviour can be analysed in Switzerland because the tax system reflects the country's federal structure and is unique in several regards. Of the OECD countries surveyed (OECD, 1999b), Switzerland has the highest share of sub-central government taxes in total tax revenues of general government. Only Canada (not surveyed in OECD, 1999b) has a higher share

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

of sub-national government tax receipts. However, in Canada, income taxes are mainly set at the provincial level; therefore, they account for less than 10% of local government tax revenues (Joumard and Kongsrud, 2003). In Switzerland, the main local tax sources are personal income taxes, accounting for about three-quarters of local tax revenue, as opposed to other decentralised countries like the United States, in which property taxes are the most prominent local source. Thus, Switzerland stands out among other OECD countries as the nation in which local governments use their tax-setting autonomy most effectively; *i.e.* income tax rates are the most important fiscal parameter at the local level and vary widely between communities.

32. In the United States, which also has a decentralised tax structure, less than 10% of local communities levy income taxes and the rates are generally low (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 jeopardise co-operation in other areas, and vertical government transfers, which often exhibit discretionary features (Joumard and Kongsrud, 2003). Such is not 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.

33. Even though some harmonisation of cantonal tax structures was achieved in 2000 and 2001, the harmonisation mainly covered tax bases and the time of taxation.¹⁰ Thus, for each of the almost 3 000 communities, different tax rates apply and dispersion is large. For example, in 2000, for an unmarried individual with no children who earns CHF100 000 per year, the combined cantonal and local tax burden across Switzerland in communities with more than 2 000 inhabitants varied from CHF8 954 in Freienbach (Canton Schwyz) to CHF22 784 in La-Chaux-de-Fonds (Canton Neuchâtel).

34. At the top income levels, differences in marginal rates are even more pronounced. Total marginal rates (including all government levels) for an annual income of CHF500 000 ranged from about 21% (again in Freienbach, Canton Schwyz) to more than 46% (in Lauterbrunn, Canton Berne). Even between communities less than 20 km apart, differences in average and marginal tax rates of more than 5% are quite common. This unique situation makes Switzerland a particularly interesting case study for analysing the impact of different tax rates on migration: in contrast to other areas with different tax rates and internal freedom of movement (for instance, the United States or the EU), people may migrate solely for tax reasons and later commute to work without having also to change their employment. In other words, if tax competition matters in the context of migration, it should have a measurable impact in Switzerland.

35. One objective of this study is to analyse whether two groups of inhabitants are particularly tax-sensitive; namely, people with high qualifications, and immigrants. To better understand the incentive structure for the latter group, some particularities of the Swiss immigration system should be noted.¹¹ 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.¹²

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

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

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

36. Settlement permits (C-permits) are given to people who have resided in Switzerland for five years [European Economic Area (EEA) 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. Therefore, it is particularly important in the Swiss context to distinguish between immigrants and foreigners. The former group encompasses all individuals born abroad who did not have Swiss citizenship at the time of birth. The latter group includes all people who do not have a Swiss passport; *i.e.* it also covers second and third-generation foreigners.

37. Until the 1990s, Switzerland's immigration policy favoured low-skilled immigration. However, since 1991, immigration has become gradually restricted to highly qualified individuals and has favoured immigration from countries belonging to the European Economic Area. 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 tax treatment like that of the Swiss – if they earn more than CHF120 000. Thus, tax competition should only have an impact on B-permit foreigners earning more than CHF120 000 and on C-permit foreigners.

5. Data and methodology

38. Measuring the effectiveness of the tax policy measures that are widely practised by communities to attract 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.

39. This analysis is conducted primarily using data from the 2000 Swiss census, which covered the entire population of Switzerland – both foreigners and natives – and thus contains data on all 7.5 million Swiss residents, including almost 1.5 million immigrants. Although census data generally yields only limited information on individual migration behaviour, the 2000 census has very rich information for the purposes of this study. It includes information on current location and location five years ago, educational level, nationality, place of birth and the category of a foreigner's permit. The information on the place of residence five years previously allows for an analysis of actual migration behaviour using micro-data.¹³ The entire empirical analysis of location factors for highly skilled migrants is limited to individuals above the age of 20. To avoid biases that may occur with family migration flows, the regression analysis at the individual level is limited to the household head, defined as the person who works the most hours per week.

40. 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 general in empirical studies, highly skilled people are thus defined by their qualification level, specifically, those individuals having a university degree or equivalent (*i.e.* people who attended a vocational college). According to the Swiss Labour Force Survey, the mean income of highly qualified foreigners in 2000 was CHF180 000. Therefore, it can reasonably be assumed that most of them earned at least CHF120 000, or could expect to do so in the foreseeable future. This assumption is important because the Swiss census data do not include income data. Thus, even if they have only B-permits (see section four), the immigrants could profit from tax differences within cantons.

13. Unfortunately, there is no information available on whether or not people may have affected more than one move within this period.

41. The tax burden for the highly skilled can be measured in a variety of ways.¹⁴ The approach taken here uses the average tax rate at a “representative” income level for highly skilled persons which is set at CHF150 000, as this level corresponds closely to the average household income of this group.

42. Federal statistics on the tax burden are taken from Eidgenössische Steuerverwaltung (for various years) and cover all communities with more than 2 000 inhabitants.¹⁵ As in other studies (*e.g.* Feld and Kirchgässner, 2001), the analysis is augmented by the Walter-Busch (1997) qualify-of-life measurements based on a survey of all Swiss army recruits (*i.e.* males aged about 18). Just as the new economics of migration (Stark, 1991) has drawn attention to the importance of subjective perceptions in the migration process, social science research has indicated that qualify-of-life is best measured by subjective evaluations (Walter-Busch, 1983; 2000).

43. The empirical analysis is conducted as follows: it begins with some descriptive information on high-skilled immigrants, including information on countries of origin, destination choices and the industrial sectors in which they work. The subsequent regressions provide answers to the following research questions:

5.1. *What determines the migration decision?*

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

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

where the dependent variable M_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 educational level, foreigner status, civil status, number of children, changes in tax burden and qualify-of-life between the 1995 and 2000 places of residence and community size, as well as cantonal and agglomeration dummies for the communities of origin.¹⁶ Inclusion of these variables allows determination of the socio-demographic characteristics of migrants and the push factors for migration.

45. Seventeen local industry structure variables are included, which enables purely job-related destination choices to be controlled for. The definitions of these variables are presented in Table A.1 in the Appendix.

5.2. *Do taxes and/or ethnic ties matter for the location choice of highly skilled immigrants?*

46. In a second step, a series of multinomial logit (MNL) regressions for immigrants who entered Switzerland between 1995 and 2000 are estimated. The MNL regression allows for the analysis of the determinants of immigrant community choices. The models to be estimated are as follows:

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

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

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

16. As has been noted by Feld and Kirchgässner (2001:192), “[t]he qualify-of-life indexes proxy to some extent for housing price 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”. In any case, prior empirical research has shown that capitalisation of tax differences in housing prices in Switzerland is, if at all, only partial (Feld, 2000).

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

47. “High-tax” communities are defined as communities having a sub-national tax burden at an annual income of CHF150 000 in excess of the (un-weighted) Swiss average of 17.90%, whereas “low-tax” communities are defined as those with a tax burden up to this mean. The same classification procedure applies for ethnic networks, measured as the local deviation from a supposedly equal distribution of the particular ethnic group across Switzerland. This approach is similar to that taken by Chiswick, Lee and Miller (2001).

48. The MNL analysis allows us to investigate the relative importance of network ties *vis-à-vis* the tax burden in the communities chosen by the highly skilled immigrants. The distribution of the immigrants into four categories based on the above variables is depicted in Table 1. As can be seen, immigrants mainly migrate towards communities where there is already a substantial share of migrants from their own nationalities. Furthermore, the share of highly skilled immigrants is fairly evenly distributed among the four community classes.

5.3. *What determines aggregate flows of highly skilled immigration?*

49. The last part of the study investigates whether networks and taxes influence the aggregated skills composition of immigration flows. The dependent variable in this final set of regressions depicts the respective shares of the highly qualified among the new immigrants for each community. To analyse the impact of ethnic ties, community shares are calculated separately for each of the ten largest ethnic groups immigrating between 1995 and 2000. The independent variables include the tax burden measure, a dummy variable for agglomerations and a control variable for the local industry structure. On the one hand, compared to the MNL regression, this setting has the disadvantage of relying on aggregated data; on the other, 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”.

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

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

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 qualify-of-life indicator and the local industry structure, as well as dummy variables for agglomerations and the respective cantons).

51. As each community enters several times into the regression, standard errors could be heteroskedastic. Therefore, following the correction proposed by White (1980), the regressions are corrected for robust community clusters. 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; that is, the inflow of each nationality group into each community.

6. Empirical analysis

52. As Table 2 illustrates, highly skilled immigrants come mainly from OECD countries, particularly Germany, France, the United Kingdom, Italy and the United States. Germany alone accounts for more than 25% of all highly skilled immigrants; the top five countries together account for more than half of all 107 552 highly skilled immigrants. In contrast, total immigration is concentrated towards southern European countries – namely, Italy, the former Yugoslavia, Portugal and Spain – with neighbouring Germany being a notable exception. These five countries account for almost 60% of the 1 311 795 immigrants older than 20. What is noteworthy in the data depicted in Table 2 is the variation in the share of highly skilled immigrants. 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 difference is a result of migration policy prior to the early 1990s that implicitly favoured low-skilled immigration by means of seasonal permits,¹⁷ granted mainly to people from southern European countries.

53. The gradual focus 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 countries of immigrant origin, the most important of which for labour immigration (*i.e.* new immigrants with a B-permit) since 1995 are shown in Table 3.

54. 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 entering with a B-permit since 1995, the share of highly skilled individuals is almost one-third, whereas among those who immigrated prior to that date, the share of highly skilled individuals is only about 10%.¹⁸ Despite these numbers, immigrants from southern European countries continue to be relatively low skilled. On the other hand, immigrants from central and eastern Europe, whose pre-1995 representation was very low, have a relatively high average skills level. In general, however, there is no significant correlation between the previous influx of nationals and the share of highly qualified individuals among the immigration flows: the correlation coefficient for the 183 origin countries of immigration in 1995-2000 is -0.04.

55. 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 the highly skilled employed in the corresponding sector. The classification of business sectors is done using the NOGA nomenclature (*nomenclature générale des activités économiques*).

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

57. A concentration of highly skilled foreigners can also be recorded in certain communities. Whereas the highest absolute numbers are, not surprisingly, encountered in large cities, it is more

17. Until the early 1990s, 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 of this point.

18. It should be noted that even this latter figure is above the corresponding share for the total population (8%), that is, even earlier immigrant cohorts are over-represented at the top end of the qualification scale.

interesting to look at those communities having the highest share of highly skilled individuals among the immigrant population (Table 5).

58. First, it is interesting to note that communities around the Lake Geneva region figure prominently among those with the highest share of highly skilled among the foreign population. Second, many of these communities have no tax rates significantly below the national average. This latter observation 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. However, within these cantons, a negative correlation exists between the share of highly skilled immigrants and the tax burden in the respective community. This finding is a first indicator of a sequential nature for location choice; that is, 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 restricted to differences in cantonal rates.

6.1. *What determines the migration decision?*

59. The regression analysis first studies internal migration within Switzerland. The results of these binomial regressions are depicted in Table 6; summary statistics can be found in Table A.2 in the Appendix.

60. A first observation is that the main predictions of migration theory can be confirmed. Migrants are relatively young and typically single. Highly skilled individuals are also more inclined to migrate. The migration propensity declines with the number of children and the community size. Somewhat surprising is the fact that females have a higher propensity to migrate than males, although the effect is small. It should be noted, however, that because the study is limited to the household head (defined as the person working the most hours), there is *a priori* no reason to believe that women should be less mobile. At first sight, it might also seem surprising that immigrants are substantially less mobile; however, it should be remembered that for most immigrants, a change in the canton of residence is subject to permission. Furthermore, the effect of foreign nationality is *a priori* ambiguous. On the one hand, foreigners could be less emotionally tied to a certain location, which would imply an increase in tax sensitivity; on the other, network links, institutional obstacles and information asymmetries tend to limit tax sensitivity. In any case, the effect of immigrant status is greatly reduced as soon as the canton is controlled for.

61. 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. The effect is even stronger for highly qualified people, who are apparently more attracted towards low-tax communities. In models 2 to 4, there is no evidence that highly qualified foreigners are more sensitive to tax differences than highly qualified Swiss citizens. When cantonal effects are controlled for, the coefficient for the interaction between tax difference and highly qualified foreigners changes its sign, and, once local industry structure is controlled for, it even becomes significant. Hence, there is some indication that highly skilled foreigners are relatively more sensitive to differences in taxation. That this impact only arises after cantonal effects are controlled for can again be partly explained by the fact that immigrants are restricted in their mobility: as noted above, a change in the canton of residence requires authorisation, meaning that full freedom-of-residence choice for foreigners only applies within a given canton.

62. The logistic regression allows determination of the relation between tax burden and probability of moving for the four groups of particular interest to this study: lower skilled immigrants, highly skilled immigrants, the total lesser skilled population (*i.e.* including the Swiss and all foreigners born in Switzerland) and the highly skilled native-born population. Chart 1 depicts the values derived in model 5 for the relation between moving probability and the difference in tax rates for a single 30-year old male.

The x axis represents the range of the 90% interval of the community tax differences between 1995 and 2000 for all individuals.

63. For a highly skilled native, the probability of migrating to a community with a tax burden one percentage point lower than the community of origin 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% *versus* 18.5%). In comparison, the effect of marriage lowers the probability of migration by almost 7%. 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. Differences in tax rates thus appear to have a similar impact on natives and immigrants. Indeed, what matters is not the distinction “immigrants *versus* natives”, but rather the skills level.

6.2. *Where do new immigrants go?*

64. The analysis now turns to the MNL models, to investigate the community chosen by new immigrants from the ten most important countries of labour immigration origin between 1995 and 2000 as depicted in Table 3. These ten countries account for almost two-thirds of all labour immigration into Switzerland during that period. As discussed above, it might be assumed that the highly skilled tend to move to communities with lower taxes. Furthermore, network ties can be supposed to matter less for the highly skilled. Model 1 includes only the dummy variable for the highly qualified. Model 2 adds basic socio-demographic characteristics, and model 3 additionally includes dummy variables for the countries of origin. Both network and tax effects should materialise primarily 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. Model 4 accordingly controls also for the cantons (and agglomerations). Table 7 depicts the coefficients of the dummy variable for the highly qualified in the four models. Summary statistics are presented in Table A.3 in the Appendix.

65. The first and most important result is that all the estimated coefficients are positive, with six out of the twelve being statistically significant. As any category should be preferred over the reference category for the highly skilled, this finding tends to support the predictions. Apparently, highly skilled immigrants favour low-tax communities: in all four models, they are significantly over-represented in the low-tax communities. The results are less conclusive with respect to the ethnic network sizes. However, 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 the most valid for the purpose of this study. The model 4 analysis shows that the highly skilled are relatively more attracted than their fellow nationals to communities with low taxes and small ethnic networks.

66. 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 the person is highly skilled. These odds can be transformed into probabilities: being highly qualified increases the probability of choosing a low-tax, small ethnic network community instead of a high-tax, large ethnic network community, by 55%. Even though considerable, this figure does not imply a very large degree of selectivity.¹⁹ The MNL analysis thus confirms that taxes have an impact, but not one that is very large.

19. Odds can be transformed into probabilities in the following way: $\text{Probability} = \text{odds} / (1 + \text{odds})$. A probability of 50% would imply an equal distribution among the two categories.

6.3. *What determines the share of highly skilled among new immigrants?*

67. The last set of regressions studies the location 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 shows the results of the weighted Tobit regressions; summary statistics are depicted in Table A.4 of the Appendix.

68. A very robust influence of the tax burden on the share of the highly skilled among the new immigrants can be observed. Indeed, apart from the tax burden, there is little else that is statistically significant as a determinant. It should be noted that the coefficients in the Tobit model cannot always be interpreted easily;²⁰ however, running weighted least square regressions, in which the coefficients can be interpreted directly, leads to results that are quantitatively identical and gives a good indication of the magnitude of the effect.²¹ In models 3 and 4, for example, a 1% decrease in the community tax rate leads to a corresponding increase in the share of highly skilled people among new immigrants of 0.7%. In contrast, in model 3, being located in an agglomeration leads to an increase of more than 11%. Thus, the effect of the tax burden on the composition of the immigrant flows is not large. The Tobit analysis also indicates that large communities are associated with a higher qualification level of immigrants, but the effects are not robust.

69. The share of highly skilled is not influenced by the qualify-of-life indicator. Although the sign of the network size coefficient is mostly negative (which would imply that network ties matter less for the highly skilled), it is not significant at conventional levels.

7. **Conclusions**

70. Even prior to the emerging competition for highly skilled immigrants, 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. As a result, 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 that aims at providing more taxation autonomy to the *Länder*.²² On the other hand, an important objection against such policies is related to the potential negative spill-overs from tax competition among local governments; specifically, local governments may engage in a wasteful competition for taxpayers that may lead to sub-optimally low rates.

71. However, tax competition will only materialise 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, under which income taxes are primarily determined at the local

20. The Tobit model assumes non-observabilities in the dependent variable that 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 in which the values of the dependent variable are zero due to other factors than non-observability. He proposes the sample-selection correction of Heckman (1974) as an alternative. This choice, however, is not possible here due to the aggregated nature of the data.

21. We also ran these regressions with different subsets of the cantons of Eastern Switzerland, which form a region within easy commuting distance. Again, the results were both qualitatively and quantitatively very similar.

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

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 so cannot adequately analyse the individual determinants of migrant location choices.

72. The most important finding of this study is that the community tax burden has a significant impact on highly skilled migration. Both highly skilled natives and immigrants react to tax differences in a similar way, *i.e.* they are more inclined to migrate to low-tax areas. This result is very robust and holds even after several factors, including quality-of-life measures, are controlled for. But the effect is quite small, which casts some doubt on the effectiveness of tax incentives as a means of attracting highly skilled immigrants, as has been attempted in, among other countries, the Netherlands and Sweden. If the tax burden does not strongly affect community choice at the sub-national level in a country where tax rate differences of 10% within a distance of 100 km are common, it is unlikely to have a large impact on international migration flows.

APPENDIX

Table A.1. Definitions of variables and terms used in the analysis

Variable/term	Definition
Household head	A person over 20 working the most hours per week in the household. If this applied 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 CHF150 000 in the community of residence, according to Eidgenössische Steuerverwaltung (various years).
Immigrant	Equal to 1 if respondent was 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).
Qualify-of-life	Community averages of the summary qualify-of-life indicator from Walter-Busch (1997).
Qualify-of-life difference	Value of the qualify-of-life indicator in the community of residence in 1995 minus the value of the qualify-of-life indicator in the community of residence in 2000 (see definition of qualify-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	Seventeen local industry structure dummy variables, defined as the 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 A.2. 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 qualify-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

Table A.2. Summary statistics for the binomial regression (contd.)

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
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 A.3. 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
Former 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
FYROM 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

Table A.3. Summary statistics for the multinomial regression (contd.)

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
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 list-wise deletion of variables, the number of observations does not correspond to those in Tables 1 and 7.

^aDummy variable.

Table A.4. Summary statistics for the Tobit regressions

	Mean	Standard error
Tax burden	17.851	2.675
Qualify-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
Former 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
FRYOM 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

Table A.4. Summary statistics for the Tobit regressions (contd.)

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
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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Table 1: The distribution of new immigrants into community classes

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)
Total (total share)	41 829	18 584 (44.4%)

Table 2. The most important countries of origin of the 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	29 768 (32.36%)	Italy	193 676 (3.61%)
2.	France	11 734 (24.07%)	Former Yugoslavia	117 803 (2.92%)
3.	United Kingdom	8 099 (48.52%)	Portugal	96 199 (0.78%)
4.	Italy	6 996 (3.61%)	Germany	91 988 (32.36%)
5.	United States	6 270 (65.51%)	Spain	54 925 (3.63%)
6.	Netherlands	3 679 (32.15%)	France	48 758 (24.07%)
7.	Former Yugoslavia	3 435 (2.92%)	Turkey	47 449 (3.37%)
8.	Austria	2 946 (12.40%)	FRYOM 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%)

Notes: 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 population.

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

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%)	Former Yugoslavia	11 615 (4%)
3.	United Kingdom	3 141 (60%)	France	11 568 (42%)
4.	United States	2 775 (69%)	Italy	8 699 (27%)
5.	Italy	2 370 (27%)	Portugal	5 858 (4%)
6.	Netherlands	1 141 (51%)	United Kingdom.	5 205 (60%)
7.	Russia	1 064 (55%)	Turkey	4 888 (11%)
8.	Canada	992 (59%)	United States	4 000 (69%)
9.	Belgium	855 (60%)	FYROM Macedonia	3 966 (3%)
10.	Austria	846 (28%)	Brazil	3 384 (16%)

Notes: 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 population.

Table 4. Sectors with the highest shares of highly skilled immigrants

Rank	Sectors with the highest number of highly skilled immigrants		Sectors with the highest share of highly skilled immigrants out of total employed		Sectors with the 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%	Physical 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%

Notes:^a Excluding embassies.^b Only sectors with more than 5 000 employees were taken into account.^c Only sectors with more than 5 000 employees and a share of highly skilled employees above 10% were taken into account.

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

Rank	Canton	Community ^a	Share of high-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)

Notes:

^aOnly communities with more than 500 immigrants were 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 6. Determinants of internal migration – binomial logit regression

	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)
Qualify-of-life difference ^c			-0.717** (0.022)	-0.801** (0.023)	-0.352** (0.024)
Qualify-of-life difference ^c × highly qualified			0.254** (0.053)	0.257** (0.055)	0.603** (0.056)
Qualify-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

Notes: 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 7. Location choice of new immigrants – multinomial 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 numbers 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 countries of origin to model 2. Model 4 adds dummy variables for agglomerations and cantons to model 3. ***/** significant at the 5%/1% level, respectively.

Table 8. Location choice of new immigrants – weighted Tobit regressions

	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)
Qualify-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

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

^aDummy variable.

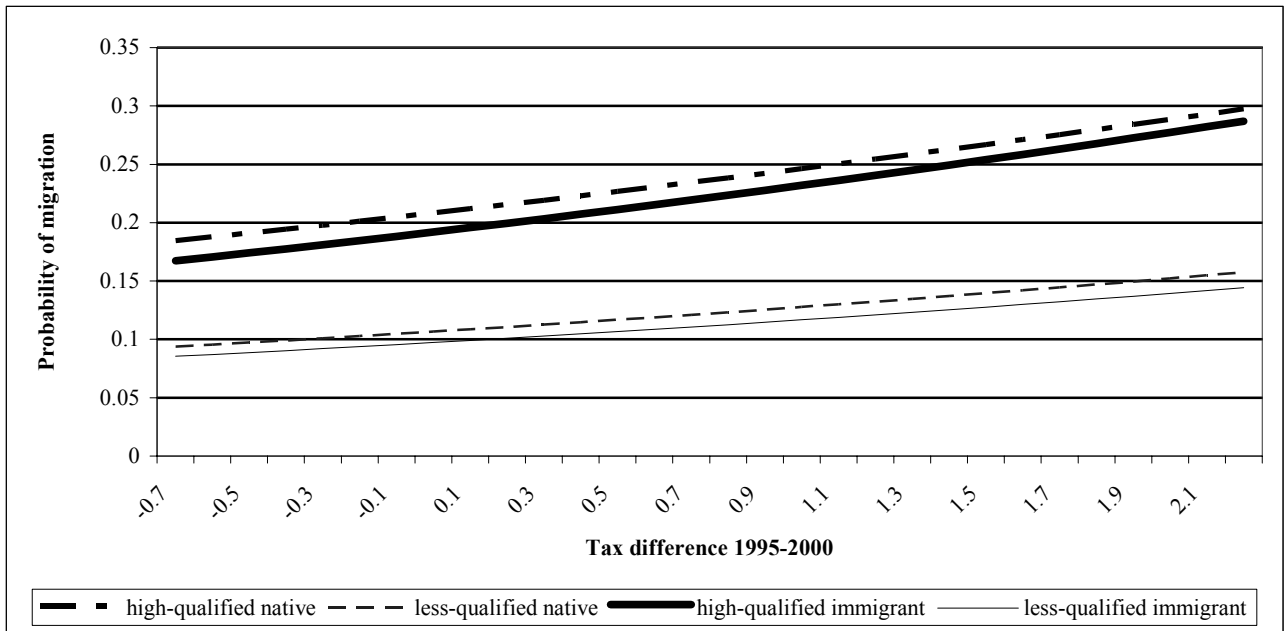
^bIncluding dummy variables for the nationalities.

^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.

Chart 1. The effect of tax difference on the probability of migration



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