Immigrant Workers and Farm Performance – Evidence from Matched Employer-Employee Data

Nikolaj Malchow-Møller[†*], Jakob Roland Munch[‡*], Claus Aastrup Seidelin[†*], Jan Rose Skaksen[§*]

[*] *Centre for Economic and Business Research (CEBR), Copenhagen Business School*
[†] *Department of Business and Economics, University of Southern Denmark*
[‡] *Department of Economics, University of Copenhagen*
[§] *Department of Economics, Copenhagen Business School*

Contact person: Nikolaj Malchow-Møller, Department of Business and Economics, University of Southern Denmark, phone: +45 65502109, fax: 045 65503237, e-mail: nmm@sam.sdu.dk

Abstract: Many developed countries have recently experienced a significant inflow of immigrants in the agricultural sector. At the same time, the sector is still in a process of structural transformation resulting in fewer but bigger and presumably more efficient farms. In this paper, we exploit detailed matched employer-employee data for the entire population of Danish farms to analyze the micro-level relationship between these two developments. We find that farms that employ immigrants tend to be both larger and pay higher wages. Furthermore, farm survival and job creation are both positively affected by the use of (especially Eastern European) immigrants, and this does not happen at the expense of the already employed (native) workers.

Acknowledgements: This paper is part of a joint project between CEBR and the Rockwool Foundation Research Unit. Funding for this project from the Rockwool Foundation is gratefully acknowledged. The authors wish to thank Jan Holst Hansen, Jonas Helth Lønborg and Marianne Deleuran Grunnet for excellent research assistance.

1. Introduction

In many developed countries, the agricultural sector – or the rural sector more generally – has experienced an increasing number of immigrants in recent years. According to the National Agricultural Worker Survey, foreign-born newcomers, who are immigrants that have been in the country for less than a year, increased their contribution to the U.S. farm workforce from 10 percent in 1993-1994 to 16 percent in 2001-2002.[1] In Europe, countries like Italy, Spain, Portugal and Greece have also experienced a rapid increase in migrant employment in the agricultural sector in the last decades (Kasimis, 2005), and in Denmark, the share of immigrant workers in the agricultural sector increased from less than 2% in 1993 to more than 9% in 2006.

Furthermore, the agricultural sector is still in a process of structural transformation where many farms close while others grow larger and more productive. In the US, for example, the number of farms has decreased from around 6 million in the first half of the 20th century to around 2 million by the turn of the century. In the same period, average farm size more than doubled, while agriculture's share in total employment has fallen dramatically.[2] As we shall see, a similar development has taken place in Denmark.

It is generally believed that migrant labor has helped filling labor deficits and reduced labor costs in agriculture, see, *e.g.*, Kasimis (2005) and Huffman (2005), but the question is whether there is also a more direct micro-level relationship between the use of immigrants and the structural transformation of farms. In other words, does the employment of immigrants help a farm to survive and expand? Or is it only the farms that survive and grow that are able to hire immigrants? Or is there no relationship between these two developments at the farm level? The purpose of this paper is to take a first step towards answering these questions. This, however, requires comprehensive farm-level data about the

[1] The National Agricultural Workers Survey (NAWS), www.doleta.gov/agworker/naws.cfm.
[2] The United States Department of Agriculture, www.usda.gov.

composition of employment at the individual farm – data which are rarely available. Fortunately, we have access to a unique linked employer-employee dataset for the entire population of farm establishments and workers in the Danish agricultural sector in the period 1993-2006.

Theoretically, we can imagine all three situations above. First, immigrants could simply represent an aggregate supply shift, with immigrants taking up a larger share of the total labor supply in the agricultural sector but with no farm-level relationship between the employment of immigrants and farm performance.

Second, immigrants may constitute a cheap and relatively flexible source of labor that benefits the individual farm. It is well known from other studies that immigrants receive lower wages – both within agriculture and other sectors of the economy; see, *e.g.*, Card (2005). While part of the lower wage may reflect a lower productivity, part of it is likely to reflect more limited outside options for immigrant workers (*e.g.* limited employment probabilities in other sectors of the economy) making them a cheaper source of labor; see, *e.g.*, Malchow-Møller *et al.* (2011). This could in turn improve farm performance, as measured by, *e.g.*, survival, growth, and productivity.[3]

Third, it could also be the case that only certain types of farms are able or willing to hire immigrants, and that these are also the more successful farms. The existence of fixed and sunk costs of hiring immigrants (a change of working language, attitudes *etc.*), which may vary across farms, and/or the fact that immigrants cannot manage all functions at a farm may imply that it requires a farm of a certain type (or size) to employ immigrant labor, and these

[3] Related to this, Devadoss and Luckstead (2008) have argued that immigrants may also provide complementary input to capital and educated (native) labor. This could be in the form of, *e.g.*, knowledge about different production techniques and foreign markets.

farms may at the same time perform better than other farms. In this case, the causality runs from (unobserved) farm characteristics to the employment of immigrants.

The second and third possibilities are, of course, not mutually exclusive. It could well be that immigrants are only hired by certain types of farms and that they subsequently affect the performance of these farms. The purpose of the present paper is to provide some first evidence on the importance of these different possibilities.

Specifically, we ask the following questions in the paper: (i) Are farm establishments that employ immigrants different from other farms? (ii) What is the relationship between the employment of immigrants and farm performance, and does this reflect that farms were different ex-ante, or is it because the immigrants gave rise to a different development ex-post? And (iii) What are the consequences for the individual workers already employed at the farm when immigrants are hired?

We answer these questions in the following way. First, we compare key characteristics of farms that employ immigrants to farms that do not employ immigrants to establish whether any differences exist. To the best of our knowledge, this has not been done systematically before. Second, we estimate the relationship between the use of immigrants, on the one hand, and farm survival and job creation, on the other hand. We also use fixed-effects estimations to establish whether any differences were present ex-ante or only arose following the employment of the immigrants. Although time-varying farm-specific shocks might still affect both farm performance and the decision to hire immigrants – and hence prevent a strict causal interpretation of the fixed-effects findings – it allows us to take at least a first step towards disentangling the causal effects of the immigrants. Finally, we estimate a model of individual job separation risk to assess the consequences of employing immigrants for the workers already employed at the farm.

To preview our results, we find that farms with immigrant workers tend to be both larger and pay higher wages. Furthermore, farm performance, as measured by job creation and farm survival, is positively associated with the use of immigrants – especially immigrants from Eastern Europe, who in a Danish context are immigrants from low-income countries. While part of this correlation can be explained by unobserved farm characteristics, part of it also seems to reflect a positive effect of the immigrants. In other words, our results support both the second and the third possibility above: immigrants are hired by the more successful farms (perhaps because of fixed and sunk hiring costs), but they also improve the performance of the farms when hired. Finally, we do not find that the improved performance takes place at the expense of the already employed (native) workers.

In the literature, there are several studies of the more aggregate/general effects of immigration, in particular the effects on wages and employment of native workers. Most of these analyses focus on the wage or net employment consequences for a group of individuals (regions, industries or skill-groups) following an increase in the supply of immigrant workers. Examples of such analyses are Card (1990, 2001, 2005), Borjas *et al.* (1997), Pischke and Velling (1997), Borjas (2003, 2006), Angrist and Kugler (2003), Dustmann *et al.* (2005), Ottaviano and Peri (2005, 2011) and Aydemir and Borjas (2007). There is substantial variation in what the analyses find as being the consequences of immigration. In Longhi *et al.* (2005, 2006), the results from a large number of analyses are compared and the authors conclude that in general there is a small negative employment and/or wage effect for native wage earners due to immigration.

Within agricultural economics, there has been an increasing focus on the importance of immigrant workers, and Partridge *et al.* (2008) argue for potentially different effects of immigrants in this sector than in the rest of the economy. However, the number of studies focusing explicitly on the agricultural sector is much more limited, and existing studies of

immigrants in agriculture have typically relied on either aggregate data or relatively small samples of households, which do not allow them to address the above issues; see, *e.g.*, Taylor and Martin (1997, 2003) and Devadoss and Luckstead (2008).

Estimating a simultaneous equations model on data from Californian towns, Taylor and Martin (1997) find evidence of a circular relationship between immigration and farm employment. An increase in the number of foreign-born people increases farm employment; and an increase in farm employment also raises immigration. A similar finding is reported in Taylor and Martin (2003). See also Martin and Taylor (1998) and Taylor and Martin (2001) for summaries of these studies.

Based on a calibration exercise, Devadoss and Luckstead (2008) have more recently argued that an increase in the use of immigrant workers in California vegetable production actually has a very small negative effect on native employment in that sector. Related to this, Venturini (1999) finds some evidence of displacement as an increase in the number of illegal immigrants working in the Italian agricultural sector is found to reduce the number of natives employed in the sector.

The rest of the paper is structured as follows. In Section 2, we describe the data used in the paper and present some descriptive statistics. In Section 3, we analyze the relationship between the employment of immigrants and farm performance. In Section 4, we consider the consequences for the already employed workers of hiring immigrants. Section 5 concludes.

2. The Data

We use data from the Integrated Database for Labor Market Research (IDA) compiled by Statistics Denmark. IDA contains annual register data at the individual level regarding labor market status and performance (employment, wages, *etc.*) and personal background characteristics such as age, education, immigrant status and family characteristics. Wage and

employment information in IDA concerns primary employment in the last week of November each year. Furthermore, all wage workers are linked to an establishment in IDA, and both individuals and establishments are tracked over time. From IDA, we draw our "sample" containing all individuals in a given year with primary employment in the agricultural sector, defined as establishments with NACE codes in the interval [0, 150000]. We have data for the years 1980-2006, but in most analyses we restrict attention to the period 1993-2006 since the use of immigrants in agriculture prior to that period was limited.

The fact that individuals are linked to establishments allows us to aggregate individual data at the establishment level and to use this information about the establishment (*e.g.* the educational composition, the average experience and the average wage of the workers) both at the establishment level and at the individual level. The establishment level information also includes the age of the establishment and a detailed industry classification that allows us to distinguish between four sub-sectors: *Arable farming*, *Livestock and mixed enterprises*, *Horticulture*, and *Other types of farming*.

Immigrants are defined as persons born outside Denmark by non-Danish parents, *i.e.*, parents who do not have Danish citizenship or were born outside Denmark themselves. If no information about the parents is available, an individual born outside Denmark is also considered as an immigrant. Consequently, all individuals born in Denmark are considered to be native Danes, irrespective of the status of their parents, just as all individuals born abroad who have at least one Danish parent are considered as Danes. This definition also implies that immigrants include refugees and family reunified persons who have come to Denmark for non-job related reasons, as well as foreigners who have come to Denmark primarily to work. Note that the origin country of an immigrant is defined from the parents' countries of birth (or citizenship) whenever that information is available. That is, an immigrant born by Italian parents in Canada is considered Italian.

[Insert Figure 1 around here]

Traditionally, agriculture has been extremely important in Denmark, both in terms of GDP, employment and exports. Just after WW2, the agricultural sector was responsible for approximately 30% of the employment in Denmark. Figure 1 shows the development since 1980 in the total employment as well as the number of wage workers in the Danish agricultural sector. The difference between the two curves is the number of self-employed. This includes both self-employed farmers working alone and self-employed with employees, *i.e.*, those running a personally-owned establishment. From the figure, we can see that while the number of wage workers has been relatively constant at a level around 30,000-40,000, the number of self-employed has been rapidly declining – from around 140,000 in 1980 to around 40,000 in 2006. This mirrors the trend in agriculture towards fewer, but larger, establishments as shown in Figure 2.

[Insert Figure 2 around here]

Even though the definition of establishments excludes farms without employees (*i.e.*, farms run by a single self-employed individual), figure 2 shows a sharp decline in the number of establishments, from almost 20,000 in 1980 to close to 11,000 in 2006. This also reveals that the majority of the 40,000 self-employed in 2006 do not have employees. Finally, figure 2 also shows a significant increase in the average size of an establishment from less than 2.5 employees (excluding the owner) in 1980 to 3.5 employees in 2006.

Figure 3 shows that there has also been a pronounced increase in the use of immigrant workers in the agricultural sector, especially since 1993. Until the mid1990s, the agricultural sector relied significantly less on immigrant workers than the economy in general. After that, the use of immigrants in agriculture increased far more rapidly than in the rest of the economy. In 2006, immigrants thus made up 9% of the wage workers in agriculture, but only around 6% of the wage workers in the economy as a whole.

[Insert Figure 3 around here]

In analyzing the role of immigrants, we shall in some of the analyses below distinguish between three groups of origin countries for the immigrants: (i) Immigrants from Western Europe, the United States, Canada, Australia, New Zealand and Japan; (ii) Immigrants from Eastern Europe, which currently includes Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Moldova, Montenegro, Poland, Republic of Macedonia, Romania, Russia, Serbia, Slovakia and Ukraine; and (iii) Immigrants from other (mainly less developed) countries, including Turkey and Pakistan as well as Asian and African countries.

Whereas immigrants from the third group have increased in relative importance over the last ten years when considering the entire economy (due to an increased number of refugees and family-reunified persons from these countries), they constitute a smaller and decreasing share within agriculture as shown in Figure 4. Instead, the agricultural sector has seen a marked relative increase in the use of Eastern European immigrants from about 10% in 1995 to about 60% of the immigrants in 2006. Immigrants from Western Europe etc. have diminished their share among wage workers in agriculture and in the economy more generally, despite the fact that these immigrants have had more easy access to the Danish labor market than the other groups of immigrants, and the fact that the language barrier is likely to be smaller for this group than for the other two groups.

[Insert Figure 4 around here]

This development suggests that the employment of immigrants within agriculture may have played a very different role than in the rest of the economy, as also suggested by Partridge *et al.* (2008). The huge and increased concentration of Eastern European immigrants in the agricultural sector (even before the enlargement of the European Union in 2004 and 2007 which granted free access to the Danish labor market for workers from 10

Eastern European countries[4]) combined with the fact that wages in Eastern Europe are considerably lower than in Western Europe also indicate that these immigrants may have played a different role than other immigrants in the agricultural sector.

In order to take a first look at the farm-level evidence regarding the relationship between the use of immigrants and farm characteristics, Table 1 compares average key values of farms that employ immigrants to average key values of farms that only employ native workers for the years 1993, 2000 and 2006. As can be seen, establishments that use immigrant labor are significantly larger although this difference has become smaller over time. Furthermore, throughout the period immigrants have been more prevalent within *Horticulture*.

In 1993, the shares of employees with vocational and higher education, respectively, were higher on farms that used immigrants than on other farms. However, this had changed by 2006. Conversely, while there were no significant differences in average tenure and average experience between farms with and without immigrants in 1993, in 2006 farms employing immigrants exhibited considerably less average experience and average tenure among its employees.

Finally, the average wages of native workers have throughout the period been considerably higher (5-10%) on farms that employ immigrants, whereas wages to immigrants are significantly lower – a difference that has increased over time. In the absence of data on farm sales and value added, we may interpret the higher native wages on the farms that employ immigrants as an indication of higher productivity on these farms.[5]

[4] Before the enlargement of the European Union in 2004, it was possible for Danish firms to recruit Eastern Europeans in sectors that experienced bottlenecks. Local occupation councils, in which both employers and employees were represented, decided whether the particular area was a bottleneck.

[5] Unfortunately, data on sales and value added are only available for a rather small (and not representative) number of farms (the largest ones).

[Insert Table 1 around here]

In sum, although farms with immigrant workers tended to employ less experienced and less educated workers and exhibited higher job turnover (lower average tenure) than farms without immigrants in 2006, they were both larger and paid higher wages to their native workers. In the following section, we analyze this relationship between the use of immigrant workers and farm performance in more detail.

Note that the findings in Table 1 are similar to those in the literature on international firms, which finds that exporting and/or multinational firms are both larger and pay higher wages; see, *e.g.*, Bernard *et al.* (2007). Here we find that another dimension of internationalization, namely the use of immigrants, is also associated with larger scale and higher wages. From this, however, we cannot tell, whether this is due to a causal effect of the immigrants. We return to this below.

3. Immigrant Workers and Farm Performance

In this section, we consider the relationship between the employment of immigrant workers and farm performance as measured by establishment survival and job creation.

We start by analyzing the importance of immigrants for establishment survival using discrete survival analysis; see, *e.g.*, Meyer (1990) and Wooldridge (2002). Note that establishment closure need not imply farm closure, as the farm may, in principle, continue without wage workers employed. Our data do not allow us to control for this possibility. Still, establishment survival seems to be a good indicator of farm performance.

Table 2 contains the results from an estimation of a linear probability model where the dependent variable is establishment survival from year t to year $t + 1$. A linear probability model is preferred to a probit (or logit) model as it allows us to include establishment fixed

effects in columns 3 and 4. However, for columns 1 and 2, results are qualitatively similar with a probit specification.

The explanatory variables are the share of immigrants in year *t*, both in total (columns 1 and 3) and separately for the three origin-country groups (columns 2 and 4). The other explanatory variables are the size of the farm in year *t* as measured by the number of employees (four dummy variables), the share of workers with vocational and higher education in year *t*, respectively, measures of average labor market experience and tenure of the employees in year *t*, and three dummies for a more detailed industry classification (with *Arable farming* being the omitted category). Similar to, *e.g.*, Bernard *et al.* (2006), we control for the age of the establishment to capture duration dependence. As suggested by Meyer (1990), we use 12 age dummies instead of a linear specification to obtain a more flexible representation of the duration dependence. Finally, we also include year and regional dummies in the regressions.

[Insert Table 2 around here]

Column 1 shows a positive effect of the immigrant share on establishment survival. When we distinguish between the three groups of origin countries as in column 2, we find that the Eastern European immigrants are responsible for the positive effect discovered in column 1. Specifically, a 10 percentage points increase in the share of immigrants from Eastern Europe in total employment is associated with a 0.1 percentage point higher chance of survival. Immigrants from less developed countries, on the other hand, are associated with a negative effect on survival.

As expected both farm size and age are strongly associated with a higher survival probability, but to save space, the coefficients for the age dummies are not reported in the table. Furthermore, the share of employees with vocational (but not higher) education, average tenure and average experience are also associated with a higher chance of

establishment survival. We also note that the probability of farm survival is higher within livestock production.

The positive relationship between the use of immigrants from Eastern Europe and farm survival could reflect either a positive effect of the immigrants on farm performance or the fact that immigrants are only employed by certain types of farms (those that also survive). To distinguish between the two possibilities, we re-estimated the models from columns 1 and 2 with the inclusion of farm fixed effects. The results are reported in columns 3 and 4 of Table 2.

The inclusion of farm fixed effects eliminates the influences of any observable as well as unobservable but time-invariant farm characteristics that may explain both the higher survival probability and the use of immigrants. In other words, the coefficient estimated in columns 3 and 4 are identified from variation over time within a farm. Still, of course, there might be farm-specific, time-varying shocks affecting both establishment survival and the employment of immigrants, which may prevent a strict causal interpretation of the findings.

Although the effects of the overall immigrant share (column 3) and the share of Eastern European immigrants (column 4) are still found to be positive and quantitatively very similar to the OLS results – only the latter remains significant at a 10% (almost 5%) level. Hence, the significance of the effects is somewhat reduced (although not eliminated) when we control for unobservable time-invariant establishment characteristics. This points to a potential effect of especially Eastern European immigrants on farm performance. However, the fact that the inclusion of farm fixed effects reduces the estimated effect slightly also indicates that it is the inherently more successful farms that tend to hire immigrants.

To investigate these issues in more detail, we turn to job creation, which is a more nuanced measure of farm performance than farm survival. Specifically, we analyze whether job creation has been more pronounced at workplaces that use immigrant labor. This would

be a strong indication that the use of foreign labor has helped Danish farmers to stay competitive.

The measures of job creation, C_{it+k}, and job destruction, D_{it+k}, at establishment (farm) *i* between years t and $t+k$ are defined as in Davis and Haltiwanger (1992) and Davis *et al.* (1996):

$$C_{it+k} = \max(X_{it+k} - X_{it}, 0) \quad and \quad D_{it+k} = \max(X_{it} - X_{it+k}, 0)$$

where X_{it} is the employment at establishment *i* in year *t* measured as employment in the last week of November. The variable C_{it+k} is thus equal to the increase in the number of employees between t and $t+k$ if an increase has taken place. If the number of employees has decreased between t and $t+k$, C_{it+k} equals zero. Similarly, D_{it+k} is equal to the number of jobs destroyed if employment has decreased, and equal to zero if employment has increased. Note that establishments which are founded between t and $t+k$ have $X_{it} = 0$ by construction, and establishments that exit between t and $t+k$ have $X_{it+k} = 0$ by construction.

Net job creation is defined as the difference between job creation and job destruction:

$$\Delta X_{it+k} = C_{it+k} - D_{it+k} = X_{it+k} - X_{it}$$

Furthermore, job creation, job destruction and net job creation *rates* are defined as follows:

$$c_{it+k} = \frac{C_{it+k}}{0{,}5(X_{it+k} + X_{it})}, \quad d_{it+k} = \frac{D_{it}}{0{,}5(X_{it+k} + X_{it})} \quad and \quad \Delta x_{it+k} = \frac{X_{it+k} - X_{it}}{0{,}5(X_{it+k} + X_{it})}$$

Note that c_{it+k} can take values between 0 and 2, while d_{it+k} can take values between –2 and 0. Hence, the range of Δx_{it+k} is between –2 and 2.

Table 3 shows the aggregate amount of annual job creation (C) and annual job destruction (D) in the period 1994-2006 for establishments with and without immigrants employed, respectively. The average number of jobs created each year in the agricultural

sector has been between 7,000 and 8,000 while a similar number of jobs have been destroyed each year. This fits well with the relatively constant development in the total number of wage workers portrayed in Figure 1. From column (7) in Table 3, we can see that more than one third of all annual job creation takes place at new establishments. Furthermore, we can see that job creation (but also job destruction) relative to the number of employees is higher at farms that do not employ immigrants than at farms with immigrants employed.

[Insert Table 3 around here]

In order to further analyze this relationship between the use of immigrant workers and job creation, we regress the net job-creation rate at the establishment level, Δx_{it+k}, on various establishment characteristics at time t, including the share of immigrants in the establishment employment at time t.

[Insert Table 4 around here]

The first two columns in Table 4 regress the one-year-ahead job-creation rate, Δx_{it+1}, and the three-years-ahead job-creation rate, Δx_{it+3}, respectively, on the share of immigrants in farm employment at time *t*, the farm size at time *t* (four dummy variables), the age of the farm (12 dummy variables), the shares of employees with a vocational and a further education, respectively, at time *t*, the average tenure and experience on the farm at time *t*, as well as dummies for industry, county and year.

Both regressions reveal a positive relationship between job creation and the immigrant share. Quantitatively, an increase in the share of immigrants from, *e.g.*, 0 to 0.5 is associated with an increase of 0.02 in the net job-creation rate – both within a 1- and a 3-year horizon. Remember that the net job-creation rates take on values between -2 and 2. For comparison, the average values in the samples used are slightly negative: -0.36 and -0.64 for the one-year-ahead and the three-year-ahead job-creation rates, respectively (with standard deviations of 0.86 and 1.04).

Farm size, the share of employees with vocational education, average tenure and experience are other farm characteristics that are positively associated with job creation, whereas the share of employees with a higher education is negatively associated with job creation. We also note that job creation is less pronounced within arable farming.

Columns 3 and 4 split up the overall immigrant share on the origin countries of the immigrants. The results show that the positive effect discovered in columns 1 and 2 stem from the Eastern European immigrants, while the share of immigrants from less developed countries is actually significantly negatively associated with job creation three years ahead at the establishment level.

As in the case of farm survival, the positive relationship between the use of (Eastern European) immigrants and subsequent job creation may reflect either a positive effect of immigrants on farm performance or the fact that immigrants are to larger extent employed by certain types of farms – those that also tend to expand. Hence, in columns 5-8, we include farm fixed effects to eliminate the effects of unobservable time-invariant farm characteristics.

From columns 5-6, we observe that the coefficient estimate for the one-year-ahead job-creation rate becomes smaller and insignificant while the effect on the three-years-ahead job creation is almost unchanged and remains significant at the 10% level. When we distinguish between the different groups of origin countries (columns 7-8), we again find a significant positive effect of the Eastern European immigrants, although the effect is quantitatively smaller than in the OLS regression (columns 3-4).

Together this confirms that the positive correlation between immigrant employment and job creation at the farm level is not just due to unobserved farm characteristics but may (at least partly) reflect a positive effect of the Eastern European immigrants on farm performance.

An interesting question is of course whether the job creation that takes place results in native or immigrant jobs. Hence, Table 5 shows the results of regressing the native job creation rate (defined as the change in native employment between t and $t + k$ relative to the average native employment in the two years) on the same set of variables as in Table 4.

[Insert Table 5 around here]

As can be seen, the initial immigrant share is in this case associated with a much larger and more significant effect. Future native job creation is considerably higher on farms that currently employ immigrants. As total job creation is only slightly higher on farms with immigrants (Table 4), this indicates that immigrant workers are to a large degree replaced (or perhaps even displaced) by native workers in the following years.[6]

4. Immigrant Workers and Job Separations

So far, we have focused on the relationship between the employment of immigrants and farm performance as measured by establishment survival and job creation. Another relevant issue is the consequences for the individual workers already employed at the farm when immigrants are hired. Although job creation and probability of survival increase with the employment of immigrants, this could well be at the expense of the already employed workers if immigrants are used to substitute for the incumbent (and perhaps more expensive) employees.

In order to analyze this, we estimate a model for the probability of an individual worker leaving a farm. As the dependent variable we use a dummy which takes the value 1 if

[6] Note that the results in Table 5 are also fully in accordance with a job market where natives and immigrants are perfect substitutes and randomly allocated across farms at the beginning of each period, or a job market where not all matches are dissolved and re-matched each period job, but only a certain share of them. In the latter case, the three-year effect on native job creation should be larger than the one-year effect, which is also what we observe in Table 5.

the individual leaves the farm (establishment) between t and $t+1$, and the value 0 otherwise. This variable is regressed on a vector of individual and farm characteristics at time t. Again, we use a linear probability model, as this allows us to include farm fixed effects. The individual characteristics are a dummy for being *Immigrant*, two dummies for the educational level (*Vocational education* and *Higher education*) where the reference category is a high-school degree or less, *Experience* and *Tenure* in years, a dummy for being *Newly employed*, and finally an interaction term between the *Immigrant* dummy and *Tenure* to capture potentially different effects of tenure on job security for immigrants and natives. The farm characteristics include three dummies for the different sub-sectors, four dummies for firm size (not reported), the share of employees with vocational education, the share of immigrants in farm employment as well as measures of the inflows of immigrants and natives between $t-1$ and t (see below). Finally, year and regional dummies are included in all regressions.

[Insert Table 6 around here]

From column 1 we observe that the separation probability is lower for individuals with a vocational education, high experience and high tenure. In fact, tenure has a non-linear effect: while more tenure in general lowers the separation risk, the separation probability is particularly high in the first year of employment. Finally, although immigrants have a higher separation probability, a higher tenure reduces the separation probability more for immigrants than for native workers.

Turning to the farm characteristics, we observe that separation probabilities are higher within arable and livestock production, and significantly lower on larger farms. Finally, while a higher share of workers with vocational education serves to decrease the separation probability, it increases with the share of immigrants employed. Quantitatively, the separation probability is approximately 1 percentage point higher on farms where half of the

employed are immigrants compared to farms without immigrants. This should be compared with an average separation probability in the sample of more than 40%.

In column 2, we include a measure of the inflow of labor last period (defined as the change in establishment employment between $t - 1$ and t relative to establishment employment in period $t - 1$) to analyze how this affects the separation probability the following period. In column 3, we furthermore distinguish between the inflow of native workers and the inflow of immigrant workers. We find that an inflow of labor in general increases the separation probability the following period (column 2). This effect is, however, only significant for an inflow of native workers (column 3). Hence, there is no evidence that a recent inflow of immigrant labor raises the separation probability for the already employed workers.

In column 4, we interact the immigrant share and the inflow variables from column 3 with the immigrant dummy. We find that while the immigrant share is associated with a higher separation risk for natives, it is especially the immigrants that are negatively affected by an inflow of native workers last period.

Hence, the conclusion from the first four columns seems to be that a higher immigrant share is associated with a higher job-separation probability, in particular for natives, but that an inflow of immigrants last period in itself does not increase the job separation risk for the incumbent workers. This conclusion is somewhat reversed with the inclusion of farm fixed effects in column 5. Here, the effect of a higher immigrant share – which is now identified from within-farm variation over time – is to reduce the job-separation probability, in particular for natives. This indicates that the higher separation probability on

farms with many immigrants found in columns 1-4 is not a consequence of the immigrants *per se* but is likely to reflect underlying farm characteristics.[7]

Note that the short-run effect might be different, as an inflow of immigrants last period in itself is found to have a small positive effect on the job-separation probability for natives in column 5, as illustrated by the positive coefficient to *Inflow last period (immigrants)*. However, as such an inflow typically also increases the share of immigrants in employment in year *t*, the net effect is likely to be negative – even in the short run.

In sum, we do not find evidence that immigrants tend to increase the job separation risk for the incumbent workers.

6. Conclusion

Many developed countries have experienced a marked increase in the use of immigrant workers in the agricultural sector. In Denmark, the share of immigrants has risen from 2% in 1993 to 9% in 2006 – an increase which is largely due to an influx of Eastern European immigrants. At the same time, the agricultural sectors of developed countries have continued the structural transformation resulting in fewer but bigger and more efficient farms.

In this paper, we have exploited very detailed matched employer-employee data to analyze the farm-level relationship between these two developments. Besides being larger and paying higher wages, we found that there is, in fact, more job creation at and higher survival probabilities of farms employing immigrants – also when controlling for unobserved farm characteristics. This supports the theoretical idea that immigrants may improve farm performance – perhaps because they constitute a cheap and/or flexible source of labor. As we

[7] Note that while the effects of the individual characteristics in column 5 are very similar to those found in columns 1-4, the effect of farm size is also reversed in column 5, reflecting that farms that increase (decrease) in size also increase (decrease) the job-separation probability of their employees.

have stressed repeatedly, this causal interpretation may be disturbed by unobserved, non-permanent shocks to farms affecting both performance and the decision to hire immigrants.

It turns out that mainly immigrants from Eastern Europe have a positive effect on the Danish farms. As opposed to other immigrants, the majority of these immigrants have come to Denmark (and other countries in Western Europe) in recent years from the low-wage countries in Eastern Europe in order to find employment. This also supports the idea that these immigrants may constitute a cheap and flexible source of labor.

However, there is also some evidence of a positive selection in the sense that the inherently more successful farms are more likely to employ immigrants. This is revealed by the fact that the relationship between the use of immigrants and job creation/farm survival is weakened somewhat by the inclusion of farm fixed effects. This could be because the more prospering farms can make better use of the immigrants or because they face lower costs of hiring immigrants.

Furthermore, we find that native job creation is considerably higher on farms that employ immigrants, which indicates that the immigrant workers are to a large degree replaced by native workers in the following years. Finally, we do not find any evidence that the improved farm performance takes place at the expense of the already employed workers. Although, OLS regressions show that the job separation probability of incumbent workers is higher on farms that employ many immigrants, this result is reversed when controlling for unobserved farm characteristics.

The findings of the present paper open up a number of relevant research questions to be addressed in future research: Do the results extend to other countries? Do immigrants also improve other aspects of farm performance such as sales and profits? And why is it exactly that immigrants improve farm performance? Is it because they allow the farms to save on labor costs or because the immigrants bring in complementary skills? And what is it that

causes only some farms to employ immigrant workers if these have a positive effect on performance? Is it due to farm-specific differences in production methods or hiring costs, or is it also affected by, *e.g.*, differences in the local supply of immigrants?

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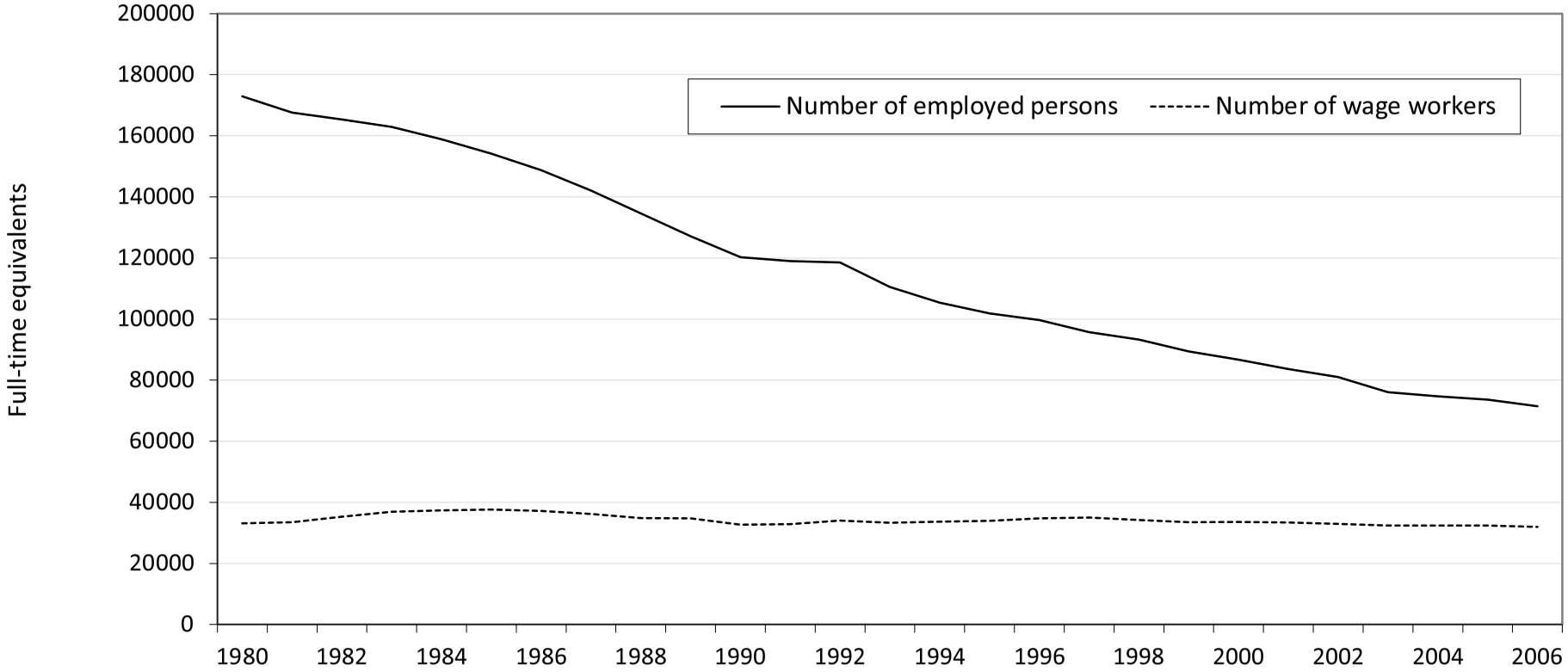
Figure 1: Total employment and wage workers in the agricultural sector, 1980-2006



Note: The number of wage workers covers all persons (in full time equivalents) with primary occupations as wage workers in the agricultural sector. The total number

Figure 2: Number and average size of agricultural establishments, 1980-2006

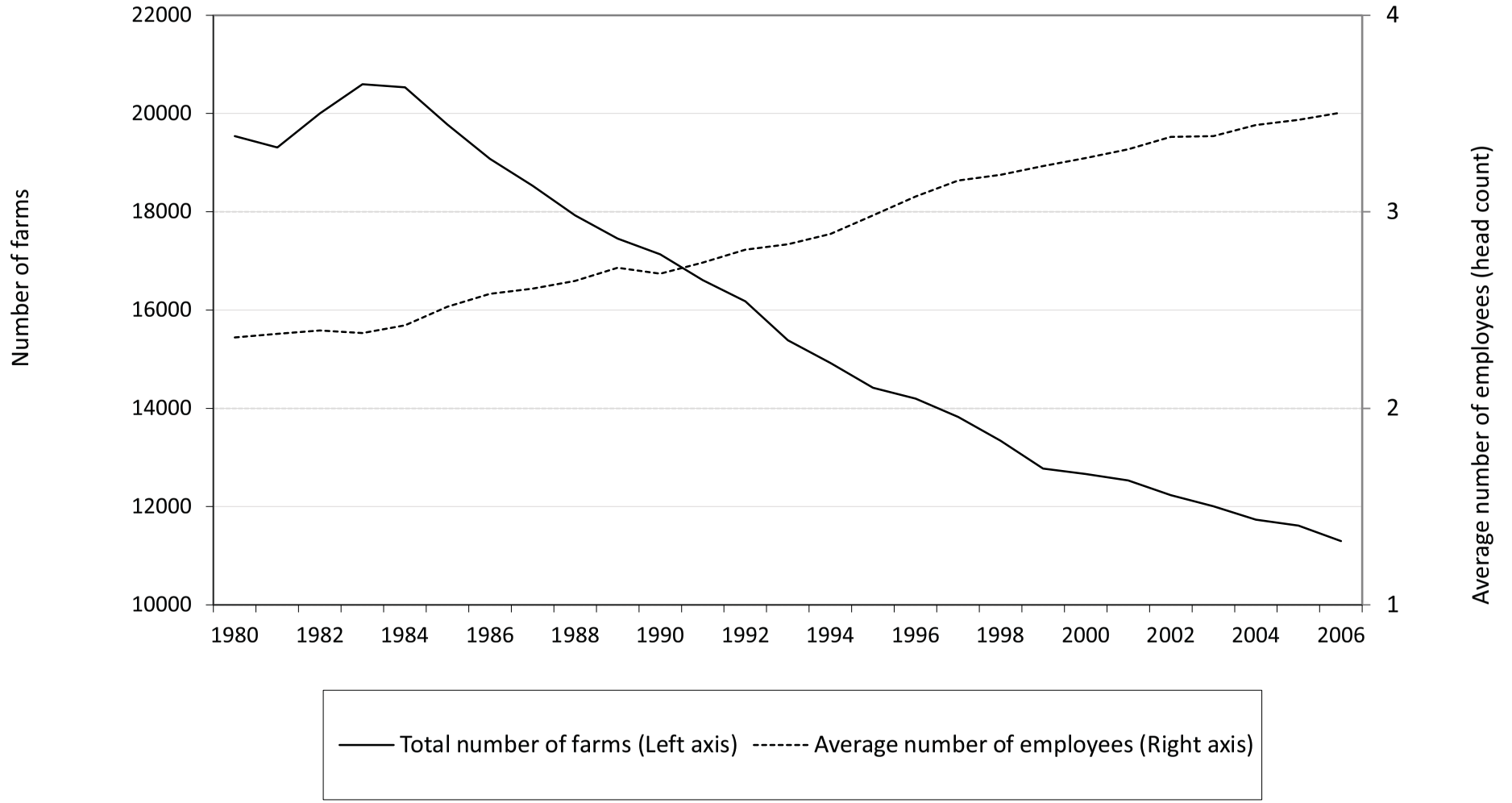
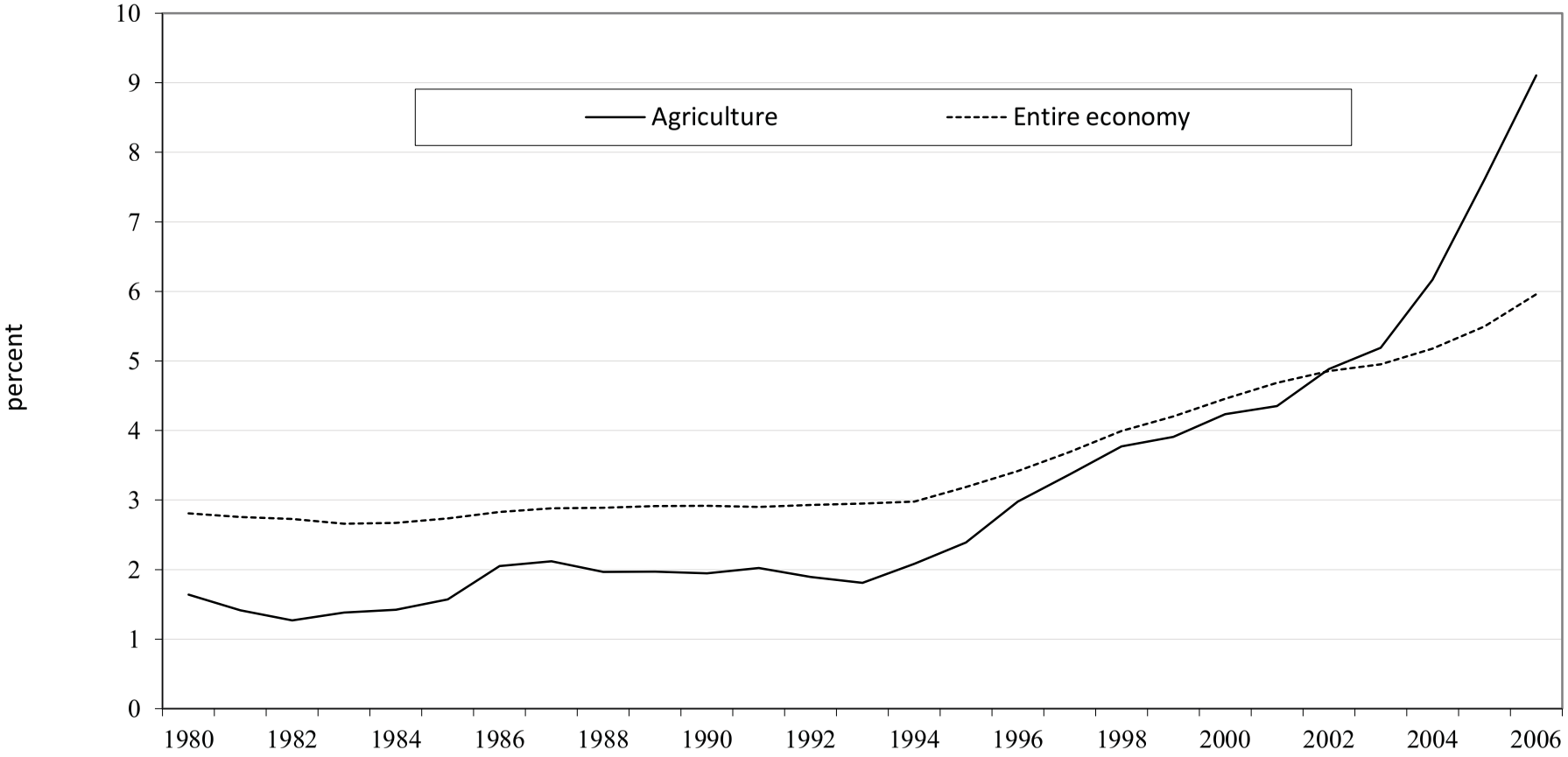


Figure 3: The share of immigrants among wage workers, 1980-2006



Note: The immigrant shares are calculated from the number of wage workers (in full-time equivalents) in agriculture and the entire economy, respectively.

Figure 4: Distribution of immigrant wage workers according to countries of origin, 1995, 2000 and 2006

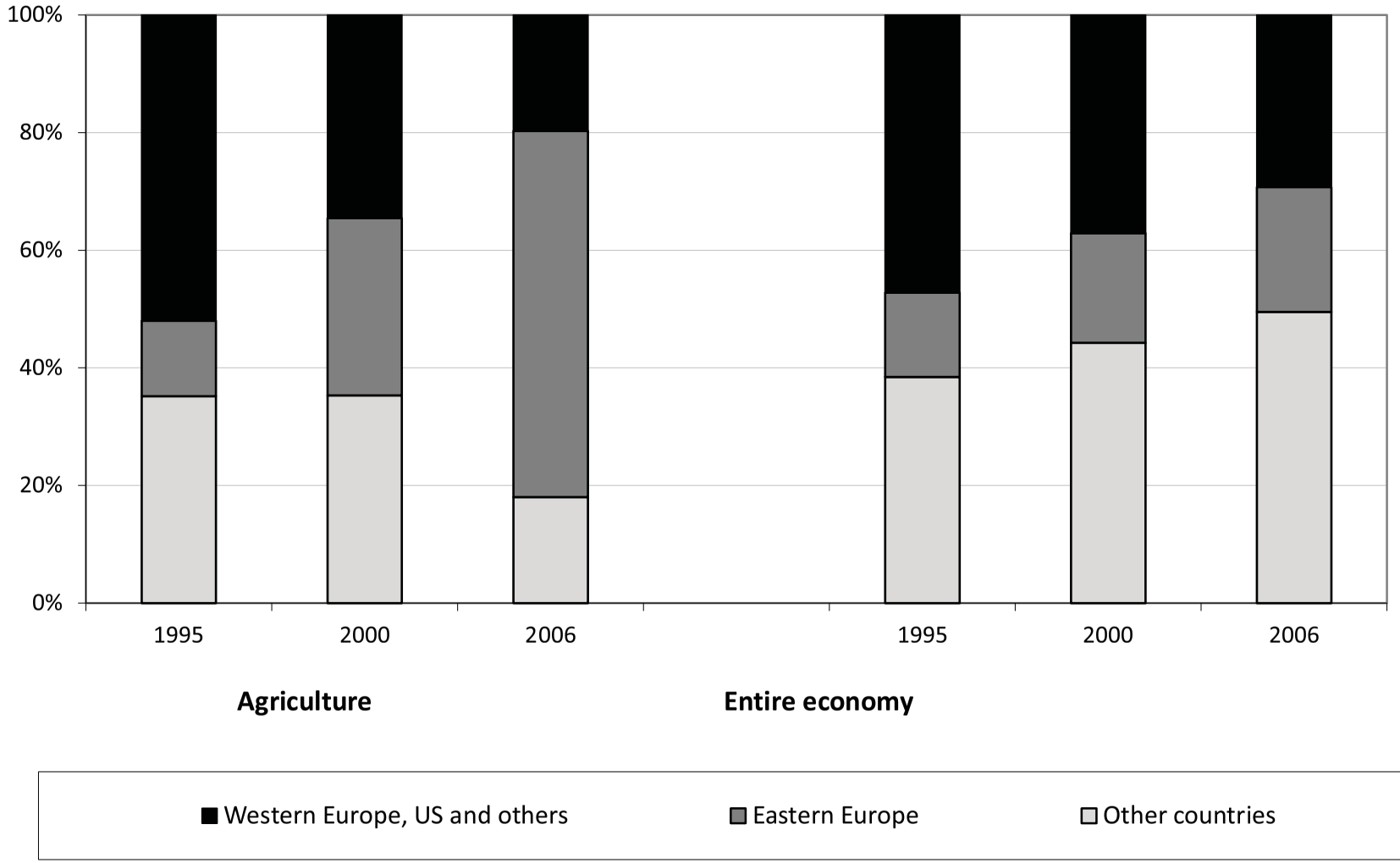


Table 1: Summary statistics of farm characteristics, 1993, 2000 and 2006

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Farms without immigrants						**Farms with immigrants**					
	1993		2000		2006		1993		2000		2006	
	# Obs	Mean	# Obs	Mean	# Obs	Mean	# Obs	Mean	# Obs	Mean	# Obs	Mean
Number of employees	14,823	2.4815	11,338	2.6425	9,038	2.7288	561	12.1450	1,326	8.6621	2,258	6.6076
Arable farming	14,823	0.1763	11,338	0.1880	9,038	0.2652	561	0.1390	1,326	0.1056	2,258	0.1594
Livestock and mixed enterprises	14,823	0.6556	11,338	0.6123	9,038	0.5296	561	0.3119	1,326	0.2044	2,258	0.1262
Horticulture	14,823	0.0732	11,338	0.0646	9,038	0.0527	561	0.4153	1,326	0.5845	2,258	0.6346
Other types of farming	14,823	0.0949	11,338	0.1351	9,038	0.1526	561	0.1336	1,326	0.1056	2,258	0.0797
Share (of workers) with vocational education	14,823	0.2445	11,338	0.3493	9,038	0.4010	561	0.3696	1,326	0.2946	2,258	0.2822
Share (of workers) with higher education	14,823	0.0101	11,338	0.0145	9,038	0.0247	561	0.0419	1,326	0.0295	2,258	0.0273
Average experience	14,823	6.5541	11,338	8.3869	9,038	10.2903	561	6.6010	1,326	5.3810	2,258	5.5757
Average tenure	14,823	2.1196	11,338	2.4407	9,038	2.9452	561	2.1083	1,326	1.6226	2,258	1.7096
Average hourly wage (all persons)	9,979	102.39	8,643	133.01	7,034	160.36	466	110.33	956	135.15	1,753	158.95
Average hourly wage (Danes)	9,979	102.39	8,643	133.01	7,034	160.36	390	113.43	821	139.99	1,414	168.10
Average hourly wage (immigrants)	0	0	0	0	0	0	339	107.91	591	128.86	1,108	148.09

Note: Summary statistics are computed as simple averages across all farms in the data set.

Table 2: Immigrant Workers and Establishment Survival

	(1)	(2)	(3)	(4)
Dependent variable = 1 if an establishment survives between year *t* and *t+1*				
Total share of immigrants	0.0119		0.0094	
	(2.02)**		(1.05)	
Share of immigrants (country group 1)		0.0058		-0.0074
		(0.57)		(-0.46)
Share of immigrants (country group 2)		0.0260		0.0209
		(3.42)***		(1.89)*
Share of immigrants (country group 3)		-0.0287		-0.0060
		(-1.68)		(-0.25)
Livestock and mixed enterprises	0.0301	0.03	0.0279	0.0279
	(10.77)***	(10.74)***	(3.36)***	(3.35)***
Horticulture	-0.0126	-0.0117	0.0136	0.0134
	(-3.15)***	(-2.92)***	(0.58)	(0.57)
Other types of farming	-0.0124	-0.0123	0.0033	0.0032
	(-3.35)***	(-3.32)***	(0.27)	(0.26)
2 employees	0.1621	0.1620	0.0826	0.0826
	(67.25)***	(67.21)***	(26.41)***	(26.40)***
3 employees	0.2017	0.2016	0.1125	0.1124
	(75.60)***	(75.57)***	(29.51)***	(29.51)***
4 employees	0.2137	0.2135	0.1332	0.1331
	(70.77)***	(70.70)***	(29.19)***	(29.19)***
4+ employees	0.2205	0.2206	0.1590	0.1590
	(85.11)***	(85.05)***	(31.07)***	(31.06)***
Share with vocational education	0.0419	0.0421	-0.0052	-0.0048
	(14.98)***	(15.00)***	(-1.21)	(-1.12)
Share with higher education	-0.0638	-0.0633	-0.0231	-0.0221
	(-5.68)***	(-5.63)***	(-1.20)	(-1.15)
Average tenure (in years)	0.0032	0.0032	-0.0081	-0.0081
	(9.03)***	(9.05)***	(-11.53)***	(-11.50)***
Average experience (in years)	0.0037	0.0037	0.0036	0.0036
	(20.51)***	(20.53)***	(11.09)***	(11.11)***
Constant	0.6917	0.6914	0.8797	0.8793
	(99.02)***	(98.92)***	(17.81)***	(17.76)***
Establishment-age dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes
Farm fixed effects	No	No	Yes	Yes
Observations	171,655	171,655	171,655	171,655
R-squared	0.1156	0.1157	0.4845	0.4845

Note: t-values are presented in parentheses. ***, ** and * indicate significance at the 1, 5 and 10% level, respectively. Standard errors are clustered at the establishment level to control for autocorrelation and heteroscedasticity.

Table 3: Aggregate job flows in agriculture, 1994-2006

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Farms without immigrants			**Farms with immigrants**			**New farms**	**All farms**		
Year	# Employees	Job creation	Job destruction	# Employees	Job creation	Job destruction	Job creation	# Employees	Job creation	Job destruction
1994	36,783	4,410	8,392	6,816	538	1,059	3,998	43,599	8,946	9,451
1995	35,840	4,267	7,425	7,254	551	953	3,465	43,094	8,283	8,378
1996	34,437	4,342	7,061	8,562	656	922	3,682	42,999	8,680	7,983
1997	33,974	4,264	7,109	9,722	849	1,364	3,332	43,696	8,445	8,473
1998	33,067	3,628	6,924	10,601	740	1,544	2,955	43,668	7,323	8,468
1999	31,616	3,612	7,026	10,907	928	1,902	3,155	42,523	7,695	8,928
2000	30,304	3,791	6,289	10,986	813	1,632	3,474	41,290	8,078	7,921
2001	29,961	3,723	5,956	11,486	1,032	1,914	3,245	41,447	8,000	7,870
2002	29,667	3,738	6,005	11,910	1,148	2,160	3,062	41,577	7,948	8,165
2003	29,028	3,588	5,831	12,332	1,079	2,197	2,655	41,360	7,322	8,028
2004	28,322	3,777	5,616	12,332	1,223	2,401	2,743	40,654	7,743	8,017
2005	27,477	3,928	5,499	12,903	1,184	2,445	2,733	40,380	7,845	7,944
2006	26,493	3,713	5,804	13,788	1,239	2,552	2,706	40,281	7,658	8,356

Note: Job creation is measured as the increase in the number of employees between time t and $t+1$ if an increase has taken place. If the number of employees has decreased, job creation is set to zero. Similarly, job destruction is measured as the number of jobs destroyed between time t and $t+1$ if employment has decreased, and is set to zero if employment has increased.

Table 4: Immigrant Workers and Job Creation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	JC rate	JC rate	JC rate	JC rate	JC rate	JC rate	JC rate	JC rate
Dependent variable:	(1 year ahead)	(3 years ahead)	(1 year ahead)	(3 years ahead)	(1 year ahead)	(3 years ahead)	(1 year ahead)	(3 years ahead)
Total share of immigrants	0.0431	0.0445			0.0235	0.0471		
	(3.25)***	(1.99)**			(1.11)	(1.67)*		
Share of immigrants (country group 1)			0.0068	0.0147			-0.0067	0.0317
			(0.30)	(0.42)			(-0.18)	(0.68)
Share of immigrants (country group 2)			0.0888	0.1191			0.0471	0.0734
			(5.09)***	(3.77)***			(1.77)*	(2.00)**
Share of immigrants (country group 3)			-0.0417	-0.1304			-0.0175	-0.0250
			(-1.07)	(-2.22)**			(-0.30)	(-0.034)
Livestock and mixed enterprises	0.0644	0.0569	0.0643	0.0566	0.0678	0.0649	0.0677	0.0647
	(10.49)***	(5.17)***	(10.47)***	(5.14)***	(3.38)***	(1.97)**	(3.37)***	(1.97)**
Horticulture	0.0355	0.0173	0.0375	0.0208	0.0273	-0.0427	0.0268	-0.0432
	(3.82)***	(0.99)	(4.03)***	(1.18)	(0.45)	(-0.42)	(0.44)	(-0.42)
Other types of farming	0.0484	0.0384	0.0489	0.0387	0.0070	-0.0536	0.0069	-0.0537
	(5.84)***	(2.48)**	(5.89)***	(2.50)**	(0.23)	(-1.05)	(0.22)	(-1.05)
2 employees	0.0969	0.1606	0.0966	0.1603	-0.3171	-0.4037	-0.3172	-0.4036
	(16.82)***	(19.00)***	(16.76)***	(18.97)***	(-43.26)***	(-47.13)***	(-43.27)***	(-47.12)***
3 employees	0.1310	0.2258	0.1305	0.2254	-0.4922	-0.6595	-0.4922	-0.6595
	(19.35)***	(20.73)***	(19.28)***	(20.70)***	(-50.88)***	(-56.59)***	(-50.89)***	(-56.59)***
4 employees	0.1627	0.2722	0.1621	0.2719	-0.5813	-0.8094	-0.5814	-0.8094
	(20.78)***	(20.82)***	(20.70)***	(20.79)***	(-48.08)***	(-54.90)***	(-48.09)***	(-54.89)***
4+ employees	0.1899	0.3246	0.1898	0.3252	-0.7060	-1.0168	-0.7060	-1.0166
	(30.69)***	(28.46)***	(30.65)***	(28.52)***	(-52.41)***	(-57.76)***	(-52.41)***	(-57.72)***
Share with vocational education	0.1146	0.1720	0.1156	0.1726	-0.0141	0.0366	-0.0134	0.0369
	(18.60)***	(16.38)***	(18.70)***	(16.42)***	(-1.38)	(2.87)***	(-1.32)	(2.91)***
Share with higher education	-0.1504	-0.1950	-0.1484	-0.1938	-0.0735	-0.0276	-0.0718	-0.0271
	(-6.24)***	(-4.63)***	(-6.16)***	(-4.60)***	(-1.64)	(-0.47)	(-1.60)	(-0.46)
Average tenure (in years)	0.0033	-0.0015	0.0033	-0.0015	-0.0189	-0.0091	-0.0189	-0.0091
	(4.27)***	(-1.00)	(4.34)***	(-0.97)	(-11.43)***	(-3.74)***	(-11.40)***	(-3.73)***
Average experience (in years)	0.0094	0.0107	0.0094	0.0107	0.0081	0.0054	0.0081	0.0054
	(23.57)***	(15.08)***	(23.60)***	(15.10)***	(10.31)***	(5.30)***	(10.32)***	(5.31)***
Constant	-0.4846	-0.7985	-0.4859	-0.7999	0.2160	0.0664	0.2151	0.0661
	(-29.95)***	(-34.27)***	(-30.00)***	(-34.31)***	(1.75)*	(0.42)	(1.74)*	(0.42)
Establishment-age dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Farm fixed effects	No	No	No	No	Yes	Yes	Yes	Yes
Observations	171.655	148.306	171.655	148.306	171.655	148.306	171.655	148.306
R-squared	0.0523	0.0603	0.0524	0.0604	0.4443	0.6298	0.4443	0.6299

Note: t-values are presented in parentheses. ***, ** and * indicate significance at the 1, 5 and 10% level, respectively. Standard errors are clustered at the establishment level to control for autocorrelation and heteroscedasticity. JC rate: Job creation rate.

Table 5: Immigrant Workers and Native Job Creation

	(1)	(2)	(3)	(4)
	Native JC rate	Native JC rate	Native JC rate	Native JC rate
Dependent variable:	(1 year ahead)	(3 years ahead)	(1 year ahead)	(3 years ahead)
Total share of immigrants	0.7846	1.1129	1.2786	1.8102
	(62.43)***	(55.93)***	(54.34)***	(60.75)***
Livestock and mixed enterprises	0.0507	0.0381	0.0608	0.0621
	(8.17)***	(3.46)***	(2.92)***	(1.88)*
Horticulture	0.0182	-0.0055	0.0175	-0.0623
	(1.91)*	(-0.31)	(0.28)	(-0.61)
Other types of farming	0.0704	0.0714	-0.0078	-0.0698
	(8.36)***	(4.58)***	(-0.24)	(-1.36)
2 employees	0.0702	0.1248	-0.3345	-0.4231
	(11.94)***	(14.62)***	(-44.39)***	(-48.60)***
3 employees	0.0911	0.1743	-0.5222	-0.6914
	(13.00)***	(15.75)***	(-52.06)***	(-58.17)***
4 employees	0.1230	0.2141	-0.6147	-0.8540
	(15.11)***	(16.04)***	(-49.41)***	(-56.77)***
4+ employees	0.1475	0.2648	-0.7464	-1.0672
	(23.40)***	(23.00)***	(-54.35)***	(-59.42)***
Share with vocational education	0.1172	0.1732	-0.0089	0.0302
	(18.76)***	(16.50)***	(-0.85)	(2.33)**
Share with higher education	-0.1457	-0.1717	-0.0508	0.0229
	(-6.09)***	(-4.17)***	(-1.11)	(0.39)
Average tenure (in years)	0.0045	0.0008	-0.0164	-0.0075
	(5.74)***	(0.52)	(-9.85)***	(-3.09)***
Average experience (in years)	0.0097	0.0110	0.0083	0.0056
	(23.95)***	(15.43)***	(10.55)***	(5.41)***
Constant	-0.5188	-0.8557	0.1822	0.0958
	(-31.43)***	(-36.52)***	(1.43)	(0.61)
Establishment-age dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes
Farm fixed effects	No	No	Yes	Yes
Observations	171.655	148.306	171.655	148.306
R-squared	0.0660	0.0790	0.4416	0.6275

Note: t-values are presented in parentheses. ***, ** and * indicate significance at the 1, 5 and 10% level, respectively. Standard errors are clustered at the establishment level to control for autocorrelation and heteroscedasticity. JC rate: Job creation rate.

Table 6: Immigrant Workers and Job Separations

	(1)	(2)	(3)	(4)	(5)
Dependent variable = 1 if a worker leaves an establishment between year *t* and *t+1*					
Individual characteristics:					
Immigrant	0.0199	0.0198	0.0201	0.0398	0.0230
	(3.71)***	(3.62)***	(3.66)***	(5.01)***	(2.85)***
Experience (in years)	-0.0077	-0.0076	-0.0076	-0.0077	-0.0082
	(-60.38)***	(-58.61)***	(-58.60)***	(-58.65)***	(-55.36)***
Tenure (in years)	-0.0140	-0.0134	-0.0134	-0.0134	-0.0105
	(-52.03)***	(-50.04)***	(-50.06)***	(-49.76)***	(-38.58)***
Newly employed (tenure=0)	0.1033	0.1026	0.1026	0.1029	0.0621
	(36.75)***	(35.11)***	(35.04)***	(34.99)***	(18.41)***
Vocational education	-0.0427	-0.0446	-0.0446	-0.0448	-0.0484
	(-21.40)***	(-21.64)***	(-21.64)***	(-21.70)***	(-22.21)***
Higher education	0.0018	0.0024	0.0024	0.0021	0.0003
	(0.30)	(0.38)	(0.38)	(0.33)	(0.05)
Immigrant x Tenure	-0.0087	-0.0085	-0.0088	-0.0096	-0.0068
	(-5.56)***	(-5.31)***	(-5.42)***	(-5.94)***	(-3.63)***
Farm characteristics:					
Livestock and mixed enterprises	0.0062	0.0085	0.0084	0.0081	-0.0246
	(1.76)*	(2.32)**	(2.31)**	(2.23)**	(-1.52)
Horticulture	-0.0211	-0.0178	-0.0179	-0.0188	0.0450
	(-4.18)***	(-3.44)***	(-3.46)***	(-3.62)***	(2.33)**
Other types of farming	-0.0264	-0.0215	-0.0215	-0.0208	0.0245
	(-5.54)***	(-4.41)***	(-4.41)***	(-4.27)***	(1.05)
2 employees	-0.0036	-0.0076	-0.0076	-0.0083	0.0721
	(-1.24)	(-2.34)**	(-2.34)**	(-2.57)**	(17.16)***
3 employees	-0.0059	-0.0098	-0.0098	-0.0111	0.1112
	(-1.81)*	(-2.65)***	(-2.65)***	(-3.01)***	(20.47)***
4 employees	-0.0153	-0.0198	-0.0198	-0.0215	0.1317
	(-4.09)***	(-4.77)***	(-4.77)***	(-5.15)***	(20.44)***
4+ employees	-0.0344	-0.0367	-0.0367	-0.0392	0.1633
	(-10.46)***	(-10.26)***	(-10.25)***	(-10.75)***	(22.66)***
Share with vocational education	-0.0260	-0.0257	-0.0257	-0.0254	0.0209
	(-6.11)***	(-5.77)***	(-5.77)***	(-5.72)***	(3.74)***
Total share of immigrants	0.0937	0.0939	0.0986	0.1344	-0.0820
	(9.70)***	(9.55)***	(9.16)***	(8.40)***	(-4.06)***
Inflow last period (all persons)		0.0100			
		(3.48)***			
Inflow last period (Danes)			0.0106	0.0100	-0.0073
			(3.49)***	(3.44)***	(-2.92)***
Inflow last period (immigrants)			0.0018	0.0032	0.0390
			(0.24)	(0.29)	(2.92)***
Personal x farm characteristics:					
Immigrant x Total share of immigrants				-0.0696	0.0448
				(-3.09)***	(1.86)*
Immigrant x Inflow last period (Danes)				0.0193	0.0123
				(2.20)**	(1.42)
Immigrant x Inflow last period (immigrants)				-0.0094	-0.0582
				(-0.71)**	(-3.77)***
Year dummies	Yes	Yes	Yes	Yes	Yes
Regional dummies	Yes	Yes	Yes	Yes	Yes
Farm fixed effects	No	No	No	No	Yes
Observations	508,069	464,470	464,470	464,470	464,470
R-squared	0.1156	0.1155	0.1155	0.1156	0.2026

Note: Arable farming and 1 employee hired at the farm are the omitted categories. t-values are presented in parentheses. ***, ** and * indicate significance at the 1, 5 and 10% level, respectively. Standard errors are clustered at the establishment level.