

Ex S3.2 Interpreting Model Results 2 Example

Background

For this project, you examine the effects of three world price shocks, a 25% decrease in the world price of cereals and oilseeds, a 25% decrease in the world export price of livestock, and a combined shock.

Analysis – 25% Reduction in PWM for Grains

All agricultural regions produce four commodities – cereals & oilseeds, livestock, other agriculture and construction. As seen in table 1, 39% of output of the Free state is in cereals and oilseeds; 35% of output of North west is in cereals and oilseeds; only 6% of output of the West cape is in cereals and oilseeds. Livestocks are 65% of output in Gauteng and 62% of output in East Cape. The commodity share of output is assumed to be fixed so a change in output in an agricultural region will result in the same percent change in output of each commodity produced in that region.

Table 1 Share of commodity c in output of agricultural regions
(ioqxacqx)

	Cereals and oilseeds	Livestocks	Other agriculture	Construction
Agric West cape	0.06	0.27	0.66	0.01
Agric North cape	0.20	0.39	0.39	0.02
Agric North west	0.35	0.51	0.14	0.01
Agric Free state	0.39	0.44	0.16	0.01
Agric East Cape	0.02	0.62	0.34	0.02
Agric KwaZulu	0.07	0.45	0.47	0.01
Agric Limpopo	0.08	0.23	0.68	0.01
Agric Mpumalanga	0.22	0.30	0.46	0.01
Agric Gauteng	0.09	0.65	0.25	0.02

Table 2 Domestic commodity output by agricultural region (percent change)

	Cereals and oilseeds	Livestocks	Other agriculture	Construction
	base closure	base closure	base closure	base closure
	25% fall PWM grains	25% fall PWM grains	25% fall PWM grains	25% fall PWM grains
Agric West cape	1.18	1.18	1.18	1.18
Agric North cape	-2.53	-2.53	-2.53	-2.53
Agric North west	-5.19	-5.19	-5.19	-5.19
Agric Free state	-6.41	-6.41	-6.41	-6.41
Agric East Cape	3.44	3.44	3.44	3.44
Agric KwaZulu	1.53	1.53	1.53	1.53
Agric Limpopo	0.16	0.16	0.16	0.16
Agric Mpumalanga	-2.93	-2.93	-2.93	-2.93
Agric Gauteng	2.37	2.37	2.37	2.37

Agricultural output declines in North cap, North west, Free state and Mpumalnga – each of these regions has a high share of cereals and oilseeds in production so a decrease in the world price of imports will displace domestic production of cereals and oilseeds and output in those regions decline. Land

Analysis – 25% Reduction in PWE for Livestocks

Table 3 Domestic commodity output by agricultural region (percent change)

	Cereals and oilseeds	Livestocks	Other agriculture	Construction
	base closure	base closure	base closure	base closure
	25% fall PWE livestock	25% fall PWE livestock	25% fall PWE livestock	25% fall PWE livestock
Agric West cape	-0.59	-0.59	-0.59	-0.59
Agric North cape	-1.65	-1.65	-1.65	-1.65
Agric North west	-2.70	-2.70	-2.70	-2.70
Agric Free state	-1.82	-1.82	-1.82	-1.82
Agric East Cape	-4.57	-4.57	-4.57	-4.57
Agric KwaZulu	-2.60	-2.60	-2.60	-2.60
Agric Limpopo	-0.11	-0.11	-0.11	-0.11
Agric Mpumalanga	-0.51	-0.51	-0.51	-0.51
Agric Gauteng	-4.77	-4.77	-4.77	-4.77

When the world export price of livestock declines by 25%, output in all agricultural regions declines, see Table 3. Livestock is an important commodity for all agricultural

regions, with the commodity share of output ranging from 23% to 65%. Livestock is most important in Guateng (65% of output) and East Cape (63% of output), see Table 1. These are also the regions with the biggest decline in output, 4.77% for Guateng and 4.57% for East Cape, see Table 3.

Analysis – 25% Reduction in PWM for Grains and 25% Reduction in PWE for Livestocks

Table 4 Domestic commodity output by agricultural region (percent change)

	Cereals and oilseeds	Livestocks	Other agriculture	Construction
Agric West cape	0.64	0.64	0.64	0.64
Agric North cape	-4.16	-4.16	-4.16	-4.16
Agric North west	-7.83	-7.83	-7.83	-7.83
Agric Free state	-8.25	-8.25	-8.25	-8.25
Agric East Cape	-1.00	-1.00	-1.00	-1.00
Agric KwaZulu	-0.97	-0.97	-0.97	-0.97
Agric Limpopo	0.05	0.05	0.05	0.05
Agric Mpumalanga	-3.49	-3.49	-3.49	-3.49
Agric Gauteng	-2.27	-2.27	-2.27	-2.27

The combined world price shock reduces output in most agricultural regions. Some resources, such as capital and labor can move to other activities. However, land is only used as an input to agriculture so output cannot decline in all agricultural regions.