Online Appendix for:

Integrating Refugees by Addressing Labor Shortages? A Policy Evaluation

Mette Foged, Janis Kreuder and Giovanni Peri

February 12, 2022

Contents

1 Data and Additional Information About the "Industry Packages" Policy

1.1 Collection of Roll-Out Data

We collected data on the policy in several steps as described below. The total time frame for the data collection was approximately 18 months.

Step 1. *Initial Roll-Out Data Collected, March - April 2019*

21 municipalities had the policy implemented by one of the two consultancy firms, LG Insights and Foreninger Nydansker, from 2013 to 2017. We obtained detailed data from the digital archives of the two firms, including the exact date of the first "Industry Packages"-introduction course for refugees in the municipality (see Table 1).[1]
At this stage, we also identified that additional municipalities could have implemented the policy without formal collaboration with one of the two specialized firms (see step 3).

Step 2. *Qualitative Interviews. August – November 2019*

We visited two municipalities that had implemented the "Industry Packages" and conducted interviews with them to gather qualitative evidence about experiences and challenges. The positive experiences with the policy were stressed and specific emphasis was given to the following aspects: I) The purpose-driven nature and transparency of the program helped increase motivation among refugees and companies who participated in the program. II) The implementation of the program led to more cooperation between actors involved in the integration efforts of the municipalities. III) The program gave municipalities a clear plan and structure of the activities provided under the Integration Program. The clear purpose and structure were seen as helpful by the municipality staff in a period of transition towards a more job-oriented approach to integration in national policies (see Section 2 of the main text).

Step 3. *Identification of Additional Potential Adopters, April 2020*

As mentioned in step 1, we knew that additional municipalities could have adopted the program without a formal connection to any of the two consultancies and we decided to make an effort to identify those through different means:

I We acquired information on municipalities that had participated in an initial workshop with LG Insights about the "Industry Packages' but subsequently did not enter into a formal agreement about implementation.

II We searched online resources that mentioned a connection between individual municipalities and the "Industry Packages" ("Branchepakker" in Danish). These resources included newspaper articles about the policy and available documentation on municipal integration efforts, such as transcripts from municipal council meetings.[2]

III We revisited a nationwide survey in Danish municipalities about their use of various integration tools and practices between 2007 and 2017. The survey had been conducted in 2017/18 as part of the larger research

[1] We also collected the date that the municipality had entered a formal agreement with one of the two consultancies. We do not utilize this date for two reasons. First, the date the program became available to refugees in the municipality is the relevant starting date for the refugees. Second, we do not have a contract date for municipalities that adopt without assistance from these firms.

[2] E.g. https://fho.dk/blog/2016/01/21/integrationsmodeller/, https://politik.herning.dk/dagsorden/Beskaeftigelsesudvalg/07-09-2016/Dagsorden(ID1249)/Bilag/Punkt_78_Bilag_1_Implementering_af_ny_lovgivning_BSK_Udvalget_7_september_2016_Version_3.pdf and https://www.rudersdal.dk/files/media/2017/50/beskaeftigelsesplan_2018.pdf.

agenda on integration of refugees under the Economic Assimilation Research Network, financed by Innovation Fund Denmark.[3]One question in the survey was about the use of "Industry Packages' in the municipality.

In total we identified 26 potential additional adopters of the policy in this step (beyond the 21 identified in Step I).

Step 4. *Follow-Up Survey Among Potential Adopters, May - June 2020*
In collaboration with LG Insight, we developed a series of questions regarding the implementation of the "Industry Packages" with the purpose of evaluating whether the 26 additional municipalities (identified in step 3) had followed the original concept. LG Insights then contacted representatives from the integration team of the 26 municipalities that had either participated in an introductory workshop about "Industry Packages", been mentioned in an online resource, or confirmed in the national survey that they had used or were currently using "Industry Packages". This was during the first Covid-19 lockdown in Denmark in spring 2020, and we were only able to obtain data including the date of the first "Industry Packages"-introduction course for newly arrived refugees from 9 out of the 26 municipalities.[4] This meant that the final data set on the roll-out of the policy, which is discussed in Section 1.2, consists of the starting dates for 30 different municipalities, whereby 21 dates were obtained from one of the two consultancies that implemented the program and 9 directly from the municipalities. The 17 potential adopting municipalities that did not respond to our survey are excluded from our analysis data (see section 2.1).

Step 5. *Loyalty to the Original Concept, September-November 2020*
Utilizing the data obtained in the follow-up survey (Step 4), we were able to differentiate between varying degrees of implementation of the original "Industry Packages". We use three criteria each corresponding to one of the key pillars of policy to determine whether the self-adopting municipalities were loyal to the original concept. Section 1.4 explains the three pillars of policy (the treatment) and the exact requirements we imposed to evaluate whether the municipality had fully implemented this aspect of the policy. The evaluation along the three criteria, was conducted for all municipalities for which we had obtained starting dates of the "Industry Packages" (see section 1.2).

1.2 Roll-Out Dates

The date that a municipality started using the policy for the labor market integration of newly settled refugees is key to our research design. Table 1 lists the starting date and the source of this information. Starting date refers to the month the first refugee(s) participated in the introductory course of the "Industry Packages" policy for the 21 municipalities that collaborated with one of the two consultancies and we obtained this information from the digital archives of these firms. We were able to obtain starting dates for an additional 9 municipalities through a survey (as described in section 1.1, step 4).

This is recall-data based on survey interviews with the municipalities and we only obtained the year and quarter of implementation because the municipalities that answered our request could rarely provide a more accurate starting point. We re-code this as the month in the middle of the quarter when calculating the distance between month of settlement of a refugee and month of implementation (event time). This introduces a measurement error in our variable of interest in the 9 out of the 30 municipalities (our results are insensitive to excluding the 9 survey municipalities).

[3]For information on the survey and the data from the survey see: `https://cms.ku.dk/samf-sites/econ-sites/test/earn/Virksomhedstilbud__survey_EARN_30042018.xlsx`, `https://cms.ku.dk/samf-sites/econ-sites/test/earn/Appendix_survey_2.pdf`, and `https://lg-insight.dk/wp-content/uploads/2019/02/EARN-surveyresultater.pdf`

[4]Municipal integration staff were working from home, the usual integration efforts where suspended and during the lockdown it became harder and harder to identify the relevant people.

Table 1: Starting Dates in Danish Municipalities

Municipality	Starting Date	Source
1. Egedal	8/2017	Consultant
2. Faxe	8/2017	Consultant
3. Frederiksberg	5/2016	Consultant
4. Frederikshavn	1/2016	Consultant
5. Haderslev	9/2015	Consultant
6. Helsingør	Q3 2017	Survey
7. Hjørring	11/2016	Consultant
8. Høje Taastrup	8/2017	Consultant
9. Holbæk	9/2016	Consultant
10. Horsens	2/2016	Consultant
11. København	9/2016	Consultant
12. Kolding	5/2017	Consultant
13. Næstved	10/2015	Consultant
14. Norddjurs	3/2017	Consultant
15. Randers	Q1 2017	Survey
16. Ringkøbing-Skjern	1/2016	Consultant
17. Ringsted	8/2017	Consultant
18. Silkeborg	11/2015	Consultant
19. Sønderborg	12/2015	Consultant
20. Tønder	4/2016	Consultant
21. Varde	5/2016	Consultant
22. Vejen	2/2016	Consultant
23. Vejle	8/2013	Consultant
24. Aabenraa	Q1 2015	Survey
25. Gribskov	Q1 2016	Survey
26. Hørsholm	Q1 2018	Survey
27. Køge	Q1 2017	Survey
28. Odsherred	Q1 2018	Survey
29. Skanderborg	Q1 2016	Survey
30. Thisted	Q1 2017	Survey

Notes: Consultant refers to LG Insight or Foreningen Nydansker and the information comes from their archives. Survey refers to the survey collected in 2020 by LG Insight to gather information about additional adopters of the program (see Section 1.2, Step 4).

1.3 The "Industry Packages"

The "Industry Packages" requires careful preparation. The target industries must be identified, collaboration with private businesses within the targeted industries must be established, the competency requirements must be clearly defined and the training must be planned such that participants progressively obtain the required skills and knowledge through the training and such that the progression can be measured and feedback is possible based on the measured progression and clear goals.

The **industries** are selected based on an analysis of local job vacancies and competencies in the local pool of the unemployed. Usually, experts in the municipality together with a consultancy firm use a combination of local statistics by sector and dialog with local companies to identify the industries with good employment opportunities for refugees with no prior experience in the Danish labor market. (Below we label this pillar 1.) The idea is that industries with a particularly high shortage of labor and low entry-requirements are selected and a training program is prepared for each of them. The industries selected in each of the adopting municipalities are listed in Table 2. Many industries are typical industries of refugee employment at the national level.

Refugees select which "Industry Package" (training program) to attend by the end of an introduction course. The typical duration of the introductory course is eight weeks. The training afterwards varies in length and depends on the industry and the progress of the individual refugee. According to anecdotal evidence, it could take nine months or longer for a refugee to acquire the competencies needed for a job in the targeted industry. Some refugees may need to repeat steps in the program several times, while others complete all the training within three months. Hence, any effects of program participation should start emerging three to six months after the start of the program and it is likely that the effects only fully materialize after a year.

Each "Industry Package" is a sequence of on-the-job training put together in collaboration with local firms and taking place in the firms. The sequences have the same structure and a clear progression towards the competence requirements for the targeted industry. The competencies of the refugees are continual measured against the goals (the competence requirements). One fundamental idea behind the "Industry Package" policy is that the clear structure, goals and progression create a sense of meaning, purpose and motivation for the individual refugee. (Pillars 2 and 3 below.)

The nature of the policy also implies that everything is not possibly for the refugee. Instead of focusing on the competencies and aspirations of the refugee, the policy from the outset defines what is possible, i.e., where the local economy needs them.

In summary, the following three pillars define the policy:

1. An analysis of the local labor market to identify industries with a shortage of workers and low entry barriers for low-skilled refugees.[5]

2. A clear definition of training tasks and competence requirements for employment in the targeted industries. The tasks are defined in close collaboration with local companies.[6]

3. A step-wise coherent structure of training for refugees, whereby individual progression is measured transparently against the competence requirements in the chosen industry.[7]

[5] "Afdækning af lokale jobåbninger" (in Danish).
[6] "Definition af træningsopgaver og kompetencekrav" (in Danish).
[7] "Brug af træningsværktøjer/progressionsværktøjer" (in Danish).

1.4 Treatment Definition

LG Insight and Foreningen Nydansker confirmed that all 21 municipalities that had the policy implemented by them followed the same structure and were loyal to each of the three pillars of the program (described in section 1.3). The challenge was the additional nine potential adopters that had copied the concept with no formal cooperation or contract with either of the two consultancies (see section 1.1, Step 3).

In order to ensure that implementation of the policy in these municipalities did not differ from the originally intended structure and content, we developed a survey in collaboration with LG Insight that asked the municipalities about specific details of their implementation and LG Insight conducted the interviews (section 1.1, Step 4).

We used the following criteria when evaluating loyalty to the three pillars of "Industry Packages":

1. To confirm pillar 1, we decided to collect the list of the local industries that each municipality had identified as being suitable for the "Industry Packages" at the time of first implementation. These lists were obtained directly from the consultancy firms for the 21 municipalities that collaborated with them on their implementation. All nine municipalities that responded through the survey confirmed in the interview that they identified industries of local excess demand for labor when implementing the program but only six were able to provide a list of the targeted industries (see Table 2).[8]

2. To confirm pillar 2, municipalities that had implemented without the consultancies had to answer "Yes" to the survey question: "were the labor market tasks and competencies that a refugee had to acquire to become employed in the selected industry clearly defined?"[9], 6 out of the 9 surveyed municipalities answered 'yes' to this question (see Table 2).

3. To confirm pillar 3, municipalities that had implemented without the consultancies had to answer "yes" to the following two survey questions: "Was there a systematic follow-up on whether a refugee acquired the necessary competencies to be able to obtain employment in the selected industry? This could, for example, be via the use of progression cards or similar."[10] "Was on the job-training included in your use of "Industry Packages" (company internship and/or wage subsidized employment)?"[11] 4 out of the 9 additionally identified municipalities answered 'yes' to both questions.

Table 2 provides an overview of each of the municipalities' fulfillment of the three outlined criteria of implementation. We obtained supporting evidence of the fulfilment of all the three criteria from 23 municipalities, including the list of targeted industries. The remaining seven municipalities were either unable to provide supporting evidence that their implementation was in line with the original policy or had deviated from it. 2 out of the 7 municipalities were simply missing the list of industries from the time of implementation. Importantly, all developed a training program for refugees that targeted sectors with good employment opportunities. We use all 30 municipalities in the main analysis. Section 4.2 shows the robustness of the results to excluding municipalities for which we could not confirm one or more of the key components of the policy.

[8] Survey data, including the lists of industries from surveyed municipalities could suffer from recall error. It is not clear from the survey whether the respondent collected the information in documents from the time of implementation or the response was based on the memory of the respondent or that of a colleague.

[9] "Er det tydeligt defineret hvilke arbejdsmarkedsopgaver og kompetencer, som borgeren skulle opnå for at få job i den udvalgte delbranche?" (in Danish).

[10] "Blev der fulgt systematisk op på, om borgeren tilegnede sig de nødvendige kompetencer for at kunne opnå ansættelse i udvalgt delbranche? Dette kunne fx være via anvendelse af progressionsmålinger o.lign." (in Danish).

[11] "Indgik der virksomhedsforløb i jeres branchepakke (virksomhedspraktik og/eller ansættelse med løntilskud)?" (in Danish).

Table 2: Implementation and Loyalty to the Original Policy

Municipality	Data on Pillar 1: Targeted Industries	Data on Pillar 2: Competence Definition	Data on Pillar 3: Training Structure
1. Egedal	Retail, Kitchen and Service, Cleaning, Construction	X	X
2. Faxe	Retail, Construction,	X	X
3. Frederiksberg	Retail, Kitchen and Service, Cleaning, Construction, Warehouses, Healthcare, Transportation	X	X
4. Frederikshavn	Retail, Kitchen and Service, Cleaning, Healthcare, Agriculture, Food-Production	X	X
5. Haderslev	Retail, Kitchen and Service, Cleaning, Healthcare, Agriculture, Manufacturing	X	X
6. Helsingør	Retail, Kitchen and Service, Cleaning, Construction, Warehouses, Healthcare, Non-Food Manufacturing	X	X
7. Hjørring	Retail, Kitchen and Service, Cleaning, Agriculture, Food Production	X	X
8. Høje Taastrup	Retail, Cleaning, Construction, Transportation	X	X
9. Holbæk	Retail, Kitchen and Service, Cleaning, Construction, Transportation	X	X
10. Horsens	Retail, Kitchen and Service, Cleaning, Construction, Healthcare, Transportation, Food Production	X	X
11. København	Retail, Kitchen and Service, Cleaning, Construction, Warehouses, Healthcare, Transportation	X	X
12. Kolding	Retail, Kitchen and Service, Cleaning, Construction	X	X
13. Næstved	Retail, Kitchen and Service, Cleaning, Construction, Healthcare, Agriculture	X	X
14. Norddjurs	Retail, Kitchen and Service, Cleaning, Construction, Agriculture	X	X
15. Randers	Kitchen and Service, Cleaning, Construction, Warehouse, Transportation, Agriculture, Non-Food Manufacturing	X	X
16. Ringkøbing-Skjern	Retail, Kitchen and Service, Cleaning, Warehouse, Healthcare, Agriculture	X	X
17. Ringsted	Retail, Construction	X	X
18. Silkeborg	Retail, Kitchen and Service, Cleaning, Construction,Healthcare, Transportation, Agriculture	X	X
19. Sønderborg	Retail, Kitchen and Service, Cleaning, Construction, Healthcare, Transportation, Agriculture, Non-Food Manufacturing	X	X
20. Tønder	Retail, Kitchen and Service, Construction, Healthcare, Agriculture, Non-Food Manufacturing	X	X
21. Varde	Retail, Kitchen and Service, Cleaning, Healthcare, Transportation, Food Production	X	X
22. Vejen	Retail, Kitchen and Service, Cleaning, Healthcare, Agriculture, Food Production	X	X
23. Vejle	Retail, Kitchen and Service, Cleaning, Warehouse, Healthcare, Food Production	X	X
24. Aabenraa	*confirmed but unable to provide list*	X	X
25. Gribskov	*confirmed but unable to provide list*	X	X
26. Hørsholm	Kitchen and Service, Cleaning, Healthcare	X	*not confirmed*
27. Køge	*confirmed but unable to provide list*	X	*not confirmed*
28. Odsherred	Retail, Cleaning, Agriculture	*not confirmed*	*not confirmed*
29. Skanderborg	Retail, Kitchen and Service, Cleaning, Warehouse, Healthcare, Transportation, Agriculture	*not confirmed*	*not confirmed*
30. Thisted	Retail, Cleaning, Warehouse, Agriculture, Food Production, Office	*not confirmed*	*not confirmed*

Notes: "Pillar" refers to the key elements of the original policy described in sections 1.3 and 1.4.

2 Register Data

2.1 Adopting Municipalities

There are 98 municipalities in Denmark. We exclude the following 17 municipalities because they potentially adopted the program but did not respond to our survey (see Section 1.1, Steps 3 and 4): Allerød, Assens, Bornholm, Fredericia, Frederikssund, Glostrup, Greve, Halsnæs, Herning, Hillerød, Kerteminde, Nyborg, Odder, Odense, Rudersdal, Svendborg and Syddjurs. This leaves us with 30 adopting municipalities and 51 municipalities that did not adopt the policy according to our information.

Following the event-study literature we only include municipalities that eventually adopted the policy. The advantages of this approach are two. First, adopting municipalities could be systematically different from never-adopting municipalities. Second, it is possible that municipalities could have adopted the program without us knowing. This would bias the effects towards zero if included in the control group.

2.2 Sample of Refugees and the Density of the Inflow Across Time

Selecting our analysis sample requires combining multiple registers. First, we utilize data on the admission category of immigrants (Admission Register, OPHG) to identify individuals who were granted refugee status or family-reunification with a refugee in Denmark. For brevity we refer to everyone as refugees.

Second, we exclude refugees who settle in Denmark before January 2008 and after April 2019 (migration register, VNDS). Refugees are typically settled in a municipality within a month of being granted asylum. Quota refugees from the resettlement program of the United Nations' Refugee Agency (UNHCR) and individuals reunified for family reasons with refugees settle in Danish municipalities directly from abroad.[12] All of them are eligible for the policy from their first date of legal residence in Denmark, corresponding to the their official immigration date.[13]

The high frequency data we use for outcomes (see Section 2.3) are available until April 2020. We can, therefore, follow the labor market outcomes of everyone for at least one year. We observe the municipality of first legal residence and the date of settlement in the municipality, (migration register, VNDS; internal migration register FLYT, and population register, BEF), which marks the beginning of potential participation in the "Industry Packages".

Third, we restrict our sample to refugees who were in the age interval 25 to 64 years old at the date of immigration (first date of legal residence). Individuals below 18 years of age or approaching retirement are not relevant. For refugees aged 18 to 24, the target of the integration efforts is education, making them highly unlikely candidates for participation in the "Industry Packages" policy. Similarly, we exclude refugees with a university degree from the sample (education register, UDDA), because integration efforts are usually targeted at helping such refugees find employment within their profession.

As a final step, we exclude refugees who stayed in Denmark for less than one year (1.5 percent) and female refugees who gave birth during the first year or up to one year prior to refugee recognition (since they were likely to have been on maternity leave).[14] These steps leave us with 8556 refugees.

[12] 79 percent of our population are refugees (see Table 3), less than 5 percent of them Quota refugees.

[13] The typical refugee would not be recorded in any of the registers at our disposal when entering Denmark and applying for asylum. Their refugee status and date of being granted refugee status in Denmark are observable to us in the Admission Register (OPHG). The immigration date (from VNDS) typically marks the date the refugee moves out of the refugee camp and is placed in a municipality that is then responsible for the Integration Program.

[14] A few additional refugees ($N = 3$) were excluded because we could not identify their municipality of settlement. We also excluded 71 refugees who found employment prior to settlement in the municipality. Such employment is most likely obtained during the waiting period in the asylum center and could not be the result of any municipal interventions.

Table 3 shows the initial characteristics of this group. Our sample contains 79 percent refugees and 21 percent family reunification to existing refugees. They are aged 25-64 and the majority are men. The three largest country of origin groups are Syria (58 percent), Iran (8 percent), and Somalia (6 percent). 70 percent have only basic schooling and many have small children.

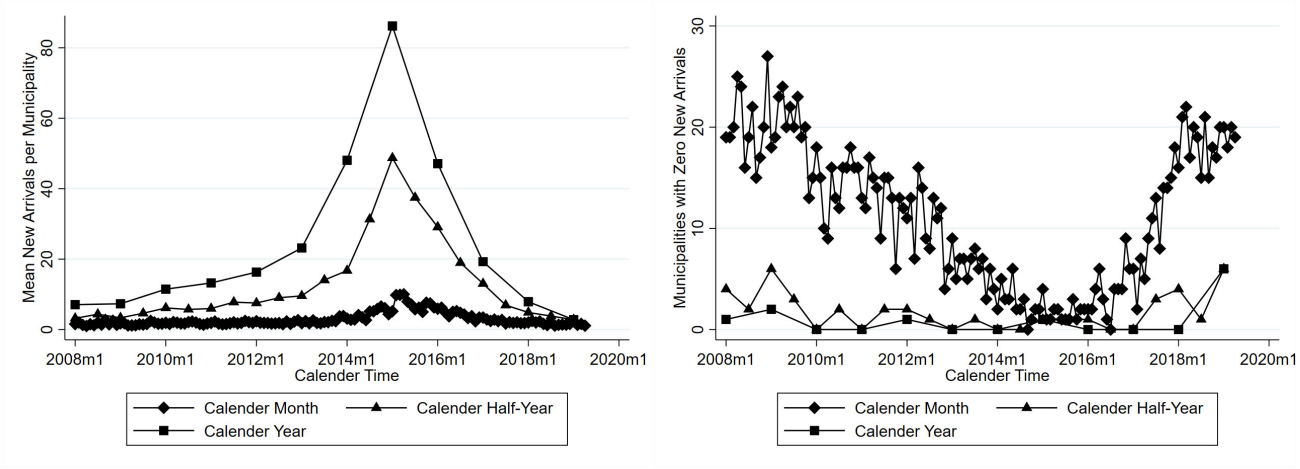
Figure 1 provides information about the settlement of new refugees in adopting municipalities in Denmark. Panel a shows the mean number of new refugees in adopting municipalities by month. This data is too thin to estimate a model with event time and calendar time in months. We therefore aggregate the data. Panel b shows that once we aggregate to years, the number of municipalities receiving zero refugees in the binned time interval is close to zero. The key variable in our empirical model is event time.

Table 3: Initial Characteristics of Refugees

	Mean	SD	Min	Max
Male	0.63	0.48	0	1
Age at immigration	35.10	8.47	25	64
Asylum	0.79	0.41	0	1
Syrian	0.58	0.49	0	1
Eritrean	0.10	0.30	0	1
Iranian	0.08	0.28	0	1
Afghan	0.06	0.23	0	1
Iraqi	0.02	0.15	0	1
Somalian	0.02	0.14	0	1
Other country of origin	0.14	0.34	0	1
Basic School	0.70	0.46	0	1
Secondary	0.10	0.30	0	1
Non-University Tertiary	0.15	0.36	0	1
Education Missing	0.04	0.20	0	1
Children age 1-3	0.18	0.38	0	1
Children age 1-6	0.36	0.48	0	1

Notes: $N = 8556$. Sample selection is described in section 2.

Figure 1: Refugee Settlements in Adopting Municipalities



(a) Mean Number of New Refugees

(b) No New Refugees

2.3 Outcome Variables

The outcomes we analyze come from monthly tax returns filled by employers and reported to the Danish Tax Authority (EIndkomst Register, BFL). Hence, the source is high quality, high frequency, third-party reported information. We define different measures of employment based on the hours worked in the reference period and supplement this with weekly data on unemployment and subsidized employment (DREAM Register). With these data sources we define the following key variables:

Employment

1. Main (4 hours): Employment is an indicator variable equal to one if the individual had at least four hours of paid employment in the month. This definition reflects the ILO definition of employed people as those with at least one hour of employment in the past week.

2. Excl. Wage Subsidies: Employment without subsidized employment. We supplement our main employment definition (based on BFL) with a criteria that the individual had no subsidized employment in the month (according to DREAM).

3. Min. 80 hours: Full-time employment is 160,33 hours of work per month in Denmark. 80 hours, therefore, corresponds to being employed half of the month.

4. Share of full-time: Employment measured in full-time equivalents. The variable takes on values in the unit interval measuring hours worked as a share of full-time employment in the month. An individual is considered working full-time if employed at least 160,33 hours in the month.

Unemployment

An individual is unemployed in a month if the individual was unemployed in at least 2 out of 4 weeks.

3 Refugees, Eastern Europeans and Other Immigrants in the Danish Labor Market

Panel a of Table 4 shows the mean labor market outcomes in the first (12 months), the fourth (48 months) and the seventh year (84 months) after arrival for refugees, Eastern Europeans and Other Immigrants. Panel b shows their distribution across the top five industries of refugee employment, and Panel c shows attrition from the sample.

We sample Eastern Europeans and other Immigrants using the same sample selection criteria as for the refugees (section 2.2). Most refugees stay in Denmark (97 percent), while 32 percent of Eastern Europeans and 44 percent of Other Immigrants have left the country within seven years of arrival. Hence, the potential comparison groups becomes increasingly selected over time since arrival in Denmark. Selection is not strong on the labor market outcomes and does not go in the same direction for the two immigrant groups. We see a weak tendency for the Eastern Europeans who stay longer to also earn a higher wage but the opposite picture for Other Immigrants.

Refugees have fled persecution and war. They arrive unprepared for the Danish labor market and do not have a job upon arrival. Hence, employment is far below the other two immigrant groups in the first year, but once they find employment. they tend to work in similar low-skilled jobs. The most frequent occupations are unskilled jobs in the bottom of the income distribution such as cleaning and simple food service jobs. This is especially true for the Eastern Europeans and they are our preferred comparison group when we perform placebo tests for the presence of local demand shocks correlated with "Industry Packages" implementation.

Due to the conflict in Syria, a lot more refugees than Eastern European workers arrived late in our sample and when we compare the groups over time, we lose more refugees than other immigrants due to the individual time series reaching the end of our panel. Once, a reasonable share of refugees have found employment, e.g., in month 48, their hourly wage is relatively similar to the Eastern Europeans. They earn, on average, 22-23 USD per hour in 2015 prices.

Table 4: Refugees and Eastern European Immigrants

	Refugees			Eastern Europeans			Other Immigrants		
	Month 12	Month 48	Month 84	Month 12	Month 48	Month 84	Month 12	Month 48	Month 84
				(a) Mean Outcomes					
Employed (min. 4h)	0.09	0.38	0.39	0.65	0.67	0.67	0.49	0.58	0.62
Employed (min. 80h)	0.06	0.28	0.31	0.52	0.54	0.57	0.39	0.47	0.53
Unemployed	0.87	0.43	0.41	0.02	0.13	0.17	0.02	0.09	0.12
Log Hours	4.38	4.54	4.64	4.71	4.73	4.78	4.70	4.73	4.77
Log Income	7.44	7.68	7.81	7.85	7.94	8.04	8.11	8.07	8.08
Log Hourly Wage	3.04	3.09	3.10	3.15	3.16	3.17	3.39	3.28	3.23
				(b) Share of Employment					
Top 5 Industries of Refugees in Month 12									
Restaurants and mobile food service activities	0.17	0.13	0.10	0.06	0.06	0.05	0.12	0.09	0.06
Cleaning activities	0.13	0.09	0.12	0.16	0.19	0.17	0.11	0.16	0.15
Retail sale in non-specialized stores	0.04	0.03	0.02	0.01	0.01	0.01	0.01	0.02	0.02
Processing of meat and production of meat products	0.04	0.05	0.05	0.04	0.05	0.04	0.00	0.01	0.01
Other social work activities without accommodation	0.03	0.02	0.03	0.00	0.01	0.01	0.01	0.02	0.03
				(c) Attrition					
Attrition due to Emigration		0.05	0.07		0.28	0.32		0.39	0.44
Attrition due to Panel End		0.18	0.73		0.28	0.46		0.24	0.38
Observations	8,556	6,447	1,694	13,971	6,043	2,888	36,282	13,073	6,359

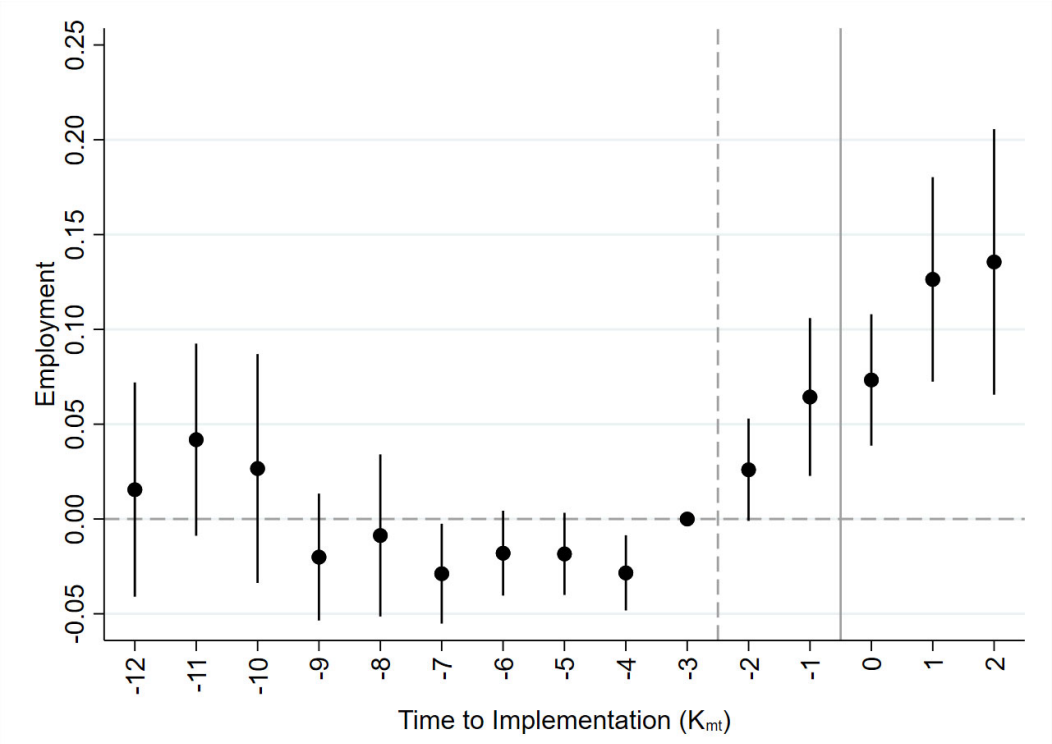
Notes: Month 12, month 48 and month 84 in the columns refer to the number of months after settlement. We use the three-digit ISIC classification of industries. The fifth industry in the table is a residual category under social work that includes non-residential nursing and care activities not elsewhere classified.

4 Additional Results and Robustness Checks

4.1 The Simple Event-Time Graph

Figure 2 shows the mean employment of refugees one year after arrival by six-month bins of event time. Event time 0 in the graphs shows the first cohort that arrived after implementation of the "Industry Packages", while -1 and -2 are event time intervals where refugees arrived up to one year prior to implementation. In -3 and prior, refugees have no possibility of entering through the program before we measure the outcomes one year after arrival because they arrive more than one year prior to implementation. The figure is similar to Figure 1 in the main text but without any control variables. All results we show in the main text include as a minimum year and municipality fixed effects. These are important to control for general time trends and structural differences across municipalities.

Figure 2: The Unconditional Employment Rate by Event Time



Notes: The plotted estimates are the unconditional mean employment one year after placement by half-year bins of event time and relative to event time -3 and 95-percent confidence intervals.

4.2 Robustness to Definition of Treated Municipalities

Table 5 shows that the main results are robust to excluding municipalities that did not provide the list of targeted industries (pillar 1), that did not confirm that the competence requirements were clearly defined (pillar 2), that did not confirm that the training followed the intended structure (pillar 3) or that did not meet all three strict criteria for loyalty to the original policy (see Sections 1.3 and 1.4). The point estimates and their statistical significance are extremely robust to excluding municipalities that could not provide sufficient evidence that the criteria we constructed to evaluate loyalty to the original policy were followed. In fact, we can exclude all 9 municipalities ("Survey Municipalities") that did not involve any of

the two consultancy firms in the implementation and still obtain similar results (Figure 2 of the main text).

The majority (4 out of 7) of the municipalities that could not confirm that all three pillars of the original program had been followed adopted it in 2017 and 2018 (see Table 1) where few new refugees were placed in Danish municipalities (Figure 1). For that reason, these municipalities receive relatively little weight in the refugee-level estimations we run.

Table 5: Employment Effect with Stricter Treatment Criteria

	Main	Pillar 1	Pillar 2	Pillar 3	All Pillar
	(1)	(2)	(3)	(4)	(5)
			Panel A: *Immidiate Effect*		
Share of first year	0.053**	0.059**	0.051**	0.057**	0.060**
	(0.020)	(0.023)	(0.021)	(0.021)	(0.025)
Mean (Dep.)	0.09	0.09	0.09	0.09	0.09
Observations	8205	7462	7382	7034	6513
			Panel B: *Impact over Time*		
After 12 Months	0.050**	0.048*	0.041**	0.045**	0.043*
	(0.021)	(0.024)	(0.019)	(0.019)	(0.023)
Mean (Dep.)	0.09	0.09	0.09	0.09	0.09
Observations	6359	5786	5698	5396	5007
After 18 Months	0.057**	0.061*	0.037	0.041	0.041
	(0.026)	(0.030)	(0.024)	(0.026)	(0.030)
Mean (Dep.)	0.15	0.15	0.15	0.15	0.15
Observations	5371	4890	4789	4540	4202
After 24 Months	0.104***	0.109***	0.083***	0.103***	0.098***
	(0.032)	(0.035)	(0.027)	(0.025)	(0.028)
Mean (Dep.)	0.21	0.21	0.21	0.21	0.21
Observations	4467	4075	3974	3787	3491
Individual Controls	X	X	X	X	X
Municipality FE	X	X	X	X	X
Year FE	X	X	X	X	X
Employed-to-Population	X	X	X	X	X

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The columns in Panel A contain two separate regressions and show the parameter(s) of interest (α) and the standard error(s) in parentheses. Each column in Panel B contains three separate regressions with the outcome 12, 18 and 24 months after placement and shows the parameter of interest and the standard error in parentheses. Observations with event times $t = \{-2, -1\}$ are excluded when the outcome is measured after 12 months, event times $t = \{-3, -2, -1\}$ are excluded when we measure the outcome after 18 months, and event times $t = \{-4, -3, -2, -1\}$ are excluded when we measure the outcome after 24 months. See Section 3.1. in the main text for a detailed description of each of the estimations.

4.3 Other Outcomes

Table 6 shows the impact of the policy on hours, earnings and hourly wage in month 12 for those employed in that month. Only 9 percent of the sample is employed after one year and the employment effect represents roughly half of the baseline (see Table 1 in the main text). This has two implications. First, the estimated impact on the outcomes shown in Table 6 are noisy due to the small number of observations and we are unable to detect any effect on hours, earnings or hourly wage. Second, the point estimates are small, and there are two possible explanations. Either the policy had no effect on productivity and the intensive margin of employment, or the employment effect generates composition changes in the employed that bias any potential positive impact downwards.

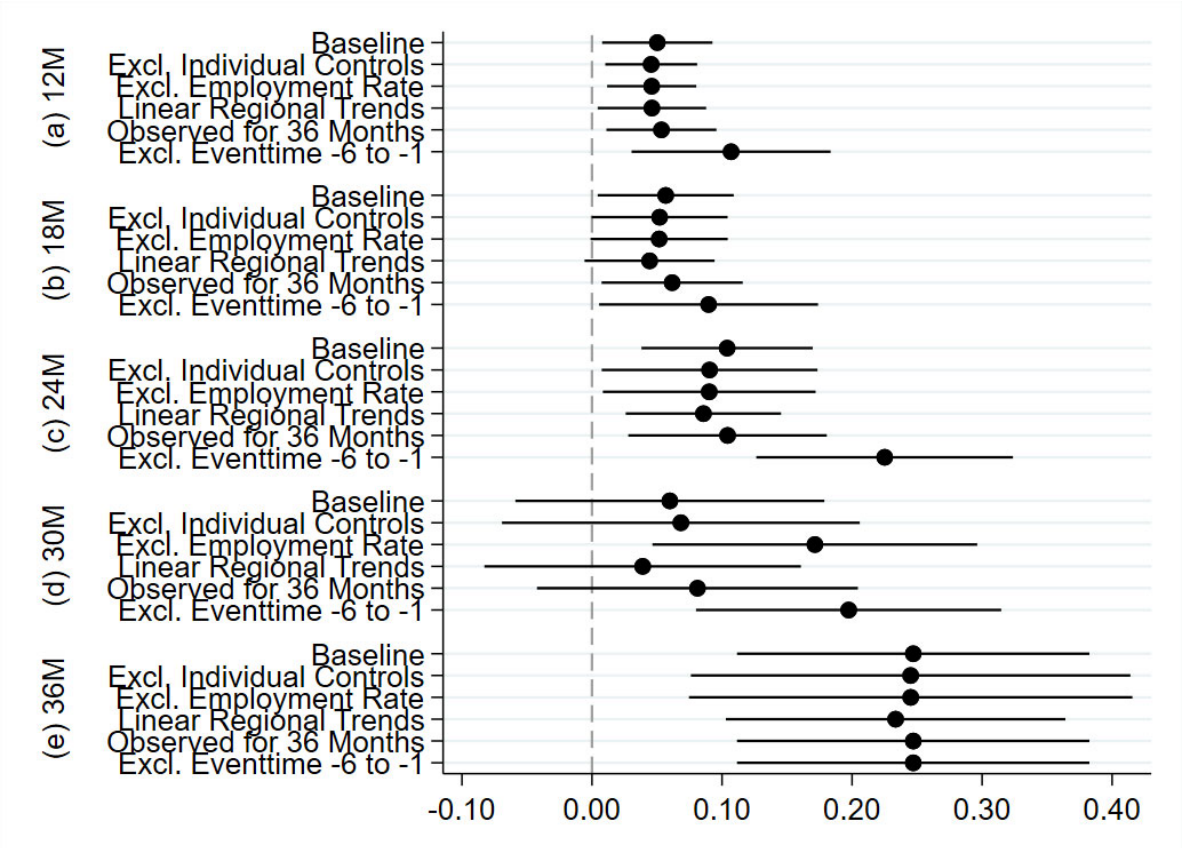
Table 6: Impact On Hours, Earnings and Hourly Wage

	Log Hours (1)	Log Income (2)	Log Hourly Wage (3)
Share of first year	0.017	0.017	-0.001
	(0.163)	(0.169)	(0.064)
$\mathbb{1}(K\_m, t = -2)$	-0.141	-0.101	-0.041
	(0.133)	(0.129)	(0.073)
$\mathbb{1}(K\_m, t = -1)$	0.021	0.114	-0.092
	(0.166)	(0.174)	(0.062)
$\mathbb{1}(K\_m, t \geq 0)$	0.043	0.022	0.021
	(0.151)	(0.150)	(0.070)
Mean (Dep.)	4.38	7.44	-3.05
Observations	745	745	745
Individual Controls	X	X	X
Municipality FE	X	X	X
Year FE	X	X	X
Employed-to-Population	X	X	X

4.4 An Extended Time Profile of Estimated Effects

Table 7 shows the impact over time. Each column is a different employment measure or unemployment, similar to Table 1 in the main text. The rows show a different specification than Table 1 in the main text. Namely, the specification comparing fully treated to untreated, excluding observations that could be partially treated before we observe the outcome. The table shows a dramatic decline in observations when the time horizon is expanded and as a consequence estimates become volatile and imprecise for the longest time horizons (30 and 36 months). The Figure 3 shows our baseline specification similar to column 1 in Table 7 and the sensitivity to alternative specifications. The estimates are not sensitive to excluding/including individual controls and also not to different specifications of the general economic conditions, as discussed in the main text. However, the smaller sample, that can be used to estimate the impact after three years, increases the point estimate, suggesting that the point estimate after three years is exaggerated. We conclude that it is not possible to estimate the impacts of the policy beyond the first two years.

Figure 3: Employment Effect Over Time



Notes: The figure shows the coefficient on $\mathbb{1}(K_{m,t} \geq 0)$ in equation (1) and the 95-percent confidence interval. Event time $K_{m,t} = -2$ and $K_{m,t} = -1$ are excluded, when the outcome is measured after 12 months, and one additional event-time parameter is excluded for each additional semester the time horizon is extended. The regressions after 3 years (36 months), therefore, exclude observations towards the end of the sample period that cannot be observed for 36 months because the panel ends and observations with event times $t = \{-6, -5, -4, -3 - 2, -1\}$.

Table 7: Impact Over Time

	Main, 4 Hours (1)	Excl. Wage subsidies (2)	80 Hours (3)	Share of Fulltime (4)	Unemployment (5)
After 12 Months	0.050**	0.028**	0.032	0.032*	-0.051*
	(0.021)	(0.012)	(0.020)	(0.018)	(0.028)
Mean (Dep.)	0.09	0.07	0.06	0.06	0.88
Observations	6359	6359	6359	6359	6359
After 18 Months	0.057**	0.020	0.054**	0.047**	-0.055
	(0.026)	(0.027)	(0.024)	(0.019)	(0.033)
Mean (Dep.)	0.15	0.11	0.10	0.10	0.82
Observations	5371	5371	5371	5371	5371
After 24 Months	0.104***	0.095***	0.081***	0.066**	-0.046
	(0.032)	(0.030)	(0.028)	(0.026)	(0.043)
Mean (Dep.)	0.21	0.17	0.15	0.14	0.74
Observations	4467	4467	4467	4467	4467
After 30 Months	0.060	0.036	0.037	0.024	-0.044
	(0.058)	(0.039)	(0.049)	(0.045)	(0.061)
Mean (Dep.)	0.24	0.21	0.17	0.17	0.68
Observations	3644	3644	3644	3644	3644
After 36 Months	0.247***	0.237***	0.180***	0.148***	-0.245***
	(0.066)	(0.051)	(0.052)	(0.051)	(0.056)
Mean (Dep.)	0.27	0.23	0.18	0.18	0.63
Observations	2973	2973	2973	2973	2973
Individual Controls	X	X	X	X	X
Municipality FE	X	X	X	X	X
Year FE	X	X	X	X	X
Employed-to-Population	X	X	X	X	X

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Each column separate regressions based on equation (1) in the main text and shows the coefficient on $\mathbb{1}(K_{m,t} \geq 0)$ and the standard error in parentheses. Event time $K_{m,t} = -2$ and $K_{m,t} = -1$ are excluded, when the outcome is measured after 12 months, and one additional event-time parameter is excluded for each additional semester the time horizon is extended. The regressions after 3 years (36 months), therefore, exclude observations towards the end of the sample period that cannot be observed for 36 months because the panel ends and observations with event times $t = \{-6, -5, -4, -3-2, -1\}$. Each column shows a different employment measure or unemployment, similar to Table 1 in the main text.

4.5 Employment Effect in Specific Industries

Table 8 first replicates the main employment effect from Tables 1 in the main text using only the observations for which we have industry of employment (column 1). Next, we use the same specification to estimate the effect on an indicator for employment in one of the targeted industries in the municipality (column 2) and in selected industries often used in the "Industry Packages" (columns 3-8). Employment in a local shortage industry explains roughly half of the overall employment effect.

Table 8: Employment Effect and Industry of Employment

	Any Employment (1)	Local Shortage Industry (2)	Retail (3)	Food/Service (4)	Cleaning (5)	Construction (6)	Care (7)	Agriculture (8)
			Panel A: *Immediate Effect*					
Share of first year	0.059**	0.033	0.009	0.014	-0.003	0.002	0.000	0.002
	(0.023)	(0.022)	(0.007)	(0.009)	(0.005)	(0.007)	(0.003)	(0.003)
Mean (Dep.)	0.09	0.05	0.01	0.02	0.01	0.00	0.01	0.00
Observations	7462	7462	7462	7462	7462	7462	7462	7462
			Panel B: *Impact over Time*					
After 12 Months	0.048*	0.025	0.010	0.007	-0.002	0.004	0.001	0.005
	(0.024)	(0.022)	(0.007)	(0.011)	(0.008)	(0.007)	(0.004)	(0.003)
Mean (Dep.)	0.09	0.05	0.01	0.02	0.01	0.00	0.01	0.00
Observations	5786	5786	5786	5786	5786	5786	5786	5786
After 18 Months	0.061*	0.013	0.008	0.010	0.001	0.003	-0.010	0.008*
	(0.030)	(0.038)	(0.011)	(0.019)	(0.012)	(0.007)	(0.008)	(0.004)
Mean (Dep.)	0.15	0.08	0.02	0.03	0.01	0.00	0.01	0.00
Observations	4890	4890	4890	4890	4890	4890	4890	4890
After 24 Months	0.096***	0.044	0.020	0.014	0.003	0.002	-0.011	0.015
	(0.032)	(0.028)	(0.019)	(0.025)	(0.008)	(0.006)	(0.010)	(0.009)
Mean (Dep.)	0.21	0.12	0.03	0.04	0.02	0.00	0.02	0.00
Observations	4075	4075	4075	4075	4075	4075	4075	4075
Individual Controls	X	X	X	X	X	X	X	X
Municipality FE	X	X	X	X	X	X	X	X
Year FE	X	X	X	X	X	X	X	X
Employed-to-Population	X	X	X	X	X	X	X	X

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses. We exclude three municipalities (Aabenraa, Gribskov, Køge) for which we could not obtain the list of targeted industries. The first column replicates the employment effect, the dependent variable in the second column is a dummy equal to one if the individual obtained employment in one of the industries of local labor shortage, and the dependent variables in the remaining columns are dummies for employment in one of the industries of typical refugee employment.

4.6 Impact on Language Acquisition

Table 9 shows estimated effects on language proficiency (column 1) and hours of language training (columns 2 and 3). We measure language proficiency based on the tests passed in the mandatory language training program. The tests can be mapped into the Common European Framework of Reference for Languages (CEFR), which organises language proficiency in six levels from A1 to C2 (coded as integers from 0 to 5). In our data we observe refugees passing tests equivalent to CEFR levels A1 to C1. The estimated coefficients in column 1 to 3 are economically small and rarely significant. Our share-specification in the first row shows that refugees arriving before and after the "Industry Package" policy was introduced are on the same CEFR level after one year (difference is -0.08 and highly insignificant). Refugees in our sample are roughly assigned 350 hours of language training in the first year, and we see no difference between treated and control in this respect. Our share specification shows that the treated are absent from 18 hours more than the control. This is small relative to the total hours assigned and not significant at conventional levels in the other specifications. Hence, we conclude that "Industry Packages" do not have economically or statistically important effects on language training or the acquired level of proficiency.

We also show that the assignment to language training tracks (columns 4 to 6) are not affected. There are three language training tracks. They progress at different pace. The initial assignment to language training tracks is based on the initial skills and language learning ability. It is, therefore, reassuring that the coefficients in column 4 to 6 are always close to zero and never significant, consistent with the assumption that individual characteristics (observed and unobserved) of the refugees did not change around implementation.

Table 9: Impact on Language Training and Language Proficiency

	Language Proficiency (1)	Hours Assigned (2)	Hours Missed (3)	Track 1 (4)	Track 2 (5)	Track 3 (6)
			Panel A: *Immediate Effect*			
Share of first year	-0.080	-3.300	17.728***	-0.029	0.022	0.007
	(0.059)	(25.004)	(6.426)	(0.032)	(0.039)	(0.017)
$\mathbb{1}(K\_m, t = -2)$	-0.083	-7.011	0.752	-0.036	0.034	0.003
	(0.050)	(12.300)	(4.314)	(0.026)	(0.026)	(0.011)
$\mathbb{1}(K\_m, t = -1)$	-0.114*	-12.540	9.791*	-0.056	0.048	0.009
	(0.055)	(13.460)	(4.545)	(0.029)	(0.034)	(0.015)
$\mathbb{1}(K\_m, t \geq 0)$	-0.062	0.050	13.763	-0.030	0.024	0.006
	(0.071)	(31.522)	(7.884)	(0.034)	(0.040)	(0.018)
Mean (Dep.)	0.61	354.72	78.64	0.42	0.51	0.07
Observations	7902	7930	7930	7590	7590	7590
			Panel B: *Impact over Time*			
12 Month	-0.071	5.947	17.124	-0.020	0.015	0.005
	(0.081)	(35.560)	(9.176)	(0.034)	(0.041)	(0.019)
Mean (Dep.)	0.62	353.85	76.02	0.42	0.50	0.07
Observations	6058	6084	6084	5810	5810	5810
18 Month	-0.093	-32.200	20.184	-0.052	0.070	-0.018
	(0.129)	(41.282)	(15.741)	(0.045)	(0.054)	(0.025)
Mean (Dep.)	1.08	541.93	125.86	0.42	0.50	0.08
Observations	5000	5024	5024	4951	4951	4951
24 Month	-0.148	-96.822	-1.758	-0.055	0.078	-0.023
	(0.166)	(50.699)	(22.861)	(0.042)	(0.050)	(0.034)
Mean (Dep.)	1.40	703.22	170.89	0.42	0.50	0.08
Observations	3897	3945	3945	4169	4169	4169
Individual Controls	X	X	X	X	X	X
Municipality FE	X	X	X	X	X	X
Year FE	X	X	X	X	X	X
Employed-to-Population	X	X	X	X	X	X

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses. Language Proficiency is the CEFR-level coded as ranging from 0 to 5 where 0 is no observed language proficiency (no modules/tests completed/passed), 1 corresponds to the lowest CEFR (A1) and 5 corresponds to the highest level observed in our data (C1). Tracks 1 to 3 refer to the first assigned Danish language training track.