# Appendix A

Table A1. Population distribution of immigrants and immigrant entrepreneurs in Sweden across ethnic country groups over the period 2003-2010

| Country Group of Birth | Immigrants | | Immigrant Entrepreneurs | |
| --- | --- | --- | --- | --- |
| | Frequency | Percent | Frequency | Percent |
| 1. Nordic Countries [a] | 926,708 | 24 | 43,917 | 23 |
| 2. EU15 [b] | 340,432 | 10 | 23,722 | 13 |
| 3. Europe [c] | 923,755 | 24 | 35,684 | 19 |
| 4. Africa | 247,642 | 6 | 6,721 | 3.5 |
| 5. North America | 90,906 | 2 | 4,644 | 2.5 |
| 6. South America | 239,633 | 6 | 5,969 | 3 |
| 7. Asia | 1,028,463 | 27 | 66,637 | 35 |
| 8. Oceania | 13,907 | 0.4 | 927 | 0.5 |
| 9. Soviet Union | 19,472 | 0.5 | 1,075 | 0.6 |
| Total | 3,830,918 | 100 | 189,296 | 100 |

[a] "Nordic Countries" excludes Sweden
[b] "EU15" excludes Denmark, Finland, and Sweden
[c] "Europe" excludes EU15 and the Nordic countries

Table A2. Variable description

| Variables | Description | Source |
|---|---|---|
| ***Dependent Variable*** | | |
| *STARTUP* | Dummy denoting whether an employed immigrant decided to become an entrepreneur from year *t-1* to year *t* (1), or not (0). | Individual-level Register Database (LISA), SCB |
| ***Explanatory Variables*** | | |
| *ETH1* | See section 4.2 | Authors' calculation, LISA |
| *ETH2* | See section 4.2 | ,, |
| *ETH3* | See section 4.2 | ,, |
| ***Control Variables: Individual Characteristics*** | | |
| *AGE* | Entrepreneur's age in year *t-1* | LISA, SCB |
| *AGE^2* | *Age* squared | |
| *MALE* | Dummy indicating the entrepreneur's gender, 1 for Male and 0 for Female | ,, |
| *SCHOOLING* | Number of years to complete the immigrant's highest achieved level of education in year *t-1*. | ,, |
| *MARRIED* | Dummy indicating whether the immigrant is married (1), or not (0) in year *t-1*. The variable is also set to 1 for immigrants in domestic partnerships. | ,, |
| *CHILDREN* | Dummy indicating that the immigrant has children registered as living in the same residence in year *t-1*. | ,, |
| *EDUCATION SPEC.* | A set of 8 dummies, indicating the type of education associated with each immigrant's highest achieved level of education. | ,, |
| ***Control Variables: Job &Workplace Characteristics*** | | |
| *WAGE* | The immigrant's wage, in Swedish krona, in year *t-1* (ln). | LISA, SCB |
| *OCCUPATION SPEC.* | A set of 9 dummies at one digit ICSO-88 standard, denoting the immigrant's occupation specialization. | ,, |
| *PLANT SIZE* | Number of employees in the same work establishment as the immigrants in year *t-1* (ln). | Business Register Database, SCB |
| *PLANT EXIT* | Dummy, denoting whether the work plant of immigrant in *t-1* has discontinued its operations before the next period *t* | ,, |
| *INDUSTRY* | A set of 9 dummies at one digit NACE code, denoting the sectoral affiliation of immigrant's work place. | ,, |
| ***Control Variables: Regional Characteristics*** | | |
| *URBANIZATION* | Population density in region *r* year *t-1* | Authors' calculation using Firms and Establishments Dynamic database, SCB |
| *ENTREPRENEURSHIP* | Share of entrepreneurs in region *r* year *t-1* | |

Table A3. Descriptive statistics

| Variables | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|
| *STARTUP* | 0.012 | 0.11 | 0 | 1 |
| *ETH1* | 4.05 | 3.64 | 0 | 41.24 |
| *ETH2* | 0.36 | 0.56 | 0 | 12.78 |
| *ETH3* | 0.02 | 0.04 | 0 | 0.76 |
| *AGE* | 43.5 | 10.5 | 25 | 64 |
| *MALE* | 0.48 | 0.50 | 0 | 1 |
| *SCHOOLING* | 13.16 | 3.65 | 6 | 22 |
| *CHILD* | 0.57 | 0.49 | 0 | 1 |
| *MARRIED* | 0.55 | 0.50 | 0 | 1 |
| *WAGE* | 7.32 | 1.50 | 0 | 12.78 |
| *PLANT EMPLOYEE* | 4.01 | 2.10 | 0.69 | 9.41 |
| *PLANT EXIT* | 0.45 | 0.50 | 0 | 1 |
| *URBANIZATION* | 10.60 | 1.36 | 6.61 | 12.94 |
| *ENTREPRENEURSHIP* | 0.77 | 0.43 | 0 | 2.78 |
| *EDUCATION SPECIALIZATIONS* | | | | |
| Education: General | 0.26 | 0.44 | 0 | 1 |
| Education: Pedagogics & teaching | 0.06 | 0.24 | 0 | 1 |
| Education: Humanities & arts | 0.05 | 0.21 | 0 | 1 |
| Education: Social science | 0.15 | 0.36 | 0 | 1 |
| Education: Natural science | 0.05 | 0.21 | 0 | 1 |
| Education: Technology & manufacturing | 0.20 | 0.40 | 0 | 1 |
| Education: Agriculture & forestry | 0.01 | 0.10 | 0 | 1 |
| Education: Health & medical care | 0.16 | 0.37 | 0 | 1 |
| Education: Services | 0.05 | 0.22 | 0 | 1 |
| *OCCUPATION SPECIALIZATIONS* | | | | |
| Occupation: Legislators, senior officials, managers | 0.04 | 0.18 | 0 | 1 |
| Occupation: Professionals | 0.17 | 0.38 | 0 | 1 |
| Occupation: Technicians | 0.13 | 0.34 | 0 | 1 |
| Occupation: Clerks | 0.08 | 0.26 | 0 | 1 |
| Occupation: Service and shop sales workers | 0.25 | 0.43 | 0 | 1 |
| Occupation: Skilled agricultural & fishery workers | 0.01 | 0.05 | 0 | 1 |
| Occupation: Craft and related trades workers | 0.07 | 0.26 | 0 | 1 |
| Occupation: Machine operators and assemblers | 0.12 | 0.33 | 0 | 1 |
| Occupation: Elementary occupations | 0.14 | 0.34 | 0 | 1 |
| *INDUSTRY SPECIALIZATIONS* | | | | |
| Industry: Agriculture, hunting and related services | 0.02 | 0.14 | 0 | 1 |
| Industry: Manufacture of wood & of products of wood | 0.08 | 0.27 | 0 | 1 |
| Industry: Manufacture of office machinery & computers | 0.06 | 0.23 | 0 | 1 |
| Industry: Electricity, gas, steam and hot water supply | 0.03 | 0.17 | 0 | 1 |
| Industry: Sale. maintenance and repair of motor vehicles | 0.14 | 0.35 | 0 | 1 |
| Industry: Land transport; transport via pipelines | 0.07 | 0.25 | 0 | 1 |
| Industry: Real estate activities | 0.17 | 0.37 | 0 | 1 |
| Industry: Education | 0.30 | 0.46 | 0 | 1 |
| Industry: Sewage and refuse disposal | 0.04 | 0.18 | 0 | 1 |

*Note for Appendix 3* The number of observations for the variable *STARTUP* is 2,761,678. For the rest of variables, the number of observations is 3,832,839 which is the total population of working-age individual immigrants over the period 2003-2010. The log value is shown in the table for continuous variables. The ethnic variables (*ETH1*, *ETH2*, *ETH3*) and share of entrepreneurship in the region *(ENTREPRENEURSHIP)* are multiplied by 100, in order to have a convenient interpretation of the marginal effects in the subsequent analysis.

Table A4. Correlation matrix

| | STARTUP | ETH1 | ETH2 | ETH3 | AGE | MALE | SCHOOLING | CHILD | MARRIED | WAGE | EMPL | EXIT | URBA | ENTREP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STARTUP | 1 | | | | | | | | | | | | | |
| ETH1 | 0.002 | 1 | | | | | | | | | | | | |
| ETH2 | -0.022 | 0.621 | 1 | | | | | | | | | | | |
| ETH3 | 0.067 | 0.457 | 0.355 | 1 | | | | | | | | | | |
| AGE | -0.012 | -0.001 | 0.016 | -0.063 | 1 | | | | | | | | | |
| MALE | 0.045 | -0.008 | -0.151 | 0.071 | -0.016 | 1 | | | | | | | | |
| SCHOOLING | -0.002 | -0.097 | -0.030 | -0.110 | -0.085 | -0.040 | 1 | | | | | | | |
| CHILD | 0.010 | 0.028 | 0.034 | 0.025 | -0.092 | -0.071 | 0.005 | 1 | | | | | | |
| MARRIED | 0.010 | 0.042 | 0.024 | 0.024 | 0.153 | 0.004 | -0.002 | 0.297 | 1 | | | | | |
| WAGE | -0.171 | -0.029 | -0.001 | -0.146 | 0.077 | 0.045 | 0.123 | -0.023 | 0.007 | 1 | | | | |
| EMPL | -0.151 | -0.035 | 0.061 | -0.160 | 0.023 | -0.025 | 0.152 | -0.015 | 0.000 | 0.304 | 1 | | | |
| EXIT | -0.085 | -0.020 | 0.059 | -0.069 | -0.025 | -0.019 | 0.076 | -0.012 | -0.015 | 0.117 | 0.398 | 1 | | |
| URBAN | 0.006 | 0.028 | -0.046 | 0.079 | -0.106 | 0.029 | 0.100 | -0.045 | -0.089 | -0.004 | 0.055 | 0.058 | 1 | |
| ENTREP | 0.009 | 0.442 | 0.216 | 0.309 | -0.038 | 0.021 | 0.013 | -0.004 | -0.030 | -0.005 | -0.008 | 0.026 | 0.379 | 1 |

## Appendix B. Identification issues

A key issue in the literature on social interactions (and entrepreneurial decisions) is how to identify the relevant 'interaction arena'. Empirical work has tackled this issue through addressing the so-called 'reflection problem' and 'sorting problem' (cf. Manski, 1993). A true local social interaction effect can be identified if one can isolate such an effect from a non-random spatial sorting of individuals (here immigrant entrepreneurs) into specific locations (here municipalities). It is argued that individuals who decide to start a firm in the near future may move to certain entrepreneurial regions before they actually start their firm. However, at least in Sweden this does not seem to be the case. Andersson and Larsson's (2016) recent study supports this view. Using similar Swedish data as our paper, they showed that all entrepreneurs (including immigrant entrepreneurs) are indeed less mobile than ordinary employees before they start their businesses. This pattern is in line with the notion of 'home bias' of entrepreneurs, meaning that entrepreneurs start their new businesses at the place where they have lived (for a long time) before (Dahl & Sorenson, 2012), enabling them to better exploit the local endowments.

Another issue related to the 'interaction arena' concerns the geographical boundaries within which effective social interactions between entrepreneurs occur. Typically, such geographical areas are identified as cities or municipalities (Lee, 2000; Giannetti and Simonov, 2004; 2009). A recent study discussed and identified lower levels of aggregation all the way down to the neighbourhood level of 1 km$^2$, arguing that the city level arena is 'too large' for social interactions among entrepreneurs (cf. Andersson and Larsson, 2016). Nevertheless, in this paper we still chose the city (municipality) and not the neighbourhood as the relevant arena for social interaction for the immigrant entrepreneurs. Our reasoning is as follows. Immigrant (entrepreneurs) socially interact with other immigrant (entrepreneurs) differently than native (entrepreneurs). This is because of the 'magnetic' nature of interaction of co-ethnic immigrants (as the minorities in a host country) (Mazumdar et al, 2000; Birman et al, 2005; Danzer & Yaman, 2013). Immigrants find each other beyond a 1 km$^2$ neighbourhood through a variety of events (religious and/or non-religious ones), get to gathering events, picnics, etc. If they would limit their interaction with co-ethnics within an area spanning only 1 km$^2$, they would meet and socially interact with very few members of their EC (see, e.g. Zivkovic's (1994) study of Croatian in North America).

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