



**Export Premium, Productivity, Trade Openness and
Wage Inequality in China: Empirical Evidence from
Firm-Level Data**

Faqin Lin

School of Economics

THESIS

Submitted to the University of Adelaide in
Partial Fulfilment of the Requirements for the Degree of
Doctor of Philosophy in Economics

September 2012

Contents

Abstract	III
Declaration.....	VI
Acknowledgments.....	VII
1 Introduction.....	1
1.1 Background	1
1.2 Broad literature	4
1.3 Research questions	6
1.4 Outline.....	7
2 Literature review	10
2.1 Literature relating to exports and productivity at the firm level	10
2.1.1 Theory, hypothesis and empirics.....	10
2.1.2 Methodology issues	16
2.2 Literature relating to heterogeneous export premium at different export destinations.....	19
2.3 Literature relating to wage inequality and trade openness at the firm level.....	21
2.4 Summary	25
3 The export premium in China: An empirical investigation using firm-level data ..	29
3.1 Introduction.....	29
3.2 Data description and firms' characteristics	31
3.3 Export premium in China.....	39
3.4 Export premium at the disaggregated data level.....	47
3.5 Concluding remarks	50
4 Exporting and productivity in China: Self-selection and learning by exporting	53
4.1 Introduction	53
4.2 Estimating firm productivity.....	54
4.3 Self-selection and learning by exporting	60
4.3.1 Self-selection effect.....	61

4.3.2	The learning-by-exporting effect	64
4.4	The learning-by-exporting effect by matching econometrics	71
4.5	Concluding remarks	79
5	Heterogeneous export premium: Inter-county, interprovincial and international..	81
5.1	Introduction	81
5.2	Data and private firms.....	82
5.3	Export premiums by destinations	87
5.3.1	Preliminary results	87
5.3.2	Regression analysis	88
5.3.3	Multiple levels of trade	95
5.4	Matching econometrics as a robustness check.....	100
5.5	Concluding remarks	106
6	Wage inequality and international trade: evidence from China	109
6.1	Introduction.....	109
6.2	Empirical strategy	111
6.2.1	General approach	112
6.2.2	Wage inequality and trade openness indexes	113
6.3	Trade openness on wage inequality	120
6.3.1	Benchmark results.....	120
6.3.2	Endogeneity	123
6.4	Concluding remarks	128
7	Conclusion	130
7.1	Summary.....	130
7.2	Policy applications	134
	Appendix A: List of Abbreviations	136
	Appendix B: List of Tables	137
	Appendix C: List of Figures	139
	Bibliography.....	140

Abstract

This thesis uses Chinese firm-level data to investigate the relationships between the export premium, firm productivity and wage inequality. Using Chinese annual survey data for all state-owned firms and other non-state-owned firms with sales on mainland China over 5 million RMB, the author finds that there is a series of premiums for exporters compared with non-exporters and on average, exporters are more productive (based on 1999-2003 data). Firms with relatively high export values will also be relatively more productive. Quantile results show that the premium decreases with the increase of the quantile. In addition, the export premium declines over time and across the industries, provinces and ownership types, and the higher the export intensity, the lower the export premium.

The thesis further investigates the question: what determines the export premium – the selection effect or learning-by-exporting effect? First, the author uses the Olley and Pakes (1996) method to control both selection and simultaneity bias to estimate the reliable firm productivity. Then the author tests the self-selection and learning-by-exporting effects both parametrically and non-parametrically. The author finds both strong self-selection and learning-by-exporting effects at the aggregate level. The higher the productivity the firm has today, the easier for the firm to export tomorrow. The learning-by-exporting effect is the most significant in the second year after exporting. However, at the more disaggregated level, no significant learning effect is found within sectors and within middle and western provinces. A significant

learning effect is found in eastern provinces. The learning-by-exporting effect across different ownership types is not robust to different testing methods.

In addition, the author uses Chinese privately-owned firm-level survey data to investigate the heterogeneous export premium associated with different levels of trade. Firms engaged in international trade have higher premiums than firms which trade only across province borders. Firms which trade across province borders have higher premiums than firms that only trade within their province. Furthermore, export premium deviation between international trade and interprovincial trade is much smaller compared with the export premium deviation between interprovincial trade and inter-county trade. This finding implies that compared with the inter-county premium, the premium at interprovincial level is similar to the premium at the international level (though the former is actually less than the latter). The export premium caused by the self-selection effect can reflect the trade cost and it tells that trading goods across provincial borders within China is as onerous as crossing national borders.

The next question to consider is whether engaging in international trade causes the wage inequality between firms to increase? To find out the answer, the author adopts an estimation strategy to study the effect of international trade on wage inequality in two steps. First the Chinese annual survey firm-level data is used to calculate the wage inequality indexes—Gini and Theil of each province; as well as two dimensions of trade openness—intensive margin and extensive margin of each province. Thereafter the panel data is used to study the impacts of trade margins on

wage inequality between provinces. The results show that the variation of trade openness itself can explain nearly 70 percent of variation of wage inequality across China's provinces and the extensive margin has a larger impact on increasing wage inequality than the intensive margin. Instrumental variable (IV) regression results imply that with one unit of increase in trade openness, the intensive margin increases wage inequality by nearly one unit and the extensive margin increases wage inequality by 1.2 to 1.3 units.

Key words: Export premium, productivity, self-selection effect, learning-by-exporting effect, matching, intensive margin, extensive margin, wage inequality

JEL Classification: D24, F10, F14, F16, J31, L1

Declaration

I certify that 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 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 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.

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 catalogue and also through web search engines, unless permission has been granted by the University to restrict access for a period of time.

2012.09.20

Acknowledgments

First and foremost I want to thank my principal supervisor Christopher Findlay. I met him in 2009 when he was making a visit to Beijing, China. During that time, I was a PhD student in the University of International Business and Economics in Beijing. Christopher encouraged me to come to the University of Adelaide to continue my studies. Though very busy as Head of School and later Dean of the Faculty of Professions, he has taught me, both consciously and unconsciously, how a good paper is produced. He has always given me sufficient freedom to choose and decide my topic of interest, while providing suggestions and insightful comments. I appreciate all his contributions of time, ideas, and funding to make my PhD experience productive and stimulating. The joy and enthusiasm he has for his research was contagious and motivational for me, even during tough times in the PhD pursuit.

I would like to acknowledge my co-supervisors, Richard Pomfret, Tatyana Chesnokova and Nicholas Sim. I have often discussed my research with Richard Pomfret and thank him for the time and patience he has shown. I am grateful to Tatyana and Nicholas. At PhD workshops and regular seminars, Tatyana has offered insightful comments for my thesis, which has helped me to improve the paper tremendously. Nicholas taught me how to write good papers and supervised me to develop the method from an econometric point of view.

I am also indebted to Yihong Tang at the Central University of Finance and Economics, Beijing, China, who was my supervisor before I came to Australia. Without her support and encouragement, I could not have come here to continue my study. I also thank Sandy McConachy of the University of Adelaide, who helped me a great deal during my application process and during my time studying in Adelaide.

My appreciation also goes to the other school staff including academic and professional staff for their help in the course work, seminar comments and daily life in Adelaide. The names are (among many others), Kym Anderson, Fabrice Collard, Jacob Wang, Ralph Bayer, Dmitriy Kvasov, Duygu Yengin, Seungmoon Choi, Nadya Baryshnikova, Allison Stokes, Sandra Elborough, Sherry Dzonsons and Litsa Morris. I also very much appreciate Nicola Chandler's enthusiasm, intensity, and willingness to do the proof reading and editing work for my thesis.

I thank the China Scholarship Council for the financial support. I also acknowledge my PhD colleagues in the same office – Hang Wu, Jiang Lin and Xiaobo He and many others including Chang Chen and Hui Li for the time we spent together in Adelaide.

Finally, I should thank my wife Lixia Zhang for her support in daily life to help me to focus on my research. I also thank my family members, my mother, brother, uncles and Lixia Zhang's mother, father and sister for their help and support during my overseas study.

Thank you all very much.