



The Public Defense
of the Doctoral Thesis in Economics
by

Péter Harasztosi

on

Essays on agglomeration economics and trade

will be held on

Wednesday, Dec 16, 2013 at 14:00 am

in the

Monument Building, Senate room of CEU

Central European University

Nádor Street 9, Budapest

Thesis Committee:

László Mátyás (Chair)

Álmos Telegdy (Internal member)

Sergei Lychagin (Internal member)

László Paizs (External member)

Áron Horváth (External member)

Examiners:

Pamina Koenig, Professor of Economics, University of Rouen and Paris School of Economics

(External Examiner)

Almos Telegdy, Recurrent Visiting Associate Professor at the CEU and Senior Research Associate of
the Institute of Economics of the Hungarian Academy of Sciences

(Internal Examiner)

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

Abstract

The thesis consists of four papers on Hungarian trading firms. Chapter 1 is a descriptive study portraying the trade behavior of Hungarian firms from 1992-2003. It confirms stylized facts emerged from recent international literature. Chapter 2 investigates the heterogeneous response of traders to agglomeration economics and argues that externalities that determine density premium for firms will be affected by the firms' involvement in trade. Results imply that the elasticity of agglomeration on productivity is much larger for traders than for non-traders. Given that firms' trade participation is endogenous to firm performance, various treatment methods are offered to solve this endogeneity issue. Key results are robust and well above the gap suggested by simple self-selection models. Chapter 3 investigates the effect of agglomeration economies on exporting activity. Evidence suggests that exporting activity exhibits spillovers and, that corresponding benefits are country and product specific. In addition, export spillovers exhibit considerable heterogeneity. Foreign-owned firms benefit from peers generally, domestic firms only from the agglomeration of domestic exporters. Chapter 4 tracks the adoption of imported machinery over time and space in Hungary. It investigates the effects of peers on the firms' decision to import foreign machines and finds that the probability of importing sector specific machinery is positively affected by the presence of local prior importers of the same machine.

Firms and Products in International Trade: Data and Patterns for Hungary

joint with Gábor Békés and Balázs Muraközy

Published in: Economic Systems Vol. 35. No. 1. 2011. 4-24.

Chapter 1 is aimed at introducing the key features of the data as well as basic description of the most important patterns of international trade and establishing stylized facts on heterogeneous trading firms in Hungary. The descriptions give additional insight on Hungarian trade with respect to previous efforts in three dimensions, (i) it includes import behavior, (ii) the analysis includes the service sector that is the main actor in aggregate imports, (iii) and includes analysis of the changes in the structure of partner countries.

The dataset is compiled with the purpose of investigating international trade at the firm level. Balance sheet and customs information for the period 1992-2003 are merged with a firm-product-country panel of manufacturing trade observations. The chapter is to provide descriptive statistics on this comprehensive dataset focusing on international trade related phenomena: prevalence of trading activity, concentration of trade volume within and across sectors and over space. Furthermore, basic inference about the variety of trading partner countries and product categories is provided.

The chapter offers the following insights to trade behavior of Hungarian firms. Only a small share of firms participates in international trade; in Hungary less than third of the manufacturing firms export and about third import. Trade volume is concentrated; the largest five percent of traders in are responsible for more than eighty percent of the export and import volume. Hungarian trading firms are different than non trading firms along a number of dimensions. Traders are more productive, employ more than three times as many workers as non-traders, pay higher wage and are more capital intensive. When assessing trade related heterogeneity across firms importing activity is as well as important to take into consideration as exporting. Though, a large number of firms sell only a single product or just to a single country, most of Hungarian trade is carried out by multi-product firms trading with many countries. Hungarian trade is concentrated spatially around the capital Budapest and for the benefit of the western regions.

Agglomeration Premium and Trading Activity of Firms

joint with Gábor Békés

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Chapter 2 looks at how firm heterogeneity - in terms of participation in international trade - affects the measurement of agglomeration elasticity. While participation in foreign markets is closely related to productivity, we will argue that trade status itself matters. We do not model macro-heterogeneity (just control for it) but focus on how the absorption of local externalities is enhanced by the firms' trade status. In other words, we will take a reduced form equation of firm productivity and agglomeration, and investigate if the agglomeration elasticity for trading firms is greater than for non-traders. International traders might benefit more from agglomeration due to a different set of externalities enjoyed by traders or a better utilization of externalities available for all firms.

We investigate the role of firms' international trade status in explaining heterogeneity in terms of agglomeration elasticity using firm level, location specific data from Hungary for the 1992-2003 period. In a pooled OLS model, we find a general agglomeration elasticity of 4-5 percent and for firms engaged in international trade having an additional productivity advantage of 2 percent. Moreover, looking at separate samples, while trading firms do indeed benefit from density, it is uncertain if non-trading firms gain at all. To address biases arising from firms' location selection, we use historical instruments of population density.

As the trade literature argues, while a part of the productivity premium of traders might be obtained after they enter foreign markets by learning, a growing body of empirical evidence suggests that bigger and better firms self-select into trader status. Indeed, it is possible that precisely the more productive firms become traders and when weighing up the different behavior of traders versus non-traders, we merely quantify the different reactions of more productive versus less productive firms in line with theories on absorptive capacity.

Given that we focus on firms' trade participation, which is endogenous to firm performance, an important task of the paper is to offer some treatment of this endogeneity issue. We will apply three methods to treat this problem. First, we will increase the comparability of samples of non-trading and trading firms by a matching process. Second, we offer a placebo treatment exercise to attend to the endogeneity of trading status and find that only 25 percent of the original difference is related to simple productivity differences. Finally, to absorb any time invariant heterogeneity (e.g. related to management capacity leading to superior performance) at the firm level, we use firm fixed effects. Furthermore, to test robustness of results from other angles, we add spatial lags, extend results for the number of firms instead of density, and consider the impact of large or multi-site firms. All these methods confirm our results.

Export spillovers in Hungary

Chapter 3 investigates the existence and scope of local spillovers generated by exporting firms to facilitate export entry of firms. It asks whether firms are more likely to enter foreign markets when there are more trading firms in their vicinity. To answer these questions, the approach developed by Koenig et al. (2010)¹ is applied to examine the export behavior of Hungarian manufacturers from 1993 to 2003, whose location and trade activity is known at the product and country level.

The contribution of the chapter is twofold. First, it examines spillovers on new very detailed dataset on firms' export activity, where location information is available at the municipality level. Second, the paper offers investigations into the heterogeneity of the spillover effect with respect to country and firm characteristics.

Results show a positive effect of local peers on export entry and also that these spillovers are rather specific to destination country and product. I find that spillovers are stronger when peers export the same product. An additional peer that exports to the same country increases the entry probability by 0.3 per cents. An additional local peer exporting the same product to the same county increased entry probability by 3.2 percents.

Results suggest that industry specific spillovers, such as sharing or matching play an important role in agglomeration benefits. General knowledge or experience about trade with a destination country has to be specific to the targeted product market.

Examining the heterogeneity of spillovers reveals that spillovers differ significantly with respect to the composition of the peers and the characteristics of the firm who enjoys the benefit. First, with respect to ownership, I find that while foreign-owned firms benefit from peers generally, domestic firms do not appear to benefit from more foreign peers only more domestic ones. State-owned firms do not seem to generate any spillover effect. Second, larger firms benefit relatively more from export-agglomerations and also firms in less dense location, where an additional peer is more values. Third, the strength of spillover depends inversely on the destination country's gravity characteristics. Spillovers matter more for distant countries and for countries for smaller markets.

¹ Koenig, P., Mayneris, F., Poncet, S., 2010. Local export spillovers in France. *European Economic Review* 54 (4), 622–641

Machine imports, technology adoption and local agglomeration

Chapter 4 looks at the extent to which locally accumulated knowledge of machine imports affect new adoptions. I ask whether the previous machine imports by local firms encourage other firms to also invest in the same specific machinery. I assume that the more firms in the location have imported a machine, the easier it is for another firm to be informed about the advantages and the specifics of certain innovations. It will be able to learn more easily whether a machine fits firms' expectations about adaptability and profitability. In addition, if the machine is available from many countries, firms learn whether it is worth substituting a machine from one country with one from another. If these learning channels are at work, I hypothesize that in the absence of peers a firm would be less inclined to import a given machine or it would import it much later. Also, the firms' country choice for a machine would not differ across regions.

To answer these questions, I compile a dataset that matches machine level import observations to Hungarian manufacturing firms for 1992-2003. The period provides several advantages. First, the share of foreign machinery investment of manufacturing firms is over 60 percent in all machine investments. The period starts with Hungary's early transition years, prior to which foreign machinery was not generally available to domestic firms. Possibly, every machine imported in the early 1990's can be regarded as technologically more modern and more advanced than previously installed machinery.

I find that the presence of an additional previous importer of a specific machine in the same location increases the probability of a firm importing the same machine by about eight per cent. In addition to the decision on importing machinery, I investigate which country the machine is chosen to be imported from. The results show that firms tend to import a particular machine from the country which was chosen by the prior importers. At the same time, I find a negative relationship when other firms have imported the same machine from a different country. The positive effect from peers diminishes over distance. All results stay robust after controlling for location-specific and location-sector-specific unobserved heterogeneity and location-specific business cycles.

To better understand the sources and the nature of the spillovers I investigate the heterogeneity of the peer effect depending on the characteristics of the peer and the benefiting firms. Results reveal that non-exporters and exporters are benefiting more from firms who serve the same respective foreign or domestic markets. Also, investigations with respect to the size of the firm and the unit price of the machinery reveal that smaller firms benefit from larger firms' import of non-expensive machinery. The larger firms, at the same time, benefit more from the non-cheap imports of larger firms. Finally, results reveal that domestic firms benefit mostly from other domestic firms and not from foreign-owned firms.

CURRICULUM VITAE

PÉTER HARASZTOSI

**Department of Economics, Central European University
11 Nádor St.
Budapest 1051, Hungary**

Nationality: Hungarian
Birth date: 1980. May 21.
Birth place: Szolnok, Hungary
Contact: harasztosi@gmail.com

Studies

2006 – Central European University, Phd Studies in Economics
2004 – 2006 Central European University, Economics MA
1999 – 2004 College for social theories (TEK)
1998 – 2004 Budapesti Közgazdaságtudományi Egyetem (Corvinus), Economics
- Major: Economic Policy, Minor: Actuary
- Erasmus semester at UFSIA, Antwerpen

Work experience

2011 – Magyar Nemzeti Bank (Central Bank), Analyst
2010 – 2010 Fiscal Council of Hungary, Economist
2007 – 2009 Hungarian Academy of Sciences- Institute of Economics - Assistant
2005 Ministry of Finance (summer internship)
2003 – 2004 Hungarian Parliament's Fiscal Committee, Assistant

Publications

- Agglomeration Premium and Trading Activity of Firms (joint with Gábor Békés), in *Regional Science and Urban Economics*, Elsevier, vol. 43(1), pages 51-64. 2012.
- Opportunities and Challenges – the Impact of Chinese Competition on Hungarian Manufacturing, - joint with Ágnes Csermely and Gábor Pellényi. In. *European Integration In A Global Economy: CESEE and the Impact of China and Russia*. Eds (Nowotny, Mooslechner and Ritzberger-Grünwald). Edward Elgar Publishing. 2012.
- Firms and products in international trade: Evidence from Hungary (joint with Balázs Muraközy and Gábor Békés), *Economic Systems* Vol. 35. No. 1. 2011. 4-24.

Working papers

- Foreign currency borrowing and growth. The case of Hungary (joint with Mariann Endrész) MNB Working Papers 2012 forthcoming
- Productivity and labour cost: heterogeneity at firm-level (Joint with László Halpern) unpublished manuscript
- Corporate sector currency mismatch in Hungary (joint with Mariann Endrész) MNB Bulletin, 2013 may.
- Currency mismatch and the sub-prime crisis: firm-level stylized facts from Hungary (joint with Mariann Endrész, Győző Gyöngyösi) MNB Working Papers 2012/8
- Tax credit, exports and regional disparity: micro-evidence from Hungary - IEHAS: joint with Gábor Békés, Aug 2012, EFIGE working papers
- Growth in Hungary 1994-2008: The role of capital, labour, productivity and reallocation. MNB Working papers 12, 2011.
- Cities never forget: A spatially robust estimation of the local agglomeration premium (Joint with Békés Gábor), Micro-Dyn WP 2/2011.

Working papers (*In Hungarian*)

- A foglalkoztatás bővítésének lehetőségei Magyarországon (joint with Viktória Gerner) 2010. KTT Műhelytanulmány