Retraining at Work: Can On-the-Job Training Subsidies Prepare Firms and Workers for Disruption?

1. Objective and motivation

Denmark has historically provided generous subsidies for on-the-job training of workers. The adult vocational training program ("Arbejdsmarkedsuddannelser (AMU)") consists of around 3,000 courses targeting low and mid skilled workers to keep their skill set up to speed with globalization and new technologies. A stated goal of the program is to "solve labor market restructuring and adaptation problems in accordance with the needs on the labor market in a short and a long term perspective" (Danish Ministry of Education, 2018). Do the training subsidies deliver on this objective? Can adult vocational training help an economy adapt to disruption caused by globalization or new technologies, or are the programs merely subsidies to firms based on idiosyncratic needs and preferences? This research project will produce new evidence to inform the optimal design of retraining policies.

Previous research has shown that workers exposed to offshoring and import competition shocks suffer larger earnings losses than other workers in the Danish labor market (Hummels et al. 2013, 2014 and Ashournia et al. 2014), and Humlum (2018) shows that adoption of industrial robots in Danish firms leads to earnings losses particularly for low-skilled workers. These findings suggest that exposed workers have skills that are no longer in demand in the domestic labor market as their former tasks have been moved abroad or taken over by a robot. As a result they are likely to benefit more from retraining than other workers in the labor market.

We will use administrative micro data from Denmark, and exploit a natural experiment in the provision of on-the-job training subsidies to address two research questions. First, we will assess the causal effects of vocational training participation on workers and firms. Second, we will examine if workers hit by globalization events gain more from training than other workers.

2. Data

We have access to a unique longitudinal matched worker-firm dataset for the entire population of Danish workers and firms since 1995. We observe firm level details on worker characteristics, imported inputs and sales disaggregated by product classification and origin country. The data draws on the so-called FIDA database with links between workers and firms, the Foreign Trade Statistics, which allows us to construct measures for offshoring, Chinese import competition and automation (e.g. Hummels et al. 2014, Ashournia et al. 2017, Humlum 2018 and Munch et al. 2018) and "Kursistregisteret" holding information about all

workers participating in on-the-job training courses in Denmark including adult vocational training.

3. Methodology

In a first step, we will describe patterns in adult vocational training participation. About 420,000 Danes participated in subsidized adult vocational training in 2010, and we can answer questions such as: Who are the workers and firms that use the subsidies? Are workers exposed to disruption more likely to enroll in training? What courses do they participate in? Does the firm or the worker pay for the training?

Next, we undertake a quasi-experimental analysis using a reform of training subsidies. In February 2011, the Danish government cut the subsidies for on-the-job training significantly, and the training activity took a steep drop of 40 percent around the date of reform implementation. The reform creates quasi-experimental variation in training participation along several dimensions allowing us to shed light on the causal effects of job training subsidies. The subsidy reform generated variation in job training activity across industries and occupations. The adult vocational training program is targeted technical and manual jobs, and preliminary analysis shows that industries and occupations that used the training subsidies intensively prior to the reform also were the ones that cut back on their training activity most dramatically once the reform was implemented. The reform also introduced differential cuts in the subsidy rates for individual training courses. The subsidy rate cuts ranged from 8 to 36 percentage points, and preliminary analysis shows that it indeed was the courses with the largest subsidy rate cuts that saw the biggest drops in participation after the reform was implemented. Finally, the subsidy reform had differential effects on workers based on their attachment to the labor market, and on firms based on their subsidy application behavior.

We intend to use the variation in exposure to the subsidy reform to conduct differences-in-differences analyses of the effects of training subsidies on firms and workers in the Danish economy. In doing so we tackle the selection problem in program evaluation (participants are not randomly selected), which usually is a major challenge. The reform provides exogenous changes in training subsidies that affect workers and firms differentially as explained above.

To address the second research question about whether workers exposed to exogenous disruption events gain more from training than other workers, we follow Hummels et al. (2014), Ashournia et al. (2017) and Humlum (2018) and use detailed bilateral trade flows in world markets to construct exogenous measures for offshoring and automation for Danish firms. This allows us to compare training effects for workers hit by disruption shocks with other workers.

Our empirical approach also enables us to examine if certain types of training are particularly useful for disrupted workers. Hummels et al. (2012) provide descriptive evidence that vocational training strengthens workers' attachment to particular manufacturing jobs that are most likely to be hit by disruption shocks in the future. We can determine if relatively short vocational training programs or fundamental educational upgrading are more effective in securing future employment and earnings for exposed workers. This will potentially have important policy implications, as today's system for training heavily emphasizes vocational courses of short duration.

4. Project participants

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5. Time plan and projected outcome

The scheduled duration of the project is two years starting October 2018. The target is to publish one paper in a highly ranked economics journal. A first draft of the paper will be ready January 2020. We intend to present the paper at international conferences and we will disseminate the results to a broader Danish audience.

References

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