AN EMPIRICAL ANALYSIS OF GLOBAL AGRICULTURAL PRICE DISTORTING POLICIES: 1960 TO 2007

Johanna Louise Croser
B.Ec (Hons), M.Ec, LLB (Hons)

A thesis submitted for the degree of

Doctor of Philosophy in

The School of Economics of

The University of Adelaide

September 2010

[blank page]

Table of Contents

[blank page]

Abstract

Economists have long been interested in measuring the extent, effects and causes of agricultural price and trade policies. The topic has drawn attention because agricultural trade between countries has almost never been free, and yet it is widely accepted that trade policy distortions affect the incentives of producers and consumers and cause a redistribution of resource use in the economy.

Traditional aggregations of agricultural price and trade distortions can be poor guides to the economic effects of agricultural price and trade policies. Measures without theoretical foundation — such as simple- or trade-weighted average price distortions — may introduce biases in analysis. Recent decades have seen improvements in aggregation theory in the form of scalar index numbers of the trade- and welfare-reducing effects of price and trade policies. Despite the new theory, however, analysts have continued to use less satisfactory measures in practice.

This thesis calculates partial-equilibrium versions of trade restrictiveness indices from the Anderson-Neary family of indices for agricultural policy distortions in 75 developed and developing countries over a period 1960 to 2007. The data for the empirical work are from the recently released World Bank Distortions to Agricultural Incentives database.

The thesis calculates indices at the country level for the sample countries. Two partial-equilibrium indices are calculated — a Trade Reduction Index (TRI) and a Welfare Reduction Index (WRI).[1] The TRI (WRI) is the uniform trade tax that yields the same loss in trade volume (welfare) as the structure of disaggregated distortions. The results of the country-level estimates show that standard weighted averages of price distortions understate the extent of global distortion from agricultural policies. One manuscript of the thesis focuses in particular on the trade restrictiveness of agricultural policy in Sub-Sahara Africa, and finds that weighted averages greatly understate the extent of regional distortion from agricultural policy by netting out offsetting distortions in exportable and import-competing sectors.

The thesis also calculates indices of agricultural policy distortions for individual commodity markets. Whereas all previous work within the trade restrictiveness indices literature has focused on constructing index numbers of distortions from the perspective of a single country, this thesis proposes taking a global view instead for individual commodity markets. Indices are estimated for 28 key agricultural commodities. Generally, the indices are well above weighted-averages of price distortions. The most distorted global markets are the milk, sugar and rice markets.

The thesis also employs the Anderson-Neary framework to consider the trade- and welfare-reducing effect of individual policy instruments. The aim of the work is to determine the relative contributions of different policy instruments to reductions in global trade and welfare over time and across countries. The most significant result empirically

[1] The definition of the acronym TRI in this thesis is different to that used by Anderson and Neary and several others who have adopted their definition.

is the importance of export taxes pre-1990s and their substantial contribution to the fall in global trade- and welfare-restrictiveness of agricultural policy over the past two decades.

Finally, the thesis examines the extent to which the Protection for Sale Model (PFS) of Grossman and Helpman (1994) holds for agricultural sectors at different stages of development. The test uses a new methodology proposed by Imai, Katayama and Krishna (2008). The Distortions to Agricultural Incentives dataset is used for the analysis. The PFS model is estimated in a cross-country setting, which allows for examination of the role of different government institutional factors in PFS framework.

Declaration

This work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution to Johanna Louise Croser 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.

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 work contained within the thesis (as listed below) resides with the copyright holders of those works.

- Lloyd, P.J., J.L. Croser and K. Anderson (2010), 'Global Distortions to Agricultural Markets: New Indicators of Trade and Welfare Impacts, 1960 to 2007' *Review of Development Economics* 14(2) (May 2010), pp. 141–160.

- Croser, J.L., P.J. Lloyd and K. Anderson (2010), 'How Do Agricultural Policy Restrictions on Global Trade and Welfare Differ Across Commodities?' *American Journal of Agricultural Economics* 92(3) (April 2010), pp. 698–712.

I 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 catalogue, the Australasian Digital Theses Program (ADTP) and also through web search engines, unless permission has been granted by the University to restrict access for a period of time.

Signed:

Date: 6 September 2010

[blank page]

Acknowledgments

This thesis is part of a larger project on the evolution of distortions to agricultural incentives caused by price, trade and exchange rate policies in a large sample of counties (see www.worldbank.org/agdistortions). The project was implemented under the leadership and guidance of my principal supervisor, Professor Kym Anderson. I would like to acknowledge and sincerely thank Professor Anderson for the opportunity to work on and contribute to this project. Without him, this thesis would not have been possible. I am extremely grateful for his generous and insightful advice and assistance throughout the writing of the thesis. I am also grateful for his willingness to work as a co-author on three of the manuscripts in this thesis. I acknowledge funding from World Bank Trust Funds provided by the governments of the Netherlands (BNPP) and the United Kingdom (DfID), and from the Australian Research Council, which were made possible through my involvement in the project.

Dr Ernesto Valenzuela, my co-supervisor, provided insightful and helpful advice throughout the writing of this thesis. I benefited greatly from his feedback and comments, and willingness to answer questions. I am grateful for his assistance with data management.

Professor Peter Lloyd, my co-author on two papers, provided guidance and invaluable feedback on the first two manuscripts of the thesis, for which I am very grateful.

I thank the School of Economics, University of Adelaide for employment opportunities and resources over the past three years. I particularly thank Head of School, Professor Christopher Findlay, for his administrative support towards the time of thesis submission.

I am indebted to the Department of Economics, University of British Columbia, for PhD coursework and instruction in 2005–2007. The rigorous coursework at UBC provided a strong foundation to undertake the research in this thesis. I acknowledge financial support from the University of British Columbia and the Reginald & Annie Van Fellowship funds.

I am grateful to several people who commented on drafts of manuscripts in this thesis at various stages over the past 18 months. I thank Professor Jonathan Pincus for his comments on the first two manuscripts. I thank two anonymous referees for their comments on manuscript 1; and two anonymous referees and the editor of the American Journal of Agricultural Economics for their comments on manuscript 2, all of which significantly improved the quality of the work herein. I thank participants at the Australian Conference of Economists, Adelaide, September 2009, for comments and questions on the first three manuscripts. For detailed comments on manuscript five, I am grateful to Dr Alessandra Olper. I thank the examiners of this thesis for useful comments and suggestions (which have been incorporated into this final work).

On a personal note, several people were instrumental in the completion of this thesis. I owe sincere thanks to my parents for their support and encouragement over a number of years. My heartfelt thanks to Kate and Sandy for exceptional support and many meals. Thanks to Emily and Adam for support from afar. My deepest gratitude to Sarah, who

provided many hours of personal support in the last year of writing this thesis. And thanks to Nick, who keeps me grounded, reminds me of the need for a balance between work and life and encourages me to look forward in life.

Finally, a big thanks to my wonderful friends at the School of Economics — Signe Nelgen especially, and Claire Hollweg, Suraya Abdul Halim and Stephanie Schulte — without whom I would not have survived the many hours writing, analysis and data work needed to complete this thesis.

Structure of thesis

This thesis is composed of a portfolio of five manuscripts.

The first two manuscripts are joint papers that have been published. Manuscript 1 was published in the *Review of Development Economics* in May 2010. Manuscript 2 was published in the *American Journal of Agricultural Economics* in April 2010. Manuscripts 1 and 2 are on the measurement of the trade- and welfare-effects of policy distortions using scalar index numbers from the Anderson-Neary family of indices.

The third manuscript is single author work on the measurement of the trade- and welfare-effects of policy distortions using scalar index numbers for individual policy instruments. The single author manuscript presented in this thesis was converted to a joint paper with Professor Kym Anderson, which is forthcoming in the Journal of World Trade, October 2010, volume 44(5).

The fourth manuscript is a joint paper that was submitted for publication to a journal in March 2010. The paper is a regional case study of the trade- and welfare-reducing effects of agricultural price and trade policy in Africa over the period 1961 to 2004.

The fifth manuscript is a single author work on the political economy of agricultural trade policy. It is currently being revised for submission to a journal.

Each manuscript is a stand-alone piece of work with self-contained references, tables and figures.

The thesis has a series of appendices, some of which provide tables and figures that were omitted from the published manuscripts to meet publication page-limits.

[blank page]

Statements of Contributions

Statement of Authorship

Global Distortions to Agricultural Markets:
New Indicators of Trade and Welfare Impacts, 1960 to 2007
Published in the *Review of Development Economics*, May 2010

Johanna Louise Croser

Contributed to methodology, performed empirical analysis of the data, interpreted results and wrote manuscript (Contribution: 50%)

Certification that the statement of contribution is accurate:

Signed ....[redacted].....Date.....30 May 2010.....

Peter J. Lloyd

Contributed methodology and editing of manuscript (Contribution: 40%)

Certification that the statement of contribution is accurate and permission is given for the inclusion of the paper in the thesis:

Signed ....[redacted].....Date.....25 May 2010.....

Kym Anderson

Contributed to planning of article, provided critical evaluation and editing of manuscript (Contribution: 10%)

Certification that the statement of contribution is accurate and permission is given for the inclusion of the paper in the thesis:

Signed .[redacted].....Date.....27 May 2010.....

[blank page]

Statement of Authorship

How Do Agricultural Policy Restrictions on Global
Trade and Welfare Differ across Commodities?
Published in the *American Journal of Agricultural Economics*, April 2010

Johanna Louise Croser

Contributed methodology, performed empirical analysis of the data, interpreted results and wrote manuscript (Contribution: 70%)

Certification that the statement of contribution is accurate:

Signed .....[redacted].....Date 30 May 2010

Peter J. Lloyd

Contributed to planning of article, provided critical evaluation and editing of manuscript (Contribution: 20%)

Certification that the statement of contribution is accurate and permission is given for the inclusion of the paper in the thesis:

Signed .....[redacted].....Date 25 May 2010

Kym Anderson

Contributed to planning of article, provided critical evaluation and editing of manuscript (Contribution: 10%)

Certification that the statement of contribution is accurate and permission is given for the inclusion of the paper in the thesis:

Signed .[redacted].....Date 27 May 2010

[blank page]

Statement of Authorship

Agricultural Distortions in Sub-Saharan Africa:
Trade and Welfare Indicators, 1961 to 2004
Submitted to a journal, March 2010

Johanna Louise Croser (Candidate)

Contributed to conceptualization of article, performed empirical analysis of the data, interpreted results and wrote manuscript (Contribution 67%)

Certification that the statement of contribution is accurate:

Signed ..... [redacted] ..... Date 23/5/2010

Kym Anderson

Planning and conceptualization of article, provided critical evaluation and editing of manuscript (Contribution 33%)

Certification that the statement of contribution is accurate and permission is given for the inclusion of the paper in the thesis:

Signed .... [redacted] ..... Date 27 May 2010

[blank page]