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Essays on international trade, firms' innovation and productivity

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Nota biográfica

Armando Mendes Jorge Nogueira da Silva nasceu no Porto a 16 de Maio de 1962. Realizou os seus estudos secundários na escola Manuel Laranjeira em Espinho. Licenciou-se em Economia pela Faculdade de Economia do Porto (FEP) em 1985, tendo-se tornado assistente estagiário da FEP em Outubro desse ano. Leccionou na FEP, a tempo parcial, até Setembro de 1996 com a categoria de assistente. Entre 1990 e 1993 também desempenhou funções docentes na Universidade Lusíada do Porto e na Universidade Portucalense. Em Maio de 1996 conclui o mestrado em Economia na FEP.

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Sumário

A presente tese centra-se no estudo do papel que o envolvimento das empresas portuguesas no comércio internacional pode ter para a respectiva capacidade inovadora e de melhoria de produtividade. O principal objectivo desta tese é o de contribuir para o esforço de clarificação, notório na literatura científica microeconómica nos últimos dez anos, acerca do nexo de causalidade entre o comércio internacional, por um lado, e a produtividade e inovação, por outro lado. Estudando empresas portuguesas entre 1996 e 2003, os resultados obtidos são importantes para o referido propósito de clarificação.

Após um capítulo introdutório, a tese compreende mais cinco capítulos.

No segundo capítulo desta tese apresentamos uma revisão de literatura sobre a hipótese de que as empresas aprendem através das suas exportações bem como sobre conceitos relacionados, como é o caso do tema da selecção das empresas para a actividade exportadora. Nesse sentido, apresentamos os principais estudos existentes, salientando as metodologias usadas e as principais conclusões de uma década de investigação sobre este assunto.

No terceiro capítulo usamos dados do quarto Inquérito Comunitário à Inovação para Portugal e testamos a hipótese segundo a qual as empresas portuguesas mais inovadoras são as exportadoras e as filiais ou subsidiárias de empresas multinacionais estrangeiras. Através da estimação de várias Funções de Produção de Tecnologia, obtivemos resultados que sugerem a confirmação de tal hipótese.

No quarto capítulo produzimos uma derivação simples do capítulo anterior para testar, em ligação com a internacionalização das empresas, o papel da Gestão dos Recursos Humanos sobre a aptidão inovadora das firmas portuguesas. Os resultados obtidos provam a importância dessa gestão para a capacidade inovadora das empresas.

No quinto capítulo utilizamos dados económico-financeiros e sobre o comércio internacional da mais ampla amostra disponível de empresas portuguesas (1996-2003) visando avaliar a importância, a concentração e o papel do comércio internacional sobre o desempenho global das empresas e em especial sobre a sua produtividade. Uma forte correlação foi detectada entre essas variáveis.

No sexto capítulo, usando a mesma base de dados e utilizando sobretudo técnicas de Matching e estimadores de diferenças às diferenças, confirmamos, em termos globais para as empresas portuguesas, quer a hipótese da selecção das melhoras empresas para os mercados exportadores, quer a hipótese da aprendizagem através das exportações.

Summary

The present thesis focuses on the role of international trade engagement for Portuguese firms' ability to innovate and to increase productivity. Through this research we intend to contribute to the effort of clarification, which has span the literature over the last ten years, about the causality nexus between trade, on the one side, and productivity and innovation, on the other side. By taking into consideration the Portuguese case between 1996 and 2003, we consider that the outcomes of our work are important for the referred clarification.

After an introductory chapter, the thesis comprises more five chapters.

In the second chapter we review the literature on learning by exporting argument and connected issues as self-selection to exports. We present the existing studies, the methodologies used and the main conclusions of a decade of investigation on this issue, which relates firms' efficiency and their respective international trade involvement.

In the third chapter, we use data on the fourth Community Innovation Survey for Portugal and we test the hypothesis that most innovative Portuguese firms are exporters and affiliates/subsidiaries of foreign multinationals. By estimating several Knowledge Production Functions, we obtained results that suggest the validity of such hypothesis.

In the fourth chapter, we produce a simple derivation of the previous chapter in order to test both the role of Human Resources Management and of internationalization for the innovativeness of Portuguese firms. We found the role of personnel training highly significant for the innovative process of Portuguese firms.

In the fifth chapter, we use economic, financial and international trade data for a large sample of Portuguese firms with the aim of confirm the importance, concentration and role of international trade for the performance of firms. A strong correlation is observed across these variables.

In the sixth chapter, using the same dataset as before and mainly Matching techniques and difference in differences estimators we confirm the learning by exporting hypothesis for Portuguese firms in the period 1996-2003. Moreover, the self selection hypothesis is also validated.

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List of abbreviations

ATT	Average Treatment effect on the Treated
BP	Breusch-Pagan test
CAE	Código de Actividade Económica – sectoral classification of business activities
CI	Capital Intensity
CIA	Conditional Independence Assumption
CIS	Community Innovation Surveys
CSA	Common Support Assumption
DC	Difficult Countries
DID	Differences in Differences
DOM	Domestic firms
Dsmall	Small Firms
E_EU	Exports only to European Union
E_EU+ODev	Exports only to EU and ODev
E_EU+PL	Exports only to EU and PL
E_Multiple	Exports to all other possible combinations of markets
E_NDev	Exports only to Non-Developed countries
E_Odev	Exports only to other Developed countries
E_PL	Exports only to PL countries
E_SPA	Exports only to Spain
ECE	Estatísticas do Comércio Externo - external-trade information
EU	European Union
EUROSTAT	European Statistical Office of the European Union
EXP	Exporters
FDI	Foreign Direct Investment
FE	Fixed-Effects models
FF	Fearless Firms
Forcap	Foreign share of Capital
GM	Global Multinationals
GMM	General Method of Moments

GPS	Generalised Propensity Score
Gr 1	Group 1
Gr 2	Group 2
Gr 3	Group 3
Gr 4	Group 4
Gr 5	Group 5
HHS	Health, Hygiene and Security in work
HMG	Home-market Growth
HR	Human Resources
HRM	Human Resources Management
I_Dev	Imports only from ODev countries
I_EU	Imports only from EU countries
I_Ger	Imports only from Germany
I_Multiple	Imports from other possible combinations of countries
I_NDev	Imports from NDev countries
I_PL	Imports only from PL countries
IAE	Inquérito Anual às Empresas – annual balance-sheet information
IM	Internal Multinationals
Imp	firm Imports
ImpMac	firm Imports Machines
IND	Industry Resources
INE	Portuguese National Statistics Institute
IPPOM	Innovation on Product, Process, Organization and Marketing
ISGEP	International Study Group on Exports and Productivity
K	knowledge stock
KPF	Knowledge Production Function
LBD	Learning-by-Doing
LBE	Learning-by-Exporting
LBI	Learning-by-Importing
LCR	Labour Costs Reductions by unit of goods produced or services provided
LIBE	Learning-to-Innovate-by-Exporting
ln	logarithm
LP	Labour Productivity
NACE	Statistical Classification of Economic Activities in the European Community
NCE	Number of Countries where Exports are sold

NCI	Number of countries from where Imports are bought
NDev	Non Developed countries
NSE	Number of products / Sectors Exported
NSI	Number of products / Sectors Imported
NT	Non-Traders
OCES	Observatório da Ciência e do Ensino Superior
ODev	Other Developed countries
OE	firms Only Exporting
OECD	Organization for Economic Co-Operation and Development
OI	firms Only Importing
OLS	Ordinary Least Squares
PL	Portuguese speaking countries
Post_CA	post-entry period for starters in Comparative Advantage (CA) sectors
Post_CD	post-entry period for starters in Comparative Disadvantage sectors (CD)
PSE	Productivity Spillovers by Exporting
PSM-DID	Propensity Score Matching with Differences in Differences estimators
R&D	Research and Development
RI	Internal Resources
Skill	firm that has Skilled production employees
SS	Self-Selection
TFP	Total Factor Productivity
TWT	Two-Way Traders
U.S.	United States of America
UK	United Kingdom
ULC	Labour Cost per unit of sales (ULC)
XMG	Export-Market Growth