Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.

A thesis presented in partial fulfilment of the requirement of the degree of Masters of Applied Economics

At Massey University, Palmerston North, New Zealand.

Michael Philip Bealing
2007
Abstract:

The benefits of eliminating cotton subsidies for Africa have been studied in terms of a higher world price, greater market share and higher export earnings for Africa. These estimates have focused on macroeconomic gains. This research simulates the effect of increases in the price on incomes of cotton growing households in rural Uganda to assess the impact on poverty levels. The Foster-Greer-Thorbecke measure of poverty is used to analyse the effect price increase on poverty. Results from this research indicate that Ugandan cotton farmers are unlikely to benefit from the elimination of cotton subsidies without price reform within its domestic cotton market. It is estimated that price reform alone can decrease poverty by 5 percent among cotton growing households in the Northern and Eastern Regions of Uganda. The results of the simulations also indicate increasing the price of cotton reduces the income gap for those households that remain in poverty despite the price increase. Thus the price increase decreases the severity of poverty amongst cotton producing households in rural Uganda.
Acknowledgements:

I would like to thank Dr. Shamim Shakur for his patient guidance and encouragement that is greatly appreciated. The research project would not be possible without the generous provision of data from the Ugandan Bureau of Statistics. I would also like to thank the Department of Applied and International Economics at Massey University for funding the research project. Last but not least I would like to acknowledge the support my family and friends provided throughout the research process. Their constant encouragement and care made this research possible.
Contents:

Abstract ............................................................................................................. 2
Acknowledgements .............................................................................................. 3
List of Figures and Illustrations ........................................................................... 7
Chapter 1: Introduction ....................................................................................... 9
Chapter 2: Literature Review ............................................................................. 11
  2.1 The Price Depressing and Trade Distorting Impacts of Cotton Subsidisation in Cotton Exporting Economies: As Described by a Large Exporter Partial Equilibrium Model ..................................................................... 11
  2.2 Producer Reviews: The Big Three: The United States, the European Union and the People’s Republic of China ........................................................................ 15
    2.2.1 Cotton Production and Policy in the United States ......................... 15
        2.2.1.1 U.S. Cotton Production .................................................... 15
        2.2.1.2 U.S. Cotton Policy .......................................................... 16
        2.2.1.3 The Step 2 Program and the WTO Ruling ......................... 19
    2.2.2 The European Union Cotton Industry: Greece, Spain and the Common Agricultural Policy .............................................................. 20
        2.2.2.1 Production and Policy in the E.U. ................................. 20
        2.2.2.2 Economic Criticism of the Cotton Policy in the E.U. ...... 22
        2.2.2.3 CAP Cotton Reform 2005 ............................................ 23
    2.2.3 China’s Cotton Industry ................................................................. 25
  2.3 Estimates of the Price Effects of Subsidy Elimination .................................. 28
    2.3.1 Goreux (2004) ............................................................................ 28
    2.3.2 Gillson, Poulton, Balcombe and Page (2004) .............................. 33
    2.3.3 Sumner (2003) ........................................................................... 39
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.3.4 Pan, Mohanty, Ethridge and Fadiga (2006)</td>
<td>46</td>
</tr>
<tr>
<td>2.3.5 Tokarick (2003)</td>
<td>49</td>
</tr>
<tr>
<td>2.4 Minot and Daniels (2005)</td>
<td>55</td>
</tr>
<tr>
<td>Chapter 3.0: Methodology</td>
<td>63</td>
</tr>
<tr>
<td>3.1 A Poverty Line for Cotton Producers in Rural Uganda</td>
<td>63</td>
</tr>
<tr>
<td>3.2 The Applied Exchange Rate</td>
<td>69</td>
</tr>
<tr>
<td>3.3 Estimating Total Household Income</td>
<td>72</td>
</tr>
<tr>
<td>3.4 The Baseline Case</td>
<td>73</td>
</tr>
<tr>
<td>3.5 Sensitivity Analysis of Poverty the Producer Price after the Elimination of Cotton Subsidies</td>
<td>75</td>
</tr>
<tr>
<td>3.6 Equivalent Households on a National and Regional Basis</td>
<td>82</td>
</tr>
<tr>
<td>3.7 Lorenz Curve and Gini Coefficient Analysis</td>
<td>84</td>
</tr>
<tr>
<td>Chapter 4: Data &amp; Data Issues</td>
<td>85</td>
</tr>
<tr>
<td>4.1 Introduction</td>
<td>85</td>
</tr>
<tr>
<td>4.2 Description of Ugandan Households by Age, Gender, Education and Size</td>
<td>86</td>
</tr>
<tr>
<td>4.3 Households in the Crop Survey 1999-2000</td>
<td>87</td>
</tr>
<tr>
<td>4.4 Crop categories for the purpose of research</td>
<td>88</td>
</tr>
<tr>
<td>4.5 Data Issues with the Cotton Producing Household in the Crop Survey Sample</td>
<td>89</td>
</tr>
<tr>
<td>4.5.1 Sales value, output sold and producer price</td>
<td>89</td>
</tr>
<tr>
<td>4.5.2 Producer Price Data Issues</td>
<td>89</td>
</tr>
<tr>
<td>4.5.3 Inconsistencies in the Total Income from Crop Sales</td>
<td>90</td>
</tr>
<tr>
<td>4.5.4 Modelling Household Income</td>
<td>91</td>
</tr>
<tr>
<td>Chapter 5.0: Results</td>
<td>92</td>
</tr>
</tbody>
</table>
Chapter 6.0: Discussion of Results

6.1 All Regions

6.2 Northern Region

6.3 Eastern Region

6.4 Central Region

6.5 Western Region

6.6 The Impact of the Elimination of Cotton Subsidies on Uganda

6.7 The Combined Impact of Price Reform within Uganda and the Elimination of Cotton Subsidies in Developed Countries

Chapter 7.0: Conclusion

Chapter 8.0: References

Chapter 9.0: Bibliography

Appendix A: Key Equations
List of Figures and Tables:

Figure 1: A Partial Equilibrium Model of the Price Depressing and Trade Distorting Effects of a Production Subsidy in a Large Exporter .............................................. 14

Figure 2: U.S. Cotton Production and Yield 1965-2004 ........................................... 16

Figure 3: A Graphical Illustration of the Effect of the Elimination of Subsidies amongst Producing Countries ................................................................. 30

Figure 4: Ugandan Shilling vs. U.S. Dollar January 1995 – September 2006 ............... 70

Figure 5: Ugandan Shilling vs. U.S. Dollar August 1999 – July 2000 ......................... 71

Figure 6: Index A World Cotton Price: Monthly Average: January 1990 – September 2006 ............................................................................................................. 77

Figure 7: Index A World Cotton Price: Monthly Average: August 1999 – July 2000 ... 78

Figure 8: Map the of Administrative Districts of Uganda .............................................. 81

Figure 9: All Regions Lorenz Curves: Baseline vs. Ugandan Producer Price + 5.0% ... 98

Figure 10: All Regions Lorenz Curves: Baseline vs. Index A Price ............................... 99

Figure 11: All Regions Lorenz Curves: Baseline vs. Index A Price + 10.0% ............... 100

Figure 12: All Regions Lorenz Curves: Baseline vs. Index A Price + 12.5% ............. 101

Figure 13: All Regions Lorenz Curves: Baseline vs. Index A Price + 15.0% ............. 102

Figure 14: Eastern Region Lorenz Curves: Baseline vs. Index A Price ......................... 103

Figure 15: Eastern Region Lorenz Curves: Baseline vs. Index A Price +12.5% ........... 104

Figure 16: Northern Region Lorenz Curves: Baseline vs. Ugandan Producer Price + 15.0% ............................................................................................................. 105

Figure 17: Northern Region Lorenz Curves: Baseline vs. Index A Price + 10.0% ....... 106

Figure 18: Northern Region Lorenz Curves: Baseline vs. Index A Price + 15.0% ....... 107
Table 1: Budgetary Transfers to U.S. Cotton Sector, 1995/96-2002/2003 (millions of U.S. dollars) ........................................................................................................................................ 18

Table 2: Estimated Government Assistance to Cotton Producers as Percentage of World Price 1997-2002 .................................................................................................................................................. 18

Table 3: Administrative Districts of Uganda ........................................................................................................................................... 81

Table 4: Results for All Regions Analysis ............................................................................................................................................... 94

Table 5: Results for the Northern Region Analysis .................................................................................................................................. 95

Table 6: Results for the Eastern Region Analysis .................................................................................................................................. 96

Table 7: Results for the Western Region Analysis .................................................................................................................................. 97

Table 8: Results for the Central Region Analysis .................................................................................................................................. 98
Chapter 1: Introduction:

The objective of this research is to provide a quantitative economic estimate of the impact of cotton price increase on poverty among rural households in Uganda. It has been suggested that elimination of cotton subsidies will benefit African cotton farmers through a higher world price, great market share for African exporters, and higher export returns for cotton. The impact of cotton subsidies on Africa was highlighted at World Trade Organisation (WTO) when four African countries, Benin, Burkina Faso, Chad and Mali, joined Brazil’s case against the United States (U.S.) cotton subsidy program. Brazil alleged U.S. cotton subsidies were illegal under the rules of the WTO and caused significant loses to Brazilian cotton farmers. The involvement of four of the world’s least developed countries caused the issue of cotton subsidies to gain momentum. Such a united front could not be ignored in the context of the Doha Development Round at the WTO.

Goreux (2004) estimated the elimination of cotton subsidies in developed countries would cause the world price of cotton to rise by 12 percent and allow developing country cotton producers to gain market share. Sumner (2003), Gillson et al (2004) and Page et al (2006) also estimated the elimination of cotton subsidies would increase the world price and allow developing countries to gain greater market share. Estimates of economic benefits for Africa have been limited to macroeconomic variables. Poverty reduction has often been suggested as a spin-off. The aim of this research project is to quantify the impact of cotton price increases on poverty among cotton producing households in Uganda as a case study for Africa.
Uganda has been successfully growing cotton since the 1930’s. Cotton is an important source of cash income in rural community and influences the level and severity of poverty in rural Uganda. The cotton industry was abandoned during the reign of Idi Amin, in favour of food crops needed for survival. The industry is still recovering, but the majority of cotton is grown on small plots of land using subsistence horticultural techniques. The results of this analysis will therefore estimate the impact of an increase in the cotton price on those most vulnerable to poverty.