

Trade and the Distribution of Welfare: An Empirical Approach

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1 Motivation

Events such as Brexit and the rise of populist politicians have pushed globalization and inequality to the forefront of public policy discussions. The central question in this debate is who gains and who loses from globalization, and by how much? Addressing this question requires detailed data on international trade, individual income, and household consumption. In this project we will merge these three types of information into a unified dataset. Using this unified dataset, we will measure how international trade affects income and consumption patterns as well as welfare of Danish workers exposed to competition from abroad.

Our project is part of a burgeoning quantitative literature on the welfare effects of globalization. The first generation of this literature addressed the effects of trade on the average welfare of nations (for a review, see Costinot and Rodriguez-Clare (2014)). Recently, a number of papers have explored the consequences of globalization on inequality within nations. Our project closely relates to this empirical literature, as we examine the *distributional* gains from trade on individuals' well-being.

We break our research topic down into three interrelated pieces. On the supply side, we ask (1) What are the effects of increased international trade on wages and returns to other factors? and (2) What are the effects on output prices? On the demand side, we ask (3) What are the effects of increased trade on the welfare of individuals given changes to prices and wages? Existing bodies of literature answer each of these questions in isolation. Our project combines methods and results from these literatures to illustrate a complete picture of distributional effects of trade through both firms' behavior and households' choices. The impact of trade on factor returns, question (1), has been addressed by a literature employing worker-firm-linked micro data, and has documented that one offshoring, one type of trade shock, has adversely affect unskilled workers' wages (Autor et al., 2013; Dorn et al., 2014; Hummels et al., 2014). Another literature has employed balance sheet information to study the effect of trade on productivity and production costs, question (2)

above. For example, De Loecker and Warzynski (2012) estimate productivity of firms when they export or sell only domestically allowing markups to differ across firms and markets. A third literature devoted to measuring the effects of trade on consumption basket across income groups within countries, our question (3) above. A recent contribution by Fajgelbaum and Khandelwal (2016) employs the Almost Ideal Demand System in a gravity-type international trade model. Conceptually, trade can affect inequality through its supply side effect on factor returns, and its demand side effect on final good prices. The literature has studied these effects separately, but not yet provided a comprehensive, empirical answer to the net distributional effects of trade. Our project addresses this gap in the literature.¹ Specifically, we examine the effects of trade on wages and consumption across income distribution, using Danish consumption survey data linked with worker-firm-linked register data.

2 Data

We will use both data from the Danish register and the Danish Household Budget Survey. The Danish Household Budget Survey contains detailed information concerning the expenditures of a sample of Danish households. This information will allow us to estimate how the consumption patterns of Danish households vary with income and other characteristics. From the Danish register, we will use data from firm balance sheets, data on worker wages, occupations and other characteristics, as well as the link between workers and establishments. This data will allow us to estimate how workers are affected by trade shocks. The Department of Economics at Copenhagen Business School already has access to the register data. We must purchase the Household Budget Survey.

3 Methodology

Our goal is to estimate the overall effect of trade on workers' wages and price indices across the wage distribution. Our empirical approach consists of four steps.

¹A recent working paper Borusyak and Jaravel (2017) uses an American expenditure survey and trade data to measure the overall effects of trade on welfare including both income and expenditure effects. Without data linking workers and firms, they are unable to precisely measure income effects from trade shocks, except through the structural of their model and strong assumptions about occupational and industry mobility to infer effects by education level. Thus they are only able to identify differential effects on college and non-college educated workers, a very coarse measure of distribution. We intend to measure income effects more finely, by occupation, industry, location, and especially initial position in the income distribution using the linked worker-firm data to which we have access.

- Step 1. We follow the literature that employs non-homothetic demand systems to estimate the income elasticity of demand across goods (Engel curves). Here, the merged data is critical, because it allows us to correctly identify each worker’s income, addressing the mismeasurement issue raised by Aguiar and Blis (2015).
- Step 2. We combine reduced form approaches as in Hummels et al. (2014) as well as more structural approaches as in Borusyak and Jaravel (2017) to identify the effects of trade on workers’ income, and how these effects vary across income distribution. Here, the merged data is critical, because it allows to exploit exogenous sources of variation to construct instrumental variables.
- Step 3. We will follow De Loecker and Warzynski (2012) to estimate the effects of trade on output prices, and on Danish firms’ decisions to export versus sell domestically. Here, the merged data is also necessary in order to construct instrumental variables.
- Step 4. We combine the estimates of trade on output prices and income and the estimated Engel curves. This integrated approach will allow us to examine the overall effects of trade on consumption shares and welfare, taking into account both wage effects and the effects of trade on final good prices. The merged data is crucial because it links consumption shares across tradeable and nontradeable sectors to wages and employment status.

4 Policy Implications

A cornerstone of Danish economic policy is the commitment to globalization. Denmark is a member of the European Union, the World Trade Organization, and the Nordic Council. At the same time, an equitable society is the embodiment of Danish values and an important goal of Danish social policy. Many Danish government programs are designed to reduce inequality, such as free access to education, nationalized health care, high marginal tax rates in the top tax bracket, and extensive social assistance. Our project will help identify the winners and losers from globalization, quantify the magnitudes of these gains and losses, and show the specific channels through which trade affects the well-being of Danes, whether through the consumption of tradeable merchandise or non-tradeable services like housing and utility. The identification of these channels is a necessary step in the design of further policies to help workers who have been adversely affected by international trade. Our results will be useful for Danish policy makers who continue their efforts to ensure that

globalization benefits the many in Denmark.

5 Project Participants

The project will be carried out by

Farid Farrokhi, Assistant Professor, Purdue University

David Jinkins, Assistant Professor, Copenhagen Business School

Chong Xiang, Professor, Purdue University

All three participants have experience in empirical research in international trade. Chong Xiang has successful publication records using Danish register data; David Jinkins and Farid Farrokhi have experience in applying quantitative methods to trade models.

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