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Simulating effects of agricultural support policies under price volatility – a China case study

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Outline

- Motivation for this study
- The modelling approach
- Policies and shocks
- Modelling results
- Take away messages

Why this study?

- China’s influence on global markets
- China’s growing demand for imports
- China is reforming its agricultural policies
- What would be the effects of policy changes

Issues and challenges

Issues

1. Rural-urban income disparities
2. Rural development
3. Food security

Policy challenges of triple highs

1. High production
2. High stock/hence high fiscal costs
3. High import

Approach

We adapted a computable general equilibrium model to consider:

- changes to China's grains policies
- price fluctuations
- implications, including distributional effects

The CGE model

Based on a publicly available PEP model (PEP-w-t) with modifications:

- Added ag and non-ag households for China
- Adopted a more flexible way for global investment allocation
- Introduced minimum support prices through stockpiling in China

The CGE model – cont.

- Adopted a translog unit cost production function
- Adopted a translog function for modelling demand by source
- Introduced CET to allocate land
- Reformulated the model as a mixed complementarity problem in GAMS

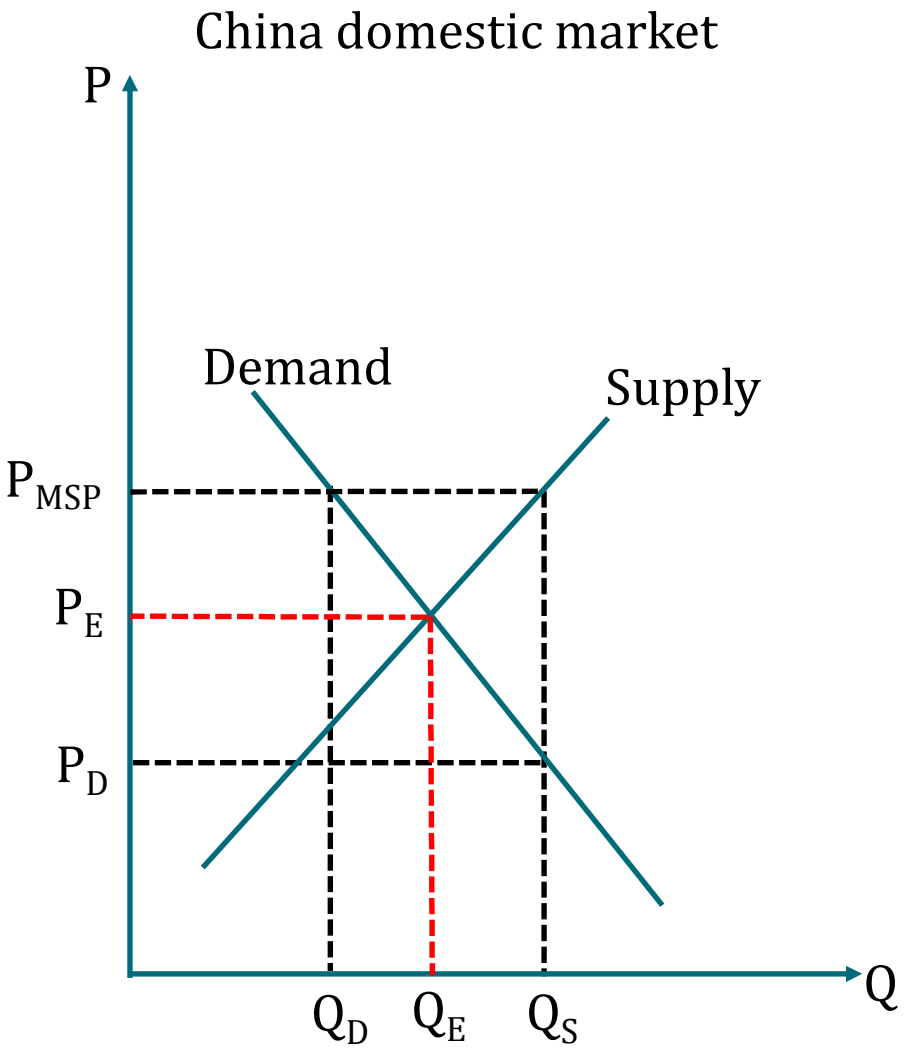
Hypothetic grains policy options modelled

- EP - Existing policy (baseline)
- DP - Deficiency payment
- CSLS - Commodity specific land subsidy
- NSCLS - Non-commodity specific land subsidy
- RP - Removal of policies
- LST - Removal of policies replaced by lump sum transfer to ag households

Hypothetic consumer support policies modelled

- S - Subsidy
- FV – Food voucher

Minimum support price - explained



$Q_S - Q_D$ is gov's purchase with stockpiling policy;

$P_{MSP} - P_D$ is gov's subsidy with subsidising policy

Price shocks modelled (temporary at 2020 only)

- No shock (baseline)
- Higher domestic productivity: leading to lower domestic price
- Lower domestic productivity: leading to higher domestic price
- Higher rest of world (i.e. excl China) productivity: leading to lower world price
- Lower rest of world productivity: leading to higher world price

Overall assessment, 2020, compared with B'line and EP

	NON SHK				Lower Dom Productivity				Higher Dom Productivity			
POLICY	**Agri HH C**	**NonAgr HH C**	**Total HH C**	**GDP**	**Agri HH C**	**NonAgr HH C**	**Total HH C**	**GDP**	**Agri HH C**	**NonAgr HH C**	**Total HH C**	**GDP**
EP					-	+	+	+	+	-	-	-
DP&S	↓	↑	↑	↑	↑-	↓+	↓+	↓+	↓+	↑+	↑+	↑+
DP&FV	↓	↑	↑	↑	↑-	↓+	↓+	↓+				
CSLS&S	↑	↑	↑	↑					↑+	↑-	↑+	↑+
NCSLS&S	↑	↑	↑	↑					↑+	↑-	↑+	↑+
LST	↑	↑	↑	↑	↑+	↓+	↑+	↓+	↑+	↑+	↑+	↑+
RP	↓	↑	↑	↑	↑-	↓+	↓+	↓+	↓-	↑+	↑+	↑+

Net present value of welfare

(% deviation from baseline)

	No shock	Higher dom price	Lower dom price
EP	0	0.01	-0.02
DP	0.06	0.05	0.06
CSLS	0.02	NA	0.02
NCSLS	0.05	NA	0.05
RP	0.06	0.05	0.06
LST	0.06	0.05	0.06

Food security, 2020, compared with B'line and EP

	NON SHK		Lower Dom Productivity		Higher Dom Productivity	
	AH C	NAH C	AH C	NAH C	AH C	NAH C
EP			-	-	+	+
DP&S	↑	↑	↑-	↑-	↑+	↑+
DP&FV	↑	↑	↑-	↑-		
CSLS&S	↑	↑			↑+	↑+
NCSLS&S	↑	↑			↑+	↑+
LST	↑	↑	↑-	↑-	↑+	↑+
RP	↑	↑	↑-	↑-	↑+	↑+

Production (CHN), 2020, compared with B'line and EP

	NON SHK	Lower Dom Productivity	Higher Dom Productivity
EP		-	+
DP & S	↓	↓-	↓-
DP & FV	↓	↓-	
CSLS & S	↓		↓+
NCSLS & S	↓		↓-
LST	↓	↓-	↓-
RP	↓	↓-	↓-

Conclusion / take away messages

- EP has adverse effects
- NCSLS (decoupled) is better than CSLS (coupled)
- LST is efficient, improving economic outcomes and distributional effects
- Export responds to world price – lower dom price in China, less export from other countries