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

- Ending Stocks = Beginning Stocks + Production – Mill Use

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

- Supply = Beginning Stocks + Production + Imports
- Demand = Mill Use + Ending Stocks + Exports
- Ending Stocks = Beginning Stocks + Production – Mill Use + Imports – Exports

Open Economy – Trade Ex. 3 –Country A – Net Exporter

- Beginning Stocks = 10
- Production = 90
- Imports = 10

} Supply ……?

- Mill Use = 80
- Exports = 20
- Ending Stock = ……?

} Demand……?

- Impo-Expo = ……?

Open Economy – Trade Ex. 3 –Country A – Net Exporter

- Beginning Stocks = 10
- Production = 90
- Imports = 10

} Supply 110

- Mill Use = 80
- Exports = 20
- Ending Stock = 10

} Demand 110

- 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. 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

} Supply ……?

- Mill Use = 120
- Exports = 10
- Ending Stock = ……?

} Demand……?

- Impo- Expo = ……?

Open Economy – Trade
Ex. 5 – Country B Net Importer

- Beginning Stocks = 30
- Production = 90
- Imports = 40

} Supply 160

- Mill Use = 120
- Exports = 10
- Ending Stock = 30

} Demand 160

- Impo- Expo = 30

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.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
- Exports = 10
- Ending Stocks = 30
- Supply=Demand=160
- Impo-Expo=30

Region 2: NET EXPORTER
- Beginning Stocks = 80
- Production = 310
- Imports = 10
- Mill Use = 280
- Exports = 40
- Ending Stocks = ……?
- Supply=Demand=……?
- Impo-Expo=……?

World Economy – 2 regions Example 7

Region 1: NET IMPORTER
- Beginning Stocks = 30
- Production = 90
- Imports = 40
- Mill Use = 120
- Exports = 10
- Ending Stock = 30
- Supply=Demand=160
- Impo-Expo= 30

Region 2: NET EXPORTER
- Beginning Stocks = 80
- Production = 310
- Imports = 10
- Mill Use = 280
- Exports = 40
- Ending Stock = 80
- Supply=Demand= 400
- Impo-Expo= -30

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 8 – what if?

Region 1: NET IMPORTER
- Beginning Stocks = 30
- Production = 99 (↑)
- Imports = 40
- Mill Use = 120
- Exports = 10
- Ending Stocks = 39 (↑)
- Supply=Demand=169 (↑)
- Impo-Expo= 30 (=)

Region 2: NET EXPORTER
- Beginning Stocks = 80
- Production = 310
- Imports = 10
- Mill Use = 280
- Exports = 40
- Ending Stocks = 80
- Supply=Demand= 400 (=)
- Impo-Expo= -30 (=)

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 =

World Economy – 2 regions Example 9 – what if?

Region 1: NET IMPORTER
- Beginning Stocks = 30
- Production = 99 (↑)
- Imports = 30 (↓)
- Mill Use = 120
- Exports = 10
- Ending Stocks = 29 (↓)
- Supply=Demand=159 (↓)
- Impo-Expo= 20 (↓)

Region 2: NET EXPORTER
- Beginning Stocks = 80
- Production = 310
- Imports = 10
- Mill Use = 280
- Exports = 30 (↓)
- Ending Stocks = 90 (↑)
- Supply=Demand= 400
- Impo-Expo= -20 (↑)

Last methodological issue: SMU

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

↑ SMU : ↑ Ending stocks
↓ Mill Use

↓ SMU : ↓ Ending stocks
↑ Mill Use

SMU – Example 10 What if?

SMU in R1 in example 5 = ……?
SMU in R2 in example 5 = ……?

- What if Production ↑ **10%** and Imports ↓**25% in Region 1?**

SMU in R1 in example 9 = ……?
SMU in R2 in example 9= ……?

SMU – Example 10 What if?

SMU in R1 in example 5 = 0.250
SMU in R2 in example 5 = 0.287?

- What if Production ↑ **10%** and Imports ↓**25% in Region 1?**

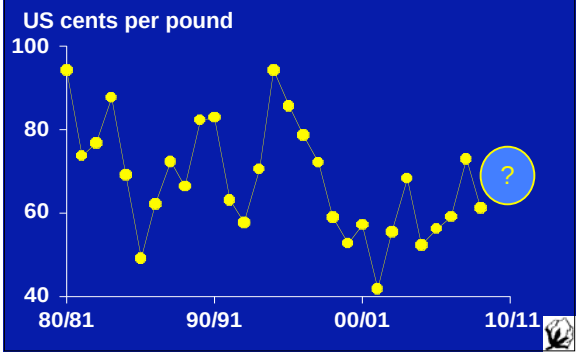
SMU in R1 in example 9 = 0.242 ↓
SMU in R2 in example 9 = 0.321 ↑

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



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

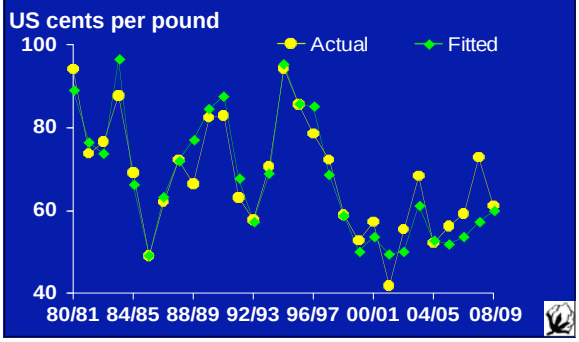
Workings of the Model (cont'd)

- 91/92-02/03 and 08/09-09/10: China net imports as a percentage of world imports in the CURRENT season

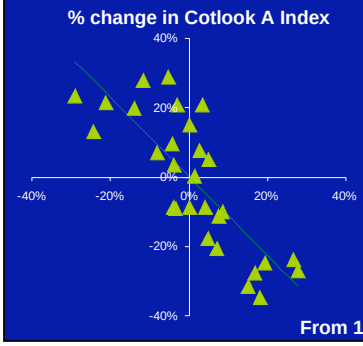
ICAC Price Model

- Estimation period 1975/76-2008/09
- Model explains 84% of the variability in the change of the Cotlook A Index
- Same-saeson 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



From 1981/82 to 2008/09

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 * (-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**

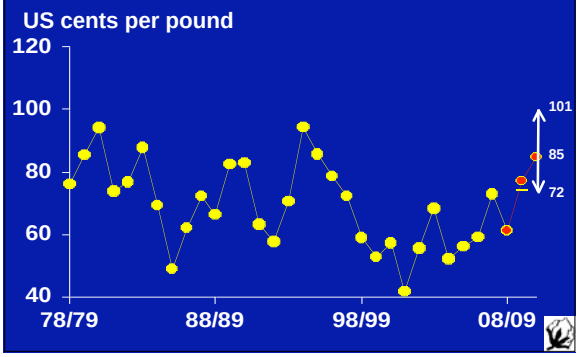
ICAC Price Model: Forecast for 2010/11

- 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**

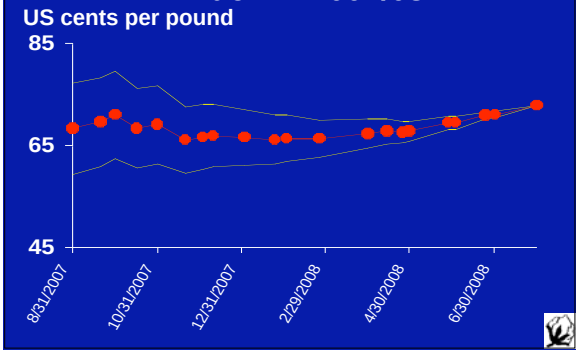
↓ Chinese Imports, ↓ SMU in China, ↑ A Index in 2011/12

Season-Average Cotlook A Index

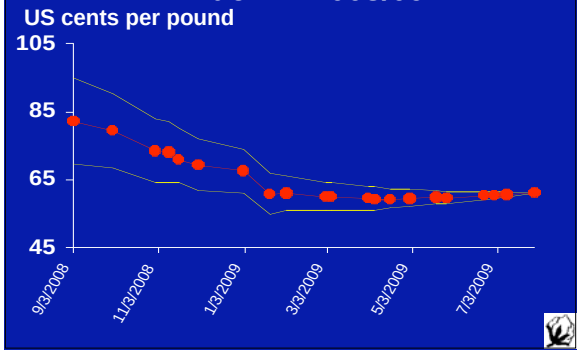


How well did the model do?

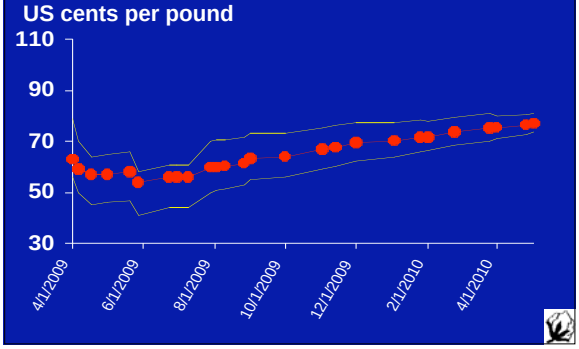
Forecast of Average A Index in 2007/08



Forecast of Average A Index in 2008/09



Forecast of Average A Index in 2009/10



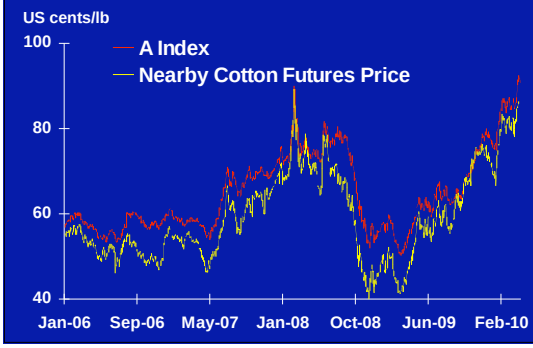
ICAC Price Model: Caveats

Relevant variables NOT included:

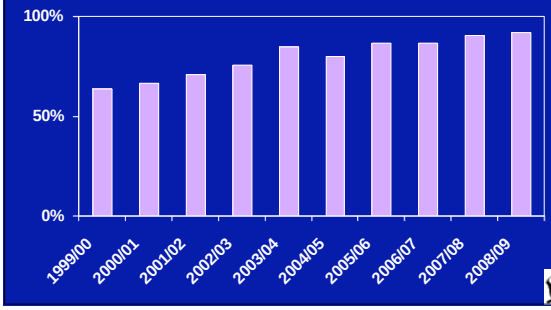
- futures prices
- polyester prices
- other commodity prices
- subsidies

Cotton Futures and Spot Prices

Commodity Futures Prices and A Index



% 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

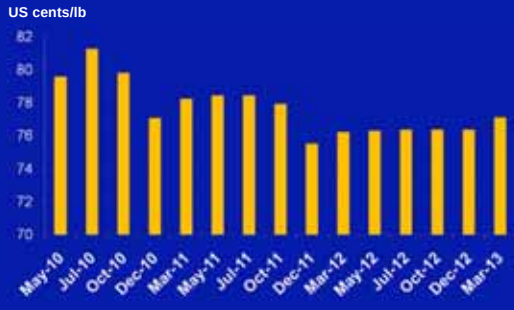
- Daily spot prices have become more responsive to changes in futures prices in recent seasons.
- A smaller decline in futures prices is required to trigger a decline in the Cotlook A Index today than in previous seasons.

Futures and Spot Daily Prices

Season	Threshold change in NB Futures Price
2000/01	-0.12
2001/02	-0.05
2002/03	-0.30
2003/04	-0.12
2004/05	-0.07
2005/06	-0.08
2006/07	-0.07
2007/08	-0.01
2008/09	-0.02

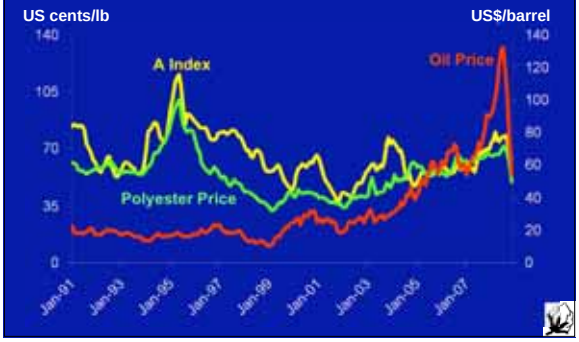
- Daily change in Futures Price lower than threshold, then A Index ↓
- Daily change in Futures Price higher than threshold, then A Index ↑

Futures Prices as of 4 May 2010



Cotton, Polyester and Oil Prices

Cotton, Polyester and Oil Nominal 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)

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

Regularities between Cotton, Polyester and Oil Real Prices

- Permanent 10% ↑ in oil prices: permanent 3% ↑ in polyester prices, permanent 3% ↑ 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

Response of Real Cotton Prices to Alternative Shocks

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!