Impact of OECD Policies on the World Cotton Market

FAO Consultation on Cotton

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Outline

1. Why do results diverge so significantly?
   a. Matching parameters to models
   b. Matching models to markets
2. "The importance of being earnestly empirical"
3. Conclusion

1. Why do results diverge so significantly?

- ☐ The wide range of price impacts (2 to 70%) has already been noted
- ☐ On one level, the divergence is largely just a function of data and parameters
    - ■ Model structures reasonably similar (PE comparative static)
    - ■ Role of assumptions
- ☐ This suggests an "easy" answer: just agree on the right data and parameters (or sensitivity bands).
- ☐ But (and there is always a but…)

1. Why do results diverge so significantly?

- ☐ There is also an extremely important, and more general, methodological issue to confront: the need to match
  - ■ Purpose (including politico-legal)
  - ■ Theory (model structure and assumptions)
  - ■ Parameters estimated econometrically
  - ■ Data
  - ■ Tests (and forecasts)
- ☐ I suggest that part of the reason for divergence lies in *mismatches* with respect to some of these. Finding a way forward requires *better matching*.

1a. Matching parameters to models

- ☐ All PE simulations appear to use "off the shelf" (OTS) elasticities.
- ☐ OTS elasticities come from empirical (econometric) models that can be specified in numerous ways.
- ☐ How sure are we that the elasticity as measured corresponds to the *theoretical* elasticity in the model?
  - ■ What curve shifters were used in the econometrics? Do they suggest a respecification of the PE model?
  - ■ What about stocks?
  - ■ More fundamentally, how were subsidies modelled econometrically?
- ☐ What are the effects of a mismatch likely to be in terms of modelling the impact of subsidies?

1a. Matching parameters to models

☐ Sensitivity analysis is important and useful, but can we do better?

➢ *In principle, "yes": good model matching should allow simulation using the stochastic properties of the data used for estimation (and the parameters).*

➢ The resulting confidence interval for model outputs would be an invaluable aid in choosing a "realistic" estimate.
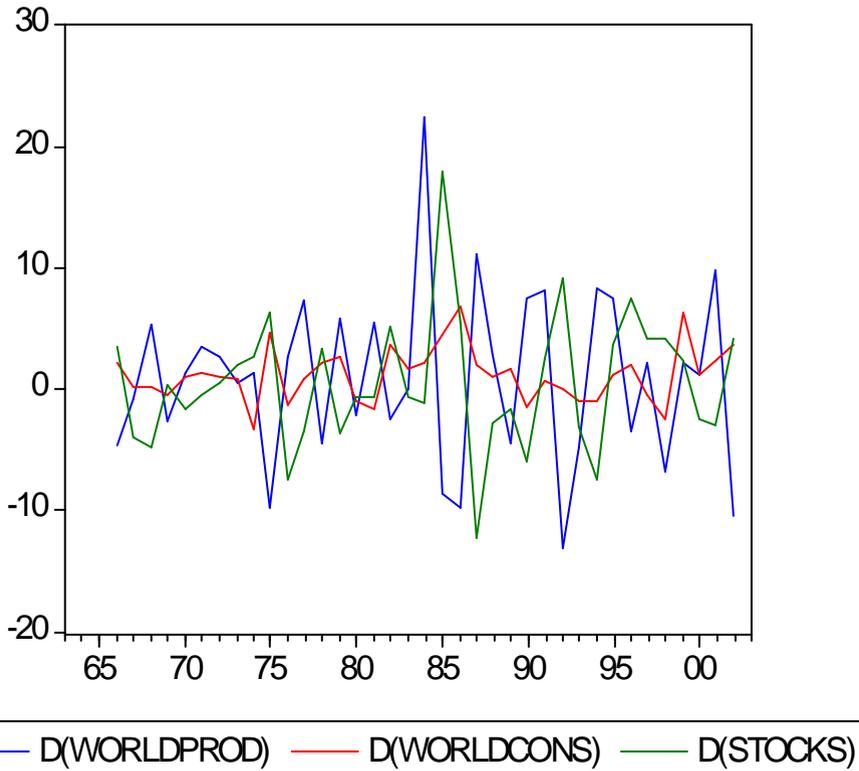
1b. Matching models to markets

- [ ] How can we be sure that the PE simulations simplify reality in "useful" ways?
    - ■ EG1, is the single fibre PE simplification a "useful" one, given suggestions of strong substitution to synthetics?
    - ■ EG2, is the single/integrated market simplification a "useful" one, given what we know about differentiation?
    - ■ EG3, is the "no stocks" simplification a "useful" one, given the data we have on the magnitudes of stocks and their fluctuations?
- [ ] Interlude: what is "useful"?
    - ■ Explain much with little?
    - ■ Render tractable without losing any essential information (defined by the research's *purpose*)

1b. Matching models to markets
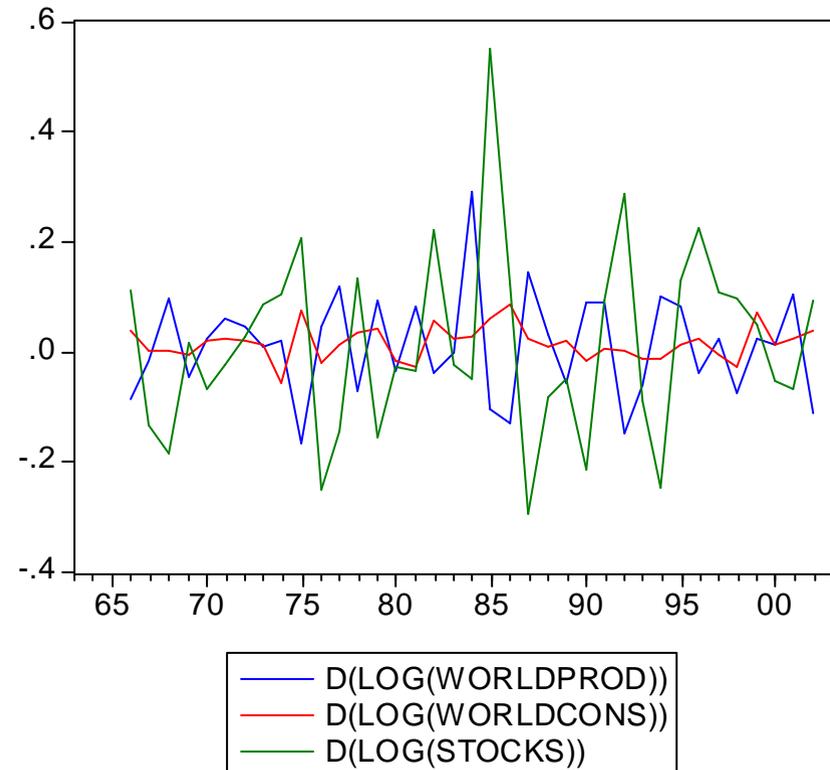
1b. Matching models to markets

- ☐ It would be nice to *test* these and other simplifications rigorously to make sure they are "useful".
- ☐ But pure PE simulations *cannot be directly tested...*
- ☐ So in the end, we run the risk of relying more on qualitative information (*a priori*) and modelling convenience than on full-scale testing.

2. "The importance of being earnestly empirical"

- ☐ Numerical PE simulations are not "empirical" in the strict sense
    - ■ Relatively limited contact with the data
    - ■ Little or no integration with "pure" empirical work (econometrics)
- ☐ ICAC's models start out as essentially empirical (forecasting), but:
    - ■ How valid is it to simply replace actual with extrapolated production data?
    - ■ Can the Price and Demand Models simply be used recursively (when they were estimated separately) with mechanical substitution and adjustment?
    - ■ What is the error involved?
    - ■ Do the "no subsidies" forecasts pass a reality check? (+70%???)

2. "The importance of being earnestly empirical"

- ☐ As a starting point, more detailed econometric work—even independently of the simulations—should help us to better match parameters to models and models to markets:
  - Hone in on the "right" elasticities *in terms of the models being used*
  - (Alternatively, suggest changes to the models to better take account of the characteristics of the estimated elasticities)
  - Identify which modelling simplifications are genuinely "useful" and which produce results that ignore important information
- ➢ One possibility (not the only one) is to go to the other extreme and attempt to "let the data speak for themselves" using time series methods (e.g., Granger causality, IRFs and FEVDs) to test broad hypotheses framed in terms of the crucial assumptions idenfified

2. "The importance of being earnestly empirical"

- A more comprehensive approach would attempt a full-scale integration of structural modelling and econometrics
- One possibility that could be imagined (and implemented):
  - Structural model with fibre and Armington-type substitution (what else?)...
  - Embedded directly in a (dynamic) panel data framework...
  - Estimated using a flexible methodology (like GMM, using lagged variables as instruments)...
  - Tested within- and out-of-sample to make sure it is "useful"...
  - Then used to perform stochastic simulations of the reduction/abolition of subsidies...
  - To produce a confidence interval for price and other effects

3. Conclusion

- ☐ What are the advantages of being "earnestly empirical"?
    - ■ Help to resolve uncertainties and divergences by linking theory and historical data
    - ■ Provide analysis that is (potentially) probative of a historical causal link between subsidies and prices (important, given the politico-legal context of this work)
    - ■ Avoid confusion in the public domain about price effects of subsidies that are not forecasts…
    - ■ And thereby reduce the scope for creating unrealistic expectations
- ☐ A question on purpose:
    - ■ Will PE simulations on their own be sufficient to "win the day" either politically or legally at the WTO?
    - ■ Is there any way (or reason) to avoid paying greater attention to the story told by historical data?