World Cotton Prices: Overview and Outlook

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Outline

1. Review of Supply-Demand concepts
2. Season-average prices: ICAC Price Model
   - Forecasting horizons
   - Variables of the model
   - Workings of the model
   - Current Forecasts
   - Caveats
3. Spot vs. futures prices
4. Cotton, polyester and oil prices

Review of Supply-Demand Concepts

Closed Economy – No trade – No carryover
• Supply = Production
• Demand = Mill Use

Supply = Demand

Closed Economy – No trade
• Supply = Beginning Stocks + Production
• Demand = Mill Use + Ending Stocks

Supply = Demand

Closed Economy – No trade Example 1
• Beginning Stocks = 10
• Production = 90
• Mill Use = 80
• Ending Stock = ......?
• Demand = ......?
• Supply = ......?
Closed Economy – No trade
Example 1
• Beginning Stocks = 10
• Production = 90
• Mill Use = 80
• Ending Stock = 20
• Demand = 100
• Supply = 100

Closed Economy – No trade
Example 2 – what if?
• Production ↑ 10%, to 99?
  Ending Stocks: ……?
  Supply = Demand = ……?
• Additionally, Mill Use ↓ 10%, to 72?
  Ending Stocks: ……?
  Supply = Demand = ……?

Closed Economy – No trade
Example 2 – what if?
• Production ↑ 10%, to 99?
  Ending Stocks = 29 (↑)
  Supply = Demand = 109 (↑)
• Additionally, Mill Use ↓ 10%, to 72?
  Ending Stocks = 37 (↑)
  Supply = Demand = 109 (=)

Open Economy – Trade
Ex. 3 –Country A – Net Exporter
• Beginning Stocks = 10
• Production = 90
• Imports = 10
• Mill Use = 80
• Exports = 20
• Ending Stock = ……?
• Impo-Expo = ……?

Open Economy – Trade
Ex. 3 –Country A – Net Exporter
• Beginning Stocks = 10
  Supply 110
• Production = 90
• Imports = 10
  Demand 110
• Mill Use = 80
• Exports = 20
• Ending Stock = 10
• Impo-Expo = -10
Open Economy – Trade
Ex. 4 - Country A – what if?
• Production ↑ 10%, to 99?
  Ending Stocks: ……?
  Supply = Demand = ……?

• Additionally, Exports ↑ 25%, to 25?
  Ending Stocks: ……?
  Supply = Demand = ……?

Open Economy – Trade
Ex. 5 – Country B  Net Importer
• Beginning Stocks = 30
• Production = 90
• Imports = 40
• Mill Use = 120
• Exports = 10
• Ending Stock = ……?
• Impo- Expo = ……?

• Supply ……?
• Demand……?

Open Economy – Trade
Ex. 6 - Country B - what if?
• Production ↑ 10%, to 99?
  Ending Stocks = ……?
  Supply = Demand = ……?

• Additionally, Imports ↓ 25%, to 30?
  Ending Stocks = ……?
  Supply = Demand = ……?

Open Economy – Trade
Ex. 4 - Country A – what if?
• Production ↑ 10%, to 99?
  Ending Stocks = 19  (↑)
  Supply = Demand = 119  (↑)

• Additionally, Exports ↑ 25%, to 25?
  Ending Stocks = 14  (↓)
  Supply = Demand = 119  (=)

Open Economy – Trade
Ex. 5 – Country B  Net Importer
• Beginning Stocks = 30
• Production = 90
• Imports = 40
• Mill Use = 120
• Exports = 10
• Ending Stock = 30
• Impo- Expo = 30

• Supply 160
• Demand 160

Open Economy – Trade
Ex. 6 - Country B - what if?
• Production ↑ 10%, to 99?
  Ending Stocks = 39  (↑)
  Supply = Demand = 169  (↑)

• Additionally, Imports ↓ 25%, to 30?
  Ending Stocks = 29  (↓)
  Supply = Demand = 159  (↓)
### World Economy – 2 regions Example 7

**Region 1: NET IMPORTER**
- Beginning Stocks = 30
- Production = 90
- Imports = 40
- Mill Use = 120
- Ending Stocks = 30
- Supply = Demand = 160
- Impo-Expo = 30

**Region 2: NET EXPORTER**
- Beginning Stocks = 80
- Production = 310
- Imports = 40
- Mill Use = 280
- Ending Stocks = ...
- Supply = Demand = ...
- Impo-Expo = ...

### World Economy – 2 Regions Example 8 – what if?
- **Production ↑ 10% in Region 1, NET Importer, to 99?**
  - Ending Stocks R1 = ...?
  - Ending Stocks R2 = ...?
  - Supply R1 = Demand R1 = ...?
  - Supply R2 = Demand R2 = ...?
  - Impo-Expo R1 = ...?
  - Impo-Expo R2 = ...

### World Economy – 2 Regions Example 9 – what if?
- **Additionally, Imports ↓ 25% in Region 1, NET Importer, to 30?**
  - Ending Stocks R1: ...
  - Ending Stocks R2: ...
  - Supply R1 = Demand R1 = ...
  - Supply R2 = Demand R2 = ...
  - Impo-Expo R1 =
  - Impo-Expo R2 =
Last methodological issue: SMU

- If Stocks-to-mill use ratio = Ending Stocks / Mill Use

\[ \uparrow \text{SMU} : \uparrow \text{Ending stocks} \quad \downarrow \text{Mill Use} \]

\[ \downarrow \text{SMU} : \downarrow \text{Ending stocks} \quad \uparrow \text{Mill Use} \]

SMU – Example 10

What if?

- SMU in R1 in example 5 = \ldots.?  
  SMU in R2 in example 5 = \ldots.?  

- What if Production \( \uparrow 10\% \) and Imports \( \downarrow 25\% \) in Region 1?

- SMU in R1 in example 9 = \ldots.?  
  SMU in R2 in example 9 = \ldots.?

SMU in R1 in example 9 = 0.242  
SMU in R2 in example 9 = 0.321

Disclaimer

- These are only examples, and do not represent the reality of any particular region or country.

ICAC Price Model

Season-Average Cotlook A Index

US cents per pound

Graph showing price trends from 80/81 to 10/11.
ICAC Price Model - Horizons
Season-average prices:
1. **Same season**: Forecasts for 2009/10 produced from August 1 2009, to July 31 2010.
2. **One-season ahead**: Forecasts for 2010/11 produced from April 1 2010 to July 31 2010.

ICAC Price Model – Regions
World split in 2 regions:
1. **China**: 40% of world mill use
34% of world imports
29% of world production
data reliability
2. **World less China**

Explanatory Variables
1. **Stocks-to-mill use ratio (SMU) in the World less China**
2. SMU in China
3. Net imports of China as a share of world imports

Workings of the Model
Change in Cotlook A Index in the CURRENT season explained by changes in:
• SMU ratio in the World-less-China in the CURRENT and PREVIOUS seasons
• SMU ratio in China in the PREVIOUS season

Workings of the Model (cont’d)
• 91/92-02/03 and 08/09-09/10: China net imports as a percentage of world imports in the CURRENT season

ICAC Price Model
• Estimation period 1975/76-2008/09
• Model explains 84% of the variability in the change of the Cotlook A Index
• Same-season forecast accounts for the observed average Cotlook A Index since August 1 to date.
Observed and Fitted Season-Average Cotlook A Index

A Index and Stock-to-Mill Use Ratio

Workings of the Model (cont’d)

%Change A Index =
- 1.0 x %Change SMU WLC current
- 0.3 x %Change SMU WLC last season
- 0.1 x %Change SMU China last season x (1-D)
- 1.4 x %Change Chinese Net Imports as a share of World Imports x (D)

D=1 if strong Chinese Gvt intervention; 0 otherwise

ICAC Price Model: Forecast for 2010/11

• ↑ 0.1% SMU ratio in World-less-China in 2010/11 (forecast)
• ↓ 22% SMU ratio in World-less-China in 2009/10 (estimated)
• ↓ 29% SMU ratio in China in 2009/10 (estimated)
• D=0 (forecast)

%Change A Index 2010/11 = -1.0 x (0.1%) - 0.3 x (-22%) - 0.1 x (-29%) = ↑ 9.5%

ICAC Price Model: Forecast for 2010/11

• What if Production in China ↑ and Chinese Imports ↓ in 2010/11?
- Chinese Imports = ↓ Exports in WLC
- ↑ Stocks in WLC
- ↑ SMU in WLC
- ↓ A Index in 2010/11

ICAC Price Model: Forecast for 2010/11

• What if India Bans Exports to China to satisfy domestic mill use in 2010/11?
- ↓ Indian Exports = ↑ Indian mill use
- Ending Stocks in WLC UNCHANGED
- ↓ SMU in WLC
- ↑ A Index in 2010/11

↓ Chinese Imports, ↓ SMU in China, ↑ A Index in 2011/12
Season-Average Cotlook A Index

US cents per pound

78/79 88/89 98/99 08/09

How well did the model do?

Forecast of Average A Index in 2007/08

US cents per pound


Forecast of Average A Index in 2008/09

US cents per pound


Forecast of Average A Index in 2009/10

US cents per pound


ICAC Price Model: Caveats

Relevant variables NOT included:

- futures prices
- polyester prices
- other commodity prices
- subsidies
Cotton Futures and Spot Prices

% of days in which the A Index moved in the same direction as the previous day’s Nearby Futures price

Futures and Spot Daily Prices

- Daily spot prices have become more responsive to changes in futures prices in recent seasons.
- A smaller decline in futures prices is required to trigger a decline in the Cotlook A Index today than in previous seasons.

<table>
<thead>
<tr>
<th>Season</th>
<th>Threshold change in NB Futures Price</th>
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<tbody>
<tr>
<td>2000/01</td>
<td>-0.12</td>
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<tr>
<td>2001/02</td>
<td>-0.05</td>
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<td>2002/03</td>
<td>-0.30</td>
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<tr>
<td>2003/04</td>
<td>-0.12</td>
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<td>2004/05</td>
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<tr>
<td>2007/08</td>
<td>-0.01</td>
</tr>
<tr>
<td>2008/09</td>
<td>-0.02</td>
</tr>
</tbody>
</table>

Futures Prices as of 4 May 2010
Cotton, Polyester and Oil Prices

Regularities between Cotton, Polyester and Oil Real Prices
1. Polyester prices depend on past values of polyester prices and oil prices
2. Low transmission of shocks from oil prices to polyester prices (1:0.3)

Response of Real Cotton Prices to Alternative Shocks
• Permanent 10% ↑ in oil prices: permanent 3% ↑ in polyester prices, permanent 3% ↑ in cotton prices
• Permanent 10% ↑ in polyester prices: permanent 10% ↑ in cotton prices
• Temporary 10% ↑ in cotton prices: ↑ first, then ↓ to level 2% higher than pre-shock level

Cotton, Polyester and Oil Nominal Prices

Regularities between Cotton, Polyester and Oil Real Prices
3. Cotton prices depend on past values of cotton prices, but maintain an equilibrium relation with polyester prices.
4. Cotton Prices tend to be 4% higher than polyester prices, and “follow” polyester prices.
5. Oil prices indirectly affect cotton through polyester prices
Oil and Cotton Prices

- IMF forecasts: 29% ↑ in nominal oil prices in 2010, and 3% ↑ in 2011
- In real prices: 25% ↑ in 2010, and ↓1% in 2011
- Real Cotton Prices (3% of oil changes)= ↓1% in 2010 and 0% in 2011
- Nominal cotton prices: ↑4% in 2010; ↑3% in 2011

Summary

- ICAC Price Model
- SMU and Cotton Prices
- Futures
- Cotton, Oil and Polyester Prices

To download full papers:
http://www.icac.org/cotton_info/speeches/english.html

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Thank you for your attention!