TRADE AND ECONOMIC DEVELOPMENT:
EVIDENCE FROM LESS DEVELOPED COUNTRIES

a thesis
by
Ngoc Thien Anh Pham

submitted in partial fulfillment of the requirements
for the degree of
Doctor of Philosophy

April, 2016
Contents

List of Tables iv

List of Figures vi

Abstract viii

Acknowledgements xi

Declaration xii

Chapter 1: Introduction 1

References 5

Chapter 2: Child Mortality in the LDCs: The Role of Trade, Institutions and Environmental Quality 6

Statement of Contributions 7

Abstract 8

1 Introduction 9

1.1 Relation to the Literature 11

1.2 The Organization of the Paper 14

2 Data 14

2.1 Baltic Dry Index Based Instrument 15

2.2 Health 19

2.3 Political System 21

2.4 Trade and the Environment 22

3 Methodology 22

3.1 Estimation Issues 24
Chapter 3: Trade Cost and Economic Development: Evidence from Landlocked Developing Countries

Statement of Contributions

Abstract

1 Introduction

2 Data and Variables

2.1 Development Indicators

2.2 Trade and Harpex Cost

3 The Model

3.1 Estimation Issues

4 Results

5 Trade Cost, Trade, and Economic Development

6 Conclusion

References

Appendix B

Chapter 4: Exports and Urbanization: Evidence from Sub-Saharan African Countries

Statement of Contributions

Abstract

1 Introduction
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Data and Variables</td>
<td>98</td>
</tr>
<tr>
<td>2.1</td>
<td>Data on Exports</td>
<td>98</td>
</tr>
<tr>
<td>2.2</td>
<td>Data on Urbanization</td>
<td>99</td>
</tr>
<tr>
<td>2.3</td>
<td>Data on Urban Development</td>
<td>100</td>
</tr>
<tr>
<td>2.4</td>
<td>Data on Sectoral Production</td>
<td>101</td>
</tr>
<tr>
<td>2.5</td>
<td>A Measure of Export Cost</td>
<td>102</td>
</tr>
<tr>
<td>3</td>
<td>Methodology</td>
<td>104</td>
</tr>
<tr>
<td>3.1</td>
<td>Estimation Issues</td>
<td>104</td>
</tr>
<tr>
<td>4</td>
<td>Results</td>
<td>111</td>
</tr>
<tr>
<td>4.1</td>
<td>Standard Estimates and the CCE Approach</td>
<td>111</td>
</tr>
<tr>
<td>4.2</td>
<td>Baseline Results - the IV-CCE Approach</td>
<td>112</td>
</tr>
<tr>
<td>4.3</td>
<td>Robustness checks</td>
<td>116</td>
</tr>
<tr>
<td>5</td>
<td>Do Exports promote Urban Development?</td>
<td>123</td>
</tr>
<tr>
<td>6</td>
<td>Do Exports affect Economic Structure?</td>
<td>128</td>
</tr>
<tr>
<td>7</td>
<td>Conclusion</td>
<td>133</td>
</tr>
<tr>
<td></td>
<td>References</td>
<td>134</td>
</tr>
<tr>
<td></td>
<td>Appendix C</td>
<td>139</td>
</tr>
</tbody>
</table>

**Chapter 5: Concluding Remarks** 145
List of Tables

Chapter 2: Child Mortality in the LDCs: The Role of Trade, Institutions and Environmental Quality 6

Table 1: OLS Regression of Trade on Child Mortality 26
Table 2: IV Regression of Trade on Child Mortality 27
Table 3: IV Regression of Trade on Child Mortality (Autocracies and Democracies) 28
Table 4: Robustness Check 1: Using Commodity Price Index as Instrument for Trade 33
Table 5: Robustness Check 2: Trade, Infant Mortality and Life Expectancy (Autocracies Only) 34
Table 6: Robustness Check 3: Additional Control Variables (Autocracies Only) 36
Table 7: Trade and Pollution (Autocracies Only) 39
Table 8: Pollution, Child Mortality, Infant Mortality and Life Expectancy (Autocracies Only) 41
Table A1: Summary Statistics 48
Table A2: List of Variables, Definitions and Sources 49

Chapter 3: Trade Cost and Economic Development: Evidence from Landlocked Developing Countries 50

Table 1: Trade Cost, GDP and Night Lights 69
Table 2: Trade Cost and Health 74
Table 3: Robustness Check: Additional Country-Level Control Variables 75
Table 4: Trade Cost, Trade and Economic Development 80
Chapter 4: Exports and Urbanization: Evidence from Sub-Saharan African Countries

Table 1: Exports and Urbanization - Standard Fixed Effects and CCE approaches

Table 2: BDI Cost, Exports and Urbanization

Table 3: Robustness Check 1: Control for Income levels

Table 4: Robustness Check 2: Control for Urban bias

Table 5: Exports and the Growth of Primate Cities

Table 6: Exports, Urban Infrastructure and the Urban-Rural Infrastructure Gap

Table 7: Exports and Sectoral total Production

Table 8: Exports and Sectoral Employment

Table 9: Exports and Sectoral Productivity

Table 10: Sectoral total Production and Urbanization

Table 11: Sectoral Productivity and Urbanization

Table C1: Summary Statistics

Table C2: List of Variables, Definitions and Sources

Table C3: Economic factors and Urban-rural Infrastructure Gap in Water Accessibility

Table C4: Economic factors and Urban-rural Infrastructure gap in Sanitation Facilities

Table C5: Exports and Sectoral Female Employment Share

Table C6: Sectoral Female Employment Share and Urbanization
# List of Figures

## Chapter 2: Child Mortality in the LDCs: The Role of Trade, Institutions and Environmental Quality

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The Baltic Dry Index</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>The BDI Growth and Trade Growth for a Sample of LDCs</td>
<td>17</td>
</tr>
<tr>
<td>3</td>
<td>The BDI Growth and Trade Growth of China</td>
<td>19</td>
</tr>
<tr>
<td>4</td>
<td>The (Absolute) Average BDI Elasticity of Child Mortality for a Sample of Autocratic LDCs</td>
<td>31</td>
</tr>
<tr>
<td>5</td>
<td>The Proposed Causal Chain of Trade, Environment and Health</td>
<td>37</td>
</tr>
</tbody>
</table>

## Chapter 3: Trade Cost and Economic Development: Evidence from Landlocked Developing Countries

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The Harpex Index</td>
<td>61</td>
</tr>
<tr>
<td>2</td>
<td>Trade in the LLDCs, China and the US</td>
<td>64</td>
</tr>
<tr>
<td>3</td>
<td>The Harpex Index Growth and Trade Growth for a Sample of LLDCs</td>
<td>65</td>
</tr>
<tr>
<td>4</td>
<td>The Harpex Index Growth and Trade Growth of the LLDCs, Brazil, Canada, China and the US</td>
<td>66</td>
</tr>
<tr>
<td>5</td>
<td>The (Absolute) Elasticity of GDP per capita with respect to the Harpex Index for each LLDC</td>
<td>72</td>
</tr>
<tr>
<td>6</td>
<td>The (Absolute) Elasticity of Night Lights per capita with respect to the Harpex Index for each LLDC</td>
<td>73</td>
</tr>
</tbody>
</table>
Chapter 4: Exports and Urbanization: Evidence from Sub-Saharan African Countries

| Figure 1: The Baltic Dry Index | 89 |
| Figure 2: The BDI Growth and Trade Growth of a Sample of SSAs | 103 |
| Figure 3: The BDI Growth and Trade Growth of China | 108 |
| Figure 4: The (Absolute) BDI Semi-Elasticity of Urbanization for each SSA | 109 |
|                                                                 | 116 |
Improving living standards is a key priority for both policymakers and researchers. While trade is positively associated with income levels, finding evidence on the causal effect that trade may have on living standards is a challenge because decisions on whether to trade and how much to trade are not random. This thesis offers evidence on the extent to which trade activities can affect economic development in three groups of less developed countries: least developed countries (LDCs), landlocked developing countries (LLDCs), and Sub-Saharan African countries (SSAs).

First, the thesis investigates if a reduction in child mortality can be achieved by increasing trade in 48 LDCs between 1995 and 2012, and whether this effect depends on a country’s type of political regime, namely, democracy or autocracy. While trade empirically promotes income levels, whether the benefits of trade activities do trickle down to ordinary citizens is questionable and may be influenced by political institutions. The thesis adopts an instrumental variable approach in a panel country and year fixed effects model to deal with unobserved factors and reverse causality. To do so, the thesis employs a known trade cost indicator that exploits information of bulk dry shipping costs captured by the Baltic Dry Index (BDI). The thesis finds that regardless of political regimes, there is no evidence that under-5 child mortality rate responds to trade arising from a cheaper shipping cost. Indeed, in autocratic LDCs, trade could even cause the child mortality rate to rise. To explore why this is the case, the thesis investigates the effect that trade might have on the environment. Evidently, trade could increase pollution, and this subsequent increase in pollution...
in turn relates to an increase in child mortality.

Second, the thesis investigates the effect of trade cost on economic development in 31 LLDCs between 2001 and 2012. Lacking direct sea access, the LLDCs have expensive trade costs for shipping goods, which is considered a major reason for the LLDCs’ underdevelopment. Given that the LLDCs may rely on container freight for trade because of the long distances over land, the thesis proposes a new measurement of trade cost by exploiting information from the Harpex index, an international container shipping rate. The thesis employs a recent advancement in panel data estimation - the interactive fixed effect which has the ability to deal with a large class of unobserved confounding information. Consequently, a reduction in trade cost is found to benefit the LLDCs substantially, in such was as higher income levels and better health conditions. The thesis also finds that a trade elasticity of income is roughly 1 for the LLDCs, which is about five times that estimated for the world as a whole, suggesting that trade can be a powerful force for the LLDCs progress.

Finally, the thesis investigates the effect of exports on urbanization in 48 SSAs between 1985 and 2012. As a feature of development, the high rate of urbanization may reflect improvements in living standards in the SSAs. Finding factors contributory to determining urbanization is important to the SSAs, that are among the worlds poorest countries and home to 13% of the worlds population. The thesis adopts a novel estimator, the correlated common effects (CCE) estimator, which employs interactive fixed effects to handle a large class of omitted and potentially confounding variables and cross-sectional dependence. The thesis uses a known instrumental variable for exports, the BDI cost, which is relevant to the SSAs to address the possibility of reverse causality. An expansion in exports is found to increase the urbanization rate, expand the size of primate cities and reduce income levels of these cities. The thesis also finds that an increase in exports can improve the accessibility of water and sanitation facilities for urban residents, but at a cost of expanding an urban-rural gap in water access and sanitation facilities. To explain how exports can
affect urbanization, the thesis examines the effect of exports on shaping a country’s production in agriculture, manufacturing and services. Evidently, higher exports could expand the size of the services sector, which in turn relates to the urbanization process in the SSAs.
Acknowledgements

I am specially grateful to my principal supervisor, Dr. Nicholas C.S. Sim, for his generosity to share his research interest on trade and development, to my co-supervisor, Dr. Firmin Doko Tchatoka, for his wisdom on instrumental variables regression, and to my external supervisor, Professor Zudi Lu, for his prompt response to my technical issues. Without their inspiring guidance, continuous support and endless encouragement, finishing this thesis would be impossible.

I would like to thank Dr. Stephanie McWhinnie, Dr. Jacob Wong, Dr. Nadezhda V. Baryshnikova, Dr. Terence C. Cheng, Dr. Florian Ploeckl, Associate Professor Mandar Oak, Professor Ralph Bayer and Professor Binh Tran-Nam for their enlightening research conversations and advice. My special thanks go to Jonie Chang, an ISC advisor, for her support to my self-development, and to my fellow ISC peer mentors for their warm and supportive friendship. My appreciation also goes to all staff and my fellow postgraduate students at School of Economics for their constant support. I gratefully acknowledge financial support from the University of Adelaide.

Finally, I would like to express my debt to my family members for their endless love and encouragement.
Declaration

I, Ngoc T.A. Pham, certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name, in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission in my name, for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree.

I give consent to this copy of my thesis when deposited in the University Library, being made available for loan and photocopying, subject to the provisions of the Copyright Act 1968.

The author acknowledges that copyright of published works contained within this thesis resides with the copyright holder(s) of those works.

I also give permission for the digital version of my thesis to be made available on the web, via the University’s digital research repository, the Library Search and also through web search engines, unless permission has been granted by the University to restrict access for a period of time.

SIGNED: ..................... DATE: .....................