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Department of Economics and Statistics, Linnaeus University, Sweden, Linnaeus University Centre for Discrimination and Integration Studies, Sweden

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Ethnicity and tax filing behavior*

Spencer Bastani† Thomas Giebe ‡ Chizheng Miao§

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Abstract

We analyze differences in tax filing between natives and immigrants, focusing on two empirical examples. First, we study deductions for costs associated with traveling between home and work allowed in the Swedish tax code. Using the total population of commuters within Sweden's largest commuting zone, we find that newly arrived immigrants file substantially less than natives, immigrants with a longer stay behave more like natives, and immigrants with the longest stay file the most, even more than natives. Second, we analyze bunching behavior among the self-employed at a large salient kink point of the Swedish income tax schedule. We find much less bunching among immigrants, even after a long time in the host country, and the largest differences relative to natives in residential areas with a high immigrant concentration. Our findings have implications for the equity and efficiency of the tax system and the spatial patterns of residential and occupational choices for different ethnic groups.

Keywords: deductions, tax filing, bunching, immigrants, natives, integration

JEL classification: D31, H21, H24, H26, J22, J61, R23

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†Department of Economics and Statistics, Linnaeus University; Linnaeus University Centre for Discrimination and Integration Studies; CESifo, Germany. E-mail: spencer.bastani@lnu.se.

‡Department of Economics and Statistics, Linnaeus University; Linnaeus University Centre for Discrimination and Integration Studies. E-mail: thomas.giebe@lnu.se.

§Department of Economics and Statistics, Linnaeus University; Linnaeus University Centre for Discrimination and Integration Studies. E-mail: chizheng.miao@lnu.se.

1 Introduction

In light of increasing globalization and labor mobility, as well as recent waves of migration in Europe, the question of how immigrants interact with the tax systems of their host countries and how they access the benefits of modern welfare states has gained increased relevance. A basic insight is that if, in the government's quest for an equitable and efficient tax system, the tax system becomes too complex and relies too much on the active participation of the taxpayer to correctly provide information to the tax authority, this can result in tax burdens being unequally distributed among individuals with equal economic circumstances. This can lead to unintended welfare consequences, create distortions in economic behavior, and imply that the tax system is viewed as unfair or discriminatory, ultimately affecting its legitimacy.[1]

As knowledge about tax systems is likely to be transmitted within ethnic networks, across generations and through social interactions with experienced (native) tax filers, tax complexity is prone to particularly affect immigrants. Given the relevance of the tax system in most areas of economic life, this has consequences for a range of diverse aspects such as the efficiency of labor markets, cross-country migration incentives, social and spatial mobility, integration, and residential segregation.

In this paper, we document differences in tax filing behavior between natives and immigrants using population-wide administrative data and two specific empirical examples. First, we consider one of the largest Swedish commuting zones, the Stockholm–Uppsala region, and compare how observationally identical natives and immigrants differ with respect to if and how they file for the deduction for commuting cost that is allowed in the Swedish tax code.[2] This commuting deduction, which is the most common deduction in Sweden, implies a reduction in yearly taxable income by an amount equal to the part of an individual's annual expenses for traveling between home and work that exceeds a certain threshold (around \$1000) provided certain eligibility criteria are satisfied.[3] Second, we study to which extent self-employed natives and immigrants bunch at the largest and most salient kink point of the Swedish personal income tax schedule. This kink is located in the upper middle part of

[1] A widely acknowledged principle in the design of tax systems is that the government should provide a fiscally equal treatment of "equals". This is not a firmly rooted normative principle, but rather a legal principle or political constraint that is understood as being crucial for the long-term stability and legitimacy of the tax system.

[2] Commuting deductions are common in Western European countries, including the Nordic countries, Germany, Austria, Belgium, Luxembourg, France, the Netherlands, Switzerland, but do not exist in important economies outside Europe such as the US, Canada, UK and China (see, e.g., Potter et al. 2006 and Paetzold and Winner 2016).

[3] For example, if commuting by car, the time saving must be at least two hours per working day relative to using public transport. Notice that the deduction implies that the commuting cost (exceeding the threshold) is subsidized at a rate which depends on the individual's personal marginal tax rate.

the income distribution, where the marginal tax rate jumps by around 20 percentage points. We use both traditional (unconditional) bunching estimation as well as multivariate regressions where the outcome variable is a dummy indicating whether an individual locates at the kink. Our analysis exploits geographical information about residence and workplace, and the data allows us to differentiate immigrants by the time since arrival in the host country, by their region of origin, and the level of segregation at their residential location. We also complement our study examining differences in tax compliance for the total population.

Our main finding is that there are striking differences in tax filing behavior between natives and immigrants, but also some noteworthy exceptions. Newly arrived immigrant commuters have a substantially lower take-up of the commuting deduction than natives. Immigrants seem to learn over time, and those with a longer stay in Sweden are even more likely to file deductions than natives. Moreover, our bunching analysis reveals that self-employed immigrants are substantially less likely to bunch at the kink, even after several decades in the host country, a result mainly driven by non-European immigrants, and those who live in areas with a high immigrant concentration. Our analysis of tax compliance reveals that immigrants are more likely to miss the declaration deadline and to be fined for non-compliance, regardless of their length of stay in the country. An exception is low-income immigrants whose behavior is not significantly different from that of natives. Immigrants are also less likely to actively participate in the tax declaration process (through the filing of deductions etc.), but most of this gap closes over time.

The general purpose of our analysis is to highlight the effects of tax complexity in ethnically diverse populations, revealing factors that policymakers need to take into account when assessing the efficiency and equity properties of the tax system. However, the differences in take-up that we document also have important implications for the spatial patterns in urban labor markets. For example, in the context of our commuting deduction analysis, the lower take-up of commuting deductions among immigrants is likely to affect the geographic scope of the area in which they search for work (see e.g., Le Gallo et al. 2017), with implications for residential patterns, the formation of ethnic enclaves, urban sprawl and the quality of employer-employee matching. Moreover, the bunching evidence tells us that knowledge about how to engage in (legal) tax planning and tax minimization is very different for natives and immigrants, and suggests that those who reside in areas with a high concentration of immigrants suffer the greatest informational disadvantage. This has implications for the decision to become self-employed, and ultimately affects the economic mobility and integration of immigrants. More generally, our results suggest that the spatial allocation of immigrants can have important implications for occupational choices by affecting the diffusion of knowledge about the incentives inherent in the tax system.

Our paper contributes to the very active research literature on how individuals respond to tax complexity and the monetary incentives inherent in the tax system. This literature, which is surveyed in detail below, is increasingly highlighting that taxpayers do not perfectly optimize their behavior in relation to the tax system. However, there is not much empirical evidence showing which groups of the population are most likely characterized by such imperfect optimization and whether the effects are quantitatively significant. In this paper, we seek to fill this gap. Tax rules that are attractive on theoretical grounds might not work in practice if certain groups of taxpayers fail to respond to the implied incentives or if there are compliance and take-up costs that the policymaker did not anticipate.

The paper is organized as follows. In the next section, we survey the related literature. In sections 3 and 4 we look separately at the two examples of the commuting deduction and the bunching at the kink of self-employed. Section 5 presents additional results on tax compliance behavior. Finally, we provide concluding remarks. The Appendices A – C provide additional information and empirical results.

2 Related literature

Our first empirical example looks at the Swedish commuting deduction. To the best of our knowledge, there is not much work on deduction behavior in general, and commuting deductions in particular. The reason for this is most likely the need for large and detailed administrative data sets. Two exceptions are Paetzold and Winner (2016) and Frimmel et al. (2018), who study commuting and other deductions from a different angle than ours, focusing on the tax evasion aspect. There is however a large related literature that looks at the take-up of various social benefits. Bargain et al. (2012) show for Finnish data that 40-50% of eligible individuals do not claim social benefits. Bhargava and Manoli (2015) state that the typical EITC non-claimant forgoes an estimated $1,096.[4] In comparison to this literature, we examine tax filing behavior and focus on higher income groups of the population.

The commuting deduction analysis relates to the urban economics literature that has examined the effects of commuting costs on a range of different outcomes. For example, Black et al. (2014) emphasize that commuting distance, and related costs, have a disproportionate negative effect on female labor force participation. Le Gallo et al. (2017) show in a large controlled experiment in France that reduced commuting costs have a positive effect on the job search activity of younger individuals. Hensen et al. (2009) establish that

[4]The literature provides several explanations for the lack of take-up, such as insufficient awareness (Chetty and Saez 2013) and the way information is presented (Saez 2009). The literature has also emphasized the importance of social image concerns, such as stigma costs (e.g., Friedrichsen et al. 2018)

enhanced geographic mobility positively affects the quality of education-job matches using data from the Netherlands. Gutiérrez-i-Puigarnau and van Ommeren (2010) show using German data that those with longer commutes have higher labor supply, arguing that this is a plausible outcome when workers have the option to vary both the number of hours worked per day and the number of workdays.[5] More broadly, there is a large literature studying the effects of spatial aspects such as agglomeration and the quality and availability of transport infrastructure, on outcomes such as the geographical pattern of suburbanization, commuting behavior, employment and house prices (see, e.g., De la Roca 2017, Baum-Snow and Kahn 2000, Rosenthal and Strange 2008, Garcia-López 2012, Garcia-López et al. 2015, and Mayer and Trevien 2017). There is also a literature on spatial mismatch which argues that geographical distance is a barrier to accessing available jobs. This mechanism is thought to especially affect ethnic minorities (see, e.g., Gabriel and Rosenthal 1996, Boustan and Margo 2009, Zenou 2013). The heterogeneity in the take-up of commuting deductions between different ethnic groups that we document also adds a new angle to studies of the distributional effects of commuter subsidies (see Heuermann et al. 2017 for a recent contribution).

Our second empirical example, the bunching analysis, highlights the role of ethnic segregation in explaining how the self-employed react to the incentives in the tax system. It therefore relates to a branch of the literature studying the role of social interaction for economic behavior, emphasizing information transmission, spatial interactions and spill-over effects, and is connected to a research agenda examining spatial aspects of entrepreneurship (see Glaeser et al. 2010).[6] Chetty et al. (2013) use "sharp" bunching behavior among the self-employed as a proxy for local knowledge about tax rules and find that individuals who move from low to high bunching regions appear to optimize better after they move (in the sense of reporting incomes that to a greater extent maximize their EITC refund). Bezin and Moizeau (2017) study the relationship between cultural dynamics, urban segregation and inequality and discuss the costs and benefits of living in ethnically segregated areas. Drago et al. (2019) show by example of the Austrian TV license fee that information about

[5]See also Paetzold (2019a) who finds a positive relationship between the generosity of commuting subsidies and commuting distance.

[6]The bunching analysis also relates to the rapidly growing literature that uses bunching evidence to measure behavioral responses. See Saez (2010), Chetty et al. (2011), and Bastani and Selin (2014). Many bunching studies focus, in similarity to our study, on the self-employed as the self-employed can more easily adjust their income through tax filing or labor supply adjustment as compared to wage-earners. They are also less constrained by third-party reporting, work hours constraints and have better access to professional tax planning. Indeed, the behavior of these groups have been shown to be very different from that of wage earners (Bastani and Selin 2014, Paetzold 2019b). Some studies document 'neoclassical' responses to monetary bunching incentives (e.g., Buhlmann et al. 2018, Doerrenberg et al. 2017, Paetzold 2019b), while other studies document behavior that does not conform with standard models. For example, Engström et al. (2015) and Engström et al. (2018) show that the decision to file for deductions causally depends on whether taxpayers have an initial deficit or credit with the tax authority, indicating the importance of loss aversion.

letters to potential evaders spread and raise compliance within neighborhood networks in Austria. Also using Austrian data, in the context of commuting deductions, Paetzold and Winner (2016) find that tax evasion behavior changes when people move between workplaces, indicating the importance of the workplace as a domain of information transmission, and Frimmel et al. (2018) provide evidence of the inter-generational spill-over of tax evasion behavior.[7]

Both our empirical examples relate to the literature analyzing the effects of complexity and salience of tax rules on taxpayer behavior. These issues have recently been analyzed from theoretical and empirical perspectives by Chetty et al. (2009), Abeler and Jäger (2015), Taubinsky and Rees-Jones (2018), and Blumkin et al. (2019). The literature generally supports the idea that taxpayers respond to tax incentives, but there is an increasing awareness of the need for refined theories in order to explain observed behavior.[8] Hoopes et al. (2015) analyze taxpayers' search for information (using phone calls to the IRS and internet search data) and show that they actively get informed in order to comply with tax law. However, there is also the possibility of widespread misunderstanding of tax legislation, as highlighted by Feldman et al. (2016). Benzarti (2017) shows that taxpayers rationally forgo tax savings in order to save on compliance costs, and that such behavior is more prevalent among high-income earners, consistent with the idea that they have higher opportunity costs of time. Moreover, Aghion et al. (2018) examine how French self-employed respond to tax complexity and discuss the determinants of taxpayer learning, finding that individuals value simplicity, leave money on the table, learn over time and that complexity costs are more likely to affect individuals who are less educated or have lower income.[9]

A relevant question in our setting is what can be done to mitigate low take-up in the

[7]Other papers are Bohne et al. (2018), who document information spread through the labor mobility of managers and tax experts, Alstadsæter et al. (2018) who show how tax avoidance spreads within family networks, and Alstadsæter and Jacob (2017) who document how information about tax avoidance opportunities spreads in local communities. In the context of welfare programs, Bertrand et al. (2000) examine social network effects in welfare take-up. They find that interacting with people who speak one's own language increases welfare take-up in local networks with high welfare take-up. See also Hansen and Lofstrom (2003) for an important early contribution on the welfare take-up among immigrants in Sweden.

[8]See Bernheim and Taubinsky (2018) for an overview of the emerging field of behavioral public economics. Behavioral biases that are mentioned in the literature include inattention (e.g., Hoopes et al. 2015), self-control problems and incorrect beliefs (Allcott et al. 2019), and present bias (Lockwood 2017).

[9]Edmark and Gordon (2013) present evidence showing that high-income households respond to their relatively stronger incentives to incorporate their business. There is also a large related literature on tax morale, tax compliance and tax evasion. Allingham and Sandmo (1972) provided an early framework for thinking about tax evasion as a rational decision and the literature is surveyed by Slemrod (2007). The role of tax morale is analyzed in-depth by Luttmer and Singhal 2014. Recent papers using Scandinavian data are Engström and Holmlund (2009) who show that unincorporated self-employed who face less public scrutiny tend to under-report income to a larger extent than incorporated self-employed individuals in Sweden, and Kleven et al. 2011 who find that cheating on self-reported income components in Denmark is widespread and that threat-of-audit letters have significant effects on the reporting of these income components.

population, and there are some papers that have studied to which extent compliance frictions can be remedied by tax authorities. Mascagni (2018) is a recent survey on tax experiments, documenting a range of measures that have been tested for their effectiveness in raising compliance.[10] Bhargava and Manoli (2015) report that complexity, salience and accuracy of beliefs can be successfully changed through intervention, whereas perceived stigma costs seem harder to affect. They also cite language barriers as a reason for lower take-up, which is related to the focus of our study. Guyton et al. (2016) and Manoli and Turner (2014) show that sending reminders can affect EITC take-up, especially among low-income filers. However, repeated reminders may be necessary for long-term effects. At the same time, Chetty and Saez (2013) caution that information provision alone might not be sufficient to have a significant average effect in the total population. Finally, Ramnath and Tong (2017) show that temporary policies (a one-time stimulus payment) can induce first-time tax filing with beneficial long-term effects for taxpayers, including continued tax filing and higher wages.

3 Case 1: The commuting deduction

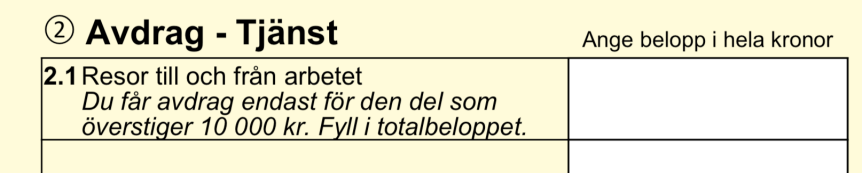
In our first empirical example we analyze how natives and immigrants respond differently to the tax system in terms of filing for commuting deductions. Commuting deductions are standard elements in the tax systems of many European countries (such as the Nordic countries, Germany and France) but notably do not exist in countries such as the US, Canada and the UK. The purpose of commuting deductions is to compensate individuals for their different costs of earning income related to their expenses for traveling between their home and workplace. One important purpose of the commuting deduction is to incentivize individuals to search for and accept employment in a larger geographical area, thereby increasing labor market efficiency and positively impacting an individual's career and earnings prospects. However, as such deductions require the taxpayer to actively inform the tax authority about their travel expenses, this will create heterogeneous take-up in the population, which has distributional and fairness consequences. In particular, it can create unmotivated differences in tax burden between less informed groups of the population and more informed groups of the population.

[10] See also Robles (2009) and Fjeldstad and Heggstad (2012) who discuss, respectively, tax education policies in US states with high immigrant concentration, and in African countries that try to build a taxpayer culture.

3.1 Details on the commuting deduction

As part of their annual tax declaration, Swedish income earners have the option of declaring their previous year's commuting cost. This can be done online or on paper.[11] This declaration results in an automatic reduction of income tax for an amount that is a function of the part of the commuting cost that strictly exceeds the respective year's eligibility threshold. The threshold was SEK 7k in 2002–2006, SEK 8k in 2007–2008, SEK 9k in 2009–2011, and SEK 10k in 2012–2013. Notice that the deduction results in a reduction of taxable income for the amount exceeding the threshold, and therefore implies an effective subsidy to commuting costs with a rate depending on an individual's personal marginal income tax rate. The commuting deduction is the most common tax deduction in Sweden (Skatteverket 2018).

Figure 1: The commuting deduction in the Swedish tax declaration form (illustration)



The tax declaration form contains a field for the deduction, see Figure 1. The instructions on the left can be translated as "Travel to and from work. You receive a deduction only for the part exceeding SEK 10 000. Fill in the total amount." Taxpayers do not have to take any action if they do not want to declare a commuting cost. In particular, they do not have to explicitly file a 'zero' commuting cost. Whenever a taxpayer does not exercise the option of declaring a commuting cost, this shows up as zero commuting cost in the data. Thus, when we discuss 'zero filing' below, this should be understood as 'no action has been taken' by the taxpayer regarding the commuting deduction. In the tax declaration, it is feasible to declare a commuting cost that is lower than the eligibility threshold. This has no apparent benefit for the taxpayer, and we refer to this as filing 'in the dominated region'.

The Swedish popular press regularly informs about tax deduction rules and common mistakes. According to a recent article (Aftonbladet.se 2018), there is widespread ignorance of the eligibility criteria among Swedish taxpayers. The tax authority in its press releases attempts to highlight the rules as well. From 2018, the tax authority provides an online tool that helps determine eligibility for the commuting deduction (Skatteverket 2018). According to the tax authority, nearly one million Swedish taxpayers declare commuting deductions, but about half of those taxpayers make some form of mistake or are not eligible at all. The

[11] In contrast to many other countries, Swedish taxpayers do not usually use specialized software to prepare their tax declaration. Such software would typically alert them to potential deductions and eligibility criteria.

most common mistake is to declare cost of commuting by car without fulfilling the eligibility criterion of a minimum two-hour time saving (per round trip) vis-a-vis public transport (Skatteverket 2018).[12] An additional eligibility criteria is that the distance between home and work must be sufficiently large, and deductions for expenses using public transport are only granted for the cheapest mode of transportation (hence, it is not possible to reach eligibility threshold by e.g. purchasing first class train tickets).[13]

In this paper, we focus on commuters between the Stockholm and Uppsala municipalities.[14] We do this for two reasons. First, this commuting region comprises one of the largest commuting flows in Sweden. Stockholm is Sweden's largest and Uppsala its fourth-largest city. Second, the geographical distance of about 70 km between these municipalities ensures eligibility for the commuting deduction if the commuter uses public transportation. The commuter trains between Stockholm and Uppsala are very well-developed. A single journey from Uppsala center to Stockholm city center takes between 30 and 50 minutes, depending on train operator and departure. If we take 2018 as a recent illustrative example, the eligibility threshold for the commuting deduction was a total commuting cost of SEK 11,000 ($\approx$ 1100 USD) and a round journey by train between Uppsala and Stockholm cost around SEK 250. A 30-day discounted ticket cost around SEK 1 700 in 2018. Thus, a commuter would reach eligibility after 45 round trips under the single journey ticket or after 7 months under the 30-day ticket.[15]

3.2 Data

We use population-wide register data from Statistics Sweden covering the years 2002–2013.[16] The data allows us to identify individuals' municipalities of residence and their workplace location. The workplace information identifies the actual physical place of work (rather than the head office of the firm). We define an individual as a commuter if the municipalities of residence and workplace differ, and identify people who live in Uppsala and work in

[12]Taxpayers are required to save their receipts and the tax agency regularly performs audits on a subset of tax filers, requiring them to submit supporting documentation to the tax authority (such as receipts). The exact nature of these audits is not known, since details about auditing procedures are not typically conveyed by tax authorities to the public.

[13]The minimum distance requirement is always satisfied in our empirical examples.

[14]In the Tables A14 and A15 of Appendix A, we provide results for two other major commuting regions (Södertälje–Stockolm and Kungsbacka–Gothenburg) that are, however, geographically more compact and hence eligibility for the commuting deduction is less convincing that in our major example. The results are in line with the findings for the Stockholm–Uppsala region.

[15]It is also possible to travel to and from work by car and deduct the associated expenses. However, as already mentioned, here an additional eligibility rule applies requiring the commuter to save at least two hours of commuting time relative to public transportation. In our empirical application, very few individuals would be eligible for deductions for this mode of travel.

[16]The occupation data is available for this period only.

Stockholm or the other way round. This population data is linked with individuals' tax records. These contain the individuals' self-reported amount of commuting cost that has been declared in a given year's tax declaration. In this paper, we define an individual as taking up the commuting deduction if the self-reported traveling cost is (strictly) above the official threshold of the tax authority (*Skatteverket*) for the given tax year.

We restrict the sample to the working age population between age 20 and 64. Furthermore, to focus on individuals with a strong attachment to the labor market, we restrict ourselves to individuals who have an annual wage income above SEK 150k (in 2013 prices).[17]

We define natives as those born in Sweden and immigrants as all foreign-born individuals in the sample. The final sample contains 68 707 observations for natives and 9 152 for immigrants. The register data contains information about immigrants' birth region (not birth country) and their year of arrival in Sweden. Based on the available birth region data, we classify immigrants as either Non-European immigrants, European immigrants (excluding the Nordic countries) or Nordic immigrants.[18] Based on the information about year of arrival, we group each immigrant into one of three groups for each data year: arrived in Sweden less than 5 years ago, between 5 and 10 years ago, and more than 10 years ago. Furthermore, by interacting the region of birth with the time since arrival in the host country, we create 9 immigrant-cohort groups, as shown in Table 1. The majority of immigrant commuters have stayed in Sweden for more than 10 years, comprising about 74 percent of immigrant observations. In contrast, only about 14 percent of immigrants have been residing in Sweden for less than 5 years.

[17] We have studied the sensitivity of our regression results with respect to the specification of this threshold, and the results appear robust. The corresponding regression results are shown in Tables A4 and A5 in Appendix A. Moreover, the workplace information is based on November data. It is conceivable that people switch jobs or workplaces within a year which can affect the eligibility for the commuting deduction. To address this issue, we show in Table A3 in Appendix A the regression results only for those commuters who work in the same workplace for two consecutive years.

[18] Due to restrictions imposed by Statistics Sweden, the relatively small group of immigrants from the US, Canada and Oceania countries are all classified as Western European immigrants, and, thus, are included in our group of European immigrants. We have also looked at an alternative geographical classifications based on the similarity of the respective countries' taxation systems, in which we classify immigrants as either Nordic immigrants, Western European immigrants or 'other' immigrants. The corresponding results are shown in Tables A7 – A11 in Appendix A. The results suggest that recently arrived non-Nordic immigrants are less likely than natives to take up the deduction. Furthermore, recently arrived Nordic and Western European immigrants are more likely than natives to file in the dominated region.

Table 1: The composition of immigrants in the sample

	All immigrants percent	Nordic percent	European percent	Non-European percent
Length of stay ≤5 yrs	13.92	11.31	20.21	9.77
Length of stay 5−10 yrs	12.27	10.12	16.95	9.26
Length of stay >10 yrs	73.81	78.57	62.85	80.97
Observations	9 152	1 591	3 405	4 156

In Table 2 we show the age composition of native and immigrant commuters depending on their length of stay in the host country. We see that there are few age differences between immigrants with different origin, but immigrants who are more recently arrived tend to be younger.

Table 2: The average age in different population groups

	All immigrants	Nordic	European	Non-European
Length of stay ≤5 yrs	34.38	34.14	34.43	34.40
	(7.78)	(7.44)	(7.27)	(8.72)
Length of stay 5−10 yrs	37.56	35.52	37.92	37.88
	(7.85)	(7.59)	(7.08)	(8.87)
Length of stay >10 yrs	43.32	48.08	45.19	40.33
	(10.86)	(9.62)	(10.43)	(10.67)
Observations	9 152	1 591	3 405	4 156

Standard deviation in parentheses.

Table 3 shows the occupation distribution. As we can see, most of the native and immigrant commuters are working in highly skilled occupations.

Table 3: The occupation distribution among commuters

	Native commuters Percent	Immigrant commuters Percent
Legislators, senior officials and managers	11.46	6.55
Professionals	49.91	50.48
Technicians and associate professionals	22.31	20.09
Clerks	5.26	5.79
Service workers and shop sales workers	5.25	8.45
Skilled agricultural and fishery workers	0.09	0.08
Craft and related trade workers	3.05	3.25
Plant and machine operators and assemblers	1.64	1.99
Elementary occupations	1.03	3.33
Total	100.00	100.00

Table 4: Summary statistics for the outcome and control variables

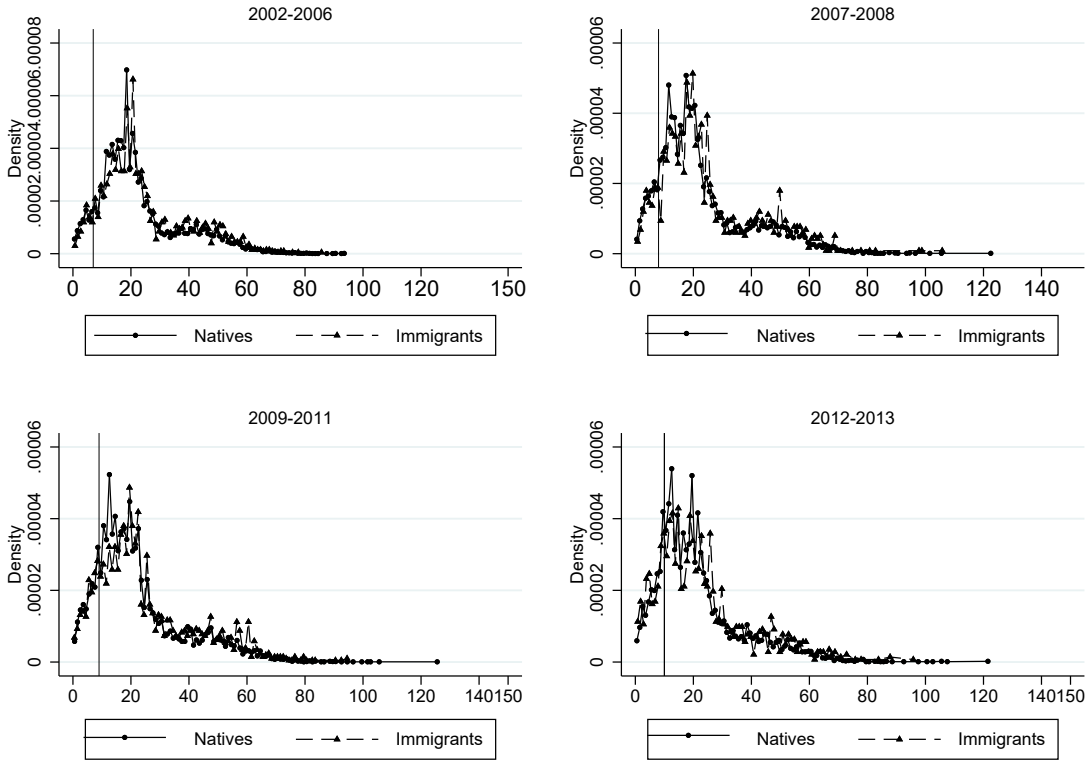
	Native commuters		Immigrant commuters	
	Mean	SD	Mean	SD
Deduction	0.64	0.48	0.63	0.48
Age	41.16	11.19	41.36	10.70
Married	0.43	0.50	0.50	0.50
Primary School	0.03	0.18	0.03	0.18
Secondary School	0.22	0.41	0.20	0.40
University	0.75	0.43	0.77	0.42
Female	0.35	0.48	0.39	0.49
Earned taxable labor income (SEK 1k)	487.56	396.49	420.10	245.16
Uppsala	0.80	0.41	0.74	0.44

Table 4 provides summary statistics for the main outcome variable and our control variables. The binary outcome variable *Deduction* in Table 4 measures whether the filed cost is strictly above the eligibility threshold or not. On average, 64 percent of commuters file some amount of commuting cost above the threshold and the mean value is very similar between native and immigrant commuters. However, as we will see below, these figures contain interesting heterogeneity. Importantly, as evident from Table 4, natives and immigrants in the sample are very similar in terms of background characteristics and the majority of commuters in the sample are highly educated. The share of university-educated commuters is about 75, resp. 77, percent for natives, resp. immigrants. The share of female commuters is 35, resp. 39, percent among natives, resp. immigrants. They also tend to have a similar regional commuting pattern. As indicated by the dummy variable *Uppsala*, about 80 and 74 percent of natives and immigrants, respectively, are living in Uppsala and commute to Stockholm. The remaining commuters travel in the other direction. The only noteworthy difference is that native commuters have higher taxable earnings than immigrant commuters.

In the sample, 50 782 natives (74 %) and 6 653 immigrants (73%) file a strictly positive commuting cost. Figure 2 shows the distribution of declared commuting cost by native and immigrant commuters. It contains four panels, one for each of the four periods in which the threshold was constant (as mentioned in section 3.1, the threshold was SEK 7k 2002–2006, SEK 8k 2007–2008, SEK 9k 2009–2011, and SEK 10k 2012–2013). We find that a substantial fraction of commuters declare commuting costs in the 'dominated region', i.e., above zero but below the eligibility threshold. However, most of the non-zero declarations are above the threshold. The majority of the filed costs fall in the interval above the threshold and below SEK 50k. There are some outliers who file very large amounts, but we are not able to verify whether these are mistakes or represent cheating.[19]

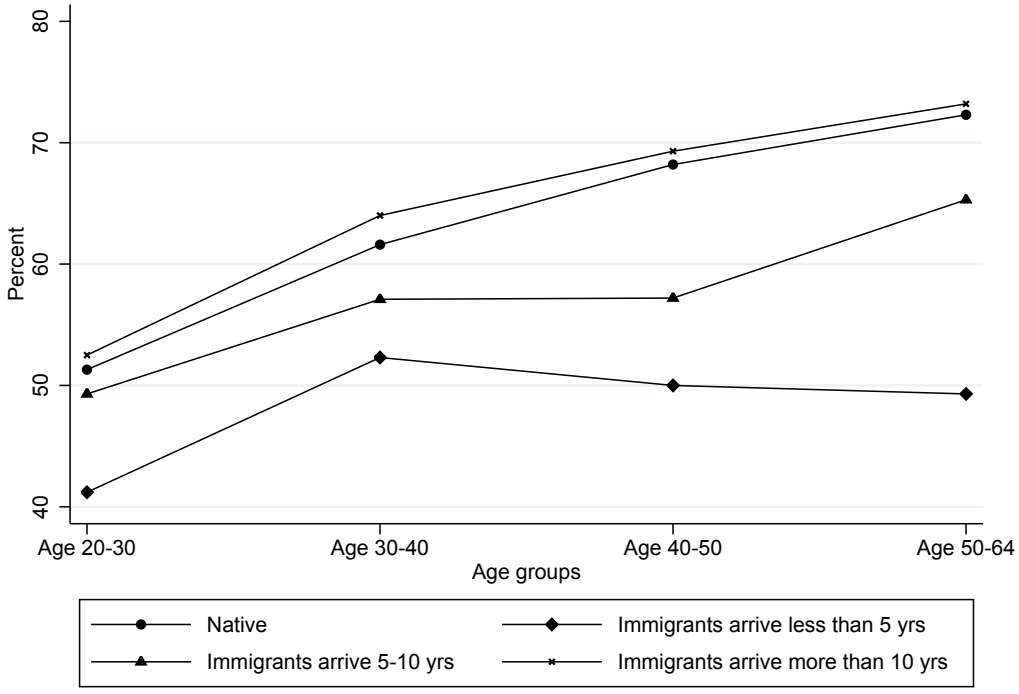
[19]Notice that, unless there is an audit, the filed amount is accepted by the tax authority. Our results are robust to excluding individuals with claimed deductions of more than SEK 50k.

Figure 2: The distribution of declared commuting cost (in SEK 1 000) across native and immigrant commuters (deduction threshold marked by a vertical line)



Finally, we show a descriptive graph showing the average take-up depending on age, ethnicity and duration of stay in the host country (see Figure 3). Here we see that there is a clear age gradient in the take-up for natives and immigrants who have stayed in the host country for a long time, but less so for more recently arrived immigrants.

Figure 3: The average take-up of the commuting deduction based on ethnicity, age, and length of stay in the host country (raw averages).



3.3 Results

We now go beyond the purely descriptive analysis and run multivariate regressions where we can control for a rich set of covariates, enabling us to compare the take-up behavior of immigrants and natives who are identical along several dimensions. A key aspect of our approach is that we focus on a commuting zone where the public infrastructure is so well-developed, making public transportation the natural choice for the vast majority of commuters, rendering concerns about unobserved differences between ethnic groups in the taste or costs for different modes of transportation less relevant. Moreover, full-time commuters using public transportation are guaranteed to be eligible for the commuting deduction.

In our regressions, we use native commuters as the reference group. We employ a linear probability model to estimate the probability of taking up the commuting deduction. Our

regression model is

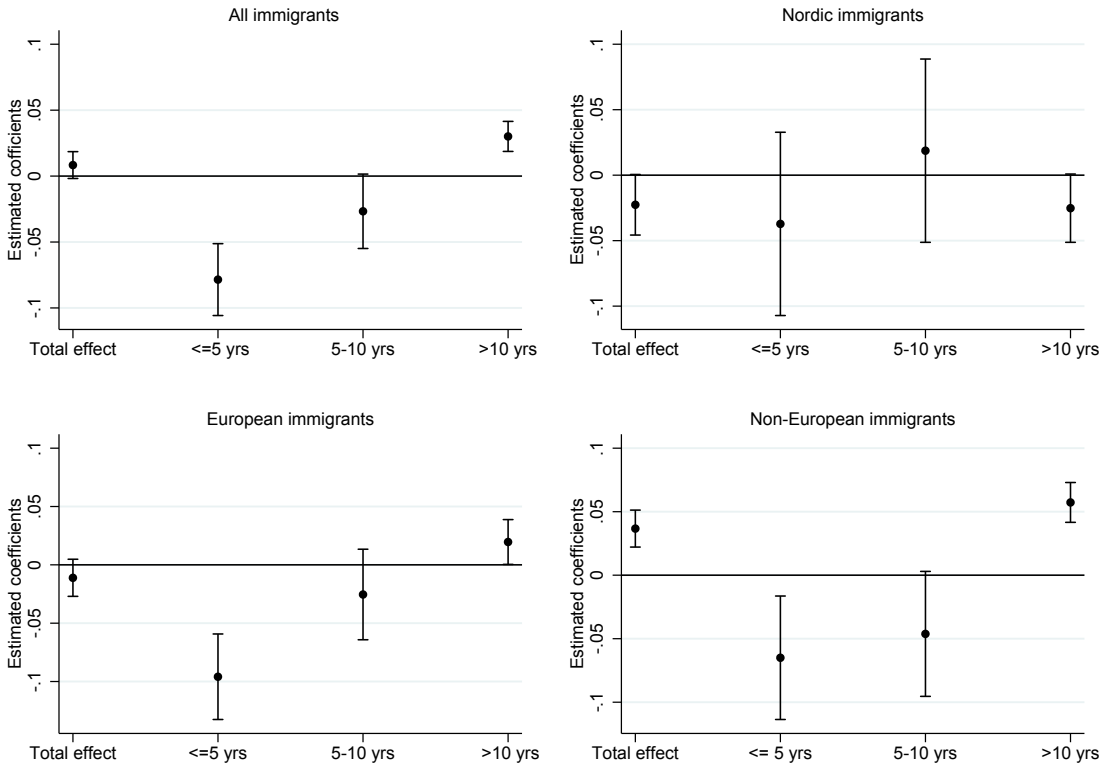
$$D_{ijt} = \alpha + \beta Imm_i + X_{it}^{'}\gamma + Occupation_{it} + \pi_j + \lambda_t + \epsilon_{it}, \quad (1)$$

where subscripts identify the commuter (i), the residential municipality (j) and the year (t). D_{ijt} is the binary outcome variable where the value 1 indicates take-up, i.e., that the self-reported commuting cost is (strictly) above the eligibility threshold in the respective year, while 0 means no take-up, i.e., the declared cost is zero or it is positive but does not exceed the threshold (dominated region). Imm_i equals 1 if the commuter is an immigrant and 0 otherwise. X_{it} is a set of control variables including age, gender, secondary school, university, marital status (whether married or not) and annual earned taxable labor income.[20] The variable $Occupation_{it}$ is a set of occupation dummies, corresponding to the categories listed in Table 3. The dummy variable π_j indicates whether the residential municipality is Uppsala or not and λ_t controls for the year effect. Finally, ϵ_{it} is an error term.

Figure 4 shows the regression results for the commuters between Stockholm and Uppsala (Table A1 in Appendix A contains the results in table form). As we use native commuters as the reference group, the estimated coefficients should be interpreted as the relative difference between immigrants and natives in terms of percentage points (positive coefficients indicate higher take-up of immigrants relative to natives). The upper left panel shows the results for all immigrants. In total, the probability of taking up the commuting deduction is on average similar between native and immigrant commuters (the estimated coefficient is slightly above zero but statistically insignificant). However, if we decompose immigrants by time since arrival, we find that immigrant commuters with fewer than five years of stay are significantly less likely to take up the deduction than natives, where the difference is about 7.8 percentage points. Over time, immigrants increase their take-up (the estimated coefficient becomes smaller in size and insignificant after five years of stay) and it becomes even larger than natives after more than ten years of stay (the coefficient is positive and significant). In Figure 4 we also decompose the effect based on immigrants' region of origin. We find that the differences relative to natives are mainly driven by immigrants from European and non-European countries. Immigrants from Nordic countries behave more or less like natives, however, they make up only 17 percent of the immigrant commuters (see Table 1).

[20] We have also performed regressions where we control for income in a nonlinear way, and all our qualitative results remain the same. The results are shown in Table A6.

Figure 4: The probability of taking up the commuting deduction by birth region and length of stay.



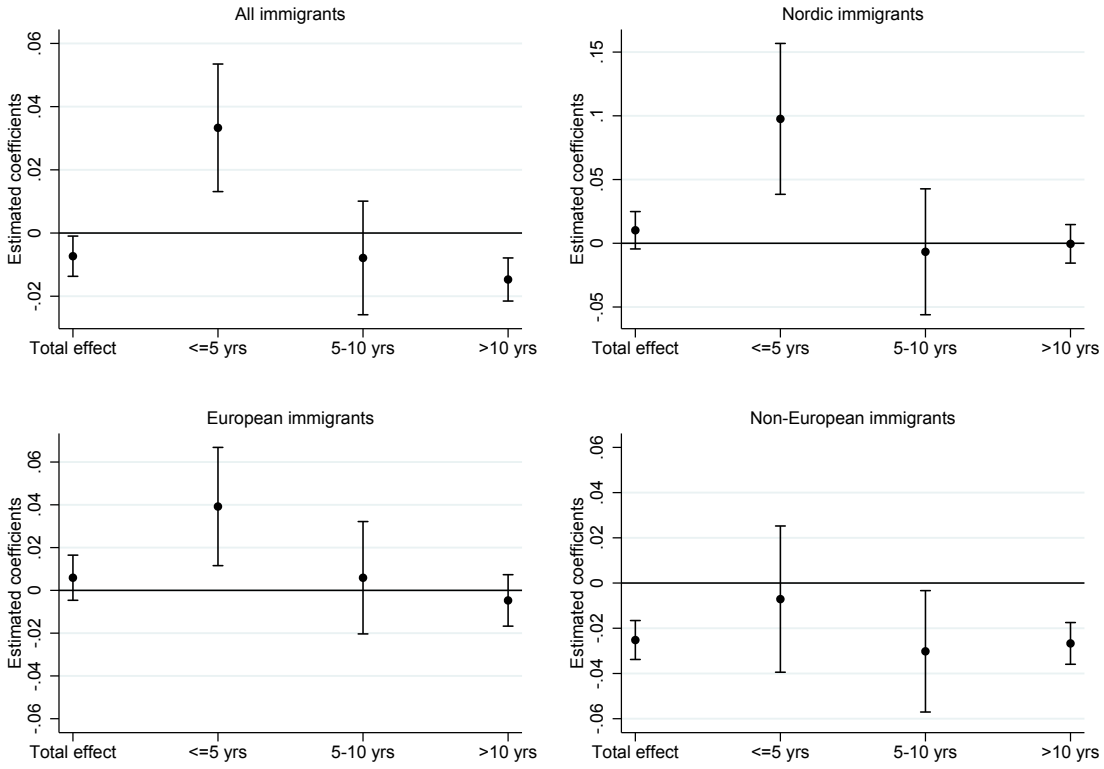
In our sample, more than 10 percent of commuters file a commuting cost in the 'dominated region', i.e. above zero but below the eligibility threshold, as Figure 5 illustrates.[21] We analyze this behavior in a regression in which the dependent variable equals 1 if the self-reported commuting deduction is in the dominated region (Table A2 in Appendix A contains the regression in table form). The dependent variable is 0 if the stated cost is either zero or above the threshold.

Similar to the previous results on the take-up of the commuting deduction, we see that the total population of immigrants is not very different from natives with respect to filing in the dominated region. However, as before, decomposing the immigrant population by length of stay reveals a clear pattern. Recently arrived immigrants from Nordic and European countries have significantly higher propensity to file in the dominated region than natives, perhaps because they expect such a deduction but are not fully informed about the rules. Moreover, immigrants appear to learn over time, and after more than 10 years, immigrants

[21]Similar to the evidence for Pakistan shown in Kleven and Waseem (2013), our filing in the dominated region is also an example of filing in a strictly dominated region that only has a cost and no benefit; and hence would not happen in a frictionless world.

are clearly less likely than natives to file in the dominated region. Non-European immigrants are already after 5 years of stay less likely than natives to file in the dominated region. In contrast to European or Nordic immigrants, it might be that Non-Europeans are not 'biased' in the sense that they are not expecting a commuting deduction and are therefore less likely to file in the dominated region. In other words, they are more likely either to not file the deduction at all (zeros) or to file a 'correct' deduction above the threshold.

Figure 5: The probability of filing a commuting cost in the dominated region



Appendix A contains supplementary material to this section. Tables A1 – A6 present regression results based on the classification of birth region described above. Tables A7 – A11 contain regression results based on an alternative classification of birth region. Table A12 presents extensive robustness checks with respect to occupation controls and more flexible age controls. Table A13 presents a formal analysis of heterogeneous take-up based on age, ethnicity and duration of stay in the host country, basically confirming the age gradient in take-up as evident from Figure 3. Finally, Tables A14 and A15 report results for two other commuting regions in Sweden.

3.4 Discussion

Our main interest is to identify relevant differences in tax filing behavior between natives and immigrants. We have found that in the context of the commuting expense deduction, that filing behavior of immigrant commuters as a whole is on average similar to that of natives. However, when differentiating immigrants by region of origin and length of stay in Sweden, striking differences emerge. Immigrants initially have a lower take-up than natives, but learn over time and after more than 10 years in the country they have an even higher take-up than natives and file less in the dominated region. One clear difference between European/Nordic immigrants and Non-Europeans is that the former initially file more in the dominated region than natives do. We conjecture that this difference is due to the fact that European and Nordic immigrants are on average more familiar with the concept of commuting deductions, but do not fully understand the eligibility criteria. This conjecture is supported by the results reported in Table A8 (Appendix A) from a regression that is based on an alternative classification of birth region, where we classify immigrants by the type of tax system in their home country. We see that Western European (and Nordic) immigrants, who are familiar with similar tax systems, file more in the dominated region than immigrants from other regions.

Around 16 percent of commuters in our sample (native and immigrants) do not file a commuting cost at all. This might have different explanations. For recently arrived immigrants, language barriers seem a convincing explanation, as the tax forms are sent out in Swedish. This conjecture is supported by the higher level of compliance of Nordic immigrants, and by the fact that immigrants catch up over time. A share of non-filers might commute by car and therefore might know that they are not eligible for deductions because they do not save two hours per round trip. There is also the possibility that individuals might be unaware of the deduction and eligibility criteria, or simply make a conscious decision not to file. Full compliance with the deduction rules requires collecting proof of one's commuting cost and adding up the expenditure. As a deduction is only granted for the amount exceeding the threshold, this might not be sufficiently attractive for everyone. Similarly, getting informed is costly, too. Moreover, in Sweden (as in other Nordic countries), a typical taxpayer's income is close to completely third-party reported and the tax authority advertises the possibility to receive an early tax return to those taxpayers who accept without changes the preliminary tax statement that is sent to them by the authority. This might discourage taxpayers from getting actively involved in information acquisition and deduction filing.

Before closing this section we would like to make three additional remarks regarding the interpretation of our estimates.

First, the literature has documented that there is a large amount of tax evasion and

cheating regarding self-reported items on tax declarations (e.g., Paetzold and Winner 2016). The Swedish tax authority also reports substantial problems with incorrect or outright unjustified deductions (Skatteverket 2018). Our data allows us to highlight differences in tax filing behavior between natives and immigrants, which is the focus of this study. We are not able to identify cheating. However, by construction of our sample, we try to make sure that we identify eligible commuters with high probability.

Second, the sample of commuters is potentially selected since knowledge of the commuting deduction might influence residential and workplace location choices (i.e. the decision to become a commuter). This might lead us to understate the group differences since less informed taxpayers are less likely to become commuters and immigrants are more likely to be uninformed. However, we are not sure about the quantitative significance of this effect.

Third, although we have been able to control for a rich set of covariates in our analysis, we cannot rule out that there are unobserved differences between natives and immigrants regarding their preferred mode of transportation (car vs. public transport). We presume, however, that conditional on observable covariates, given our focus on individuals with relatively high incomes and high education and the well-developed public infrastructure in the Uppsala-Stockholm region, differences in preferences regarding car travel and public transportation between the two groups should not be too much of a concern. A widened explanation for our findings could be that as immigrants integrate into society, both their familiarity with public transport and their familiarity with tax rules increase, starting from a potentially lower level than natives. Our results in the second empirical example (bunching) that we turn to in the next section makes us, however, confident that knowledge about the tax system is the driving factor behind our findings.

4 Case 2: Bunching estimates

Economic theory predicts that if a population of individuals have different (smoothly distributed) preferences over pre-tax income and consumption due to different earnings capacities, there should be an excess mass of taxpayers at points of the tax schedule where marginal tax rates discontinuously increase. In a very influential paper, Saez (2010) showed that this mass is proportional to the taxable income elasticity, which is a key parameter used when assessing the distortionary costs of income taxation. Our second empirical example compares the tax filing behavior of self-employed natives and immigrants by estimating elasticities capturing behavioral responses to changes in marginal tax rates at the first kink point of the

Swedish central government income tax.[22]

A key issue in the contemporary bunching literature is the question to which extent the bunching method is actually able to detect bunching responses if individuals cannot perfectly control their income level. For example, if individuals desire to locate at the kink point, but face a symmetric and normally distributed optimization error, then no bunching will be visible, provided the variance of the error component is sufficiently large. For this reason, the bunching results that have been most informative are those that relate to self-employed individuals (who by virtue of setting their own salaries have a greater flexibility to bunch at the kink) and for institutional settings with very large kinks (where the utility cost of not bunching at the kink also is large).

The major advantage of the Swedish tax kink is that it is very large (in recent years, an increase in the marginal tax rate of 20 percentage points) and located in the upper middle part of the income distribution where many taxpayers are located and the underlying income distribution is smooth and triangular shaped.[23] Therefore, the Swedish kink point provides an excellent laboratory to examine differential responses in bunching behavior between native and immigrant groups of the population. Bastani and Selin (2014) demonstrated that self-employed individuals sharply bunch at the kink, although the sizes of the implied elasticities were not very large. In this paper, we are not interested in the absolute elasticity of taxable income for self-employed individuals, but rather in the *difference* in the elasticity between natives and immigrants. We use the kink as a very salient example of a tax incentive in our quest to understand differences in tax filing behavior between different groups of the population.

4.1 Data

For our bunching analysis, we use data on the universe of Swedish taxpayers from 2002 to 2015, focusing on self-employed individuals.[24]. The location of the first central governmental tax kink point differs across years. We convert the taxable income distribution and thresholds to 2015 prices and consider the working-age population between age 20 and 64.

[22]This is the same kink point that was analyzed by Bastani and Selin (2014). In similarity to that paper, we use the refinement of Saez's bunching method developed by Chetty et al. (2011) who showed how one can estimate the excess mass at a kink point by estimating how the taxable income distribution would look like in the absence of a kink (the counter-factual distribution) by fitting a polynomial, excluding a certain interval around the kink.

[23]The identification assumption underlying the bunching method is that there should be no spike in the counter-factual distribution at the income level of the kink.

[24]In the population data, Statistics Sweden (SCB) defines a person as self-employed in a given year, if that person's November income is mainly derived from self-employment activities. If a person has both wage and self-employment income and the self-employment income multiplied by 1.6 is greater than wage income in November, SCB will classify the person as self-employed.

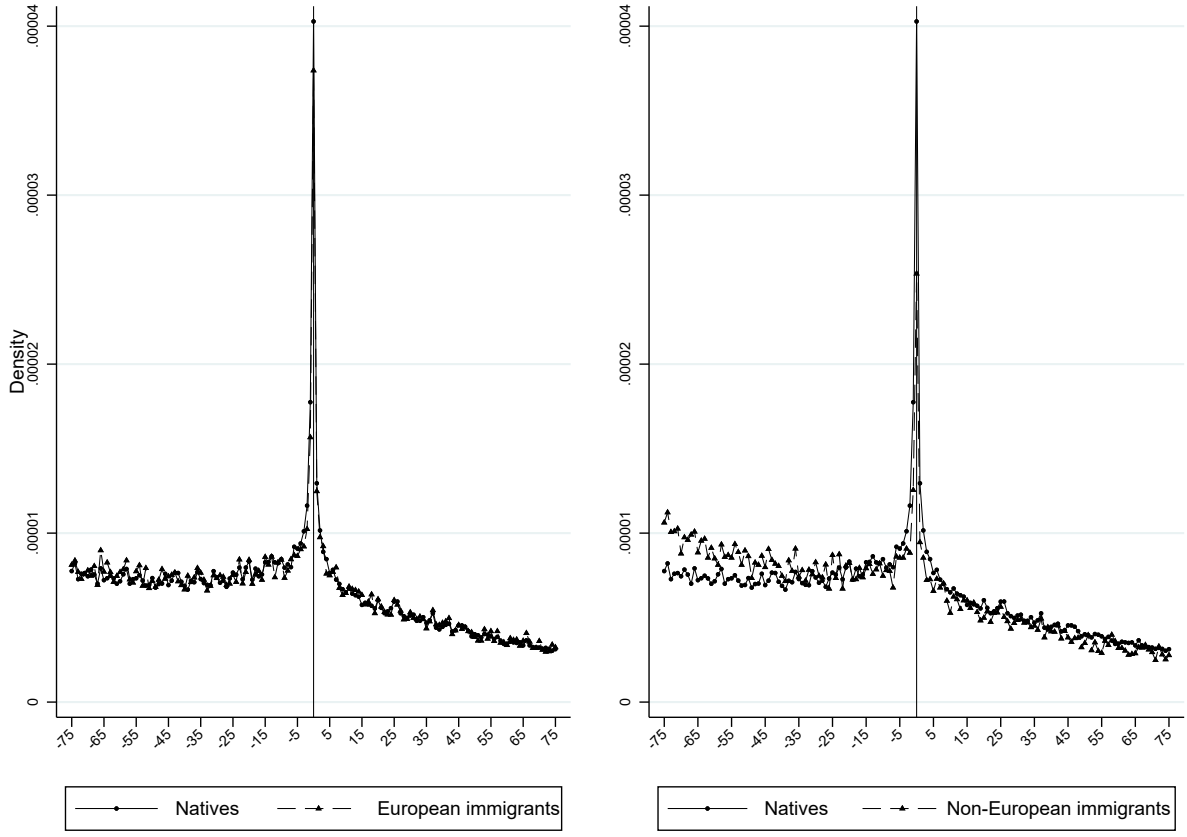
In bunching studies, the researcher typically specifies a 'small' and a 'wide' bunching window. The small bunching window determines the income observations around the kink point that should be excluded when fitting the counter-factual distribution (i.e. what the taxable income distribution would look like in the absence of a kink). The wide bunching window specifies how much data to the left and to the right of the small bunching window that is available for the estimation of the counter-factual distribution. The size of the large bunching window is of less importance provided one restricts the interval to regions of the income distribution that have the same shape and as long as one does not choose the window so large so as to include other kink points or discontinuities in the tax code that could contaminate the results.

Following Bastani and Selin (2014), we select a sample of self-employed individuals with earned taxable income falling into a wide bunching window of SEK [-75k, 75k] around the first kink point of the central government tax in a given year. As before, we define immigrants as foreign-born. We further classify immigrants into European immigrants and non-European immigrants.[25] Following the above definitions, the sample includes 1 230 926 self-employed natives and 123 671 self-employed immigrants. Among self-employed immigrants, the number of immigrants from European countries and non-European countries are 78 949 and 44 722, respectively. Panel A of Table B1 (Appendix B) contains summary statistics for the sample.

We calculate the distance between each individuals' taxable income and the first central governmental kink point. Figure 6 shows the distribution of the distance to the kink for different groups of the population, where the vertical line indicates the location of the first central governmental kink point. The left panel compares the distributions for self-employed natives and European immigrants whereas the right panel shows the distributions for self-employed natives and non-European immigrants. In the left panel, we observe a sharp spike at the kink that is similar in magnitude for both natives and European immigrants and the two distributions appear quite similar. In the right panel, however, clear differences emerge. Notably, the spike is smaller for Non-European immigrants than for natives and the density to the left of the kink looks quite different.

[25]The bunching estimation is data-intensive. Therefore, we include Nordic immigrants as a part of the European immigrants, different from our classification in the commuter deduction analysis. As before, European immigrants include immigrants from Canada, U.S. and Oceania countries.

Figure 6: Distance to the first kink point of the central government tax, 2002-2015



4.2 Results

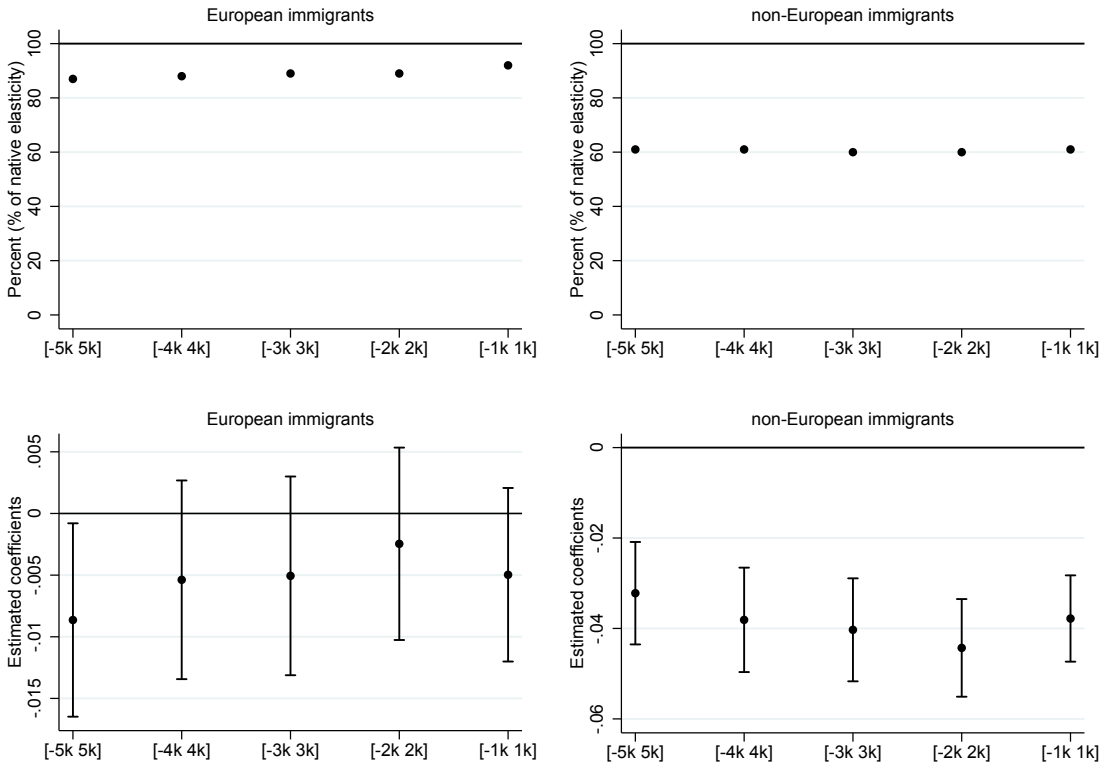
4.2.1 Baseline results

In our analysis, we fix the wide bunching window to SEK [-75k, 75k] and perform a sensitivity analysis with respect to the size of the small bunching window, choosing intervals between SEK [-5k, 5k] and SEK [-1k, 1k] around the kink point. We use different sets of small bunching windows because the selection of the small window is subjective. A too small (large) bunching window would underestimate (overestimate) the excess mass and the associated behavioral response. As our parametric fit of the counter-factual distribution we use a 7th degree polynomial.[26] All standard errors for the estimated excess mass are computed using a conventional bootstrap procedure. For each estimate of the excess mass at the kink, we

[26]Sensitivity checks using different bunching windows and polynomial orders are shown in Tables B3 and B4 in Appendix B, and the results are robust. The difference in excess mass between self-employed natives and European immigrants remains small, whereas the difference between self-employed natives and non-European immigrants remains large.

compute the corresponding taxable income elasticity.[27]

Figure 7: Baseline bunching estimates and regression coefficients



The results are shown in Figure 7. The upper panel of the figure displays taxable income elasticities for immigrants obtained through bunching estimation, expressed as a percentage of the corresponding native elasticities. The lower panel shows the differences between natives and immigrants in terms of the probability to locate in a given interval around the kink, as measured by a multivariable regression controlling for background characteristics.

We begin by describing the upper panel which contains the bunching estimates. Looking at the results for the small bunching window [-5k, 5k], we see that the difference in taxable income elasticity between self-employed natives and European immigrants is small.[28] On average, the implied elasticity for self-employed European immigrants is around 90 percent of the native elasticity. In contrast, the elasticity for self-employed non-European immigrants is only about 60 percent of the native elasticity (upper right panel of Figure 7). Complementing

[27]For details on the computation of the taxable income elasticity, refer to the text in the beginning of Appendix B.

[28]Observe that the results are similar for the other "small" windows. Notice also that Table B2 (upper half, Appendix B) shows that the elasticity for self-employed natives is about 0.041.

Figure 7, we present the corresponding graphical bunching analyses in Figure B1 (Appendix B) and the exact bunching estimates as well as the implied elasticities for each group in the upper half of Table B2 (Appendix B).

The bunching analysis highlights different bunching behavior between natives and, especially, non-European, immigrants. However, these differences might be due to differences in individual characteristics as well as due to regional differences. Therefore, we complement the bunching estimation with regressions where we are able to control for individual characteristics and municipal fixed effects.[29]

We focus on the following linear probability model:

$$Y_{ijt} = \alpha + \beta Europe_i + \gamma NonEurope_i + X_{it}^{'}\theta + \pi_j + \lambda_t + \epsilon_{it} \tag{2}$$

The subscripts i, j and t denote individual, municipality and year. The dependent binary variable Y equals 1 if the taxable income is within the small bunching window and 0 otherwise. The dummy variables *Europe* and *NonEurope* indicate the region of origin of immigrants, with self-employed natives as the reference group. The estimated coefficients β and γ measure to what extent the propensity of an immigrant's taxable income falling in the small bunching window differs from that of self-employed natives. X_{it} is a set of control variables: age, female, secondary school, university and marital status. π_j and λ_t control for municipality and year fixed effects.

The regressions results are presented in graphical form in the lower half of Figure 7 (see Table B2 in Appendix B for more detailed results). The estimated coefficients for self-employed European immigrants are quantitatively small and statistically insignificant, supporting the finding above that bunching among European immigrants is not very different from bunching among natives. In contrast, the coefficients for non-European immigrants vary from about -0.03 to about -0.04 as we shrink the small bunching window from [-5k, 5k] to [-1k, 1k] SEK, and all the estimates are statistically significant. The probability of a non-European immigrant to fall into the small bunching window of SEK [-5k, 5k] is about 3 percentage points lower than that of self-employed natives. Altogether, the regression results are in line with the bunching estimation in the sense that they show that self-employed natives respond more to the kink than self-employed non-European immigrants, whereas Eurpean

[29]For this regression analysis, we restrict the sample to the wide window SEK [-10k, 10k] around the central governmental tax point, which makes earnings ability among the self-employed more comparable. This subsample contains 265 671 natives, 15 827 European immigrants and 7 729 non-European immigrants. In the restricted sample, 169 643 natives, 9 903 European immigrants and 4 572 non-European immigrants have incomes that fall in the small bunching window [-5k, 5k]. The summary statistics for this restricted sample are given in panel B of Table B1 (Appendix B).

immigrants exhibit similar behavior as natives.[30]

Having presented the baseline bunching analysis, we now take a closer look at how the composition of our sample of self-employed immigrants affects the bunching results. We first look at ethnic segregation at the place of residence, followed by analyzing the role organizational form for the self-employed, i.e., whether their businesses are incorporated or not. For each case, we conduct a bunching estimation as well as regressions as described above.

We have also repeated the bunching analysis using taxable income before any deductions. The results do not differ much from the baseline results, indicating that self-employed people mainly use either labor supply or income planning to locate at the kink point rather than deductions. This is in line with Paetzold (2019b) who showed that deductions are not a major channel for income adjustment for self-employed in Austria.

In our commuting deduction analysis we considered immigrants' time since arrival in the host country to be an interesting dimension to study. This is also an interesting dimension to consider in the bunching analysis. However, the average length of stay for self-employed European and non-European immigrants is about 27 and 21 years respectively. Given that the bunching analysis is conducted in a high income region of the income distribution, sample size limitations precent us from investigating this issue here.[31]

4.2.2 Residential segregation

The advantages and disadvantages of living in an ethnic enclave have been discussed in the literature.[32] On the one hand, an ethnic enclave may facilitate the transmission of information among immigrants. On the other hand, a more segregated area may hinder integration and access to information due to fewer interactions with natives and the society of

[30]We have also done the regression for the large window SEK [-10k, 20k]. The results are shown in Table B5 in Appendix B. The findings remain robust.

[31]We have performed bunching analyses for European and non-European immigrants based on whether their length of stay is more than 20 years. The analysis shows that the variable 'time since arrival' plays a less important role in this exercise. For immigrants with less than 20 years of stay, the taxable income elasticity as a percentage of the native one is about 92% and 64% for European and non-European immigrants respectively. For immigrants with more than 20 years of stay, the corresponding figures are about 82% and 58% for European and non-European immigrants respectively. We have also performed the corresponding regression analyses. Again, we find that self-employed non-European immigrants, regardless of length of stay, are less likely to be located in the small bunching window as compared to self-employed natives, whereas bunching behavior of self-employed European immigrants, regardless of length of stay, is statistically similar to self-employed natives.

[32]It has been argued that local social networks affect individual response to welfare take-up through information and through norms, e.g., Bertrand et al. (2000) who use language to proxy for the size of the local social network. For policy makers, the presence of network effects needs to be taken into account as it can strengthen the effect of policies (through multiplier effects) or weaken them, if the network 'pressure' discourages take-up directly or indirectly.

the host country. An ethnic enclave can also exert 'pressure' through norms and (perceived) stigma cost. Therefore, tax filing behavior of immigrants living in an ethnic enclave may differ from that immigrants who live in less segregated areas.

In the data, we can identify individuals' residential location at parish level. A municipality in Sweden can include several parishes. According to Statistics Sweden, there are about 290 municipalities and about 1 500 parishes in Sweden in 2011. In this section, we restrict attention to the years 2002–2014 for which the parish data is available. Using the whole population data of Sweden, we calculate, for each parish, the share of European immigrants and the share of non-European immigrants.[33] These shares, respectively, constitute a distribution of immigrant shares (at parish level) for the whole of Sweden, separately for European and non-European immigrants.[34] Using these two distributions, we define, respectively, three immigrant concentration levels with cutoffs at the 25th and 75th percentile of the distribution.[35] Thus, we obtain a measure of whether a given self-employed European (non-European) immigrant lives in a parish with low, medium or high concentration of European (non-European) immigrants. As before, the wide income windows for the bunching and regression analysis are SEK [-75k, 75k] and [-10k, 10k], respectively, but the small bunching window is always [-5k, 5k].

The upper half of Figure 8 displays bunching estimates of taxable income elasticities for self-employed immigrants relative to natives. The corresponding graphical bunching analysis is shown in Figures B2 and B3 (Appendix B). The elasticity for natives is about 0.041. For self-employed European immigrants, the elasticity is close to the native level, but decreasing in the concentration of European immigrants in the parish. For non-European immigrants who live in less segregated areas, the elasticity is close to that of natives, as the upper right panel of Figure 8 (Low concentration) shows. However, for non-European immigrants living in more segregated areas, the elasticity is only about half of the native elasticity.

Next, we turn to the regression results, which are shown in the bottom half of Figure 8 (Table B6 in Appendix B contains the results in table form). In all the regressions, natives are the reference group. The estimated coefficients for European immigrants (lower left panel of Figure 8) are quantitatively small and not statistically significant. For non-European immigrants, we find that those who live in less segregated areas are (statistically) similar to natives in terms of the likelihood of falling into the bunching window SEK [-5k, 5k].

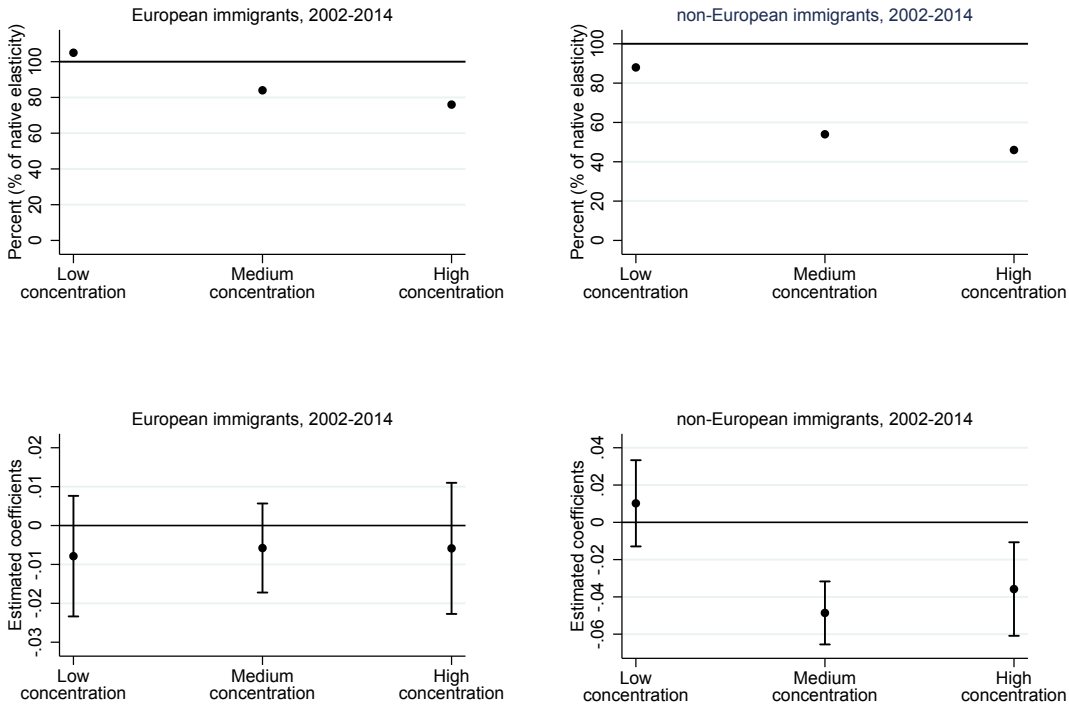
[33]To be precise, the share is computed as the total number of European (resp. non-European) immigrants divided by the total population in the given parish.

[34]The smallest share of European immigrants in any parish is 0.69 percent and the largest is 47 percent. The respective numbers for non-European immigrants are 0.16 percent and 46 percent. The absolute immigrant share of Sweden is 19 percent in 2018.

[35]These cutoffs can be expressed in terms of absolute immigrant concentration. The numbers are 7 percent and 13 percent for European immigrants. For non-Europeans they are 5 percent and 19 percent.

However, non-European immigrants that live in more segregated parishes (medium and high concentration) are about 5 percentage points less likely than self-employed natives to fall into the income interval SEK [-5k, 5k]. To sum up, the results indicate that immigrants, particularly non-European immigrants, who live in less segregated areas might be better integrated into the host country's society from a tax filing behavior perspective. However, it is also important to point out that we cannot establish causality here, e.g., we do not know whether individual behavior changes when immigrants move into a more or less segregated area. We hope to explore this in future work.[36]

Figure 8: Residential segregation: Bunching and regression analysis



4.2.3 Organizational form

Engström and Holmlund (2009) have shown that self-employed individuals with unincor-

[36]One possibility would be to use some refugee placement policy (see e.g., Edin et al. 2003, Åslund 2005, and Åslund and Rooth 2007 for Sweden and Damm 2014 for Denmark). The Swedish placement policy occurred in 1987-1991 when the tax system looked quite different as compared to our period of 2002-2014 and it is an open question whether it would provide sufficiently strong variation in immigration concentration to highlight differences in tax filing behavior several decades later, given the possibility for people to change location since their initial placement and given our focus on individuals with relatively high incomes.

porated businesses differ in their income reporting behavior from self-employed with incorporated businesses. Incorporated firms may use more professional tax planning, but they also tend to have more employees and firm owners, making it more difficult for a single self-employed individual connected to an incorporated firm to perfectly adjust their salary. Hence whether incorporated or unincorporated business owners are more or less likely to bunch at the kink is ambiguous.

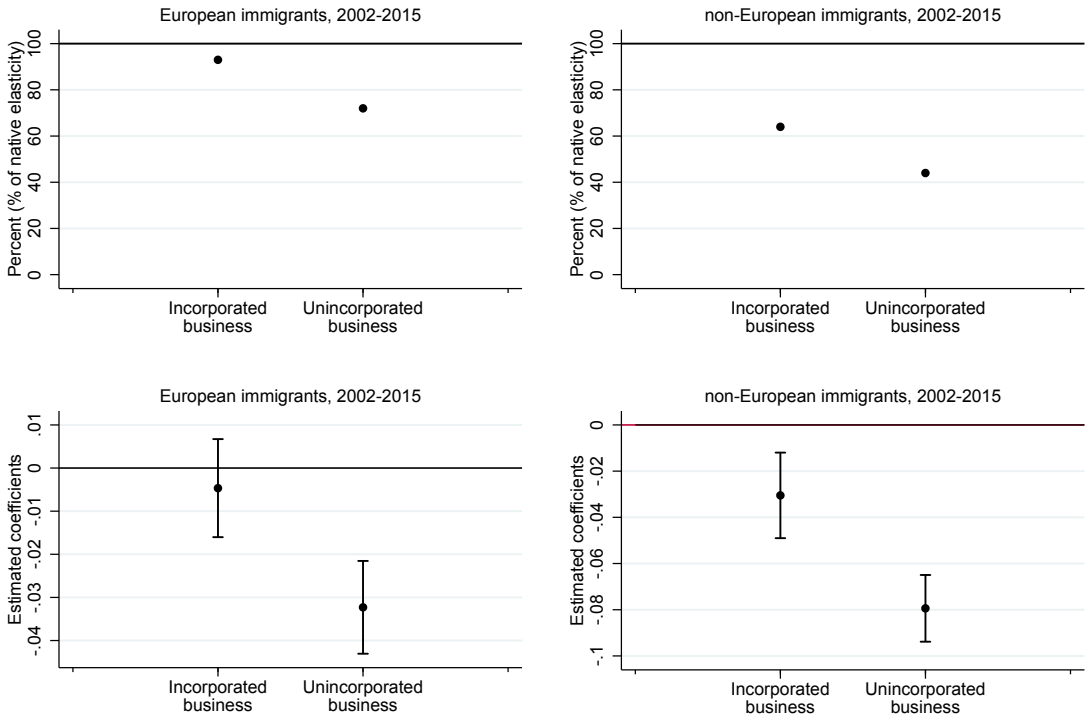
In Table B1 (Appendix B, for the wider window [-75k, 75k]), we show summary statistics, describing the composition of our sample with respect to organizational form. We see that about 61 percent of self-employed natives are connected to an incorporated business while the corresponding figures for European and non-European immigrants are about 51 percent and 37 percent. As before, we perform bunching estimation and regressions, in this case focusing only the small bunching window SEK [-5k, 5k].

The upper half of Figure 9 shows the difference in elasticity between immigrants and natives, divided up by organization form. The corresponding graphical bunching analyses are shown in Figures B4 and B5 (Appendix B). First, consider incorporated businesses. The elasticity for self-employed natives associated with incorporated businesses is about 0.022, which is smaller than the native elasticity in the baseline results. The corresponding elasticity for European immigrants is close to that of natives, whereas the elasticity for non-European immigrants is only about 60 percent of the native. Turning to unincorporated businesses, the elasticity for natives is about 0.074. The elasticity difference between natives and all immigrants is larger than for incorporated businesses. The taxable income elasticity of non-European immigrants is only half of that of natives. The results show that self-employed people with unincorporated businesses bunch more than those with incorporated businesses. Moreover, the behavioral difference between natives and immigrants is larger among individuals tied to unincorporated firms than among those tied to incorporated firms.

The bottom half of Figure 9 illustrates the regressions results for the propensity to have a taxable income falling into the small bunching window (the more detailed regression results are presented in Tables B7 and B8 in Appendix B). Among the self-employed with incorporated businesses, we find that non-European immigrants are about 3 percentage points less likely than natives to fall in the small bunching window. European immigrants, on the other hand, are not statistically significantly different from natives. As regards to unincorporated businesses, we find a large probability difference between non-European immigrants and natives. On average, the probability of having a taxable income falling within the small bunching window for non-European immigrants is about 8 percentage points less than that of natives. The difference between European immigrants and natives is smaller, around 3 percentage points. Thus, the regression results qualitatively support the findings of the

bunching estimation.

Figure 9: Organizational form: bunching and regression analysis



The taxable income elasticity for self-employed native with incorporated and unincorporated business are 0.022 and 0.074 respectively.
In the regression analysis, the reference group are self-employed native with incorporated business and with unincorporated business.

Appendix B contains supplementary material to this section. Figure B1 contains the graphical bunching analysis for the baseline case. Table B2 contains more detailed results of the bunching estimation and regressions in table form. Tables B3, B4 and B5 contain sensitivity checks. Table B1 contain summary statistics for the samples used in the bunching estimation and regressions. Figures B2 – B3 show the regression and bunching results for the residential segregation analysis, where Table B6 contains the regression results in table form. Finally, Tables B7 and B8, as well as Figures B4 and B5 provide regression and bunching results for the analysis of the role organizational form.

4.3 Discussion

The general picture that emerges from the bunching analysis is that self-employed immigrants exhibit clearly less bunching behavior than native self-employed. There is a substantial difference between European and non-European immigrants, where European immigrants exhibit behavior close to that of natives. There is a clear correlation between the degree

of residential segregation and the distance of immigrants to native bunching behavior. The distance is furthermore increasing in the residential concentration of immigrants with the same region of origin. This segregation effect is stronger for Non-European self-employed immigrants. A noteworthy exception is non-European immigrants living in low-segregation areas, who are quite close to native bunching behavior. The gap between self-employed natives and immigrants is substantially smaller among those with incorporated businesses, maybe due to reasons relating to higher entry requirements for incorporated businesses and cultures in such businesses regarding formalized tax preparation. Before closing this section, we should mention that the literature on self-employment has highlighted the different forces that may cause individuals to enter self-employment. For example, some are 'pushed' into self-employment due to lack of opportunities in wage employment, others are 'pulled' into self-employment due to business opportunities. Furthermore, the selection process is likely to be different for different immigrant groups, which could explain some of the discrepancies in bunching behavior between natives and immigrants that we have found. Here it should be noted that we focus on high income groups in the population that arguably have decent opportunities both in wage employment and self-employment. However, some obstacles to finding wage employment, such as labor market discrimination, could be relevant also for highly skilled groups of the population.[37]

5 Further Results

In this final section, we present some further results regarding differences in tax filing behavior between natives and immigrants. We focus on three different measures. First, we look at whether or not individuals have been fined for submitting their tax declaration after the deadline. The Swedish Tax Agency imposes a fee for late filing where the fee typically is between 1000 and 3000 SEK. Second, we examine the incidence of audits. The tax authority runs audits of tax declarations, and in case of incorrect filing, imposes penalties of around 20 to 40 percent of the unpaid tax. Third, we examine the difference between the preliminary income tax amount sent to the taxpayer by the authority and the final tax amount. Whether or not these two amounts are different provides a measure of the taxpayer's active participation in income reporting: If the amounts differ, the taxpayer has made additional declarations. If the amounts are equal, the taxpayer either had nothing to declare in addition, or has not exercised that option. As mentioned earlier, the tax authority grants early tax returns for taxpayers who accept the preliminary tax statement without asking for additional tax deductions. In all these exercises, we focus on the whole immigrant population,

[37] See Hammarstedt and Miao (2019) for a recent analysis of self-employment in Sweden.

which includes both low income and high income taxpayers.

We create three binary variables: i) whether the taxpayer has been engaged in late tax filing; ii) whether the authority has imposed tax surcharges for incorrect tax filing; and iii) whether the taxpayer is not actively participating in the tax declaration. A taxpayer is defined as not actively participating in the tax declaration if the preliminary tax is equal to the final tax. Using these three variables as dependent variables, we examine the effect of immigrant status (and origin), using natives as the reference group. We employ a linear probability model, controlling for age, gender, education attainment, marital status, total taxable income, municipality and a year fixed effect.

We find that immigrants have a larger probability of filing their taxes late, independently of their length of stay in the host country. When differentiating by income (in three groups, divided by the 25th, 50th, and 75th percentile), we find one exception to this pattern. Low income immigrants (except for Nordic immigrants) behave similar to natives, although the estimated coefficients are not economically significant (see Figure C1 in Appendix C).

We find that immigrants have a higher propensity for non-compliance (as measured by the audit measure), regardless of length of stay. As we see in Figure C2 in Appendix C, there is again an exception for low-income European and non-European immigrants: they are similar to natives. Moreover, tax non-compliance increases with income for non-European immigrants (see Figure C2, lower left panel). Differentiating the population according to the composition of their income sources, we find that the difference in tax non-compliance between natives and immigrants is substantially larger for those with business income. All these results should be interpreted with caution, as we have no information about how the tax authority selects taxpayers to be audited.

Finally, we find that immigrants are less likely to actively participate in income declaration (see Figure C3 in Appendix C). There is a very clear trend with respect to length of stay in the host country: Immigrants close most of the gap over time (even when controlling for total taxable income), but there remains a difference even after more than 10 years in the country. The gap remains the largest for non-European immigrants.

6 Concluding Remarks

In this paper, we have analyzed differences in tax filing behavior between natives and immigrants using population-wide data from Sweden and two specific empirical examples.

Our first empirical example examined the difference in the take-up of commuting deductions between immigrants and natives, controlling for a rich set of covariates. We found that immigrants with a longer stay in the host country (independent of origin) and immigrants

from Nordic and European countries, behave more like natives whereas the differences are strongest for non-European immigrants who have recently arrived in the host country. The gap to natives is closed over time, and the gap is closed completely for individuals with more than 10 years in the host country. Interestingly, immigrants with the longest stay in the host country file even more than natives.

Our second empirical exercise examined differences between natives and immigrants in terms of the extent of bunching among the self-employed in response to a very large and salient kink point of the Swedish income tax schedule. These bunching responses, that reflect causal responses to the tax system, show that there are striking differences in tax filing behavior between natives and immigrants, even for immigrant self-employed who have stayed in Sweden for a long time. Moreover, we have seen that differences in bunching behavior between natives and immigrants are strongly correlated with residential segregation. This is especially the case when examining non-European immigrants. An interesting exception is non-European immigrants living in low-segregation areas, who behave similar to natives. We do not, however, know whether our results are driven by selection into these areas, or whether there are true exposure effects as documented by, e.g., Chetty et al. (2013).

We complemented our study examining several measures of tax compliance for the whole population of Swedish taxpayers. Immigrants are more likely to miss the declaration deadline and to be fined for non-compliance, regardless of their length of stay in the country. An exception are low-income immigrants whose behavior is not significantly different from that of natives. Immigrants are also less likely to actively participate in the tax declaration process (through the filing of deductions etc.), but most of this gap closes over time.

Several remarks are in order. First, immigration to Sweden has not been homogeneous over time in terms of source countries, skills and migration motives, just to name a few relevant aspects. We have set out to document differences in behavior between immigrants and natives regarding tax filing behavior in one particular time window, but we have not explicitly studied the process of convergence in tax filing behavior between natives and immigrants by following individuals over time. A large body of work in the migration literature has studied the process of assimilation and immigrant's economic convergence towards natives. In the US context, this research has shown that earlier cohorts of immigrants assimilate faster towards natives than later cohorts due to differences in earnings abilities (see, e.g., Borjas 1995). In our context, these cohort effects are likely to be less important, and our results are potentially easier to generalize to other contexts, since in both our empirical examples, we focus on samples of immigrants and natives that have high incomes (and are thereby integrated into the labor market) and share a similarly high education background. Second, our study documents differences in tax filing behavior, but cannot address the issue

of tax evasion or cheating. In that sense, a part of the documented behavioral differences might be differences in tax evasion. However, regardless of the cause of the behavioral differences, the fairness of taxation is affected and the consequences of a low take up are materialized. Third, there seems to be scope for policy intervention (we refer to some successful policy measures in the literature section), such as alleviating language barriers for recently arrived immigrants, but a range of open questions remain, e.g., whether or not segregation and network effects cause the observed differences in tax filing behavior that we have documented, or why a substantial gap in bunching behavior remains even after a very long time in the host country. We hope to address these questions in future research.

The primary focus of our paper has been to analyze the differential take-up by informed (native) and less informed (immigrant) workers, highlighting the effects of tax complexity on take-up in ethnically diverse populations. We have not formally analyzed the impact of differential take-up on equilibrium spatial patterns in labor markets. This is an important research question with implications for a range of different aspects, such as labor supply, the formation of ethnic enclaves, urban sprawl and the quality of employer-employee matching. A formal analysis of such effects may be possible using our policy context, but is left as another interesting direction for future research.

7 Appendix A (Commuting deduction)

Table A1 shows the regression results for commuters between Stockholm and Uppsala. The reference group is always native commuters.

Table A1: The probability of taking up the commuting deduction among Stockholm and Uppsala commuters

	(1) Deduction	(2) Deduction	(3) Deduction	(4) Deduction	(5) Deduction	(6) Deduction	(7) Deduction	(8) Deduction
Immigrant	0.00154	0.00835						
	(0.00529)	(0.00519)						
Nordic Imm.			-0.00209	-0.0226				
			(0.0120)	(0.0118)				
Europe. Imm.			-0.00370	-0.0111				
			(0.00830)	(0.00811)				
Non-Europe. Imm			0.00722	0.0367**				
			(0.00763)	(0.00743)				
Imm. arrive $\leq$ 5 yrs					-0.128**	-0.0785**		
					(0.0139)	(0.0139)		
Imm. arrive 5-10 yrs					-0.0571**	-0.0267		
					(0.0146)	(0.0144)		
Imm. arrive > 10 yrs					0.0356**	0.0301**		
					(0.00595)	(0.00581)		
Non-Europe imm. $\leq$ 5 yrs							-0.157**	-0.0650**
							(0.0249)	(0.0248)
Non-Europe imm. 5-10 yrs							-0.101**	-0.0462
							(0.0253)	(0.0251)
Non-Europe imm. > 10 yrs							0.0393**	0.0573**
							(0.00825)	(0.00800)
Europe imm. $\leq$ 5 yrs							-0.127**	-0.0959**
							(0.0185)	(0.0187)
Europe imm. 5-10 yrs							-0.0409*	-0.0254
							(0.0201)	(0.0198)
Europe imm. > 10 yrs							0.0456**	0.0196*
							(0.0101)	(0.00980)
Nordic imm. $\leq$ 5 yrs							-0.0677	-0.0372
							(0.0362)	(0.0357)
Nordic imm. 5-10 yrs							-0.0105	0.0187
							(0.0366)	(0.0357)
Nordic imm. > 10 yrs							0.00844	-0.0252
							(0.0135)	(0.0133)
Control variables								
Age		0.00574**		0.00578**		0.00560**		0.00567**
		(0.000163)		(0.000163)		(0.000164)		(0.000165)
Married		0.00148		0.00119		0.00278		0.00240
		(0.00361)		(0.00361)		(0.00362)		(0.00361)
Secondary School		0.0786**		0.0792**		0.0768**		0.0775**
		(0.0105)		(0.0105)		(0.0105)		(0.0105)
University		0.101**		0.102**		0.101**		0.101**
		(0.0105)		(0.0105)		(0.0105)		(0.0105)
Female		-0.0378**		-0.0373**		-0.0382**		-0.0378**
		(0.00363)		(0.00363)		(0.00363)		(0.00363)
Earned taxable labor income		4.55e-09		4.84e-09		4.19e-09		4.53e-09
		(5.35e-09)		(5.37e-09)		(5.34e-09)		(5.36e-09)
Occupation dummies								
Reference group: Legislators, senior officials and managers								
Professionals		0.0424**		0.0424**		0.0425**		0.0424**
		(0.00575)		(0.00575)		(0.00575)		(0.00575)
Technicians and associated professionals		0.00887		0.00859		0.00868		0.00857
		(0.00642)		(0.00642)		(0.00642)		(0.00642)
Clerks		0.0277**		0.0269**		0.0278**		0.0274**
		(0.00925)		(0.00925)		(0.00925)		(0.00925)
Service workers and shop sales workers		-0.0972**		-0.0999**		-0.0974**		-0.0990**
		(0.00959)		(0.00960)		(0.00958)		(0.00960)
Skilled agricultural workers		-0.169**		-0.170**		-0.166**		-0.166**
		(0.0604)		(0.0606)		(0.0601)		(0.0603)
Craft and related trade workers		-0.249**		-0.249**		-0.249**		-0.248**
		(0.0118)		(0.0118)		(0.0118)		(0.0118)
Plant and machine operators and assemblers		0.0774**		0.0762**		0.0776**		0.0766**
		(0.0141)		(0.0141)		(0.0140)		(0.0140)
Elementary occupations		-0.155**		-0.160**		-0.148**		-0.150**
		(0.0166)		(0.0166)		(0.0166)		(0.0167)
Municipality dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	77 859	77 859	77 859	77 859	77 859	77 859	77 859	77 859

* and ** denote the significance on the 5 and 1 percent level respectively.

Standard errrors are shown in parenthesis.

The reference group are native commuters between Uppsala and Stockholm.

Next, we look at commuters who file commuting cost in the dominated region, i.e., above zero but below the threshold. The dependent variable equals 1 if the self-reported commuting cost is above zero but does not exceed the threshold and equals 0 if the self-report commuting cost is either zero or (strictly) above the threshold. The results are shown in Table A2.

Table A2: The probability of filing the commuting deduction in the dominated region

	(1) Dominated region	(2) Dominated region	(3) Dominated region	(4) Dominated region
Immigrant	-0.00733*			
	(0.00325)			
Nordic Imm.		0.0102		
		(0.00748)		
Europe. Imm.		0.00591		
		(0.00538)		
Non-Europe. Imm		-0.0252**		
		(0.00439)		
Imm. arrive $\leq$ 5 yrs			0.0333**	
			(0.0103)	
Imm. arrive 5-10 yrs			-0.00788	
			(0.00917)	
Imm. arrive $>$ 10 yrs			-0.0147**	
			(0.00348)	
Non-Europe. imm. $\leq$ 5 yrs				-0.00710
				(0.0165)
Non-Europe. imm. 5-10 yrs				-0.0302*
				(0.0137)
Non-Europe. imm. $>$ 10 yrs				-0.0267**
				(0.00471)
Europe. imm. $\leq$ 5 yrs				0.0392**
				(0.0141)
Europe. imm. 5-10 yrs				0.00590
				(0.0134)
Europe. imm. $>$ 10 yrs				-0.00470
				(0.00614)
Nordic imm. $\leq$ 5 yrs				0.0976**
				(0.0302)
Nordic imm. 5-10 yrs				-0.00668
				(0.0252)
Nordic imm. $>$ 10 yrs				-0.000449
				(0.00771)
Control variables	Yes	Yes	Yes	Yes
Occupation dummies	Yes	Yes	Yes	Yes
Municipality dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
N	77 859	77 859	77 859	77 859

* and ** denote the significance on the 5 and 1 percent level respectively.

Standard errrors are shown in parenthesis.

The reference group are native commuters between Uppsala and Stockholm.

The included covariates are: age, secondary school, university, female, marital status and earned income.

Table A3: The probability of taking up the commuting deduction for commuters between Stockholm and Uppsala who work in the same workplace for two consecutive years

	(1) Deduction	(2) Deduction	(3) Deduction	(4) Deduction
Immigrant	0.0185**			
	(0.00601)			
Nordic Imm.		-0.0206		
		(0.0134)		
Europe. Imm.		-0.00121		
		(0.00923)		
Non-Europe. Imm		0.0564**		
		(0.00882)		
Imm. arrive $\leq$ 5 yrs			-0.0820**	
			(0.0190)	
Imm. arrive 5-10 yrs			-0.00742	
			(0.0172)	
Imm. arrive $>$ 10 yrs			0.0371**	
			(0.00656)	
Non-Europe imm. $\leq$ 5 yrs				-0.0592
				(0.0369)
Non-Europe imm. 5-10 yrs				-0.0300
				(0.0330)
Non-Europe imm. $>$ 10 yrs				0.0746**
				(0.00923)
Europe imm. $\leq$ 5 yrs				-0.110**
				(0.0249)
Europe imm. 5-10 yrs				-0.000383
				(0.0226)
Europe imm. $>$ 10 yrs				0.0253*
				(0.0107)
Nordic imm. $\leq$ 5 yrs				-0.00685
				(0.0458)
Nordic imm. 5-10 yrs				0.0142
				(0.0421)
Nordic imm. $>$ 10 yrs				-0.0255
				(0.0148)
Control variables	Yes	Yes	Yes	Yes
Occupation dummies	Yes	Yes	Yes	Yes
Municipality dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
N	52 872	52 872	52 872	52 872

* and ** denote the significance on the 5 and 1 percent level respectively.

Standard errrors are shown in parenthesis.

The reference group are native commuters between Uppsala and Stockholm.

The included covariates are: age, secondary school, university, female, marital status and earned income.

Table A4: The probability of taking up the commuting deduction for commuters with wage income above SEK 100k

	(1) Deduction	(2) Deduction	(3) Deduction	(4) Deduction
Immigrant	0.00654			
	(0.00497)			
Nordic Imm.		-0.0228*		
		(0.0114)		
Europe. Imm.		-0.0137		
		(0.00782)		
Non-Europe. Imm		0.0346**		
		(0.00706)		
Imm. arrive $\leq$ 5 yrs			-0.0841**	
			(0.0126)	
Imm. arrive 5-10 yrs			-0.0347**	
			(0.0134)	
Imm. arrive $>$ 10 yrs			0.0326**	
			(0.00565)	
Non-Europe imm. $\leq$ 5 yrs				-0.0767**
				(0.0211)
Non-Europe imm. 5-10 yrs				-0.0507*
				(0.0220)
Non-Europe imm. $>$ 10 yrs				0.0598**
				(0.00775)
Europe imm. $\leq$ 5 yrs				-0.0949**
				(0.0175)
Europe imm. 5-10 yrs				-0.0284
				(0.0191)
Europe imm. $>$ 10 yrs				0.0208*
				(0.00956)
Nordic imm. $\leq$ 5 yrs				-0.0557
				(0.0334)
Nordic imm. 5-10 yrs				-0.00957
				(0.0347)
Nordic imm. $>$ 10 yrs				-0.0211
				(0.0130)
Control variables	Yes	Yes	Yes	Yes
Occupation dummies	Yes	Yes	Yes	Yes
Municipality dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
N	85 010	85 004	84 932	84 926

* and ** denote the significance on the 5 and 1 percent level respectively.

Standard errors are shown in parenthesis.

The reference group are native commuters between Uppsala and Stockholm.

The included covariates are: age, secondary school, university, female, marital status and earned income.

Table A5: The probability of taking up the commuting deduction for commuters with wage income above SEK 200k

	(1) Deduction	(2) Deduction	(3) Deduction	(4) Deduction
Immigrant	0.0121*			
	(0.00529)			
Nordic Imm.		-0.0152		
		(0.0119)		
Europe. Imm.		-0.00561		
		(0.00822)		
Non-Europe. Imm		0.0391**		
		(0.00768)		
Imm. arrive $\leq$ 5 yrs			-0.0708**	
			(0.0150)	
Imm. arrive 5-10 yrs			-0.0169	
			(0.0150)	
Imm. arrive $>$ 10 yrs			0.0315**	
			(0.00589)	
Non-Europe imm. $\leq$ 5 yrs				-0.0467
				(0.0283)
Non-Europe imm. 5-10 yrs				-0.0362
				(0.0270)
Non-Europe imm. $>$ 10 yrs				0.0549**
				(0.00820)
Europe imm. $\leq$ 5 yrs				-0.0985**
				(0.0197)
Europe imm. 5-10 yrs				-0.0134
				(0.0204)
Europe imm. $>$ 10 yrs				0.0275**
				(0.00980)
Nordic imm. $\leq$ 5 yrs				-0.00677
				(0.0374)
Nordic imm. 5-10 yrs				0.0162
				(0.0368)
Nordic imm. $>$ 10 yrs				-0.0209
				(0.0134)
Control variables	Yes	Yes	Yes	Yes
Occupation dummies	Yes	Yes	Yes	Yes
Municipality dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
N	74 133	74 132	74 061	74 060

* and ** denote the significance on the 5 and 1 percent level respectively.

Standard errors are shown in parenthesis.

The reference group are native commuters between Uppsala and Stockholm.

The included covariates are: age, secondary school, university, female, marital status and earned income.

7.1 Results based on an alternative classification of birth region

In tables A7 – A11, we repeat most of the commuting deduction analysis for an alternative classification of birth region of immigrants. The idea is to group immigrants by the proximity

Table A6: The probability of taking up the commuting deduction among Stockholm and Uppsala commuters, including nonlinear controls for income.

	(1) Deduction	(2) Deduction	(3) Deduction	(4) Deduction
Immigrant	0.00969			
	(0.00519)			
Nordic Imm.		-0.0227		
		(0.0118)		
Europe. Imm.		-0.00955		
		(0.00810)		
Non-Europe. Imm		0.0385**		
		(0.00743)		
Imm. arrive $\leq$ 5 yrs			-0.0761**	
			(0.0139)	
Imm. arrive 5-10 yrs			-0.0251	
			(0.0144)	
Imm. arrive $>$ 10 yrs			0.0312**	
			(0.00581)	
Non-Europe imm. $\leq$ 5 yrs				-0.0617*
				(0.0247)
Non-Europe imm. 5-10 yrs				-0.0436
				(0.0251)
Non-Europe imm. $>$ 10 yrs				0.0588**
				(0.00801)
Europe imm. $\leq$ 5 yrs				-0.0938**
				(0.0187)
Europe imm. 5-10 yrs				-0.0242
				(0.0197)
Europe imm. $>$ 10 yrs				0.0210*
				(0.00979)
Nordic imm. $\leq$ 5 yrs				-0.0353
				(0.0357)
Nordic imm. 5-10 yrs				0.0193
				(0.0357)
Nordic imm. $>$ 10 yrs				-0.0258
				(0.0133)
Control variables	Yes	Yes	Yes	Yes
Occupation dummies	Yes	Yes	Yes	Yes
Municipality dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
N	77 859	77 859	77 859	77 859

* and ** denote the significance on the 5 and 1 percent level respectively.

Standard errrors are shown in parenthesis.

The reference group are native commuters between Uppsala and Stockholm.

The included covariates are: age, secondary school, university, female, marital status and earned income (quadratic form).

of the country of origin's legal and tax system to that of Sweden by distinguishing between Nordic, Western European, and other immigrants.

Table A7: The probability of claiming communting deduction (alternative classification of birth region)

	(1) Deduction	(2) Deduction	(3) Deduction	(4) Deduction
Immigrant	0.00835			
	(0.00519)			
Nordic Imm.		-0.0226		
		(0.0118)		
Western Europe. Imm.		-0.0386**		
		(0.0130)		
Other. Imm.		0.0265**		
		(0.00613)		
Imm. arrive $\leq$ 5 yrs			-0.0785**	
			(0.0139)	
Imm. arrive 5-10 yrs			-0.0267	
			(0.0144)	
Imm. arrive $>$ 10 yrs			0.0301**	
			(0.00581)	
Other imm. $\leq$ 5 yrs				-0.0644**
				(0.0181)
Other imm. 5-10 yrs				-0.0300
				(0.0183)
Other imm. $>$ 10 yrs				0.0480**
				(0.00675)
Western Europe. imm. $\leq$ 5 yrs				-0.126**
				(0.0263)
Western Europe. imm. 5-10 yrs				-0.0439
				(0.0297)
Western Europe. imm. $>$ 10 yrs				0.00643
				(0.0168)
Nordic imm. $\leq$ 5 yrs				-0.0372
				(0.0357)
Nordic imm. 5-10 yrs				0.0187
				(0.0357)
Nordic imm. $>$ 10 yrs				-0.0252
				(0.0133)
Control variables	Yes	Yes	Yes	Yes
Occupation dummies	Yes	Yes	Yes	Yes
Municipality dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
N	77 859	77 859	77 859	77 859

* and ** denote the significance on the 5 and 1 percent level respectively.

Standard errrors are shown in parenthesis.

The reference group are native commuters between Uppsala and Stockholm.

The included covariates are: age, secondary school, university, female, marital status and earned income.

Table A8: The probability of filing commuting deduction in the dominated region (alternative classification of birth region).

	(1) Dominated region	(2) Dominated region	(3) Dominated region	(4) Dominated region
Immigrant	-0.00740*			
	(0.00322)			
Nordic Imm.		0.00816		
		(0.00736)		
Western Europe. Imm.		0.0195*		
		(0.00880)		
Other Imm.		-0.0172**		
		(0.00373)		
Imm. arrive $\leq$ 5 yrs			0.0337**	
			(0.0103)	
Imm. arrive 5-10 yrs			-0.00730	
			(0.00911)	
Imm. arrive $>$ 10 yrs			-0.0150**	
			(0.00344)	
Other imm. $\leq$ 5 yrs				-0.00342
				(0.0122)
Other imm. 5-10 yrs				-0.0147
				(0.0109)
Other imm. $>$ 10 yrs				-0.0195**
				(0.00405)
Western Europe. imm. $\leq$ 5 yrs				0.0762**
				(0.0210)
Western Europe. imm. 5-10 yrs				0.0137
				(0.0206)
Western Europe. imm. $>$ 10 yrs				-0.00645
				(0.00988)
Nordic imm. $\leq$ 5 yrs				0.0997**
				(0.0302)
Nordic imm. 5-10 yrs				-0.0105
				(0.0247)
Nordic imm. $>$ 10 yrs				-0.00291
				(0.00753)
Control variables	Yes	Yes	Yes	Yes
Occupation dummies	Yes	Yes	Yes	Yes
Municipality dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
N	77 859	77 859	77 859	77 859

* and ** denote the significance on the 5 and 1 percent level respectively.

Standard errrors are shown in parenthesis.

The reference group are native commuters between Uppsala and Stockholm.

The included covariates are: age, secondary school, university, female, marital status and earned income.

Table A9: The probability of claiming commuting deduction (annual income above SEK 100k; alternative classification of birth region).

	(1) Deduction	(2) Deduction	(3) Deduction	(4) Deduction
Immigrant	0.00654			
	(0.00497)			
Nordic Imm.		-0.0227*		
		(0.0114)		
Western Europe. Imm.		-0.0378**		
		(0.0126)		
Other Imm.		0.0235**		
		(0.00586)		
Imm. arrive $\leq$ 5 yrs			-0.0841**	
			(0.0126)	
Imm. arrive 5-10 yrs			-0.0347**	
			(0.0134)	
Imm. arrive $>$ 10 yrs			0.0326**	
			(0.00565)	
Other imm. $\leq$ 5 yrs				-0.0739**
				(0.0160)
Other imm. 5-10 yrs				-0.0319
				(0.0168)
Other imm. $>$ 10 yrs				0.0502**
				(0.00654)
Western Europe. imm. $\leq$ 5 yrs				-0.119**
				(0.0249)
Western Europe. imm. 5-10 yrs				-0.0565*
				(0.0286)
Western Europe. imm. $>$ 10 yrs				0.00806
				(0.0166)
Nordic imm. $\leq$ 5 yrs				-0.0558
				(0.0334)
Nordic imm. 5-10 yrs				-0.00964
				(0.0347)
Nordic imm. $>$ 10 yrs				-0.0210
				(0.0130)
Control variables	Yes	Yes	Yes	Yes
Occupation dummies	Yes	Yes	Yes	Yes
Municipality dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
N	85 010	85 004	84 932	84 926

* and ** denote the significance on the 5 and 1 percent level respectively.

Standard errrors are shown in parenthesis.

The reference group are native commuters between Uppsala and Stockholm.

The included covariates are: age, secondary school, university, female, marital status and earned income.

Table A10: The probability of claiming communting deduction (Annual income above SEK 200k; alternative classification of birth region)

	(1) Deduction	(2) Deduction	(3) Deduction	(4) Deduction
Immigrant	0.0121*			
	(0.00529)			
Nordic Imm.		-0.0152		
		(0.0119)		
Western Europe. Imm.		-0.0266*		
		(0.0131)		
Other Imm.		0.0282**		
		(0.00629)		
Imm. arrive $\leq$ 5 yrs			-0.0708**	
			(0.0150)	
Imm. arrive 5-10 yrs			-0.0169	
			(0.0150)	
Imm. arrive $>$ 10 yrs			0.0315**	
			(0.00589)	
Other imm. $\leq$ 5 yrs				-0.0564**
				(0.0199)
Other imm. 5-10 yrs				-0.0234
				(0.0194)
Other imm. $>$ 10 yrs				0.0486**
				(0.00687)
Western Europe. imm. $\leq$ 5 yrs				-0.129**
				(0.0278)
Western Europe. imm. 5-10 yrs				-0.0188
				(0.0301)
Western Europe. imm. $>$ 10 yrs				0.0140
				(0.0168)
Nordic imm. $\leq$ 5 yrs				-0.00678
				(0.0374)
Nordic imm. 5-10 yrs				0.0161
				(0.0368)
Nordic imm. $>$ 10 yrs				-0.0209
				(0.0134)
Control variables	Yes	Yes	Yes	Yes
Occupation dummies	Yes	Yes	Yes	Yes
Municipality dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
N	74 133	74 132	74 061	74 060

* and ** denote the significance on the 5 and 1 percent level respectively.

Standard errrors are shown in parenthesis.

The reference group are native commuters between Uppsala and Stockholm.

The included covariates are: age, secondary school, university, female, marital status and earned income.

Table A11: The probability of claiming commuting deduction, same workplace between years (alternative classification of birth region)

	(1) Deduction	(2) Deduction	(3) Deduction	(4) Deduction
Immigrant	0.0185**			
	(0.00601)			
Nordic Imm.		-0.0206		
		(0.0134)		
Western Europe. Imm.		-0.0350*		
		(0.0145)		
Other Imm.		0.0439**		
		(0.00718)		
Imm. arrive $\leq$ 5 yrs			-0.0820**	
			(0.0190)	
Imm. arrive 5-10 yrs			-0.00742	
			(0.0172)	
Imm. arrive $>$ 10 yrs			0.0371**	
			(0.00656)	
Other imm. $\leq$ 5 yrs				-0.0524*
				(0.0260)
Other imm. 5-10 yrs				-0.00210
				(0.0229)
Other imm. $>$ 10 yrs				0.0609**
				(0.00768)
Western Europe. imm. $\leq$ 5 yrs				-0.162**
				(0.0335)
Western Europe. imm. 5-10 yrs				-0.0283
				(0.0323)
Western Europe. imm. $>$ 10 yrs				0.0115
				(0.0179)
Nordic imm. $\leq$ 5 yrs				-0.00693
				(0.0458)
Nordic imm. 5-10 yrs				0.0141
				(0.0421)
Nordic imm. $>$ 10 yrs				-0.0254
				(0.0148)
Control variables	Yes	Yes	Yes	Yes
Occupation dummies	Yes	Yes	Yes	Yes
Municipality dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
N	52 872	52 872	52 872	52 872

* and ** denote the significance on the 5 and 1 percent level respectively.

Standard errrors are shown in parenthesis.

The reference group are native commuters between Uppsala and Stockholm.

The included covariates are: age, secondary school, university, female, marital status and earned income.

7.2 Robustness with respect to age and occupation controls

Table A12: The probability of taking up the commuting deduction among Stockholm and Uppsala commuters, robustness with respect to age and occupation controls.

	(1) Deduction	(2) Deduction	(3) Deduction	(4) Deduction	(5) Deduction	(6) Deduction
Imm. arrive $\leq$ 5 yrs	-0.128**	-0.130**	-0.111**	-0.0785**	-0.0780**	-0.0798**
	(0.0139)	(0.0139)	(0.0139)	(0.0139)	(0.0139)	(0.0139)
Imm. arrive 5-10 yrs	-0.0571**	-0.0637**	-0.0460**	-0.0267	-0.0342*	-0.0329*
	(0.0146)	(0.0145)	(0.0144)	(0.0144)	(0.0144)	(0.0144)
Imm. arrive $>$ 10 yrs	0.0356**	0.0369**	0.0432**	0.0301**	0.0275**	0.0296**
	(0.00595)	(0.00588)	(0.00583)	(0.00581)	(0.00582)	(0.00581)
Age linear	No	No	No	Yes	Yes	No
Age squared	No	No	No	No	Yes	No
Age dummies	No	No	No	No	No	Yes
Occupation dummies	No	No	Yes	Yes	Yes	Yes
Control variables	No	Yes	Yes	Yes	Yes	Yes
Municipality dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	77 859	77 859	77 859	77 859	77 859	77 859

* and ** denote the significance on the 5 and 1 percent level respectively.

Standard errrors are shown in parenthesis.

The reference group are native commuters between Uppsala and Stockholm.

Age categories are 20-30, 30-40, 40-50, and 50-64.

The included covariates are: secondary school, university, female, marital status and earned income.

7.3 Heterogeneous take-up based on age, immigration status, and duration of stay in the host country

Table A13: The probability of taking up the commuting deduction among Stockholm and Uppsala commuters, heterogeneous effects with respect to age and duration of stay in host country.

	(1) Deduction	(2) Deduction
Imm. arrive $\leq$ 5 yrs	-0.0798**	-0.211**
	(0.0139)	(0.0579)
Imm. arrive $\leq$ 5 yrs $\times$ Age 20-30		0.138*
		(0.0631)
Imm. arrive $\leq$ 5 yrs $\times$ Age 30-40		0.160**
		(0.0612)
Imm. arrive $\leq$ 5 yrs $\times$ Age 40-50		0.0821
		(0.0669)
Imm. arrive 5-10 yrs	-0.0329*	-0.0286
	(0.0144)	(0.0451)
Imm. arrive 5-10 yrs $\times$ Age 20-30		0.0455
		(0.0609)
Imm. arrive 5-10 yrs $\times$ Age 30-40		0.00561
		(0.0492)
Imm. arrive 5-10 yrs $\times$ Age 40-50		-0.0497
		(0.0534)
Imm. arrive $>$ 10 yrs	0.0296**	0.0206*
	(0.00581)	(0.00974)
Imm. arrive $>$ 10 yrs $\times$ Age 20-30		0.00495
		(0.0197)
Imm. arrive $>$ 10 yrs $\times$ Age 30-40		0.0282
		(0.0150)
Imm. arrive $>$ 10 yrs $\times$ Age 40-50		0.00174
		(0.0146)
Age 20-30	-0.180**	-0.183**
	(0.00579)	(0.00607)
Age 30-40	-0.105**	-0.109**
	(0.00445)	(0.00471)
Age 40-50	-0.0401**	-0.0397**
	(0.00450)	(0.00480)
Control variables	Yes	Yes
Occupation dummies	Yes	Yes
Municipality dummies	Yes	Yes
Year dummies	Yes	Yes
N	77 859	77 859

* and ** denote statistical significance at the 5% and 1% level, respectively.

Standard errors are shown in the parenthesis.

The reference group consists of native commuters between Uppsala and Stockholm aged 50-64.

The included covariates are: secondary school, university, female, marital status and earned income.

7.4 Results for the commuting regions Södertälje–Stockholm and Kungsbacka–Gothenburg

Here we present regression results for the commuting regions Södertälje–Stockholm and Kungsbacka–Gothenburg.

Table A14: The probability of taking up the travel deduction among commuters between Södertälje and Stockholm

	(1) Deduction	(2) Deduction	(3) Deduction	(4) Deduction
Immigrant	0.00408			
	(0.00434)			
Nordic Imm.		-0.0341**		
		(0.00832)		
Europe. Imm.		0.00382		
		(0.00743)		
Non-Europe. Imm		0.0199**		
		(0.00567)		
Imm. arrive $\leq$ 5 yrs			-0.108**	
			(0.00877)	
Imm. arrive 5-10 yrs			-0.0238*	
			(0.0104)	
Imm. arrive > 10 yrs			0.0293**	
			(0.00490)	
Non-Europe imm. $\leq$ 5 yrs				-0.107**
				(0.0119)
Non-Europe imm. 5-10 yrs				-0.00522
				(0.0135)
Non-Europe imm. > 10 yrs				0.0455**
				(0.00647)
Europe imm. $\leq$ 5 yrs				-0.107**
				(0.0132)
Europe imm. 5-10 yrs				-0.0531**
				(0.0173)
Europe imm. > 10 yrs				0.0552**
				(0.00959)
Nordic imm. $\leq$ 5 yrs				-0.107**
				(0.0289)
Nordic imm. 5-10 yrs				-0.0357
				(0.0363)
Nordic imm. > 10 yrs				-0.0283**
				(0.00886)
Control variables	Yes	Yes	Yes	Yes
Occupation dummies	Yes	Yes	Yes	Yes
Municipality dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
N	79 760	79 760	79 760	79 760

* and **denote the significance on the 5 and 1 percent level respectively.

Standard errrors are shown in parenthesis.

The reference group are native commuters between Södertälje and Stockholm.

The included covariates are: age, secondary school, university, female, marital status and earned income.

Table A15: The probability of taking up the travelling deduction among commuters between Kungsbacka and Gothenburg

	(1) Deduction	(2) Deduction	(3) Deduction	(4) Deduction
Immigrant	0.00136			
	(0.00549)			
Nordic Imm.		-0.00841		
		(0.0107)		
Europe. Imm.		0.0140		
		(0.00799)		
Non-Europe. Imm		-0.00981		
		(0.00984)		
Imm. arrive $\leq$ 5 yrs			-0.122**	
			(0.0154)	
Imm. arrive 5-10 yrs			-0.0234	
			(0.0151)	
Imm. arrive $>$ 10 yrs			0.0222**	
			(0.00621)	
Non-Europe imm. $\leq$ 5 yrs				-0.237**
				(0.0288)
Non-Europe imm. 5-10 yrs				-0.0972**
				(0.0293)
Non-Europe imm. $>$ 10 yrs				0.0242*
				(0.0108)
Europe imm. $\leq$ 5 yrs				-0.0984**
				(0.0208)
Europe imm. 5-10 yrs				-0.0170
				(0.0200)
Europe imm. $>$ 10 yrs				0.0407**
				(0.00942)
Nordic imm. $\leq$ 5 yrs				-0.0478
				(0.0342)
Nordic imm. 5-10 yrs				0.0515
				(0.0346)
Nordic imm. $>$ 10 yrs				-0.0112
				(0.0118)
Control variables	Yes	Yes	Yes	Yes
Occupation dummies	Yes	Yes	Yes	Yes
Municipality dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
N	142 317	142 317	142 317	142 317

* and ** denote the significance on the 5 and 1 percent level respectively.

Standard errors are shown in the parenthesis.

The reference group are native commuters between Kungsbacka and Gothenburg.

The included covariates are: age, secondary school, university, female, marital status and earned income.

8 Appendix B (Bunching analysis)

Table B1: Summary statistics for the self-employed native and immigrants, 2012-2015

	Native		European immigrants		non-European immigrants	
	Mean	S.D	Mean	S.D	Mean	S.D
Panel A: summary statistics for the sample in the bunching analysis						
Taxable income within the window [-75k, 75k]						
Age	47.79	10.06	48.41	9.73	43.20	9.11
Male	0.79	0.41	0.71	0.46	0.79	0.41
Married	0.58	0.49	0.63	0.48	0.69	0.46
Primary school	0.18	0.38	0.16	0.37	0.24	0.43
Secondary School	0.52	0.50	0.44	0.50	0.41	0.49
University	0.30	0.46	0.39	0.49	0.35	0.48
Incorporated business	0.61	0.49	0.51	0.50	0.37	0.48
Year since migration			26.77	14.33	21.12	9.55
Panel B: summary statistics for the sample in the regression analysis						
Taxable income within the window [-10k, 10k] but outside [-5k, 5k]						
Age	47.79	9.96	48.80	9.53	43.42	9.23
Male	0.80	0.40	0.71	0.45	0.79	0.41
Married	0.59	0.49	0.63	0.48	0.70	0.46
Primary school	0.17	0.38	0.16	0.37	0.24	0.43
Secondary School	0.51	0.50	0.43	0.49	0.40	0.49
University	0.31	0.46	0.41	0.49	0.36	0.48
Incorporated business	0.65	0.48	0.55	0.50	0.40	0.49
Taxable income within the window [-5k, 5k]						
Age	48.07	9.89	48.77	9.54	43.29	9.00
Male	0.80	0.40	0.69	0.46	0.78	0.42
Married	0.59	0.49	0.64	0.48	0.67	0.47
Primary school	0.17	0.38	0.15	0.35	0.23	0.42
Secondary School	0.50	0.50	0.41	0.49	0.40	0.49
University	0.33	0.47	0.44	0.50	0.38	0.48
Incorporated business	0.52	0.50	0.46	0.50	0.35	0.48

In Figure B1, we first present the graphical bunching analysis for self-employed natives and immigrants between 2002 and 2015.[38] Figure B1 shows the bunching estimation with the excess mass (coefficient) and the corresponding bootstrap standard error. The his-

[38]In the bunching analysis, the leftmost and rightmost bin in the bunching windows relative to the bunch point is [-5k, 5k]. The degree of polynomial is 7 and the standard error is estimated with 100 bootstraps.

togram in dots presents the actual taxable income distribution and the solid line presents the polynomial fit to the distribution. The excess mass (coefficient) is about 7.1 for self-employed natives and about 6.1 for European immigrants. It is only about 4.3 for self-employed non-European immigrants. In all three cases, the bootstrap standard errors are quite small. The sensitivity checks with different bunching windows and polynomial orders are shown in Tables B3 and B4. Using the estimated excess mass from the bunching estimation, we can compute the implied taxable income elasticity according to the formula $Elasticity = \frac{B(dz)}{k(1+0.3)\times h_0(k)\times \log\left(\frac{1-\tau_1}{1-\tau_2}\right)}$ where k is the average first central government tax point (in thousands, 2015 prices), τ_1 is the average local tax rate and τ_2 is the average central government tax rate between 2002 and 2015. We also take the payroll tax rate into account, which is about 30%. We set $k = 381, \tau_1 = 0.3151, \tau_2 = 0.5151$.

Figure B1: Bunching estimation for self-employed natives and immigrants, 2002-2015

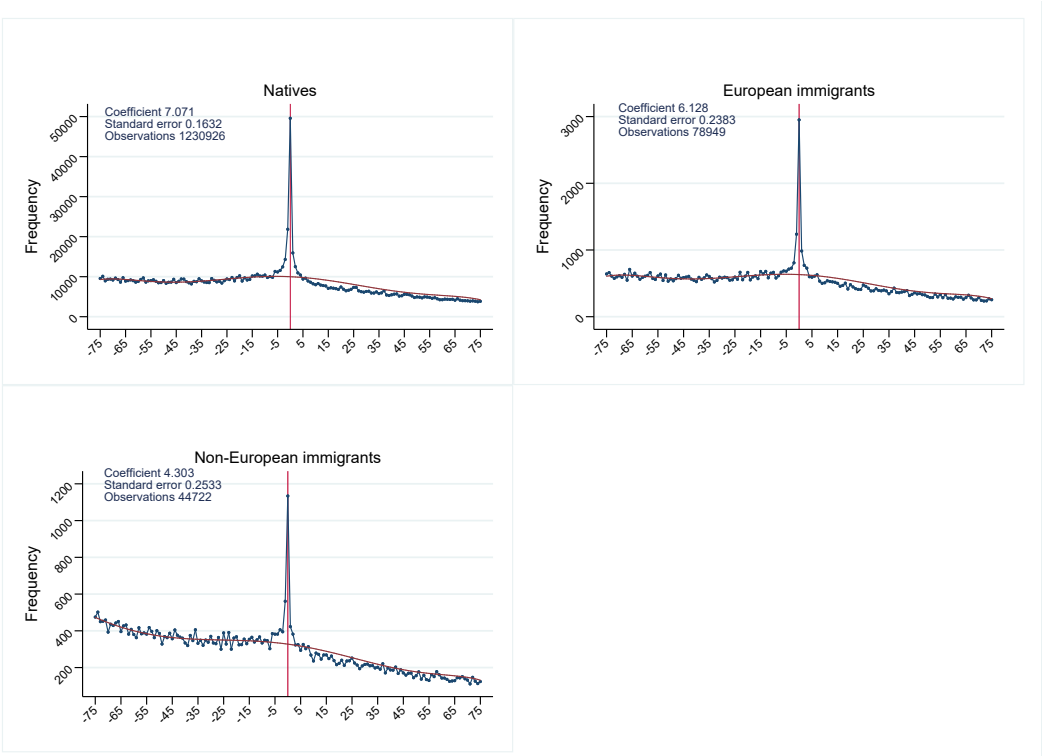


Table B2: Bunching and regression estimation, 2002-2015

	(1) [-5k, 5k]	(2) [-4k, 4k]	(3) [-3k, 3k]	(4) [-2k, 2k]	(5) [-1k, 1k]
Bunching analysis with the wider income window [-75k, 75k]					
Natives					
Excess mass	7.07	6.88	6.55	6.10	5.34
Standard error	(0.16)	(0.17)	(0.17)	(0.14)	(0.14)
Implied elasticity	0.041	0.040	0.038	0.036	0.031
non-European immigrants					
Excess mass	4.30	4.17	3.94	3.68	3.28
Standard error	(0.25)	(0.23)	(0.22)	(0.14)	(0.13)
Implied elasticity	0.025	0.024	0.023	0.022	0.019
European immigrants					
Excess mass	6.13	6.02	5.86	5.45	4.89
Standard error	(0.24)	(0.18)	(0.18)	(0.18)	(0.13)
Implied elasticity	0.036	0.035	0.034	0.032	0.029
Regression analysis with the wider income window [-10k, 10k]					
Reference group: self-employed natives					
Non-Europe. Imm	-0.0322**	-0.0381**	-0.0403**	-0.0443**	-0.0378**
	(0.00578)	(0.00589)	(0.00581)	(0.00551)	(0.00487)
Europe. Imm.	-0.00864*	-0.00538	-0.00506	-0.00246	-0.00497
	(0.00400)	(0.00411)	(0.00411)	(0.00398)	(0.00359)
Control variables	Yes	Yes	Yes	Yes	Yes
Municipality dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
N	289 227	289 227	289 227	289 227	289 227

Standard errrors are shown in parenthesis.

* and ** denote the significance on the 5 and 1 percent level respectively in the regression analysis.

The included covariates are: age, male, marital status, secondary school and university.

Table B3: Bunching estimation: Sensitivity with respect to size of the bunching windows, 2002-2015

Wide window (SEK)	Small window (SEK)	Natives	European immigrants	Non-European immigrants
[-75k, 75k]	[-4k, 4k]	6.88	6.02	4.17
		(0.17)	(0.18)	(0.23)
[-75k, 75k]	[-3k, 3k]	6.55	5.86	3.94
		(0.17)	(0.18)	(0.22)
[-75k, 75k]	[-2k, 2k]	6.10	5.45	3.68
		(0.14)	(0.18)	(0.14)
[-75k, 75k]	[-1k, 1k]	5.34	4.89	3.28
		(0.14)	(0.13)	(0.13)
[-75k, 75k]	[-5k, 2k]	6.62	5.80	3.69
		(0.20)	(0.21)	(0.19)
[-75k, 75k]	[-2k, 5k]	6.42	5.69	4.22
		(0.17)	(0.20)	(0.23)
[-75k, 75k]	[-10k, 10k]	7.34	6.22	4.38
		(0.23)	(0.37)	(0.41)
[-75k, 75k]	[-10k, 5k]	7.26	6.22	4.36
		(0.25)	(0.31)	(0.33)
[-75k, 75k]	[-5k, 10k]	6.99	6.01	4.23
		(0.24)	(0.27)	(0.30)
[-50k, 50k]	[-5k, 5k]	6.71	5.74	4.06
		(0.22)	(0.22)	(0.29)

Bootstrap standard error is reported in parenthesis.

Table B4: Bunching estimation: Sensitivity with respect to the polynomial degree, 2002-2015

Degree of polynomial	Natives	European immigrants	Non-European immigrants
1	10.95	9.5	5.84
	(0.42)	(0.42)	(0.28)
2	8.6	7.60	5.31
	(0.27)	(0.30)	(0.29)
3	8.70	7.65	5.37
	(0.26)	(0.29)	(0.29)
4	7.60	6.69	4.54
	(0.18)	(0.26)	(0.24)
5	7.60	6.70	4.53
	(0.18)	(0.21)	(0.25)
6	7.08	6.12	4.30
	(0.15)	(0.22)	(0.27)
7	7.07	6.13	4.30
	(0.16)	(0.26)	(0.26)
8	6.70	5.78	4.10
	(0.18)	(0.25)	(0.28)
9	6.70	5.77	4.08
	(0.19)	(0.25)	(0.27)

Bootstrap standard error is reported in parenthesis.

Table B5: The probability of falling into a certain bunching area, taxable income in SEK [-10k, 20k] around the central governmental tax point, 2002-2015

	(1)	(2)	(3)	(4)	(5)
	[-5k, 5k]	[-4k, 4k]	[-3k, 3k]	[-2k, 2k]	[-1k, 1k]
Non-Europe. Imm	-0.0324**	-0.0359**	-0.0365**	-0.0384**	-0.0320**
	(0.00508)	(0.00497)	(0.00476)	(0.00439)	(0.00380)
Europe. Imm.	-0.0104**	-0.00746*	-0.00675	-0.00425	-0.00547
	(0.00361)	(0.00357)	(0.00345)	(0.00326)	(0.00286)
Control variables	Yes	Yes	Yes	Yes	Yes
Municipality dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
N	371 597	371 597	371 597	371 597	371 597

* and ** denote the significance on the 5 and 1 percent level respectively.

Standard errrors are shown in parenthesis.

The reference group is self-employed natives.

The included covariates are: age, male, marital status, secondary school and university.

Figure B2: Residential segregation: bunching estimation for self-employed European immigrants, 2002–2014

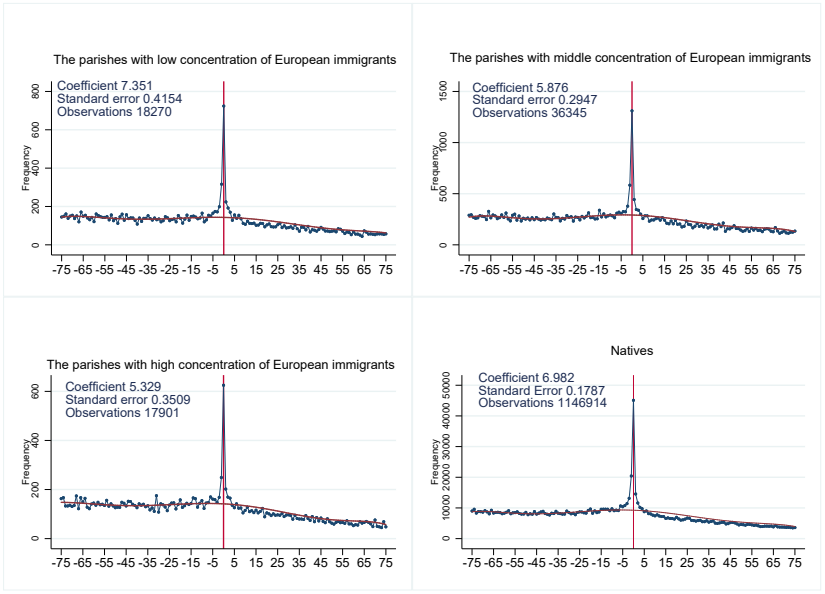


Figure B3: Residential segregation: bunching estimation for self-employed non-European immigrants, 2002–2014

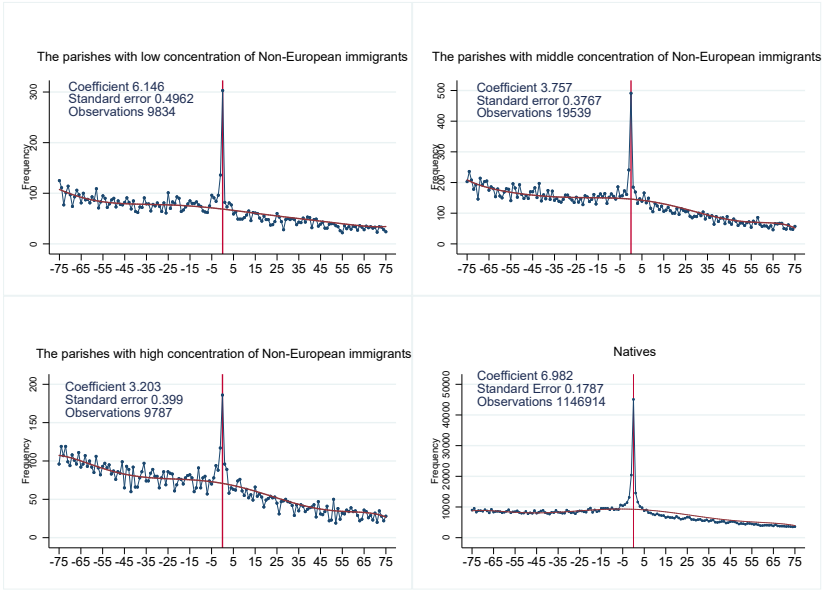


Table B6: Residential segregation: The probability of falling into a certain small bunching window, taxable income in SEK [-10k, 10k] around the first central governmental tax point, 2002-2014.

	(1) [-5k, 5k]	(2) [-5k, 5k]	(3) [-4k, 4k]	(4) [-3k, 3k]	(5) [-2k, 2k]	(6) [-1k, 1k]
Non-Europe. Imm	-0.0306**					
	(0.00616)					
Europe. Imm.	-0.00626					
	(0.00418)					
non-European immigrants						
Low concentration		0.0102	0.00189	-0.00778	-0.00616	-0.00649
		(0.0118)	(0.0123)	(0.0123)	(0.0119)	(0.0106)
Medium concentration		-0.0486**	-0.0520**	-0.0505**	-0.0509**	-0.0415**
		(0.00862)	(0.00873)	(0.00857)	(0.00810)	(0.00713)
High concentration		-0.0358**	-0.0370**	-0.0354**	-0.0432**	-0.0429**
		(0.0128)	(0.0129)	(0.0127)	(0.0118)	(0.0102)
European immigrants						
Low concentration		-0.00787	-0.00900	-0.00462	-0.00799	-0.00868
		(0.00791)	(0.00816)	(0.00819)	(0.00794)	(0.00716)
Medium concentration		-0.00578	0.000271	-0.00168	0.00121	-0.00412
		(0.00584)	(0.00600)	(0.00600)	(0.00581)	(0.00520)
High concentration		-0.00587	-0.00512	-0.00646	0.00158	0.00120
		(0.00860)	(0.00882)	(0.00877)	(0.00845)	(0.00759)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Municipality dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	267 027	267 027	267 027	267 027	267 027	267 027

* and ** denote the significance on the 5 and 1 percent level respectively.

Standard errrors are shown in parenthesis.

The reference group is self-employed natives.

The included covariates are: age, male, marital status, secondary school and university.

Table B7: The probability of falling into a certain small bunching window for self-employed people with incorporated business, taxable income in SEK [-10k, 10k] around the central governmental kink point, 2002-2015

	(1)	(2)	(3)	(4)	(5)
	[-5k, 5k]	[-4k, 4k]	[-3k, 3k]	[-2k, 2k]	[-1k, 1k]
Non-European Immigrants	-0.0305**	-0.0383**	-0.0368**	-0.0356**	-0.0277**
	(0.00945)	(0.00951)	(0.00924)	(0.00862)	(0.00741)
European Immigrants	-0.00466	-0.00286	-0.00306	-0.000859	-0.00550
	(0.00580)	(0.00588)	(0.00577)	(0.00546)	(0.00469)
Control variables	Yes	Yes	Yes	Yes	Yes
Municipality dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
N	160 520	160 520	160 520	160 520	160 520

* and ** denote significance on the 5 and 1 percent level respectively.

Standard errors are shown in parenthesis.

The reference group is self-employed natives.

The included covariates are: age, male, marital status, secondary school and university.

Table B8: The probability of falling into a certain small bunching window for self-employed people with unincorporated business, taxable income in SEK [-10k, 10k] around the central governmental kink point, 2002-2015

	(1)	(2)	(3)	(4)	(5)
	[-5k, 5k]	[-4k, 4k]	[-3k, 3k]	[-2k, 2k]	[-1k, 1k]
Non-European Immigrants	-0.0794**	-0.0908**	-0.0997**	-0.107**	-0.0970**
	(0.00737)	(0.00758)	(0.00756)	(0.00726)	(0.00653)
European Immigrants	-0.0323**	-0.0307**	-0.0320**	-0.0288**	-0.0277**
	(0.00549)	(0.00571)	(0.00582)	(0.00574)	(0.00536)
Control variables	Yes	Yes	Yes	Yes	Yes
Municipality dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
N	128 707	128 707	128 707	128 707	128 707

* and ** denote significance on the 5 and 1 percent level respectively.

Standard errors are shown in parenthesis.

The reference group is self-employed natives.

The included covariates are: age, male, marital status, secondary school and university.

Figure B4: Bunching estimation for self-employed with incorporated business, 2002-2015

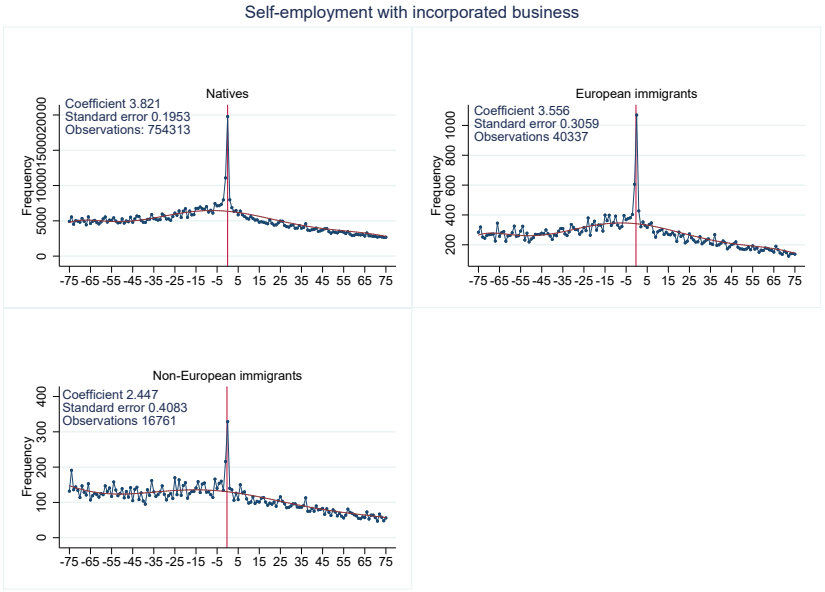
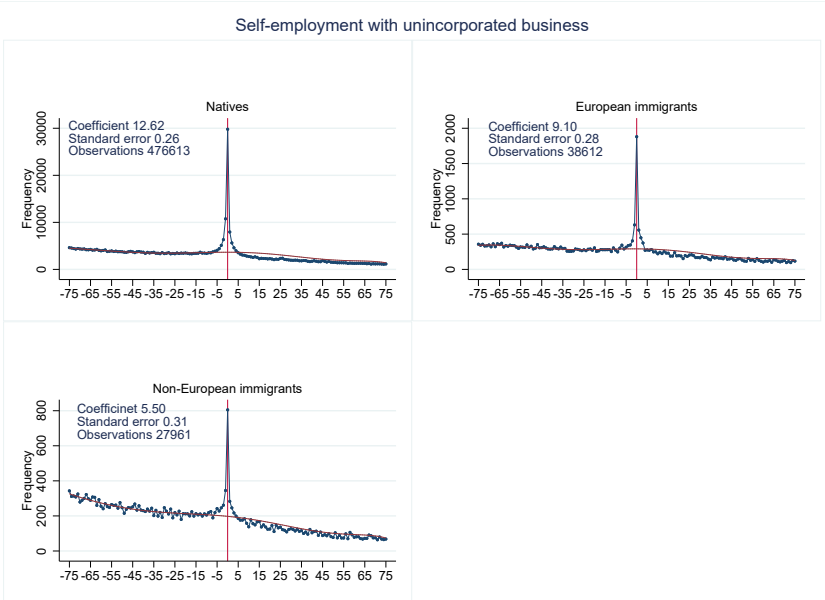
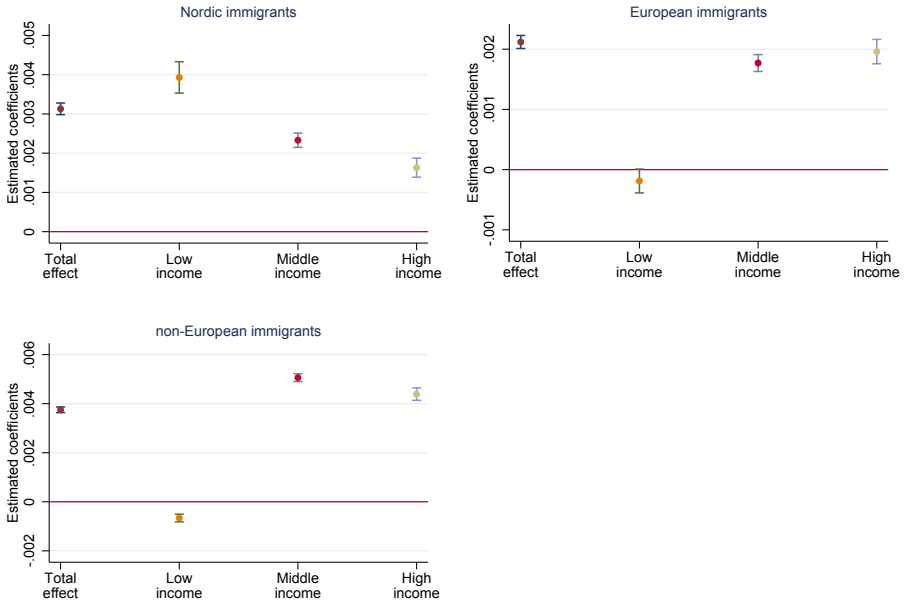


Figure B5: Bunching estimation for self-employed with unincorporated business, 2002-2015



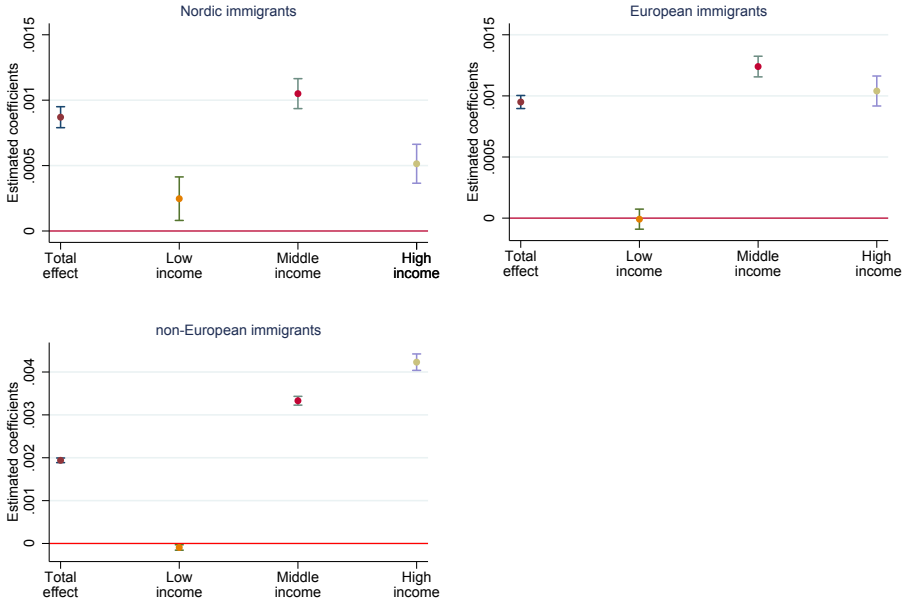
9 Appendix C

Figure C1: Late tax filings, 2002–2015



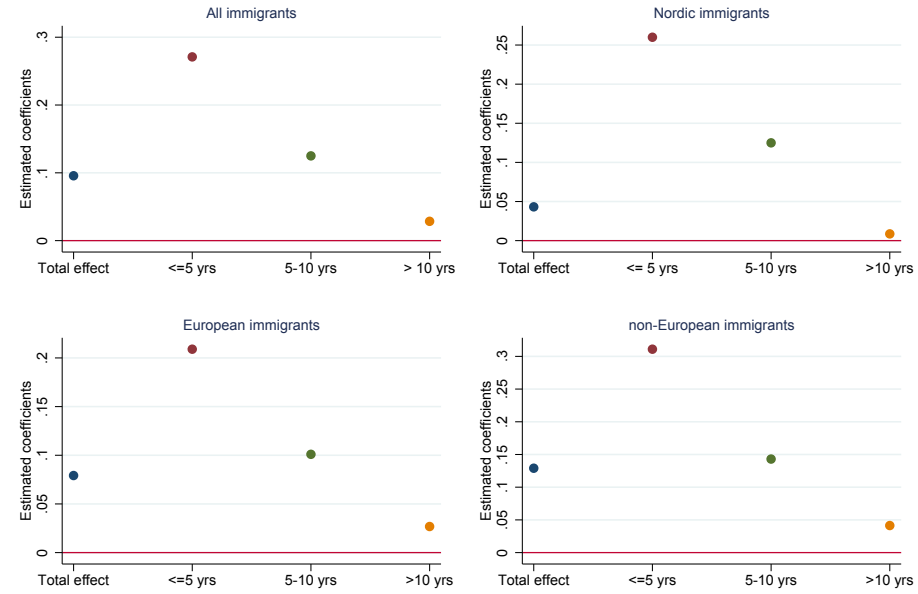
In the figure, the reference groups are natives, low income natives, middle income natives and high income natives repsectively.

Figure C2: Tax non-compliance, 2002–2015



In the figure, the reference groups are natives, low income natives, middle income natives and high income natives respectively.

Figure C3: The probability of not actively participating the tax declaration, 2002–2015



In the figure, the reference group is always natives.
The size of standard error is very small compared with the estimated coefficient. Therefore, they are not shown in the figure.

Conflict of Interest: The authors declare that they have no conflict of interest.

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