

**DISTORTIONS TO AGRICULTURAL MARKETS:  
TRENDS AND FLUCTUATIONS, 1955 TO 2010**

Signe Nelgen

A thesis submitted for the degree of

Doctor of Philosophy in

The School of Economics of

The University of Adelaide

July 2012



# Table of Contents

<b>ABSTRACT.....</b>	<b>V</b>
<b>DECLARATION .....</b>	<b>VII</b>
<b>ACKNOWLEDGMENTS .....</b>	<b>IX</b>
<b>STRUCTURE OF THESIS.....</b>	<b>XI</b>
<b>STATEMENTS OF CONTRIBUTIONS .....</b>	<b>XIII</b>
<b>CONTEXTUAL STATEMENT .....</b>	<b>3</b>
<b>CHAPTER 1: INDICATORS OF DISTORTIONS TO AGRICULTURAL MARKETS: REVISIONS, EXPANSIONS AND UPDATES TO 2010 OF A GLOBAL DATABASE.....</b>	<b>9</b>
A. INTRODUCTION.....	11
B. SUMMARY OF METHODOLOGY FOR ESTIMATING DISTORTIONS TO AGRICULTURAL MARKETS	20
C. LONG-RUN TRENDS IN NATIONAL DISTORTIONS TO AGRICULTURAL MARKETS.....	24
D. SHORT-RUN FLUCTUATIONS IN NATIONAL DISTORTIONS TO AGRICULTURAL MARKETS .....	34
REFERENCES.....	42
<b>CHAPTER 2: TRADE BARRIER VOLATILITY AND AGRICULTURAL PRICE STABILIZATION .....</b>	<b>45</b>
ABSTRACT .....	46
A. INTRODUCTION.....	47
B. IMPACTS OF TRADE RESTRICTION RESPONSES TO INTERNATIONAL FOOD MARKET SHOCKS .....	52
C. EMPIRICAL EVIDENCE.....	55
D. POLICY IMPLICATIONS.....	84
REFERENCES.....	90
<b>CHAPTER 3: HOW MUCH DO TRADE RESTRICTIONS RESPONSES CONTRIBUTE TO INTERNATIONAL PRICE SPIKES?.....</b>	<b>95</b>
ABSTRACT .....	96
A. INTRODUCTION.....	97
B. POLITICAL ECONOMY CAUSES OF DOMESTIC MARKET INSULATION .....	99
C. ECONOMIC EFFECTS OF DOMESTIC MARKET INSULATION .....	100
D. EVIDENCE OF FOOD MARKET INSULATION FROM WORLD PRICE FLUCTUATIONS .....	108
E. HOW MUCH DO NRA CHANGES CONTRIBUTE TO UPWARD PRICE SPIKES?.....	124
F. HOW MUCH DID DOMESTIC GRAIN PRICES RISE RELATIVE TO INTERNATIONAL PRICES?.....	128
G. SUMMARY OF RESULTS AND IMPLICATIONS FOR POLICY .....	130
REFERENCES.....	136
<b>CHAPTER 4: TRADE POLICY FOR LOSS AVERSION: EVIDENCE FROM AGRICULTURE.....</b>	<b>141</b>
ABSTRACT .....	142
A. INTRODUCTION.....	143
B. POLITICAL ECONOMY THEORY.....	146
C. THE AGRICULTURAL PRICE DISTORTIONS DATASET .....	150
D. EMPIRICAL EVIDENCE FOR AGRICULTURE .....	153
E. LESSONS AND POLICY IMPLICATIONS .....	168
REFERENCES.....	172

<b>CHAPTER 5: WHAT'S THE APPROPRIATE AGRICULTURAL PROTECTION COUNTERFACTUAL FOR TRADE ANALYSIS?.....</b>	<b>177</b>
ABSTRACT .....	178
A. INTRODUCTION.....	179
B. HISTORY OF DISTORTIONS TO AGRICULTURAL INCENTIVES GLOBALLY .....	181
C. INDICATORS OF PRICE DISTORTIONS .....	184
D. SECTORAL DISTORTION DIFFERENCES ACROSS COUNTRIES.....	187
E. WHAT DETERMINES THE EVOLUTION OF NRAS OVER TIME? .....	194
F. PROJECTING DEVELOPING COUNTRY NRAS FROM 2004 TO 2030 .....	199
G. PROJECTING THE COST OF TRADE-DISTORTING POLICIES AS OF 2030.....	206
H. POLICY IMPLICATIONS.....	211
REFERENCES.....	214
<b>FUTURE DIRECTIONS .....</b>	<b>221</b>
<b>APPENDICES .....</b>	<b>223</b>
APPENDIX A: DISTORTIONS REVISION, EXPANSION AND UPDATE TO 2010 .....	225
APPENDIX B: PRICE TRANSMISSION ELASTICITIES.....	247
APPENDIX C: STABILITY MEASURES OF DOMESTIC PRODUCER AND BORDER PRICES.....	279
APPENDIX D: GLOBAL AND NATIONAL WRI AND TRI ESTIMATES.....	285
APPENDIX E: BOX PLOT DISTRIBUTIONS OF NRAS .....	299
<b>ALL REFERENCES CITED IN THESIS .....</b>	<b>303</b>

## **Abstract**

The thesis analyses the patterns and underlying political economy causes of long-run trends and short-run fluctuations in national distortions to agricultural incentives. It does so by exploiting, revising and expanding a dataset of agricultural distortion measures in developing and developed countries from 1955 to 2004 for developing and 2007 for high-income countries by Anderson and Valenzuela (2008). More specifically, it extends its time period to 2009 for developing countries and 2010 for high-income countries.

An essential contribution of the thesis is the update of this database to 2010 in order to capture the most recent international food price spike period. The large dataset makes it possible to analyse insulating behaviour in agricultural markets historically over the past 55 years, and to compare governments' reactions to food market shocks and upwards and downwards price spikes in the most recent years vis-a-vis those in the past.

The thesis examines the extent of domestic market insulating behaviour of governments by both food-exporting and food-importing countries. This is because the policies of both country groups contribute substantially to international food price volatility and therefore to economic instability and to trade and welfare fluctuations. The international-to-domestic food price transmission elasticity is used as one indicator of such policy action. The evidence also allows us to test to what extent the policy decisions of governments achieve the goal of protecting domestic producers or consumers from international price spikes in either direction. The results of the analysis are subdivided into the contribution of different regions, country groups and policy instruments.

The study also quantifies the extent of the contribution of changes in national agricultural trade restrictions to food price spikes internationally, over and above to the initial exogenous price shock. Reactions of food-exporting and food-importing countries at the same time exacerbate price spikes in international food prices and therefore are a concern for all trading nations because of their nontrivial contribution to domestic and international volatility and uncertainty.

To test empirically the political economy causes of such market insulating behaviour of governments, the loss aversion theory of Freund and Oezden (2008), with amendments by Jean, Laborde and Martin (2010) to ensure suitability for agricultural markets, is drawn upon. The focus of this part of the thesis is on the question as to why countries alter assistance levels through variations in trade restrictions to protect one domestic group at the cost to others within the nation, rather than more-direct, more-efficient domestic policy instruments to protect either producers or consumers from price spikes.

The final part of the thesis focuses on potential future developments in agricultural market distortions and provides an alternative agricultural protection counterfactual for trade policy modelling than the status quo. After identifying the crucial influencing factors on agricultural distortions in the past, projections of assistance measures are provided for the year 2030. These projections make it possible to model an alternative scenario of the costs based on newly estimated political econometric equations of trade-distorting policies in the future, to compare with one that assumes no future policy changes in their baseline.

## 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 Signe Nelgen 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.

- Anderson, K. and S. Nelgen (2010), 'How do Governments respond to food price spikes? Lessons from the past', *Journal of International Commerce, Economics and Policy* 1(02): 265-285.
- Anderson, K. and S. Nelgen (2011), 'What's the Appropriate Protection Counterfactual for Trade Analysis', *Unfinished Business? The WTO's Doha Agenda*.
- Anderson, K. and S. Nelgen (2012), 'Trade Barrier Volatility and Agricultural Price Stabilization', *World Development* 40(1): 36-48, January.
- Anderson, K. and S. Nelgen (2012), Updated National and Global Estimates of Distortions to Agricultural Incentives, 1955 to 2010, Database uploaded in March 2012 at [www.worldbank.org/agdistortions](http://www.worldbank.org/agdistortions).
- Anderson, K. and S. Nelgen (2012), 'Agricultural Trade Distortions During the Global Financial Crisis', *Oxford Review of Economic Policy* (forthcoming).

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: 16 July 2012





## Acknowledgments

This thesis would not have been possible without the support given by several people and organizations. On the financial side, I am grateful for support from the Australian Research Council, the World Bank, the School of Economics, as well as the University of Adelaide for the support provided by Adelaide Scholarships International. My sincere acknowledgement goes to Professor Kym Anderson for helpful advice, comments and good guidance throughout the past three years, and for the opportunity to work as a co-author on several papers. I am grateful also for discussion with my co-supervisor, Richard Promfred, and to Suraya Abdul Halim for comments on drafts of several chapters and constant encouragement during the development of this thesis.

On a personal note, a big thanks also to my friends at the School of Economics, Johanna Croser, Claire Hollweg, Lachlan Deer and Stefanie Schulte. I am also grateful for having shared the experience of the last three years with Jayanthi Thennakoon, who so often reminded me of deadlines for administrative matters. Thanks also to Rachael Anderson for encouraging me over coffees through the hours worked at home on the weekends.

Last but not least, I would like to thank my family, Gitta, Rüdiger and Anke Nelgen for the support and encouragement over a number of years, and Dr. Fritz Struth for his influence on my development as an economist. A special thanks also to Paul Mason for his support, for his persistent confidence in me, and the many nice home cooked meals throughout the thesis completion.



## Structure of thesis

This thesis contains five chapters, which are stand-alone pieces, with self-contained references, tables and figures.

The first chapter gives an overview of empirical estimates of indicators of policy distortions to agricultural markets in the past, and of the revisions and updates to previous estimates that were estimated as part of this thesis (and which are detailed in Appendix A).

Chapter 2 and chapter 3 are based around the issue of price instability and trade barrier responses by governments to it. Chapter 2 is built upon a combination of two published papers: a preliminary analysis is published in the *Journal of International Commerce, Economics and Policy* in December 2010 and a subsequent analysis is published in the *World Development* in January 2012. Chapter 3 is forthcoming in a special issue of the *Oxford Review of Economic Policy* on altered protectionism during the recent financial crisis.

The fourth chapter has profited by comments given at its presentation at the Econometric Society Australasian Meeting (ESAM) in Adelaide (4-8 July 2011). Since then I have added empirical evidence for the loss aversion theory.

The fifth chapter focuses on the future pattern of distortions and has been published as a book chapter in the 2011 book edited by Will Martin and Aaditya Mattoo with the title *Unfinished Business? The WTO's Doha Agenda*.

The Appendices contain more detailed tables that are not included in the chapters and/or publications. They provide the interested reader with underlying data to some of the tables and figures in the chapters. Appendix A also explains the

methodology and provides some key data from the updated, expanded and revised dataset of the agricultural distortion database that was previously made publicly available by Anderson and Valenzuela (2008). The full updated, revised and expanded database will be made available to the public from March 2012 via the website [www.worldbank.org/agdistortions](http://www.worldbank.org/agdistortions).

## **Statements of Contributions**



## Statement of Authorship

Chapter 2: 'Trade Barrier Volatility and Agricultural Price Stabilization',

(Revision of a paper published in *World Development*

40(1): 36-48, January 2012).

### **Signe Nelgen (Candidate)**

Contributed to 60 %

Certification that the statement of contribution is accurate:

Signed .....Date.....

### **Kym Anderson**

Contributed to 40 %

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

Signed .....Date.....





## Statement of Authorship

Chapter 3: 'How Much Do Trade Restrictions Responses Contribute to  
International Price Spikes?'

(Revision of a paper forthcoming in a special issue of the *Oxford Review of  
Economic Policy*, on protectionism during the recent financial crisis).

### **Signe Nelgen (Candidate)**

Contributed to 60 %

Certification that the statement of contribution is accurate:

Signed .....Date.....

### **Kym Anderson**

Contributed to 40 %

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

Signed .....Date.....



## Statement of Authorship

Chapter 4: 'Trade Policy for Loss Aversion: Evidence from Agriculture'

(Revision of a paper presented at the Econometric Society Australasian Meeting (ESAM) in Adelaide, 4-8 July 2011).

### **Signe Nelgen (Candidate)**

Contributed to 75 %

Certification that the statement of contribution is accurate:

Signed .....Date.....

### **Kym Anderson**

Contributed to 25 %

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

Signed .....Date.....



## Statement of Authorship

Chapter 5: 'What's the Appropriate Agricultural Protection Counterfactual for Trade Analysis?'

(Revision of a paper published as chapter 13 (pp. 325-54) in '*Unfinished Business? The WTO's Doha Agenda*' edited by Will Martin and Aaditya Mattoo (2011), London: Centre for Economic Policy Research and the World Bank, November 2011).

### **Signe Nelgen (Candidate)**

Contributed to [...] 60 %

Certification that the statement of contribution is accurate:

Signed .....Date.....

### **Kym Anderson**

Contributed to 40 %

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

Signed .....Date.....



## Statement of Authorship

Appendix A: Distortions Revision, Expansion and Update to 2010'

(To be uploaded at [www.worldbank.org/agdistortions](http://www.worldbank.org/agdistortions))

### **Signe Nelgen (Candidate)**

Contributed to 90 % to the revision, expansion and update of Anderson and Valenzuela (2008)

Certification that the statement of contribution is accurate:

Signed .....Date.....

### **Kym Anderson**

Contributed to 10 % to the revision, expansion and update of Anderson and Valenzuela (2008)

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

Signed .....Date.....

