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Financial capital and immigrant self-employment: Evidence from a Swedish reform*

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Abstract

We study the role of capital requirement in immigrants' self-employment decision with the help of a reform implemented in Sweden in 2010 which reduced capital requirements for limited liability companies. For both men and women the reform increased both the probability of starting a limited liability firm and the probability of changing corporate form for those self-employed prior to the reform. We found that the reform affected immigrants and natives differently. Natives primarily responded to the reform by changing corporate form whereas immigrant men, especially those originating from the Middle East, responded to the reform by starting limited liability firms. Small differences emerge when we compare native women with immigrant women. Finally, it is the wage employed who start a limited liability business in the post-reform period, underlining the fact that access to financial capital is an obstacle for wage-employed individuals who opt for self-employment. This is true for both immigrants and natives. In contrast, more marginalised groups (i.e. unemployed immigrants), do not respond to the reform by starting limited liability firms.

Keywords: Self-employment; Financial capital; Limited liability; Immigrants.

JEL classification: J15, J68, L26, L51.

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1. Introduction

Researchers have paid attention to determinants behind self-employment for decades, and several factors such as human capital, family traditions and access to financial capital have been put forward as important explanations for why people choose to become, and succeed, as self-employed.[1] Research has also focused on differences in self-employment rates between immigrants and natives in different countries and explanations for why people with immigrant background choose to become self-employed.[2]

One reason for the disparities in self-employment rates between immigrants and natives, and one that might explain why immigrants and natives are not equally likely to succeed as self-employed, stems from the fact that not all ethnic groups have equal access to financial capital. A number of studies have documented that self-employed individuals with immigrant background are discriminated against when they try to access financial capital through loans from banks and financial institutions. In the United States, Cavalluzzo and Cavalluzzo (1998) and Cavalluzzo et al. (2002) found higher rates of loan denial among ethnic minority groups than among white Americans. Also in the US, Blanchflower et al. (2003) found that black-owned business were twice as likely to be denied credit than white-owned ones and that black-owned firms were charged higher interest rates on their loans than were white-owned firms. More recent studies from the US by Blanchard et al. (2008), Asiedu et al. (2012) and Fairlie et al. (2016) find similar results.

The evidence from European countries is scarcer. Using Swedish data, Aldén and Hammarstedt (2016) found that self-employed immigrants run a higher risk than self-employed natives of having their loan applications turned down. Aldén and Hammarstedt (2016) also found that self-employed immigrants were charged higher interest rates on their bank loans than self-employed natives.

Thus, we have reasons to believe that access to financial capital is an obstacle for ethnic minority groups in their self-employment activities and the choice of corporate form.[3] Research has also

[1] See e.g. Blanchflower and Oswald (1998).
[2] See e.g. Borjas (1986), Yuengert (1995), Fairle and Meyer (1996), Fairlie (1999), Hout and Rosen (2000), Fairlie and Robb (2007) and Robb and Fairlie (2009) for studies from the US. For European studies, see e.g. Clark and Drinkwater (2000) for a study from the UK, Constant and Zimmermann (2006) for a study from Germany, and Hammarstedt (2001) for a study from Sweden.
[3] Research has also shown that access to financial capital is more important for incorporated than for unincorporated self-employment (Levine and Rubinstein, 2017).

shown that market entry regulations play an important role in the self-employment decision.[4] Despite this we know relatively little about how such regulations affect the firm start-up decision among different segments of the population. In this paper, we shed additional light on this issue by studying the effect of a Swedish reform that reduced the minimum financial capital requirement for running a private limited liability company. The reform was implemented in Sweden on April 1, 2010 and entailed a reduction of the minimum financial capital requirement for private limited liability firms from SEK 100,000 (about 9,000 euros) to SEK 50,000 (about 4,500 euros).[5] The purpose of the reform was to facilitate entrepreneurship and self-employment in general, but also to encourage certain groups, such as immigrants and women, to start and to run their own firms.

The implementation of the reform allows us to study how changes in financial capital requirements affect self-employment propensities and if there are differences between immigrants and natives and between men and women. If immigrant self-employment propensities are affected more (or less) than native self-employment propensities by the reform, we have empirical evidence for the fact that access to financial capital plays different roles in the self-employment decision and for the possibilities to succeed as self-employed for immigrants and natives.

To study the impact of the reform we use population-wide register data from Statistics Sweden covering the period 2004–2015. We begin by estimating the impact on natives, and then use a difference-in-difference approach to estimate the causal impact of the reform on immigrants relative to natives. An individual can enter limited liability self-employment either by starting a limited liability firm or by changing corporate form from unlimited liability to limited liability. Therefore, we evaluate the effect of the reform at these two margins. The identification strategy relies on that the outcome variables of immigrants and natives follow a parallel trend in the absence of the reform. In the paper we show that this assumption is generally fulfilled.

We find that the reform increased both the probability of starting a limited liability firm and the probability of changing corporate form, for both men and women. We further find that the reform affects immigrants and natives differently. In particular, natives primarily respond to the reform by

[4] Some studies have shown that market entry regulation is closely related to the creation of new firms, see e.g. Klapper et al. (2006) and Branstetter et al. (2014).

[5] In 2020 the minimum financial capital requirement was lowered to SEK 25,000 (about 2,250 euros). However, due to the recentness of the implementation of this reform we are not able to evaluate its effect on self-employment propensities.

changing corporate form whereas immigrant men, and Middle Eastern immigrants especially, also respond by starting a limited liability firm. We see small differences when we compare native women with immigrant women. Finally, it is the wage-employed who start a limited liability business in the post-reform period. This is true for both immigrants and natives. In contrast, more marginalised groups (i.e. unemployed immigrants) do not respond to the reform by starting new limited liability firms.

The remainder of the paper is organised as follows: We present the reform in Section 2. In section 3 we describe the data and the empirical strategy. In section 4 we explain the descriptive results and in section 5 we describe the regression results. Section 6 presents the robustness checks. Finally, in section 7 we discuss our findings and conclude.

2. The Swedish reform

In Sweden, a person can start a business using the following business vehicles: private firm, partnership, limited partnership, economic association, and limited liability. In 2015, about 42 percent of the newly started firms were limited liability firms. This share varies by ethnicity and gender. Among natives, about 54 and 33 percent of the firms started by men and women, respectively, were limited liability firms. The corresponding shares for immigrant men and immigrant women were 31 and 20 percent.[6] Thus, natives are more likely to start a limited liability firm than immigrants, and women are less likely to start a limited liability firm than men.

An important difference among the business vehicles is the extent to which the owner(s) is (are) personally liable for the firm's finances. In other words, at least one of the owners is personally liable for the firm's finances in all vehicles but the limited liability.[7] In contrast, in the limited liability, the owner's (shareholders') personal liability is limited to the share capital. This means

[6] This is based on authors' own calculation from the data. The number of newly started business, started as limited liability firms, is calculated as the share of newly self-employed people with limited liability firms in 2015 who were wage employed or unemployed in 2014.

[7] In private firms, the owner is personally liable for the firm's finances and obligations. If two or more people wish to start a firm they can choose between starting a partnership (Sw. *handelsbolag*) or a limited partnership (Sw. *kommanditbolag*). In partnerships the partners share responsibility for the firm's finances and there is no requirement of a contribution of capital. In contrast, in a limited partnership *at least* one partner is personally liable for the firm's finances and the other partners who have invested in the firm. In cases when at least three people want to start a firm, they also have the option of starting an economic association (Sw. *ekonomisk förening*). The aim of the association should be to promote its members' interests, and, in this case, the members' financial liability corresponds to their contribution to the firm (Bolagsverket 2019).

that it is possible to invest in the limited liability firm without risking the personal finances, and in that sense the limited liability is typically regarded as a less risky way to start and run a firm. However, starting a limited liability firm requires a contribution of capital at a regulated minimum level while the other business vehicles have no such requirement.[8]

The reform studied in this paper entailed a reduction of the minimum capital requirement for private limited liability firms from SEK 100,000 to SEK 50,000.[9] The reform was implemented April 1, 2010 and meant that individuals who started a private limited liability after March 2010 could do so with less financial capital. In addition, private firms established before the implementation of the reform could reduce the share capital to the new minimum.

The reason for the reform was that the minimum capital requirement hindered many people from starting a limited liability firm. As a result, they were forced to choose other corporate forms that made them personally liable for the firm's finances. It was therefore argued that the lower capital requirement would make it easier to run and start a firm, and that the reduction would promote economic growth and increased employment. The government also posited that the reform had an important gender-equality component: to benefit business owners in the service sector by offering low capital requirements (i.e. firms typically run by women).[10]

In Sweden, the minimum capital requirement for limited liabilities has three functions. First, the requirement is a result of shareholders not being personally liable for the firm's obligations. Therefore, there must be some financial capital that can serve as a security for current and future creditors. In that sense, and secondly, the financial capital requirement benefits the shareholders by lowering the transaction costs of agreements between firm owners and creditors. This also makes it easier for the firm owner(s) to raise financial capital. Finally, a minimum capital requirement serves as an entry barrier for frivolous businesses. Thus, the entry barrier should ensure that only persons with promising business ideas start a limited liability while preventing the misuse of that corporate form.[11]

[8] Bolagsverket (2019).
[9] In September 2020, 1 SEK corresponds to 0.096 Euro.
[10] Regeringen (2009).
[11] The lower minimum capital requirement was part of changes made in Sweden as well as in the European Union to simplify regulations governing businesses. In the beginning of the 21st century, the general trend among countries in Europe was to lower or even abolish requirements of minimum capital shares for similar company forms.

The interim report underlying the reform made the point that, based on empirical evidence, that the reform was not likely to promote new enterprises.[12] Instead, it was suggested that the reduction of the minimum capital requirement may be important for the choice of corporate form and increase the flexibility at business start-up, especially for smaller firms and firms with initial capital requirements lower than SEK 100,000 (in which case the requirement may be perceived as an obstacle for business start-ups). Firms in the service sector and in business lines with limited need of investments in physical capital were identified as firms that may benefit from the reform. The interim report cited no reasons to abolish the minimum capital requirement, but argued that it was important to have some minimum level to maintain the three functions of the requirement. The interim report thus recommended a reduction to a minimum level of SEK 50,000, a recommendation that the government later accepted.[13]

3 Data and empirical strategy

3.1 Data

We use the register data from the Longitudinal Integration Database for Health Insurance and Labour Market Studies (LISA) at Statistics Sweden for 2004–2015. The database contains information about all residents of Sweden above 16 years of age. We restrict the analysis to working-age individuals (aged 20–64).[14] The data include information on sector of employment and demographic information, such as age, gender, educational attainment and region of birth.

We adopt the definition of self-employment from Statistics Sweden: A person is self-employed if his or her main income in November is from self-employment activities.[15] The data allows us to distinguish self-employed people who are running a limited liability firm from self-employed people who are running an unlimited liability firm. We exclude self-employed people working in the farming sector.

[12] For example, using cross-country data, van Stel et al. (2007) found that the minimum financial capital requirement is correlated with lower self-employment rates while there is no relation to the formation rate of nascent or young businesses.
[13] SOU 2008:49.
[14] We exclude individuals who receive a student allowance.
[15] For the year 2010, it is important to note that the employment status in our data is based on labor market information in November while the reform was implemented in April 2010.

Using information on region of birth, we define individuals who are born in Sweden as natives. We define individuals who are born outside of Sweden as immigrants and classify them into four groups based on their region of birth: Nordic countries (excluding Sweden), European countries (excluding Nordic countries), Middle Eastern countries, and other non-European countries (excluding Middle Eastern countries). We pool data from different years. The final sample comprises 24,566,067 observations for men and 24,092,202 observations for women.

3.2 Empirical strategy

The nationwide policy reform that reduced the minimum financial requirement for starting a limited liability firm provides an exogenous variation in the incentives to form such business between natives and different immigrant groups. An individual can enter limited liability self-employment either by starting a limited liability firm or by changing corporate form from unlimited to limited liability. Therefore, we evaluate the effect of the reform on these two margins.[16] To investigate the effect of the reform on these outcomes for natives and immigrants we estimate two specifications: one that allows us to study the change in the outcome variable between the pre- and post-reform period for natives and one that allows us to compare the effects of the reform on immigrants and natives.

To study the impact of the reform on natives we use the following specification:

$$y_{it} = \alpha + \sigma post\_reform_t + X'_{it}\delta + \rho Year_t + \pi_k + \varepsilon_{it} \qquad (1)$$

where y_{it} is the outcome variable for individual *i* at time *t*. To study the impact on new limited liability business start-ups we create a binary variable that is equal to 1 if an individual is self-employed and owns a limited liability firm at time *T* but was either wage-employed or unemployed at time *T-1*, and 0 otherwise.[17] The reference group is individuals who are not self-employed with

[16] An alternative outcome is the propensity of running a limited liability firm. In this case, one would study if the growth rate in the share of self-employed with a limited liability firm increases or decreases as a result of the reform. However, because the growth rate in the propensity of running a limited liability firm is the net effect of that individuals are entering and exiting limited liability self-employment, any positive effect of the reform on the probability of running a limited liability firm may be attenuated by self-employment exits. Therefore, we focus only on the more direct effects of the reform on the probability of starting a limited liability firm and the probability of switching corporate form.

[17] When we analyze the formation of new limited liability firms, we use the lagged employment status to define the labor market status the year before entry. As a result, we lose the year 2004 in the analysis.

a limited liability firm in both periods. To analyze changes at the corporate form margin, we create a binary variable that equals to 1 if firm owners switch corporate form from an unlimited liability firm at time *T-1* to a limited liability firm at time *T*, and 0 otherwise. The reference group is then firm owners who run an unlimited liability business in both periods.

The main variable of interest is $post\_reform_t$, which equals 1 for the years 2010–2015 (the post-reform period), and 0 for the years 2005–2009 (i.e. the pre-reform period). Its coefficient, σ, shows the impact of the reduction of the minimum financial requirement on the outcome variable. X'_{it} is a set of variables that control for individual characteristics, including age, marital status, educational attainment, and the number of children aged 18 or younger in the household. The variable $Year_t$ is a linear time trend and π_k are municipality fixed effects. ε_{it} denotes the error term. Standard errors are clustered at the individual level.

To analyze the extent to which the response to the reform differs between immigrants and natives, we use a difference-in-difference model with multiple comparison groups. Using this model we compare the change in the outcome variable before and after the reform of the different immigrant groups to that of natives. We use estimate the following regression model:

$$y_{it} = \alpha + \sum_{j=1}^{4} \beta_j imm_j + \sum_{j=1}^{4} \gamma_j post\_reform_t \times imm_j + X'_{it}\delta + \theta_t + \pi_k + \varepsilon_{it} \qquad (2)$$

where the variable imm_j is a set of dummy variables that indicate the birth region, *j*, of immigrants: Nordic countries, European countries, Middle Eastern countries, and other non-European countries. Natives are the reference group. To capture if immigrants and natives respond differently to the reform, we interact the post-reform period variable, $post\_reform_t$, with the immigrant-group dummy variables, imm_j. Thus, γ_j is the main coefficient of interest – the difference-in-difference estimate – that shows the extent to which the impact of the reform on the outcome variable differs between the different immigrant groups and natives. The identification strategy relies on that the outcome variable of the four immigrant groups and natives follow a parallel trend in the absence of the reform. We test the robustness of this assumption in section 5.1. X'_{it} is the set of individual control variables presented above. In this specification we control for the time trend through a set

of year dummy variables, θ_t .[18] Again, π_k is a set of municipality dummy variables and $\varepsilon_{it}$is the error term.

4 Descriptive evidence

We begin by looking at some descriptive evidence of the impact of the reduced financial capital requirement. Figures 1 and 2 show trends in the two outcome variables before and after the reform (implemented in 2010). First, we note that natives are more likely than immigrants to start limited liability firms (see Figure 1) and to change corporate form (see Figure 2). This is true for both men and women.[19] If we look at the development of the propensity to start a limited liability firm and the propensity of changing corporate form over time, the trend is fairly constant in the pre-reform period.[20] In the post-reform period, we observe an upward trend in both outcomes and for practically all groups. This is the especially the case for the probability of changing corporate form.

[18] This is not possible in specification (1), because the post-reform variable would be a linear combination of the year dummy variables.

[19] Previous research has shown high self-employment rates among immigrants from the Middle East in Sweden. However, immigrants from the Middle East are to a high extent self-employed in other corporate forms than limited liability businesses (Aldén & Hammarstedt, 2017).

[20] In Section 6 we test and discuss whether the trend in the outcome variable between natives and the different immigrant groups is parallel in the pre-reform period. This is vital because we use a difference-in-difference approach to study the impact of the reform on natives relative immigrants. Generally, the trends in the outcome variables appear to be parallel. However, there is one exception. There is some evidence that the trend in the pre-reform period at the corporate form margin differs between natives and Middle Eastern men.

Figure 1. The propensity of forming a limited liability firm among the non-self-employed.

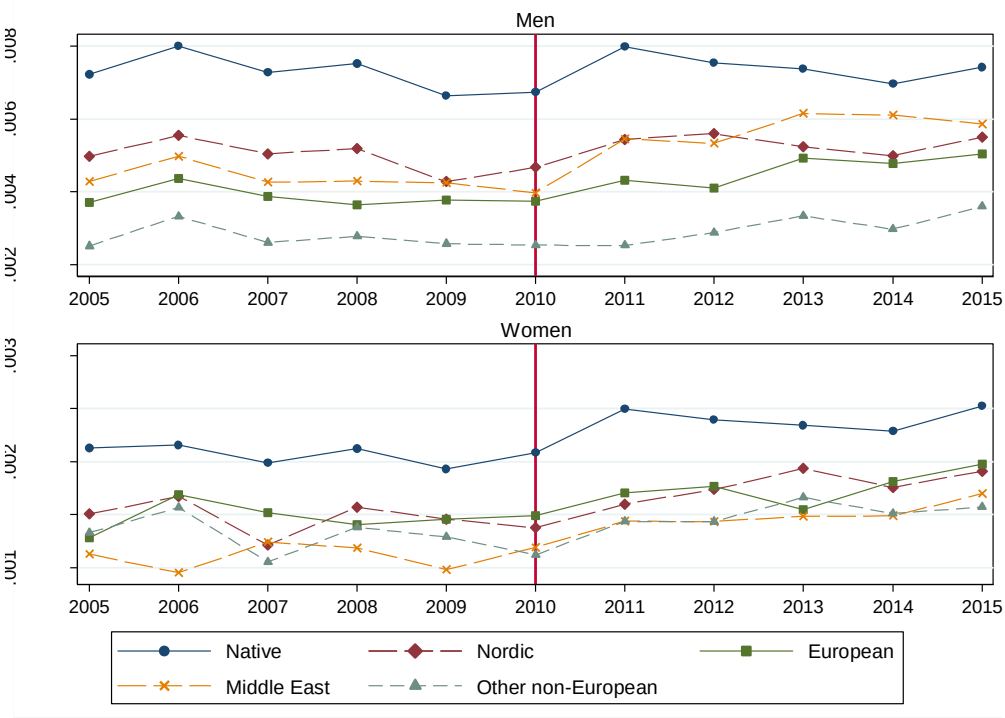

Figure 2. The propensity of switching the corporate form to a limited liability firm.

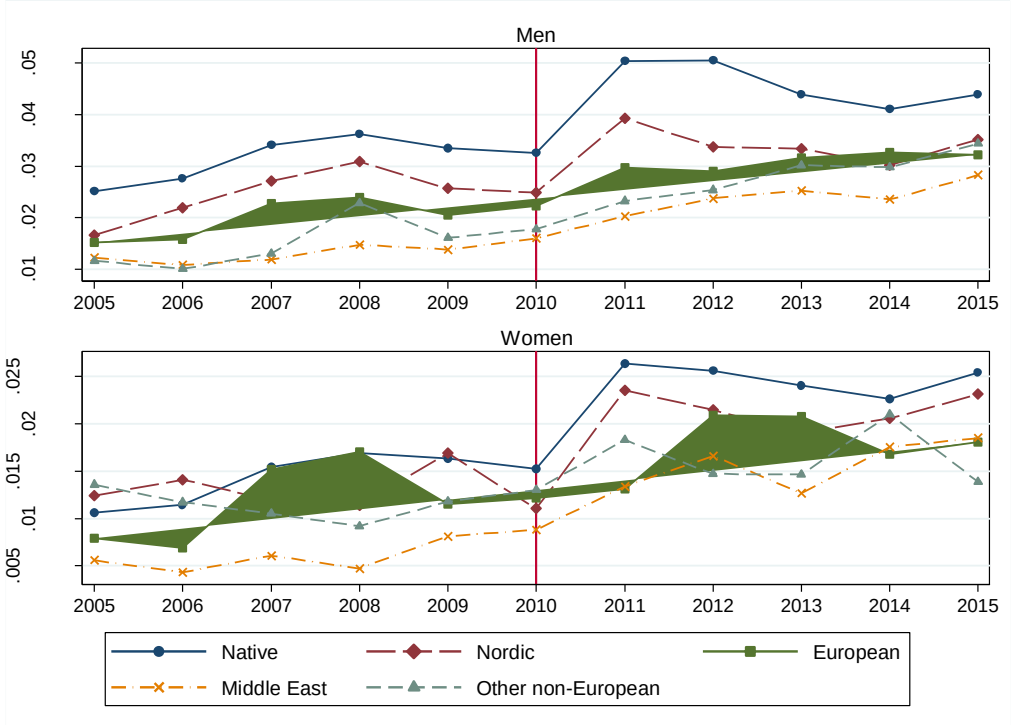

Table 1 presents the magnitude of these changes, and more precisely the average propensity of forming a new limited liability firm and of changing corporate form before and after the reform, the change in these propensities and the extent to which these changes differ between natives and the immigrant groups (i.e. the unconditional difference-in-difference estimate). Panel A in Table 1 reveals practically no change in the post-reform period in the propensity to start a limited liability firm among native men and men from Nordic countries. However, among men from Europe, the Middle East and non-European countries the corresponding propensity increased by 0.06, 0.11, and 0.03 percentage points, respectively. In contrast, the share of women who started a new limited liability firm increased in all groups. However, the difference-in-difference estimates reveal that there were no differences between native and immigrant women in this regard (the only exception is non-European immigrants). Generally, the size of the changes at this margin is relatively small, for both men and women.

If we turn the propensity of changing corporate form, panel B in Table 1 shows that this propensity increased in the post-reform period for both men and women. In addition, the increase is generally larger than that observed for new firm start-ups, suggesting that natives as well as immigrants have responded to the reduced financial capital requirements mainly by switching corporate form. Among men we see the largest increase among natives and non-European immigrants, amounting to 1.2 percentage points. For the other immigrant groups the change in the propensity of changing corporate form is between 0.04 and 0.24 percentage points smaller than that of natives. We see a fairly similar pattern among women. However, in this case there is no statistically significant difference between native women and women from Europe and the Middle East, whereas the change in the propensity of changing corporate form is about 0.4 percent points smaller for the other immigrant groups.

Table 1. Descriptive results

	(1) Natives	(2) Nordic countries	(3) European	(4) Middle East	(5) Other Non-European
Panel A: The propensity of forming new limited liability business among the non-self-employed.					
Men					
Before the reform	0.0074	0.0051	0.0039	0.0045	0.0028
After the reform	0.0074	0.0053	0.0046	0.0057	0.0030
Difference	-0.0000	0.0002	0.0006***	0.0011***	0.0003**
Difference-in-difference		0.0002	0.0007***	0.0011***	0.0003***
Women					
Before the reform	0.0021	0.0015	0.0015	0.0011	0.0013
After the reform	0.0024	0.0017	0.0017	0.0015	0.0015
Difference	0.0003***	0.0002**	0.0003***	0.0004***	0.0002**
Difference-in-difference		-0.0001	-0.0000	0.0001	-0.0001*
N	19,401,070	820,565	1,310,258	782,834	1,141,397
Panel B: The propensity of changing corporate form to a limited liability business among the self-employed.					
Men					
Before the reform	0.0313	0.0244	0.0198	0.0128	0.0150
After the reform	0.0436	0.0327	0.0297	0.0229	0.0270
Difference	0.0123***	0.0083***	0.0099***	0.0101***	0.0120***
Diff-in-diff		-0.004**	-0.0024*	-0.0022**	-0.0003
Women					
Before the reform	0.0142	0.0133	0.0119	0.0058	0.0112
After the reform	0.0231	0.0196	0.0171	0.0147	0.0160
Difference	0.0089***	0.0063***	0.0052***	0.0088***	0.0048***
Difference-in-difference		-0.0026	-0.0037***	-0.0000	-0.0041***
N	520,141	22,468	42,004	24,065	27,400

Note: *** p<0.01, ** p<0.05, * p<0.1.

5 Estimation results

In this section we turn to the regression analysis, which allows us to control for differences in individual characteristics that may correlate with the propensity of running a limited liability firm. Also, to the extent that deviations from parallel trends in the outcomes variables in the pre-reform period depend solely depend on differences in individual characteristics, conditioning on such

differences removes any bias in the estimates.[21] Tables B1 and B2 in Appendix B show descriptive statistics of characteristics for the individuals included in the analysis.

5.1 The effect of the reform

Table 2 presents the conditional effect of the reform for natives and the difference-in-difference estimates for the different immigrant groups. We focus on the two outcome variables presented in Table1: 1) the formation of new limited liability business among individuals who were not self-employed in the pre-reform period (panel A); and 2) the propensity of switching corporate form from an unlimited to a limited liability firm among the self-employed (panel B). In columns 1 and 3 we control for year and municipality fixed effects and in columns 2 and 4 we add controls for individual characteristics.

If we begin with natives, we can see that the reform increased both the probability of starting a limited liability firm and of switching corporate form. However, the effect is larger at the corporate form margin than the new start-up margin. This is true for both men and women. Thus, among natives the positive impact of the reform on the probability of running a limited liability is driven by changes in corporate form.

Interestingly, the difference-in-difference estimates for men in panel A show that the change in the propensity to start a new firm is larger for all immigrant groups than for natives, with the exception of Nordic immigrants. Thus, we see a larger response at this margin among immigrants than among natives, and especially among Middle Eastern immigrants. If we instead look at the corporate firm margin in panel B, for most immigrant groups there are no statistically significant differences from natives. The only exception is European immigrants, for whom the change is smaller. All in all, this shows that while native men respond to the reform primarily by changing corporate form, immigrant men, and Middle Eastern immigrants especially, respond both by changing corporate form and by starting limited liability firms.

Turing to women, panel A in Table 2 there are hardly any differences between immigrants and natives in the response to the reform when it comes to starting a limited liability firm. The only

[21] As a robustness check we have estimated specifications where we interact the control variables with year dummy variables, see Section 6. In this way we control for unknown shocks that differentially affect individuals with different characteristics.

exception is Middle Eastern women for whom we observe a slightly larger increase than for native women. If we look at the probability of changing corporate form, there is no statistically significant difference in the response between Nordic and Middle Eastern immigrants and natives. However, for European and non-European immigrants we observe a negative and rather large difference-in-difference estimate. Thus, native women as well as women from Nordic countries and the Middle East respond to the reform mainly by changing corporate form.

Table 2. The effect of the reform

	Men				Women			
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A The effect on the probability of forming a limited liability firm among individuals who were not self-employed.								
Post (natives only)	0.0003***	0.0003***			0.0002***	0.0002***		
	(0.000)	(0.000)			(0.000)	(0.000)		
Post × Nordic			0.0003	0.0002			-0.0001	-0.0001
			(0.000)	(0.000)			(0.000)	(0.000)
Post × European			0.0006***	0.0007***			-0.0000	-0.0000
			(0.000)	(0.000)			(0.000)	(0.000)
Post × Middle East			0.0013***	0.0015***			0.0001*	0.0002*
			(0.000)	(0.000)			(0.000)	(0.000)
Post × Other non-European			0.0004***	0.0004***			-0.0001	-0.0001
			(0.000)	(0.000)			(0.000)	(0.000)
Observations	19,673,311	19,673,311	23,525,322	23,525,322	19,401,070	19,401,070	23,456,124	23,456,124
R-squared	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.001
Panel B The probability of switching the corporate form to limited liability business among self-employed individuals.								
Post (natives only)	0.0044***	0.0040***			0.0017**	0.0017**		
	(0.001)	(0.001)			(0.001)	(0.001)		
Post × Nordic			-0.0035*	-0.0030			-0.0023	-0.0021
			(0.002)	(0.002)			(0.002)	(0.002)
Post × European			-0.0022*	-0.0042***			-0.0037***	-0.0040***
			(0.001)	(0.001)			(0.001)	(0.001)
Post × Middle East			-0.0022**	0.0008			0.0002	0.0016
			(0.001)	(0.001)			(0.001)	(0.001)
Post × Other non-European			-0.0004	0.0003			-0.0040***	-0.0028*
			(0.002)	(0.002)			(0.002)	(0.002)
Observations	821,020	821,020	1 040,745	1 040,745	520,141	520,141	636,078	636,078
R-squared	0.003	0.013	0.005	0.013	0.004	0.007	0.004	0.007
Control variables	No	Yes	No	Yes	No	Yes	No	Yes
Municipality dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Linear time trend	Yes	Yes	No	No	Yes	Yes	No	No
Year dummies	No	No	Yes	Yes	No	No	Yes	Yes

Note: Standard error is clustered at individual level. *** p<0.01, ** p<0.05, * p<0.1. Using model specification (1), we estimate the effect of the reform on natives only in columns 1, 2, 5 and 6. Using model specification (2), we estimate the effect of the reform on immigrants relative to natives in columns 3, 4, 7 and 8. The individual control variables include age, marital status, education attainment and the number of children under age 18 within the household.

5.2 Do the wage-employed and the unemployed respond differently to the reform?

We have seen that both immigrants and natives, and immigrant men especially, have responded to the reform by starting new limited liability firms. In this section we address the question of whether wage-employed or unemployed individuals have started new firms.[22]

Table 3 presents the effect of the reform on the probability of starting a limited liability firm among wage-employed and unemployed natives (panel A) and the corresponding effects of immigrants relative to natives (panel B). Among natives we can see that it is the wage-employed who start limited liability firms as a result of the reform. The propensity to start a limited liability firm is 0.3 and 0.2 percentage points larger for men and women, respectively, in the post-reform than in the pre-reform period. Among the unemployed the estimate is not statistically significant.

In panel B we see a similar result for immigrant men. For European, Middle Eastern and other non-European immigrants the difference-in-difference estimate is positive for the wage-employed and negative and/or close to zero for the unemployed. The larger impact for immigrant men than for native men among the wage-employed is a result of the larger effect on probability of starting a limited liability firm for these men (see Table 2).

Among women the difference-in-difference estimates are close to zero and not statistically significant for all immigrant groups. The only expectation is Middle Eastern women for whom we see a slightly larger effect – 0.03 percentage points – among the wage-employed on the probability of starting a limited liability firm than for natives. Taken together, this means that the increase in the probability of forming a limited liability firm among women is, as it is for men, driven by the wage-employed.

[22] We define people as wage-employed if the main labor income in November came from wage-employment. This is the official definition used by Statistics Sweden. We define people as unemployed if they are not registered as wage-employed, self-employed or student and if they do not have any labor income during the year. See Fairlie and Fossen (2018) for a discussion of the relation between labor market status and entry into self-employment.

Table 3. The effect of the reform on limited liability firm start-ups among the wage-Employed and unemployed

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Men				Women		
VARIABLES	Wage-employed	Wage-employed	Unemployed	Unemployed	Wage-employed	Wage-employed	Unemployed	Unemployed
Post (natives only)	0.0003***		0.0002		0.0002***		0.0001	
	(0.000)		(0.000)		(0.000)		(0.000)	
Post × Nordic		0.0003		-0.0003*		-0.0000		-0.0002
		(0.000)		(0.000)		(0.000)		(0.000)
Post × European		0.0008***		-0.0001		-0.0000		-0.0000
		(0.000)		(0.000)		(0.000)		(0.000)
Post × Middle East		0.0017***		0.0002		0.0003*		0.0000
		(0.000)		(0.000)		(0.000)		(0.000)
Post × Other non-European		0.0005***		-0.0003**		0.0000		-0.0001
		(0.000)		(0.000)		(0.000)		(0.000)
Observations	17 631,506	20 373,551	1 994,250	3 151,771	17 231,313	19 930,414	2 155,741	3 525,710
R-squared	0.002	0.002	0.005	0.003	0.001	0.001	0.002	0.001
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipality dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Linear time trend	Yes	No	Yes	No	Yes	No	Yes	No
Year dummies	No	Yes	No	Yes	No	Yes	No	Yes

Note: Standard error is clustered at individual level. *** p<0.01, ** p<0.05, * p<0.1. The control variables include age, marital status, education attainment and the number of children under age 18 within the household.

5.3 The effect of reform in the service sector

The interim report argued that the reform that reduced the financial capital requirement was expected to benefit firm owners in sectors with low requirements for start-up financial capital. The service sector is one such sector. Previous research has shown that many immigrants in Sweden, especially from the Middle East, are self-employed in that sector.[23] Therefore, in this section, we investigate whether the reform increased the probability of starting or switching corporate form to a limited liability firm in the service sector.[24] We therefore repeat our analysis from section 5.1 with attention to the service sector.

Table 4 presents the regression results where we compare the probability of starting or switching the corporate form to a limited liability business in the service sector in the pre- and post-reform period for natives and for immigrants relative to natives. If we start with native men, the reform increased both the probability of starting a limited liability firm and the probability of changing corporate form among men who were running unlimited liability firms in the pre-reform period. As in the main results presented in Table 2, the impact is larger at the corporate form margin.

[23] See e.g., Aldén and Hammarstedt (2017).
[24] For this purpose we define a binary variable – the outcome variable – that equals 1 if the person is self-employed and runs a limited liability business in the service sector and 0 otherwise.

Table 4. The effect of the reform in the service sector

	Men		Women	
VARIABLES	(1)	(2)	(3)	(4)
Panel A The probability of forming a limited liability business in the service sector.				
Post (natives only)	0.0002**		0.0002***	
	(0.000)		(0.000)	
Post × Nordic		0.0002		-0.0001
		(0.000)		(0.000)
Post × European		0.0002		-0.0002**
		(0.000)		(0.000)
Post × Middle East		0.0013***		0.0001
		(0.000)		(0.000)
Post × Other non-European		0.0002**		-0.0001
		(0.000)		(0.000)
Observations	19,634,502	23,483,576	19,397,016	23,451,529
R-squared	0.002	0.002	0.001	0.001
Panel B The probability of switching the corporate form to limited liability business in the service sector.				
Post (natives only)	0.0017***		0.0015**	
	(0.001)		(0.001)	
Post × Nordic		-0.0032**		-0.0014
		(0.002)		(0.002)
Post × European		-0.0039***		-0.0050***
		(0.001)		(0.001)
Post × Middle East		0.0044***		0.0014
		(0.001)		(0.001)
Post × Other non-European		0.0037**		-0.0030**
		(0.002)		(0.001)
Observations	809,441	1 028,020	519,460	635,241
R-squared	0.012	0.010	0.008	0.007

Note: Standard error is clustered at individual level. *** p<0.01, ** p<0.05, * p<0.1. Using model specification (1), we estimate the effect of reform on natives only in columns 1 and 3. Using model specification (2), we estimate the effect of reform on immigrants relative to natives in columns 2 and 4. The individual control variables include age, marital status, education attainment and the number of children under age 18 within the household.

If we turn to immigrant men, the difference-in-difference estimates for Middle Eastern and non-European men in panels A and B are positive and statistically significant. Thus, in the service sector the impact of the reform is generally larger for these immigrant men than for natives. This is in line with the main results presented in Table 2. For the other immigrant groups there is no statistically significant difference compared to natives when it comes to starting a limited liability firm, while the impact is statistically significantly smaller at the corporate form margin.

For women there is no evidence that immigrants and natives responded differently to the reform at the firm start-up margin. The only exception is women originating in European countries for whom we see a negative estimate. If we turn to the corporate form margin, there are no statistically

significant differences between Nordic and Middle Eastern women and native women; immigrant women from Europe and non-European countries do not switch corporate form to the same extent as native women in the post-reform period.

These findings suggest that the average increase in self-employment propensities in the post-reform period for Middle Eastern men is to a large extent driven by the service sector. Interestingly, in this sector, these men respond by starting a new limited liability business and by switching corporate form. For women, we find no such differences by ethnicity.

6 Robustness analysis

To test the robustness of our results we have performed several robustness checks. In this paper we use a difference-in-difference approach to study if the effect of the reduced minimum financial capital requirement, introduced in 2010, had different effects on natives and immigrants. Thus, we compare the relative effect of the reform on different immigrant groups and natives. To identify the causal effect of the reform the trend in the outcome in the pre-reform period has to be the same, parallel, for natives and the immigrant group at hand. We test this parallel trend assumption by estimating the following equation:

$$y_{it} = \alpha + \sum_{j=1}^{4} \beta_j imm_j + \sum_{j=2006}^{2015} \gamma_j \theta_t \times imm_j + X_{it}'\delta + \theta_t + \pi_k + \varepsilon_{it} \quad (3)$$

The only difference compared to equation (2) is that we, instead of using the $post\_reform_t$ variable, interact the immigrant group dummy, imm_j, with the year dummy variable. The year 2005 is used as the reference year. The estimates of the interactions γ_j then show whether the change in the outcome variable in year *t* compared to the reference year differ between immigrant group *j* and natives. To fulfill the parallel trend assumption, the estimated coefficients of the interactions should not be statistically different from zero in the pre-reform period. We have chosen not to use the year prior reform as reference year, due to the Great recession in 2009. During this year individuals may have been pushed into self-employment to escape unemployment or been forced to exit self-employment due to bankruptcy. Note that this is not a problem if the economic crisis affected immigrants and natives in the same way. However, empirical evidence show that

immigrants are more vulnerable to economic fluctuations.[25] Therefore, we mainly evaluate the parallel trend assumption based on the estimates for the years 2006–2008.

The results are presented in figures A1–A12 in Appendix A. Generally, the estimates of the immigrant group and year interactions in the pre-reform period are not statistically significantly different from zero, suggesting that the parallel trend assumption is fulfilled. However, there is one exception. There is some evidence that the trend in the pre-reform period at the corporate form margins differs between natives and Middle Eastern men. Thus, when it comes to changing corporate form we need interpret the results with some caution.

In section 5.2 we found that increased limited liability firm start-up, observed for both natives and immigrants, was driven by the wage-employed. To rule out that this effect is not driven by some other factor that have had a general positive impact on self-employment propensities, we have, as a placebo test, estimated the probability of starting an *unlimited liability* firm among the wage-employed. The results from this test show no corresponding increase in the probability of starting an unlimited liability firm among the wage-employed in the post-reform period.

Finally, to explore whether there is some unknown shock that differentially affect individuals with different characteristics, which is producing a false treatment effect, we reran the regressions including interactions of the individual characteristics and year dummies. The results, available upon request, remain the same as those presented in Table 2.

7 Conclusion and discussion

Access to financial capital is an important factor for individuals who are considering self-employment.[26] The importance of access to capital may also vary among groups, such as between immigrants and natives, and males and females. In this paper, we shed new light on the issue of the access to financial capital and its importance for the self-employment decision among immigrants and natives in Sweden.

[25] See Dustmann et al. (2010) and Bratsberg et al. (2010; 2018).
[26] See Blanchflower and Oswald (1998).

We find that the reform increased both the probability of starting a limited liability firm and the probability of changing corporate form, for both men and women. However, natives primarily respond to the reform by changing corporate form whereas immigrant men, and Middle Eastern immigrants especially, also respond by starting a limited liability firm. Among women the differences between natives and immigrants tend to be small. Interestingly, at firm start-up margin, it is the wage employed who drive the increased propensity of starting a limited liability firm in the post-reform period. This is true for both immigrants and natives. In contrast, more marginalised groups (i.e. unemployed immigrants) do not respond to the reform by starting a new limited liability firm.

What, then, can we say about financial capital requirements and immigrant self-employment propensities? As mentioned, financial capital is important for self-employment. We find that some immigrants groups responded more strongly than natives to the reform. One such group are wage-employed immigrant males originating in the Middle East who opt for self-employment in the service sector, a sector with a low financial capital requirement for firm start-ups. In contrast, self-employment propensities among unemployed immigrants were less affected by the reform. Thus, the reform did not encourage immigrants with a weaker attachment to the labour market to start limited liability firms. Instead, the results provide us with evidence that access to financial capital is an obstacle for wage-employed immigrants who opt for self-employment.

Our results have several important policy implications. The results underline the importance of good opportunities to get access to financial capital for individuals who are about to start up new ventures. In addition, our results also have implications for the ways in which market entry regulation affects self-employment behaviour across the population. At the firm start-up margin, the largest effect of the reform is found for individuals who are wage-employed; the effect of the reform for unemployed people is negligible. Thus, the reform seems to affect self-employment propensities for people who already are active on the labour market as wage-employed but not for marginalised groups who opt for self-employment as an alternative to unemployment. The increased propensity of changing corporate form in the post-reform period, observed for most immigrant groups and natives, indicates that the reform has made self-employment less risky in the sense that the firm owners' who have been able to switch corporate form – due to the lower financial capital requirement – no longer risk their personal finances, only the owners' share capital.

A question for future research is how the reform has affected the quality of newly formed firms. A motivation for a rather high financial capital requirement for limited liability firms is that it should ensure that only persons with promising business ideas start limited liability firms. If that is the case one may suspect that the reduction of the financial capital requirement has reduced the quality of new firms. However, the result that it is mainly the wage-employed (i.e. people with a strong attachment to the labour market) who started the new firms points in the opposite direction. Hence, if and how the reform has affected the quality of the new firms is an empirical question that deserves attention in future research.

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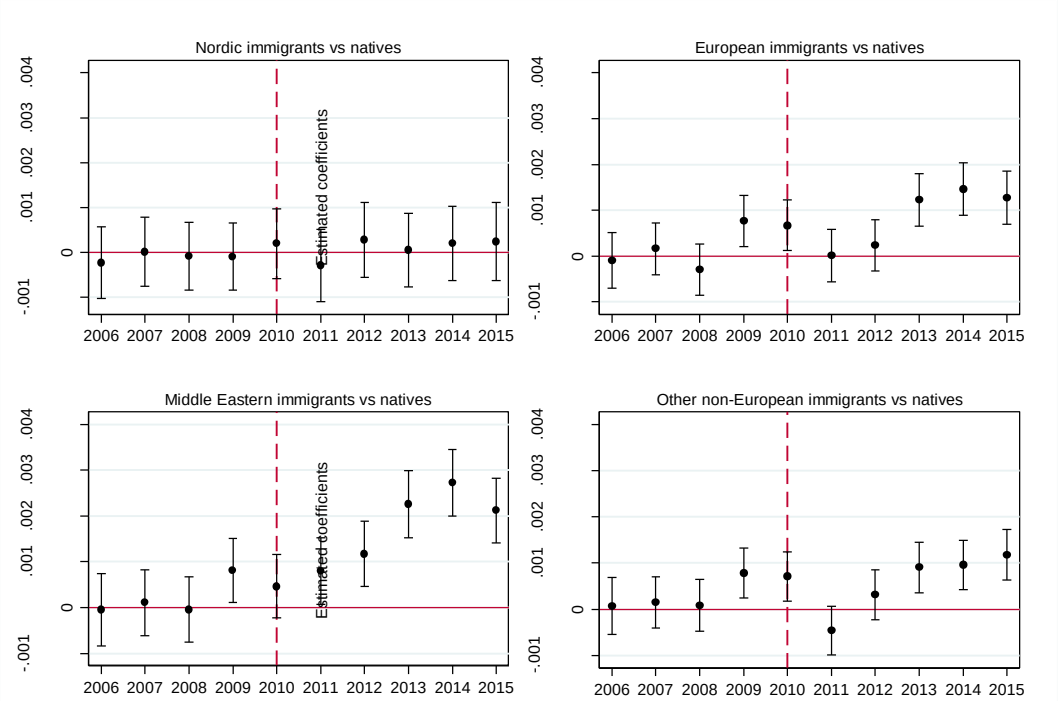
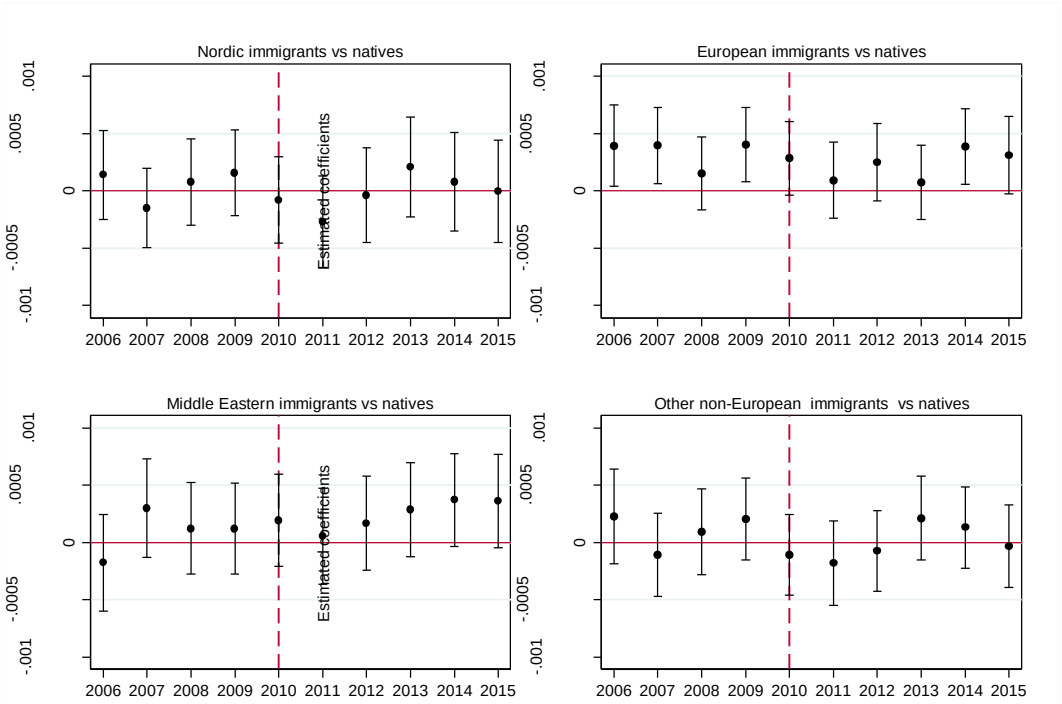
Appendix A

Figure A1. The effect of reform on the probability of forming limited liability firm among the non-self-employed men, by year



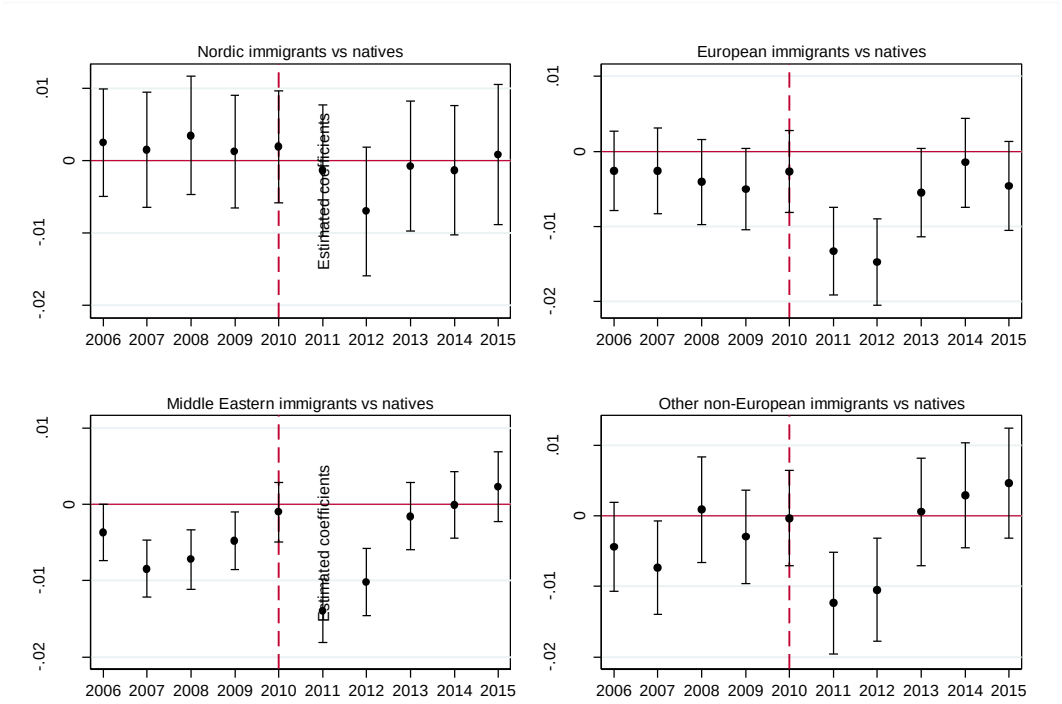
Note: the reference year is 2005

Figure A2. The effect of reform on the probability of forming limited liability firm among the non-self-employed women, by year



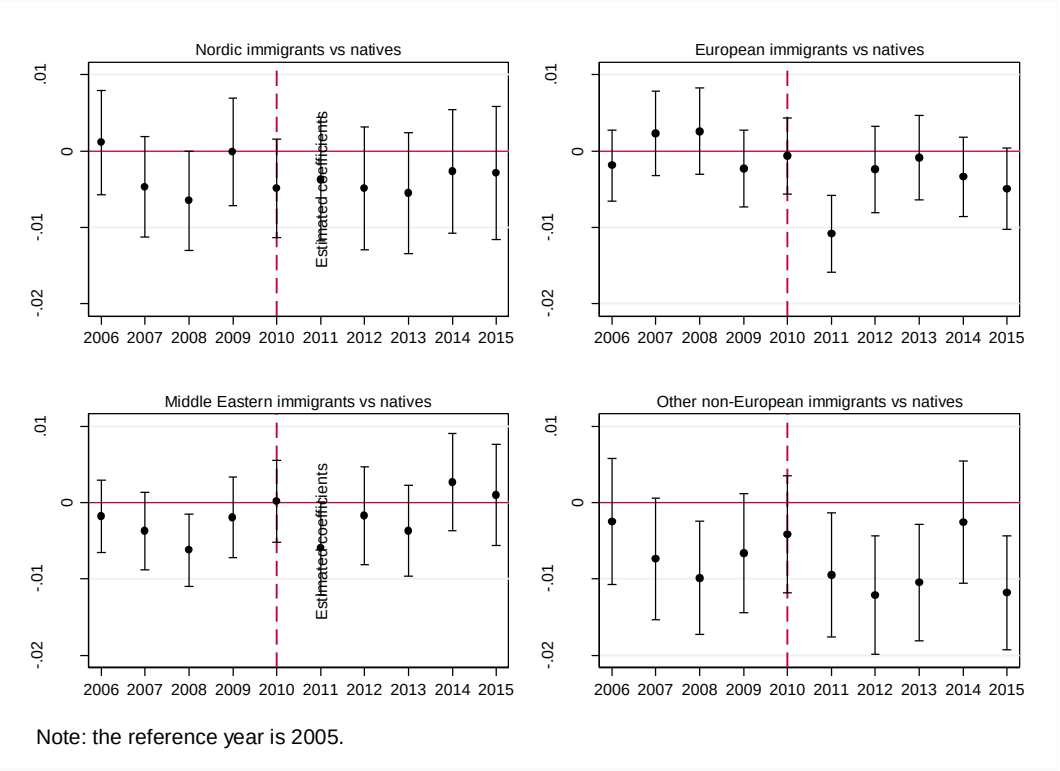
Note: the reference year is 2005.

Figure A3. The effect of reform on the probability of changing the corporate form to limited liability firm among self-employed men, by year.



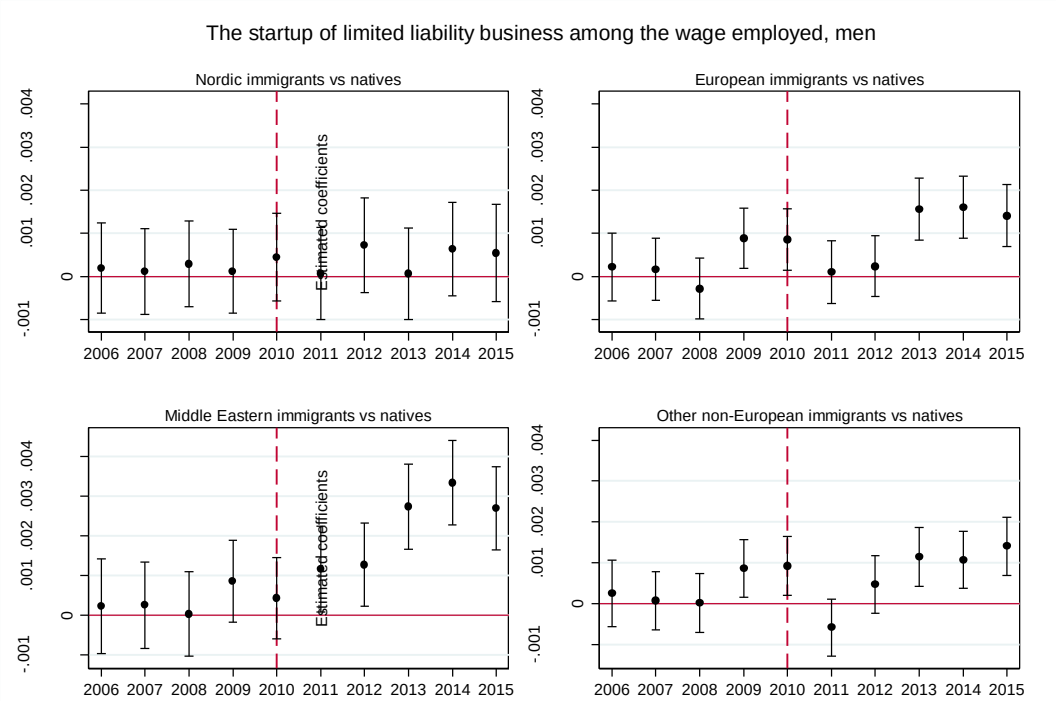
Note: the reference year is 2005.

Figure A4. The effect of reform on the probability of changing the corporate form to limited liability firm among self-employed women, by year.



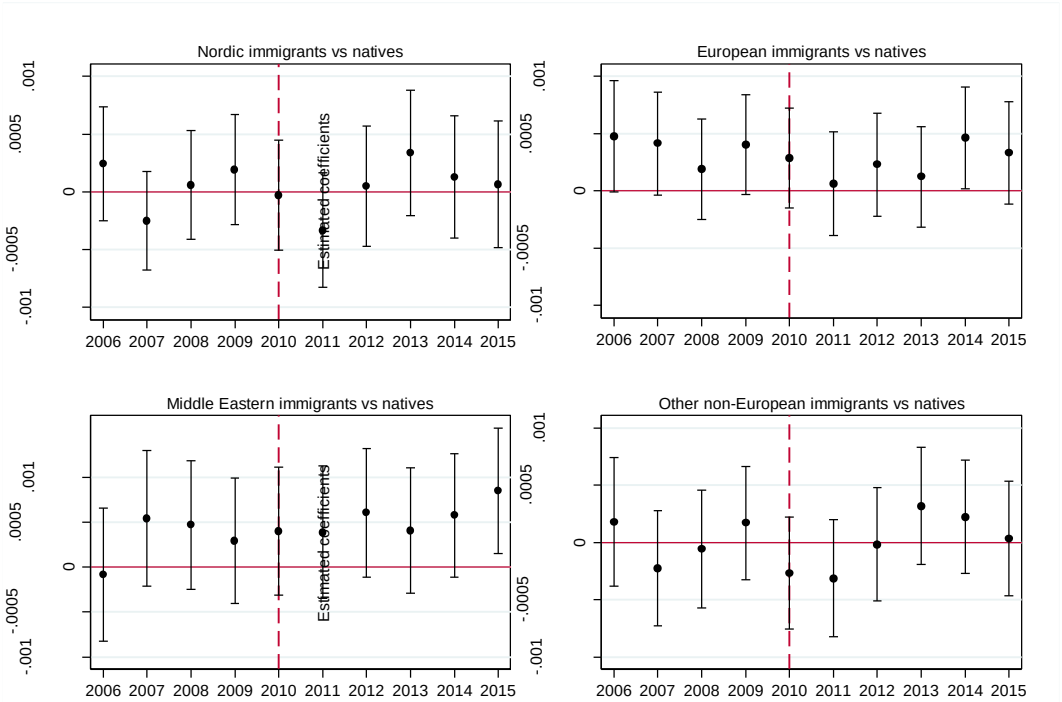
Note: the reference year is 2005.

Figure A5. The effect of reform on the probability of forming a limited liability firm among wage employed men, by year.



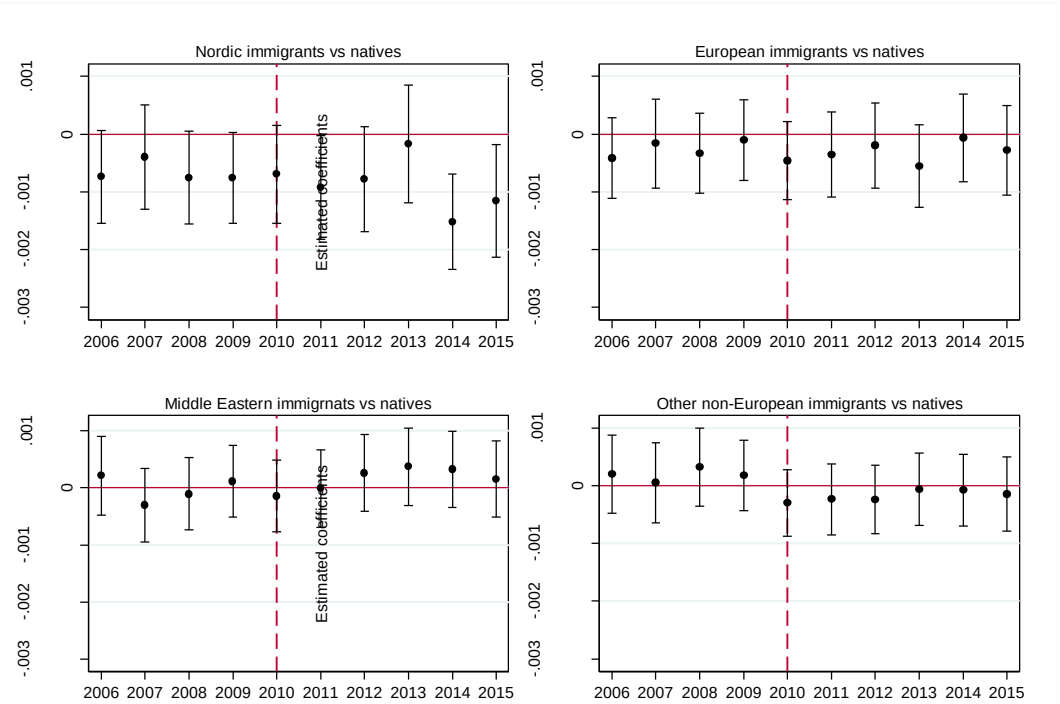
Note: the reference year is 2005.

Figure A6. The effect of reform on the probability of forming a limited liability firm among wage employed women, by year.



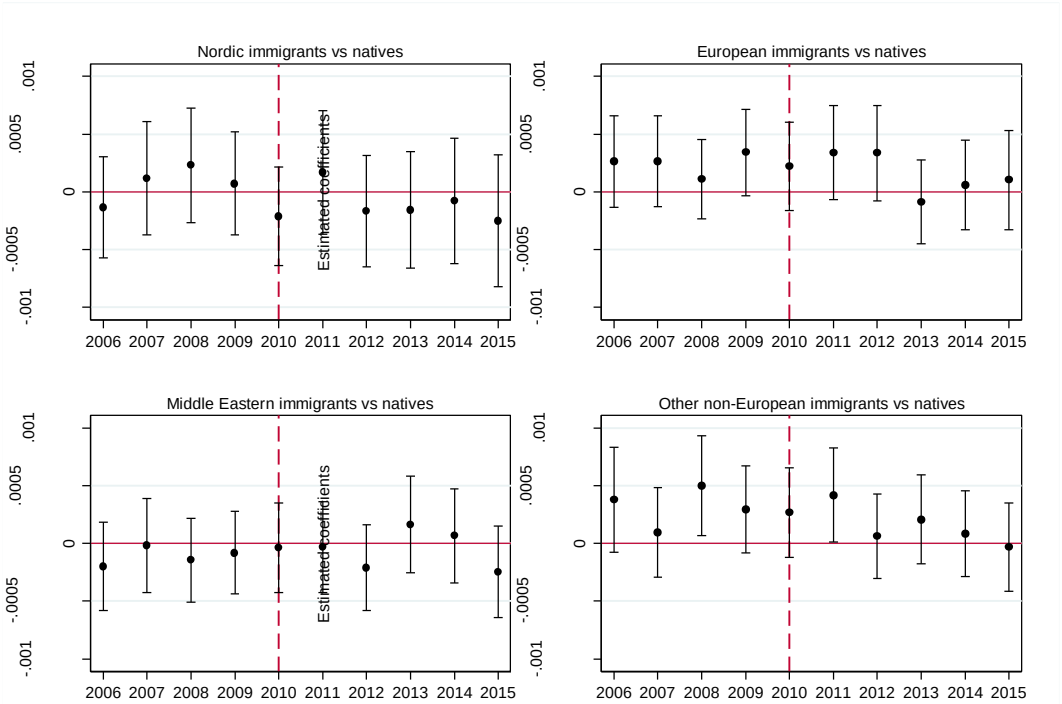
Note: the reference year is 2005.

Figure A7. The effect of reform on the probability of forming a limited liability firm among unemployed men, by year.



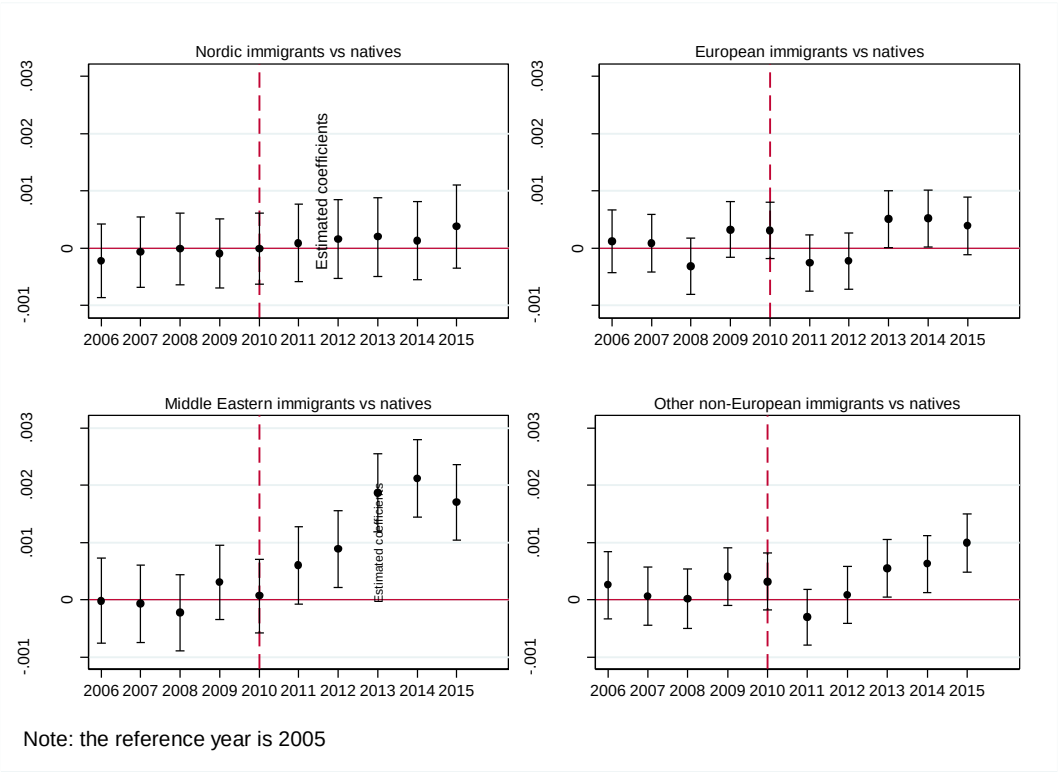
Note: the reference year is 2005

Figure A8. The effect of reform on the probability of forming a limited liability firm among unemployed women, by year.



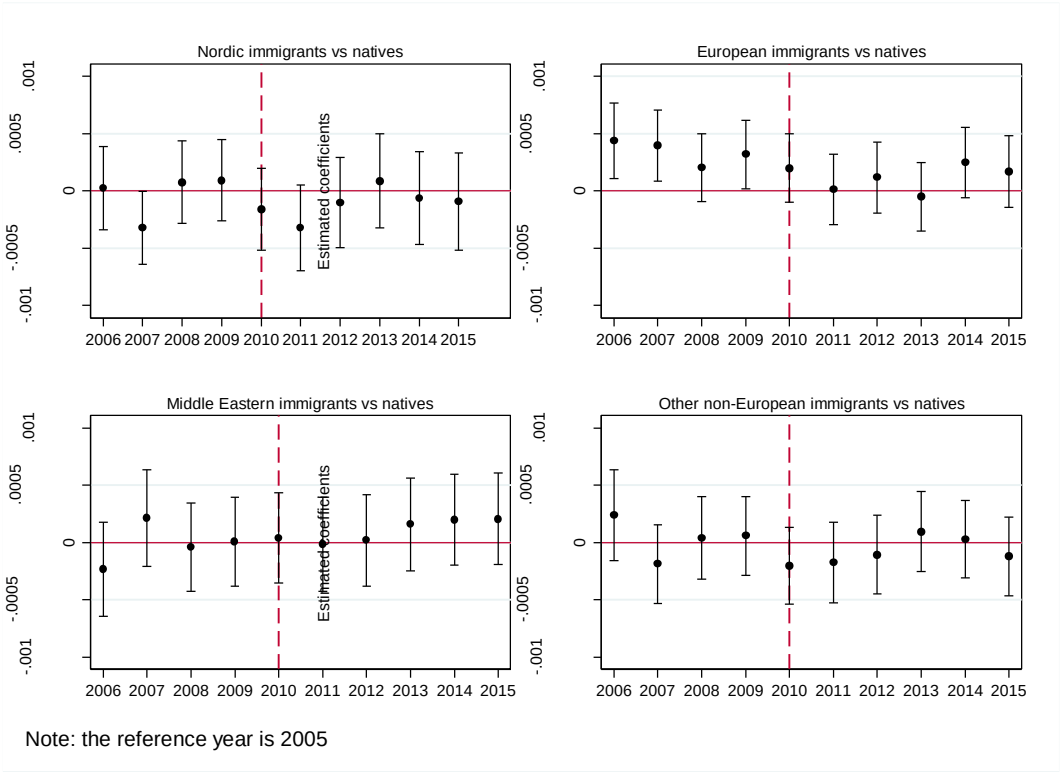
Note: the reference year is 2005.

Figure A9. The effect of reform on the probability of forming a limited liability firm in the service sector among non-self-employed men, by year.



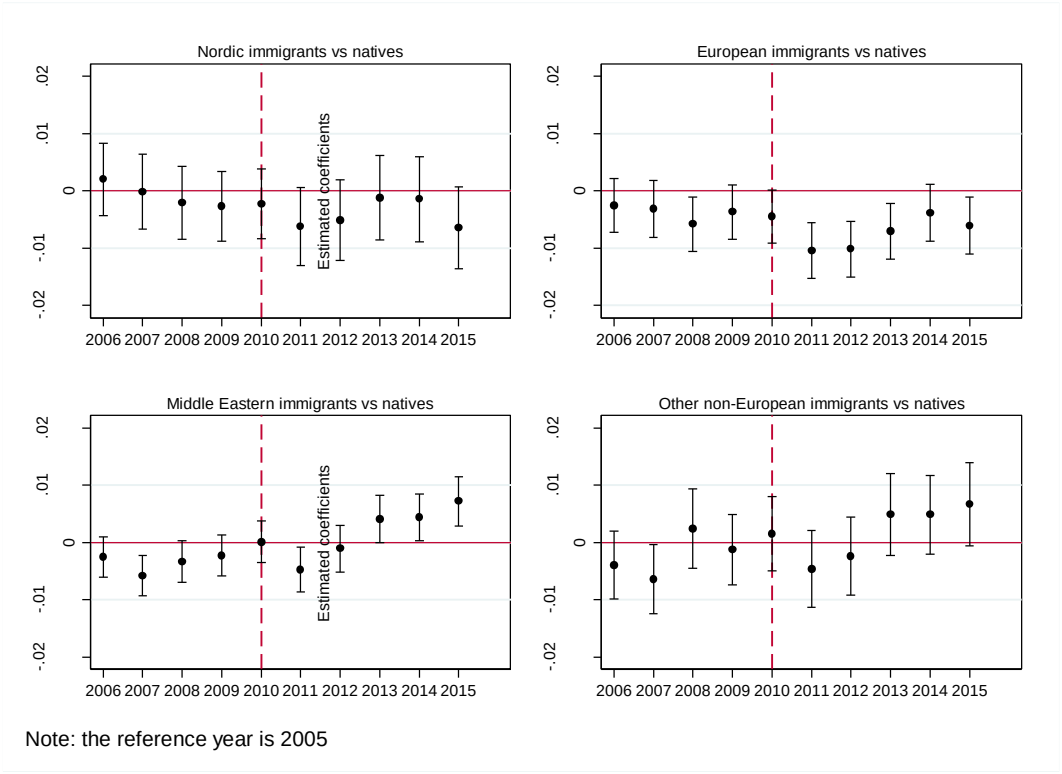
Note: the reference year is 2005

Figure A10. The effect of reform on the probability of forming a limited liability firm in the service sector among non-self-employed men, by year.



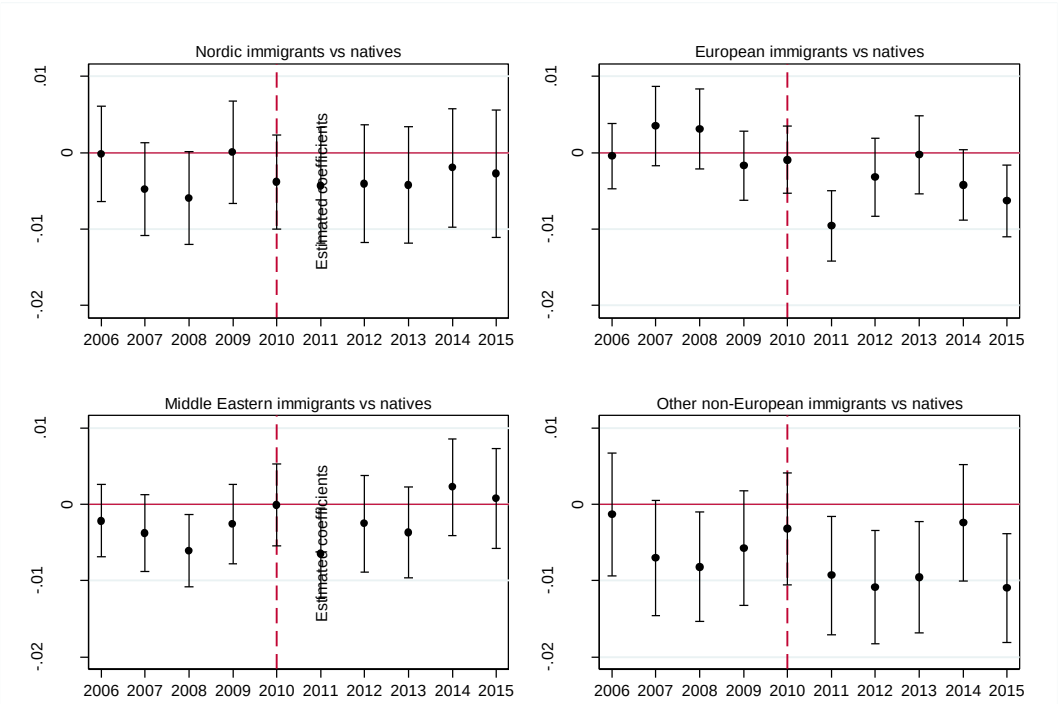
Note: the reference year is 2005

Figure A11. The effect of reform on the probability of changing the corporate form to limited liability among self-employed men in the service sector, by year.



Note: the reference year is 2005

Figure A12. The effect of reform on the probability of changing the corporate form to limited liability among self-employed women in the service sector, by year.



Note: the reference year is 2005

Appendix B

Table B1. Descriptive statistics, men.

	Native		Nordic		Europe		Middle East		Other non-Europe	
	Before	After	Before	After	Before	After	Before	After	Before	After
Panel A Individual characteristics of individuals included in the analysis at the firm start-up margin										
Age	43.76	43.38	49.24	50.04	43.51	42.58	41.12	41.74	39.64	39.56
	(12.10)	(12.22)	(10.29)	(10.22)	(11.74)	(11.67)	(10.64)	(11.16)	(10.98)	(10.95)
Married	0.411	0.389	0.428	0.425	0.549	0.513	0.614	0.596	0.457	0.470
	(0.492)	(0.488)	(0.495)	(0.494)	(0.498)	(0.500)	(0.487)	(0.491)	(0.498)	(0.499)
Children < age18	0.615	0.612	0.465	0.455	0.689	0.671	1.001	0.915	0.746	0.741
	(0.961)	(0.954)	(0.900)	(0.884)	(1.015)	(0.998)	(1.270)	(1.220)	(1.190)	(1.232)
Primary School	0.171	0.140	0.291	0.238	0.169	0.145	0.317	0.312	0.221	0.225
	(0.376)	(0.347)	(0.454)	(0.426)	(0.375)	(0.352)	(0.465)	(0.463)	(0.415)	(0.417)
Upper Secondary School	0.529	0.537	0.474	0.472	0.481	0.460	0.364	0.343	0.419	0.369
	(0.499)	(0.499)	(0.499)	(0.499)	(0.500)	(0.498)	(0.481)	(0.475)	(0.493)	(0.483)
University	0.300	0.323	0.235	0.290	0.350	0.395	0.319	0.345	0.360	0.406
	(0.458)	(0.468)	(0.424)	(0.454)	(0.477)	(0.489)	(0.466)	(0.475)	(0.480)	(0.491)
N	9,016,398	10,656,913	323,744	313,223	498,480	721,690	363,462	616,051	365,680	649,681
Panel B Individual characteristics of individuals included in the analysis at the corporate form margin										
Age	48.38	48.29	51.24	51.97	47.19	46.12	42.96	44.91	44.77	45.22
	(10.80)	(10.89)	(9.072)	(9.051)	(10.22)	(10.26)	(8.940)	(9.587)	(9.396)	(9.767)
Married	0.501	0.458	0.532	0.520	0.608	0.602	0.756	0.746	0.629	0.599
	(0.500)	(0.498)	(0.499)	(0.500)	(0.488)	(0.489)	(0.429)	(0.435)	(0.483)	(0.490)
Children < age18	0.619	0.581	0.530	0.507	0.755	0.757	1.387	1.259	1.153	1.051
	(0.967)	(0.939)	(0.947)	(0.932)	(1.021)	(1.026)	(1.309)	(1.286)	(1.312)	(1.276)
Primary School	0.239	0.192	0.290	0.240	0.150	0.126	0.349	0.355	0.218	0.201
	(0.427)	(0.394)	(0.454)	(0.427)	(0.357)	(0.331)	(0.477)	(0.478)	(0.413)	(0.401)
School	0.539	0.559	0.493	0.488	0.505	0.486	0.417	0.394	0.460	0.426
	(0.498)	(0.497)	(0.500)	(0.500)	(0.500)	(0.500)	(0.493)	(0.489)	(0.498)	(0.495)
University	0.222	0.249	0.217	0.273	0.346	0.388	0.234	0.252	0.322	0.373
	(0.415)	(0.433)	(0.412)	(0.445)	(0.476)	(0.487)	(0.423)	(0.434)	(0.467)	(0.483)
N	400,333	420,687	13,543	13,854	24,698	37,575	41,609	56,647	12,313	19,486

Note: Mean coefficients; standard deviation in parentheses.

Table B2. Descriptive statistics, women.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Native		Nordic		Europe		Middle East		Other non-Europe	
	Before	After	Before	After	Before	After	Before	After	Before	After
Panel A Individual characteristics of individuals included in the analysis at the firm start-up margin										
Age	44.99	44.60	50.21	50.96	44.27	43.74	40.53	41.63	39.41	40.30
	(11.86)	(11.97)	(10.13)	(10.41)	(11.44)	(11.75)	(10.46)	(10.90)	(10.30)	(10.44)
Married	0.473	0.450	0.482	0.469	0.573	0.539	0.683	0.659	0.510	0.513
	(0.499)	(0.497)	(0.500)	(0.499)	(0.495)	(0.498)	(0.465)	(0.474)	(0.500)	(0.500)
Children < age18	0.718	0.705	0.488	0.438	0.707	0.695	1.243	1.122	0.987	0.963
	(0.993)	(0.985)	(0.888)	(0.858)	(0.994)	(0.988)	(1.286)	(1.253)	(1.186)	(1.239)
Primary School	0.126	0.0936	0.224	0.174	0.196	0.158	0.359	0.320	0.290	0.291
	(0.332)	(0.291)	(0.417)	(0.379)	(0.397)	(0.365)	(0.480)	(0.467)	(0.454)	(0.454)
Upper Secondary School	0.502	0.483	0.459	0.445	0.414	0.382	0.350	0.331	0.377	0.331
	(0.500)	(0.500)	(0.498)	(0.497)	(0.492)	(0.486)	(0.477)	(0.471)	(0.485)	(0.471)
University	0.372	0.424	0.318	0.381	0.390	0.460	0.291	0.348	0.334	0.378
	(0.483)	(0.494)	(0.466)	(0.486)	(0.488)	(0.498)	(0.454)	(0.476)	(0.472)	(0.485)
N	8,907,309	10,493,761	416,356	404,209	533,102	777,156	281,136	501,698	402,050	739,347
Panel B Individual characteristics of individuals included in the analysis at the corporate form margin										
Age	48.42	47.96	51.83	52.56	46.97	46.12	41.05	43.08	42.32	43.60
	(10.68)	(10.85)	(8.781)	(8.912)	(9.959)	(10.51)	(9.132)	(9.572)	(9.399)	(9.234)
Married	0.584	0.542	0.588	0.567	0.637	0.604	0.745	0.738	0.608	0.564
	(0.493)	(0.498)	(0.492)	(0.495)	(0.481)	(0.489)	(0.436)	(0.440)	(0.488)	(0.496)
Children < age18	0.669	0.652	0.499	0.456	0.678	0.667	1.328	1.208	1.017	0.863
	(0.982)	(0.966)	(0.896)	(0.862)	(0.948)	(0.933)	(1.282)	(1.245)	(1.086)	(1.053)
Primary School	0.162	0.117	0.169	0.136	0.125	0.0950	0.304	0.290	0.299	0.306
	(0.368)	(0.322)	(0.375)	(0.343)	(0.330)	(0.293)	(0.460)	(0.454)	(0.458)	(0.461)
Upper Secondary School	0.545	0.544	0.490	0.455	0.452	0.434	0.493	0.485	0.374	0.335
	(0.498)	(0.498)	(0.500)	(0.498)	(0.498)	(0.496)	(0.500)	(0.500)	(0.484)	(0.472)
University	0.293	0.339	0.340	0.409	0.424	0.471	0.203	0.225	0.328	0.360
	(0.455)	(0.473)	(0.474)	(0.492)	(0.494)	(0.499)	(0.402)	(0.417)	(0.469)	(0.480)
N	244,734	275,407	11,021	11,447	15,553	26,451	9,938	14,127	8,737	18,663

Note: Mean coefficients; standard deviation in parentheses.