

Effects of Barriers to Live-sheep Exports: from a Western Australian Perspective

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Live animal export issues

- ⑧ Is it worth exporting live-sheep?
- ⑧ What happens to the State and regional economies if live-sheep export is totally banned?
- ⑧ How would different sectors of the economy be affected?
- ⑧ What role should government at different levels play?

Objective

- 6 To study the impact of a decline in live-sheep export demand and of an export market enhancement program on the State's economy.

Plan

- ⑥ Provide brief overview of the sheep industry
- ⑥ Highlight the modified WA model
- ⑥ Illustrate the simulation design
- ⑥ Welcome feedback on model simulations and results

Sheep industry

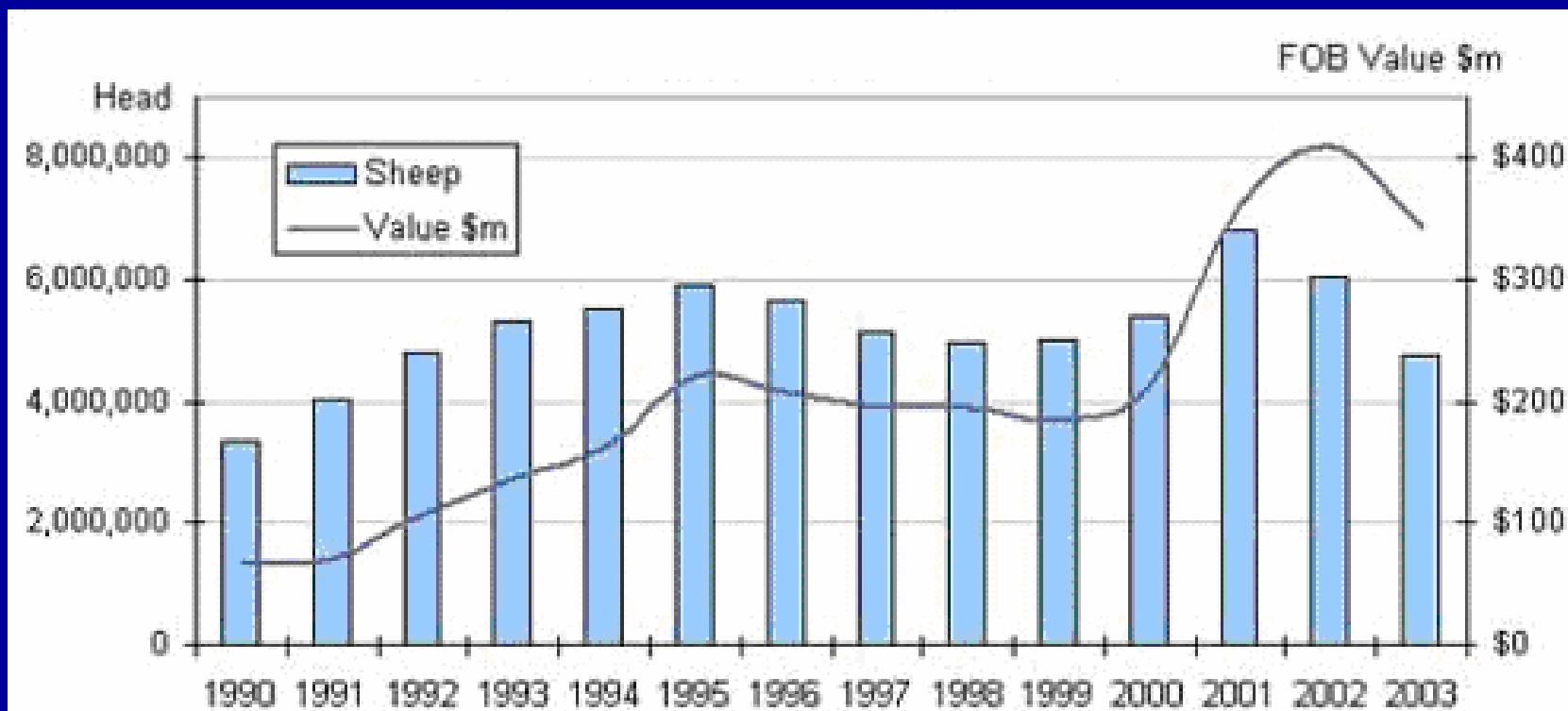
Relative importance of live-sheep exports, 2000-01

	Australia \$m	WA \$m	WA as % of Australia
Gross Domestic Product (at factor income)	586,992	66,239	11.28
Agriculture, forestry and fishing (Comp. of GSP)	20,853	2,213	10.61
Value of agricultural production	28,258	4,348	15.39
Value of live sheep production	1,667	503	30.20
Value of live sheep exports	265	195	73.59

Source: ABS, various issues

Sheep industry (contd..)

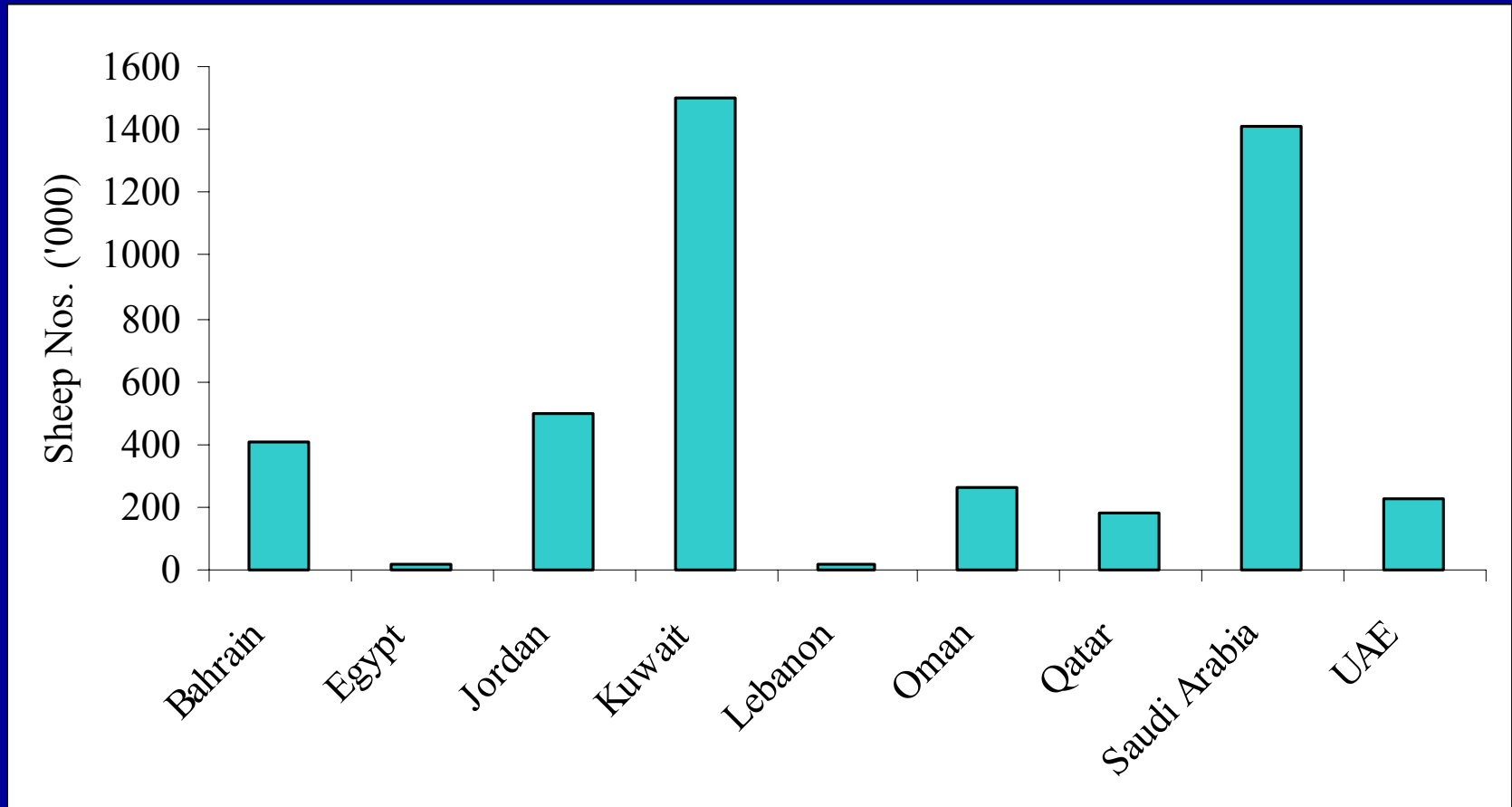
Number and value of Australian live-sheep exports, 1990 - 2003



Source: LiveCrop, 2003.

Sheep industry (contd.)

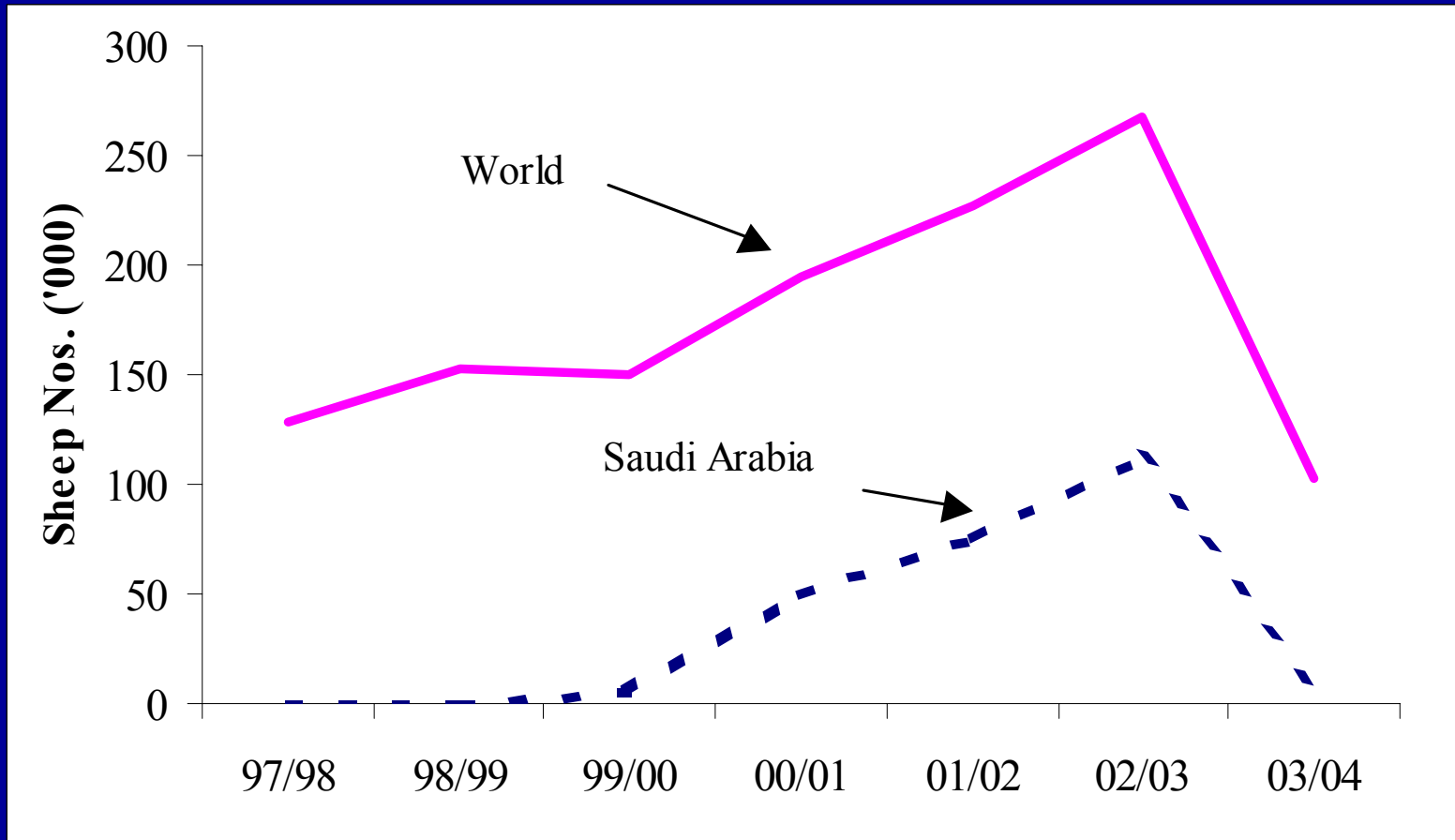
Major destination countries for Australian live-sheep exports in 2003



Source: ABS, various issues

Sheep industry (contd.)

WA's live-sheep export trends to Saudi Arabia and the world, 97/98 -03/04



Source: Department of Agriculture WA

Regional CGE Modelling Workshop, Melbourne, September 16-17, 2004

The WA Model (WAM)

- ⑥ A single-region, multi-sectoral CGE model of the WA economy
- ⑥ Theoretical structure is of ORANI
- ⑥ Has particular focus on the agriculture sector
- ⑥ Takes account of jointness in primary production in terms of capital share/swap by some agricultural industries

The WAM (contd.)

- ⑧ Input demand and commodity supplies by industries, household and government sector demand and external sectors
- ⑧ Has 109 industries, of which 10 are agricultural
- ⑧ Each industry produces a single commodity, therefore the WA model has 109 commodities.

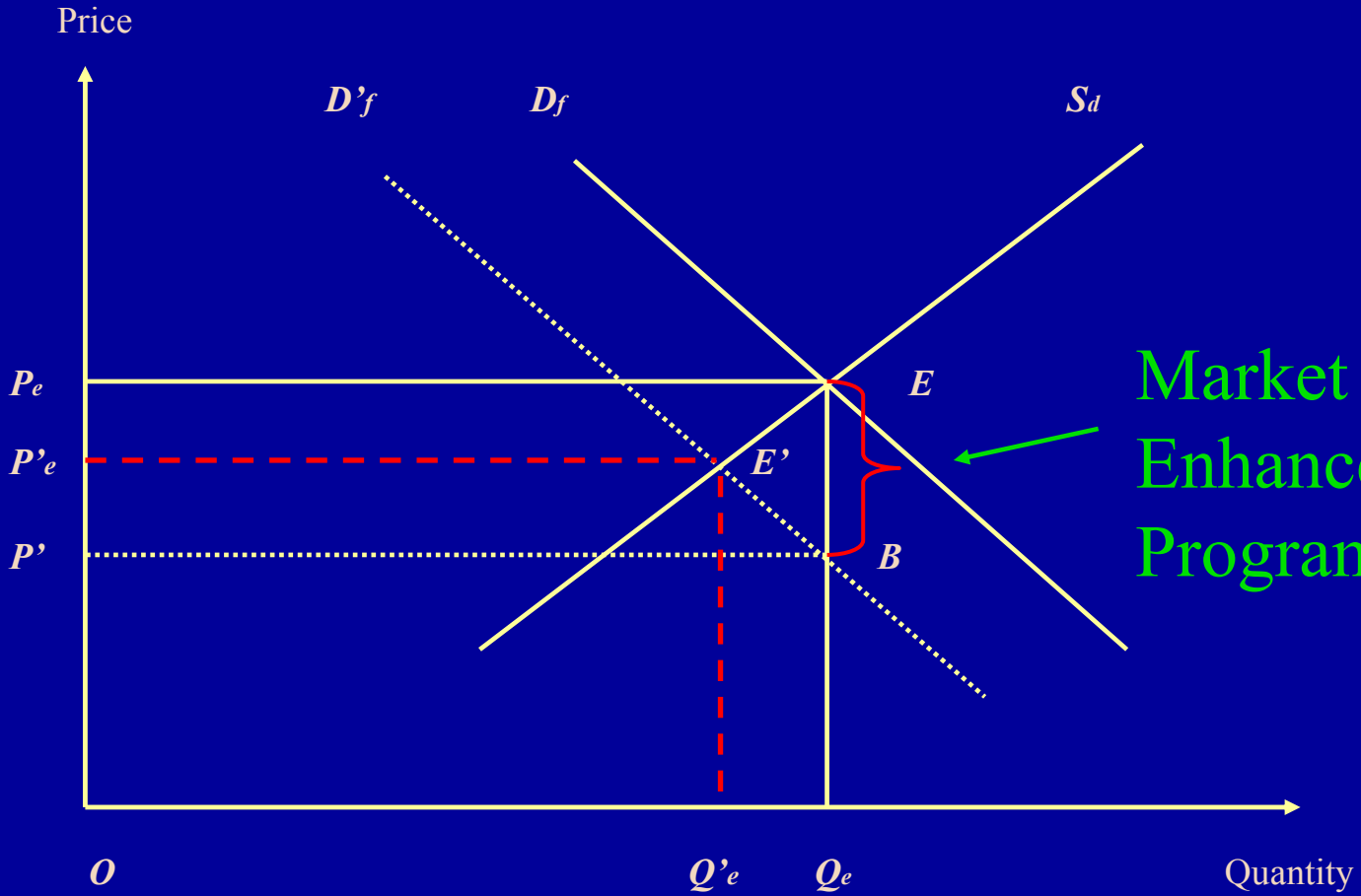
The WAM (contd.)

- ⑧ All producers face competitive markets
- ⑧ The production structure is based on the assumption of constant returns to scale
- ⑧ Each material input is separable from the others as well as primary inputs

The WAM (contd.)

- ⑥ Substitution takes place between the primary factors
- ⑥ Household consumption demand is based on the preference independence and utility maximisation
- ⑥ All goods are distinguished according to their sources of supply - WA and non-WA
- ⑥ Locally sourced good is treated as an imperfect substitution for imports.

Illustration



Simulation design

$$P_i^{e*} = \alpha_i^{e*} + (1/\eta_i^{e*}) X_i^{e*}$$

World price of exports of goods i

$$P_i^e = P_i^{e*} + t_i^e + d$$

Internal price of exportable goods i

Shock Variables	Simulation 1	Simulation 2
α_i^{e*}	-20	-20
t_i^e		+20

Capital share assumption

<u>Group A</u>	<u>Capital Share</u>	<u>Sim-1</u>	<u>Sim-2</u>
Sheep (live)	9.3	-6.538	0.048
Wool	23.6	0.142	0.006
Cereals	62.0	0.867	-0.016
Pulses and oilseeds	5.1	0.730	0.074
<u>Total</u>	<u>100.0</u>	<u>0.000</u>	<u>0.000</u>
<u>Group B</u>			
Horticulture	25.4	-0.005	-0.004
New industries	51.8	-0.005	-0.004
Dairy cattle	22.8	0.016	0.014
<u>Total</u>	<u>100.0</u>	<u>0.000</u>	<u>0.000</u>

Input coefficients (%)

Supply Industry	Sheep (live)	Meat and meat products
Sheep (live)	0.00	13.85
Wool	0.00	0.00
Cereals	3.42	0.00
Pulses & oilseeds	1.17	0.00
Beef cattle	0.00	27.95
Pigs	0.00	5.34
Poultry	0.00	8.63
Other goods and services	30.43	23.21
Total intermediate uses	35.07	78.98
Compensation of employees	5.81	12.98
Gross operating surplus	46.06	3.84
Taxes	1.33	2.44
Imports	11.78	1.75
Total	100.00	100.00

Results

Changes in export quantities (%)

Commodities	Sim-1	Sim- 2
Primary		
Sheep (live)	-13.932	0.077
Wool	0.127	0.005
Grains	0.988	-0.018
Pulses & oilseeds	0.968	0.084
Beef cattle (live)	-0.109	-0.114
Processed		
Meat & meat products	0.061	0.102

Results (contd.)

Changes in export quantities (%)

Broad industries	Sim-1	Sim- 2
Agriculture	-0.5082	0.0017
Forestry, logging & Fishing	0.0060	0.0287
Mining	0.0008	0.0035
Agriculture processing	0.0783	0.1168
Other manufacturing	0.0030	0.0123
Total	-0.0058	0.0098

Results (contd.)

Macroeconomic changes (%)

Variables	Sim-1	Sim- 2
Real GSP at market price	-0.0105	-0.0607
Total consumption (real)	-0.0105	-0.0607
Consumers Price Index (CPI)	-0.0080	-0.0404
Aggregate employment	-0.0137	-0.0459
Total imports	-0.0108	-0.0397
Total exports	-0.0058	0.0098

Results (contd.)

Direct and indirect impact (%)

Live sheep exports is 0.18% of GSP

Direct effect \approx (14% \Downarrow in sheep exports \times 0.18%
GSP share of live-sheep exports) 0.025% \Downarrow in GSP

Indirect effect \approx Total effect - direct effect i.e.
(-0.010 - (-0.025)) = 0.015% \Uparrow in GSP.

Results (contd.)

Changes in output quantities (%)

Commodities	Sim-1	Sim- 2
Primary		
Sheep (live)	-6.571	0.049
Wool	0.138	0.007
Grains	0.865	-0.015
Pulses & oilseeds	0.727	0.074
Beef cattle (live)	0.001	0.002
Processed		
Meat & meat products	0.024	0.026

Results (contd.)

Changes in output prices (%)

Commodities	Sim-1	Sim- 2
Primary		
Sheep (live)	-0.0259	-0.0010
Wool	-0.0255	-0.0010
Grains	-0.0291	0.0005
Pulses & oilseeds	-0.0215	-0.0019
Beef cattle (live)	0.0004	0.0004
Processed		
Meat & meat products	-0.0003	-0.0005

Results (contd.)

Changes in producer's prices (%)

Broad industries	Sim-1	Sim- 2
Agriculture	-0.019	0.001
Forestry, logging & Fishing	-0.003	-0.005
Mining	0.000	-0.001
Agriculture processing	-0.001	-0.003
Other manufacturing	-0.002	-0.008
Trade and transport	-0.005	-0.010
Construction	-0.004	-0.017
Services	-0.009	-0.039
Public Admin. & Defence	-0.004	-0.015

Results (contd.)

Changes in consumer's prices (%)

Broad industries	Sim-1	Sim- 2
Agriculture	-0.006	0.000
Forestry, logging & Fishing	0.000	-0.001
Mining	0.000	0.000
Agriculture processing	-0.001	-0.003
Other manufacturing	0.000	-0.006
Trade and transport	0.004	-0.011
Construction	0.004	-0.017
Services	0.006	-0.073
Public Admin. & Defence	0.006	-0.015

Results (contd.)

Changes in output quantities (%)

Broad industries	Sim-1	Sim- 2
Agriculture	-0.214	0.005
Forestry, logging & Fishing	-0.002	-0.001
Mining	0.001	0.003
Agriculture processing	0.021	0.013
Other manufacturing	-0.003	-0.008
Trade and transport	-0.011	-0.012
Construction	-0.009	-0.043
Services	-0.008	-0.030
Public Admin. & Defence	-0.010	-0.055
Total	-0.013	-0.021

Concluding comments

- Overall, decline in export demand for live-sheep has negative impact on key components of the WA economy
- In terms of broader industry impact, all the sectors decline except the mining and agricultural processing
- However, with the added incentive program the agricultural sector - the live sheep industry in particular - regains its positive output but the WA economy declines even further.

Concluding comments

- ⑥ Major exporting sectors such as mining expands under both type of shocks
- ⑥ Agricultural processing sector also expands under both the scenarios