



The Public Defence

of the Doctoral Thesis in Economics

by

Franklin Okechukwu Maduko

on

Three Essays in International Trade

will be held on

Monday, December 10, 2018 at 10am

in the

Quantum 101 room,

Central European University  
Nador 15 utca, 1051 Budapest

Thesis Committee:

Botond Kőszegi (Chair)

Balázs Muraközy (External Member)

Gábor Békés (Internal Member)

Supervisor:

Miklós Koren

Examiners:

Gábor Békés, Assistant Professor at Central European University  
(Internal Examiner)

Harald Fadinger, Professor of International Economics at University  
of Mannheim  
(External Examiner)

The doctoral thesis is available for inspection at the CEU Economics  
and Business Department

## Abstract

This thesis consists of three single-authored chapters. Each chapter employs theoretical and empirical approaches to investigate a different aspect of the effect of trade policies on the economy. In the first two chapters, I focus on Hungarian manufacturing firms, and in the third chapter, I focus on US product-level exports to 119 countries.

In the first chapter, I study the effects of import competition faced by Hungarian manufacturing firms during the period 1996-2003 on their efficiency. I start by arguing that existing methods of estimating productivity cannot be applied in my setting. So, I proposed a new framework for estimating physical productivity and study the effects of import competition on productivity of firms.

In the second chapter, I challenge the conventional assumption of production with a constant marginal cost using matched manufacturing firm-product-destination dataset from Hungary. I show that when a firm faces an exogenous export demand shock, the firm scales down its domestic sales in order to increase its exports and this effect persists even after taking longer differences of exports and domestic sales, suggesting the presence of production capacity constraints. To investigate whether this finding is innocuous for welfare, I introduce an increasing marginal cost structure in a traditional trade model and show a new channel for welfare losses from trade liberalization.

In the third chapter, I study the relationship between an improvement in intellectual property rights (IPR) in a country and the industry exports it receives from the US using product-level panel datasets of US exports to 119 countries during the period 1989-2006. I show both theoretically and empirically that an improvement in patent laws is associated with an increase in US exports, and industry-level product life-cycle length determines the sensitivity of US exports to IPR reforms.

### **Chapter 1: Quality-Adjusted Productivity and The Effect of Trade Liberalization on Productivity**

In this chapter, I study the effects of the reduction in import tariffs charged on EU imports in Hungary during the periods (1996-2003) on the efficiency of Hungarian manufacturing firms. Since, I do not observe firm-level output quantity, I propose a

structural framework that enables me estimate quantity productivity from revenue data. This framework involves integrating the demand systems faced by a firm in both the foreign and domestic markets with the firm's production function, and by this, I derive a new structural estimable equation that estimates quantity productivity. Using a matched firm-product level datasets and product tariffs, and applying the structural methodology, I find that a 10-percentage point reduction in average tariffs faced by a firm raises firm level quantity productivity by 0.97 percent and revenue productivity by 2.1 percent. This large differences between revenue and quantity productivity implies that revenue productivity overstates the effects of trade liberalization and calls for re-evaluations of numerous studies that have attributed large efficiency gains to trade liberalization. In addition, I offer a more general framework that can be easily applied in estimating firm-level physical productivity from revenue data when firms sell in both domestic and export markets.

## **Chapter 2: Increasing Marginal Cost and Welfare Implications**

In this chapter, I use a matched firm-product-destination dataset for manufacturing firms in Hungary and exploit the exogenous variations in the foreign demand addressed to a firm using an instrumental variable approach and a structural methodology to study the relationship between a firm's domestic and foreign sales while controlling for the firm's supply determinants. I find that a 10 percent exogenous increase in foreign sales leads to approximately 1.6 percent decrease in domestic sales. This finding suggests the presence of an increasing marginal cost of production, contrary to the assumption of constant marginal costs in most trade models. To shed some lights on the implications of our findings for aggregate welfare, I introduce an increasing marginal cost technology into a traditional trade model, and show that liberalizing trade results to a new channel of reductions in potential welfare gains not accounted for in previous studies. Thus, it implies that constant marginal cost assumption in trade models is not innocuous. As increasing marginal costs is a consequence of capacity constraints at the firm level (Ahn and McQuoid 2016), the findings provide support for concurrent policies that reduces trade barriers and eases capacity constraints in order to ensure the full realization of gains from trade.

### **Chapter 3: Exports and Intellectual Property Policies: Does Product Life-Cycle Length Matter?**

In this chapter, I ask the following questions: How does US exports in high technology sector react to a change in intellectual property rights (IPR) reforms in destination countries? What determines the industry sensitivity of exports to IPR reforms? To answer these questions, I build a partial equilibrium model where a profit maximizing firm in the North has acquired patents on its output and then, decides when and which countries to export. Countries are heterogeneous in their level of IPR regulation, imitation risk and economic size. The firm faces a trade-off between market expansion and market power. By exporting to all countries, the firm increases its sales and profit but faces the risk of imitation on its output which robs it of its market power. The model predicts that: strengthening IPR laws in countries in the South leads to increased exports especially in sectors with relatively longer product life-cycle length. However, this relationship is non-monotonic as products in sectors at the topmost distribution of product life-cycle length are less sensitive to stricter IPR reforms compare to sectors at the median. I use yearly panel datasets (1989-2006) consisting of US product-destination information, country-level IPR index and cross-sectional product life-cycle length data to test the predictions of the model. I find our empirical results is consistent with the predictions of the model. The results point to the importance of IPR policies in determining sectoral patterns of trade flows between countries.

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## Education

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2013 - Present	Central European University PhD Candidate in Economics
2017 - 2018	Visiting Graduate Scholar Anderson School of Management, University of California Los Angeles (UCLA) – invited by Professor Nico Voigtlander
2012 - 2013	Université Catholique de Louvain MSc (research) in Economics: Econometrics
2011 - 2013	Université Paris I, Pantheon-Sorbonne MSc Applied Mathematics to Economics and Finance
2003 - 2008	Federal University of Technology Owerri, Nigeria BTech Mathematics and Computer Science

## Current Position

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06/2018- Present	Junior Researcher, EU Horizon 2020 RESPECT Project Central European University (CEU)
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## Previous Research Experience and Other Employment

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04/2017 – 09/2017	Research Assistant to Prof Istvan Konya, Centre for Economic and Regional Studies - Hungarian Academy of Sciences. Project: Interest Premium and Net Balances: Data collection, organization, and empirical analysis.
05/2015 – 04/2017	Mentor, Milestone Educational Consultancy, Budapest
03/2011 – 08/2011	Executive Assistant Operational Risk at Zenith Bank PLC, Lagos
09/2010 – 02/2011	Market Specialist at BrandClinic, Lagos Nigeria
08/2009 – 07/2010	Market Analyst (intern) at EMTS (Etisalat Nigeria), Lagos

## Teaching Experience

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2017 - 2018	Teaching Assistant at the School of Public Policy (SPP), CEU. Delivered seminars in Economic Analysis for Policy for MA Public policy and MPA students
2015 - 2017	Tutor, Roma Graduate Preparation Program (RGPP), CEU. Delivered Lectures in Introductory Macro, Micro and Empirical Economics

2016 - 2017	Tutor, Open Learning Initiative (OLive), CEU. Delivered Lectures in Introductory Economics
2015 - 2016	Tutor, Milestone Institute Budapest. Delivered seminars in introduction to economics, and introductory mathematics for economics
2014 - 2016	Teaching Assistant at Economics Department, CEU: Delivered seminars in Macroeconomics, Microeconomics, and Mathematics Pre-session for MA students
2009 - 2009	IT Trainer, Raybam Institute Lagos. Delivered lectures in Oracle SQL, and Oracle Database 10G

### **Working Papers**

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Quality-Adjusted Productivity and The Effect of Trade Liberalization on Productivity (2018)  
 Increasing Marginal Cost and Welfare Implications (2018)  
 Exports and Intellectual Property Policies: Does Product Life-Cycle Length Matter? (2018)  
 Interest Premium and External Position: A Time Varying Approach (2018) – joint with Istvan Konya

### **Work-in-Progress**

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A Model of GDP and GNI Trade-offs in an Economy with Financial Frictions (2016)

### **Honors, Awards and Fellowship**

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Write-up Grant (2018), Central European University  
 Doctoral Research Support Grant to UCLA (2017), CEU Foundation  
 Summer School Grant (2016), CEU Foundation  
 French Embassy Nigeria Fellowship (2011)

### **Presentations and Summer Schools**

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2017	UCLA Anderson Finance PhD Seminar (November), CEU Economics Department, Brownbag Seminar (September) Summer School in Economics at Oxford University (June)
2016	CEU Economics Ph.D. Jamboree (September) Summer School in Trade Policy with Structural Gravity Model (August) at Kiel Institute of World Economy, Kiel Germany.

### **Skills**

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Software	STATA, MATLAB, R, Python, Mathematica, Latex
Language	English (Fluent), French (Intermediate), Igbo (Native)