



The Implications of GMOs for Australian Trade

by

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Aim of research project

Determine implications for Australia's trade position of a set of consumer and regulatory responses to the introduction of two GM crops: grains and oilseeds.

Builds on the work of:

Nielsen and Anderson (2001) and

Nielsen, Robinson and Thierfelder (2001).



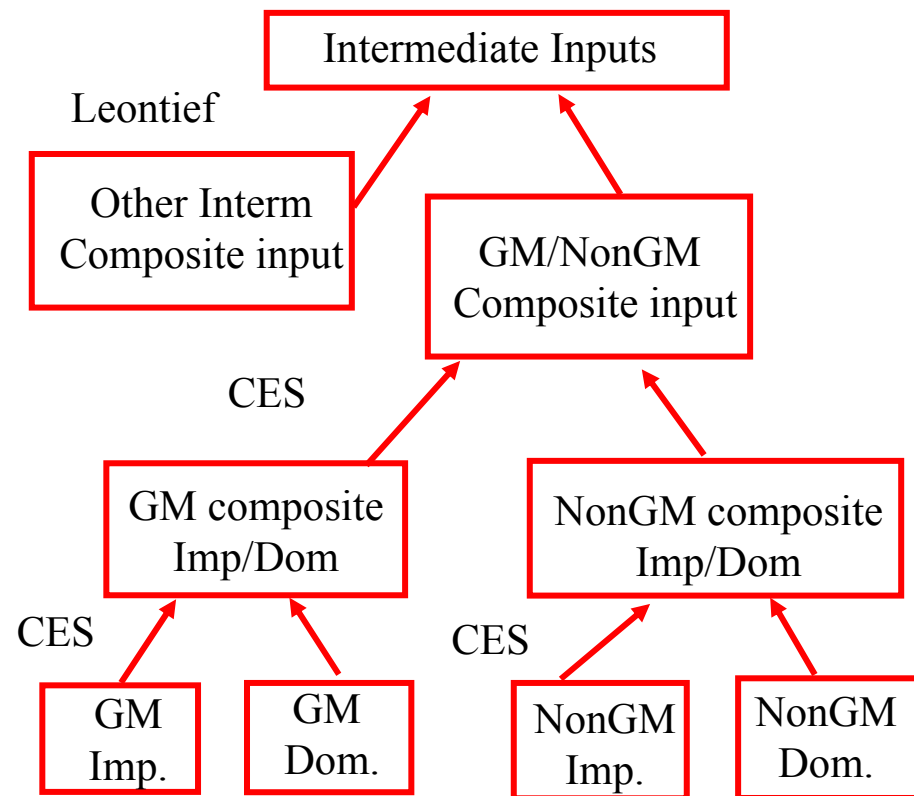
Model Alterations

- Aggregated to 10 commodities (*wheat, grains, oilseeds, livestock, other ag products, meat products, processed foods, manufactures, transport and other services*) and 8 regions (*Australia, New Zealand, Japan, Korea, China, EU, North America and rest of the world*).
- Split database for grains and oilseeds into GM and non-GM crops based current estimated market shares.
- Introduced CES nesting to production and consumer demand.
- Introduced Consumer preference shift against GMOs.

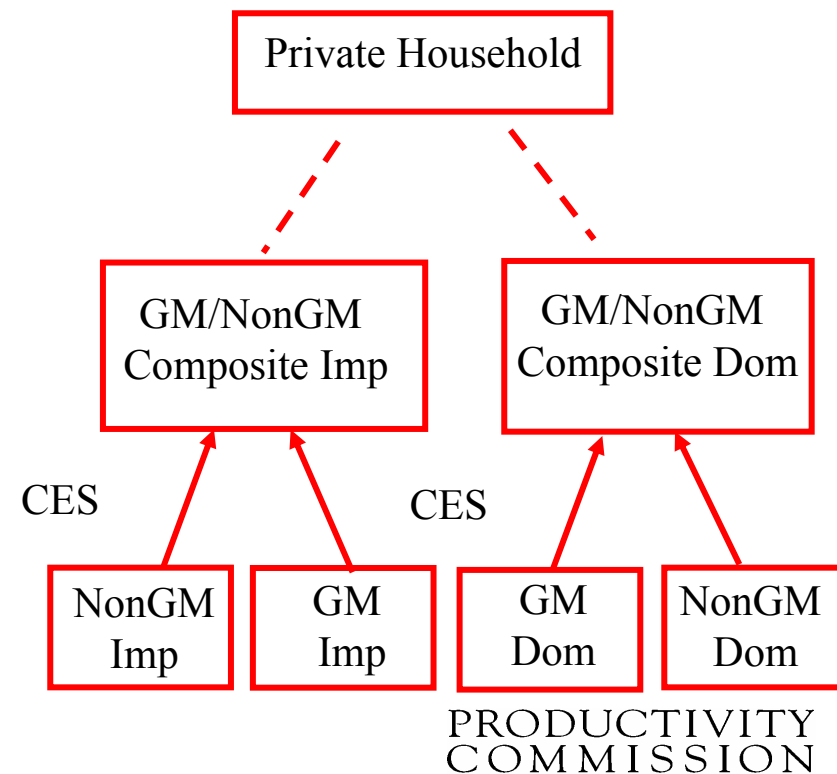


Nesting

Production Nesting



Consumer Nesting





Firm and Consumer Shocks

- Productivity shock to GM crops (shock 1)
 - 7.5% productivity increase in GM grains and 6% productivity increase in GM oilseeds
 - $aosec(j)$ - output tech change of sector j , worldwide
- Consumer resistance in some markets (shock 2)
 - 25% shift against GM crops in EU, Aust, NZ, Jpn & Kor (replaced by non-GM varieties)
 - GM commodities become less substitutable, differentiated by region
 - $fpm(i,s)$ - negative pref shift parameter on import i
 - $fpd(i,s)$ - negative pref shift parameter on domestic i
 - 3 tier resistance response implemented using substitution parameters ESBO and ESGG



Regulation Shocks

- **Regulation costs (shock 3)**

- *Domestic*

- ☞ 5% increase in costs in low threshold regions (EU, Australia and NZ)
- ☞ 2% increase in high threshold regions (Japan and Korea)
- ☞ $afeall(i,j,r)$ & $afall(i,j,r)$ - negative primary factor and output-augmenting tech changes implemented as shocks to primary factors, manufactures, services and transport

- ***Addition (to shock 3)***

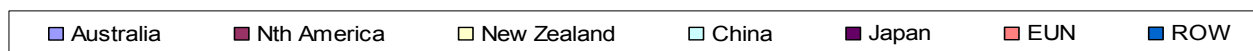
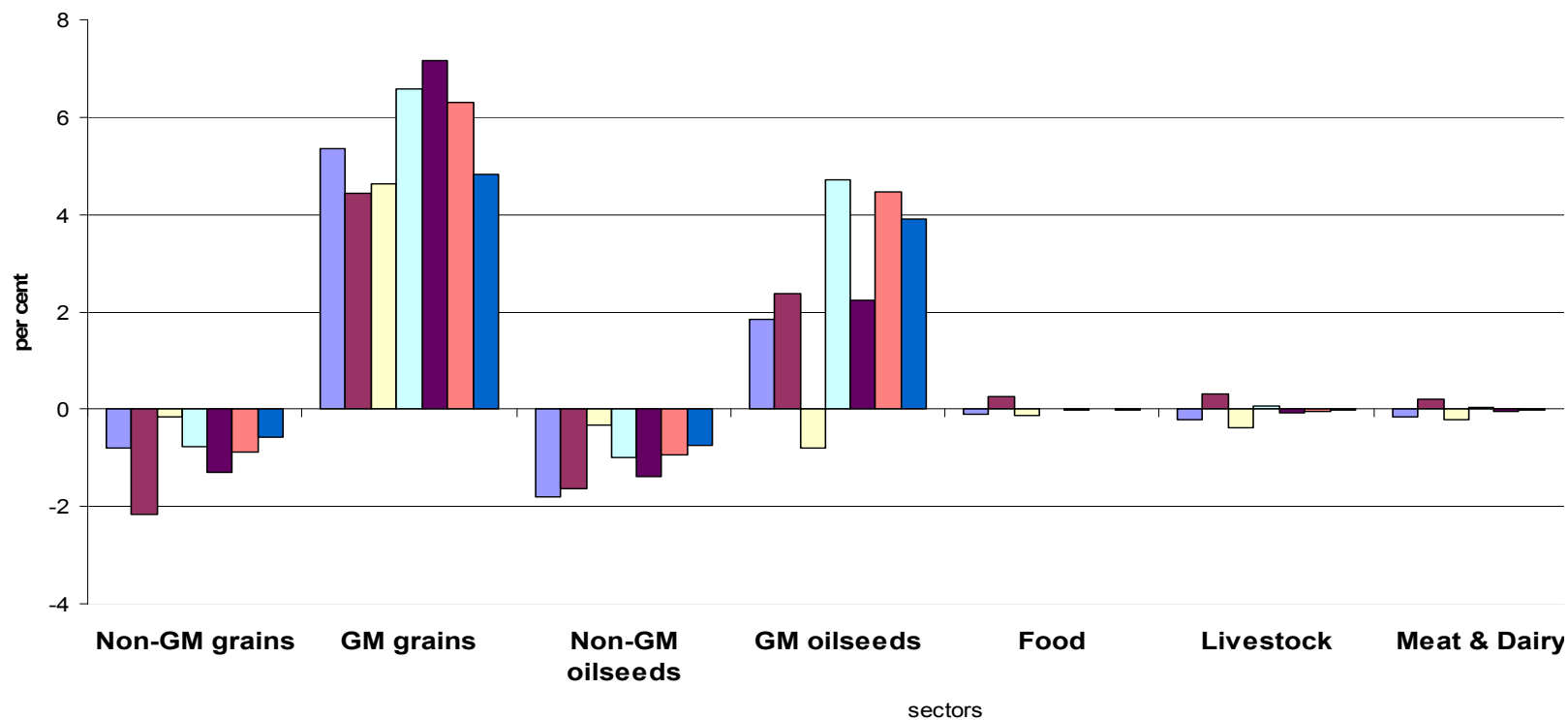
- *Import*

- ☞ 5% on imports from no regulation regions to high regulation regions
- ☞ 2% on imports from no regulation regions to low regulation regions
- ☞ 3% on imports from low reg regions to high regulation regions
- ☞ $ams(i,r,s)$ - negative import-augmenting tech change, raises price of imports to place domestic product back on even footing with imports

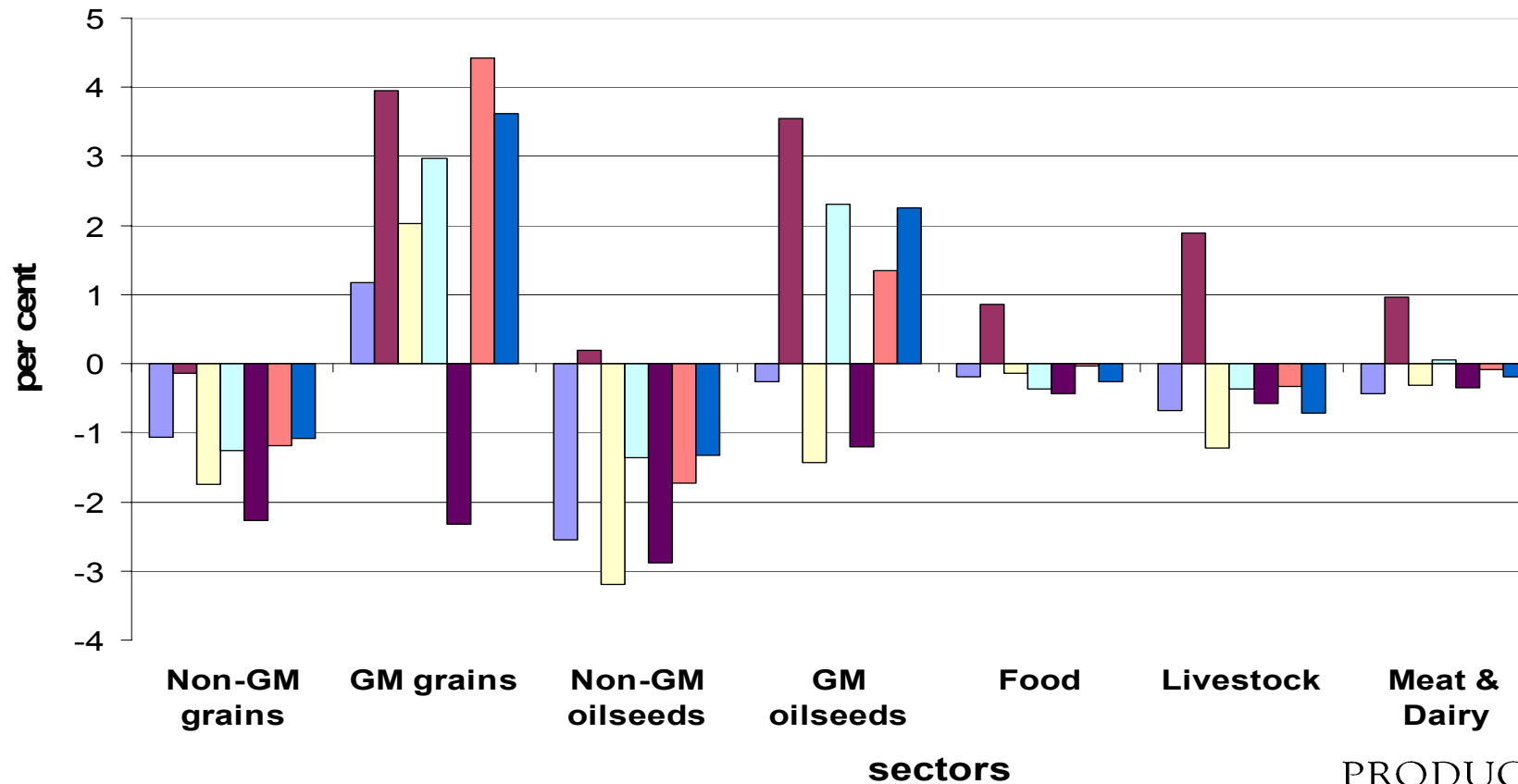


Productivity Shock Results

Change in Output

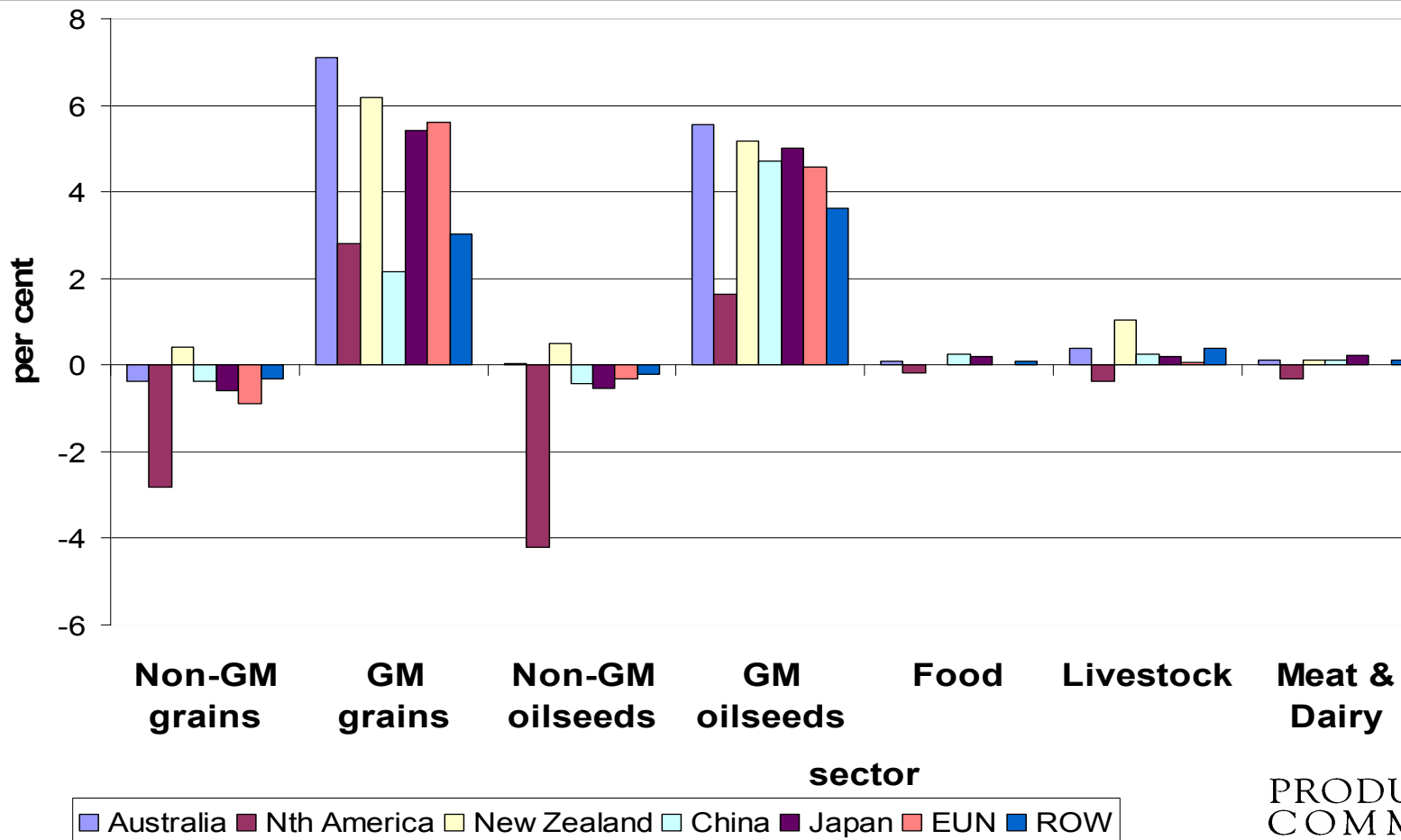


Change in Exports Productivity Shock



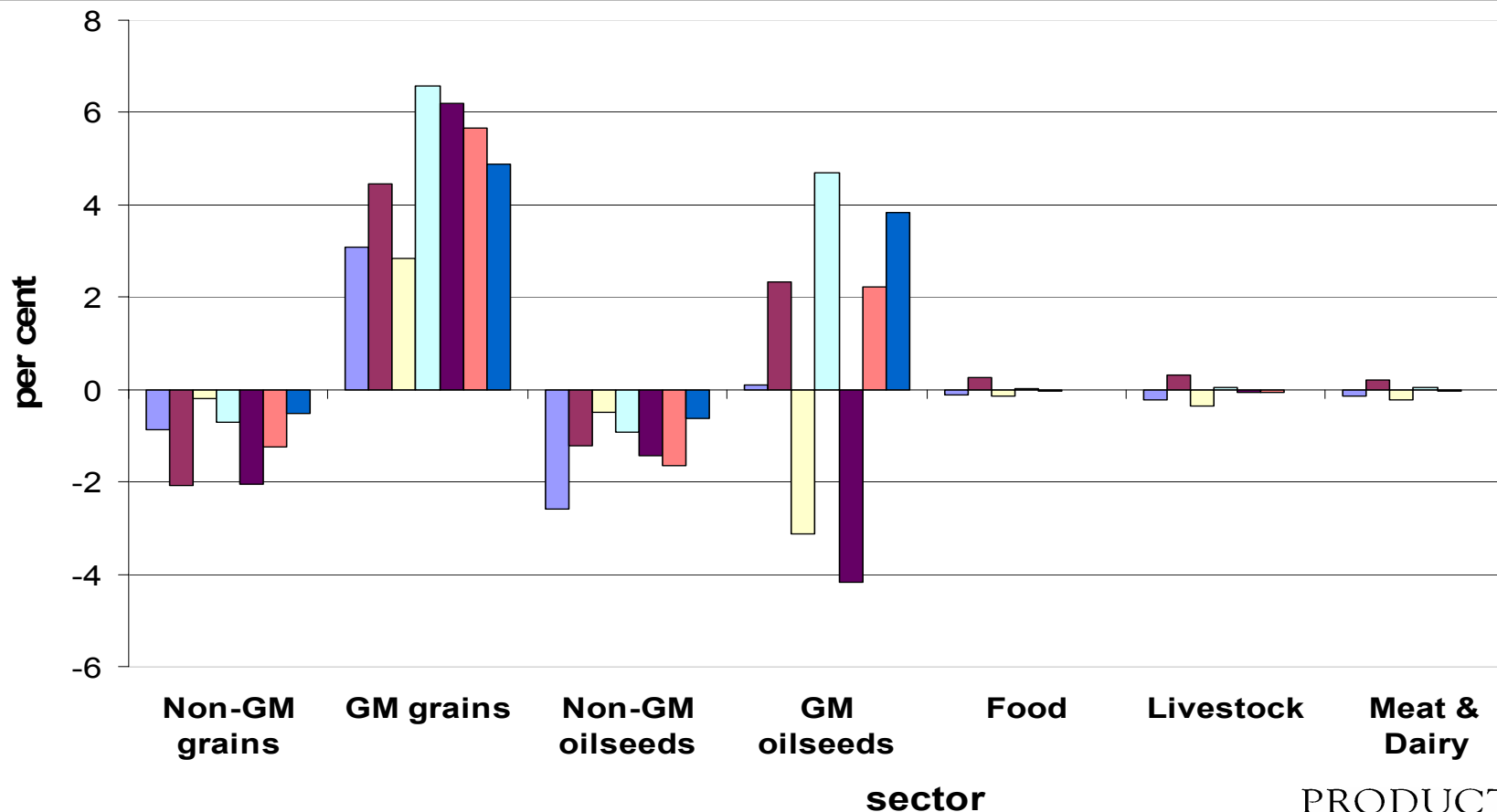
PRODUCTIVITY
COMMISSION

Change in Imports Productivity Shock

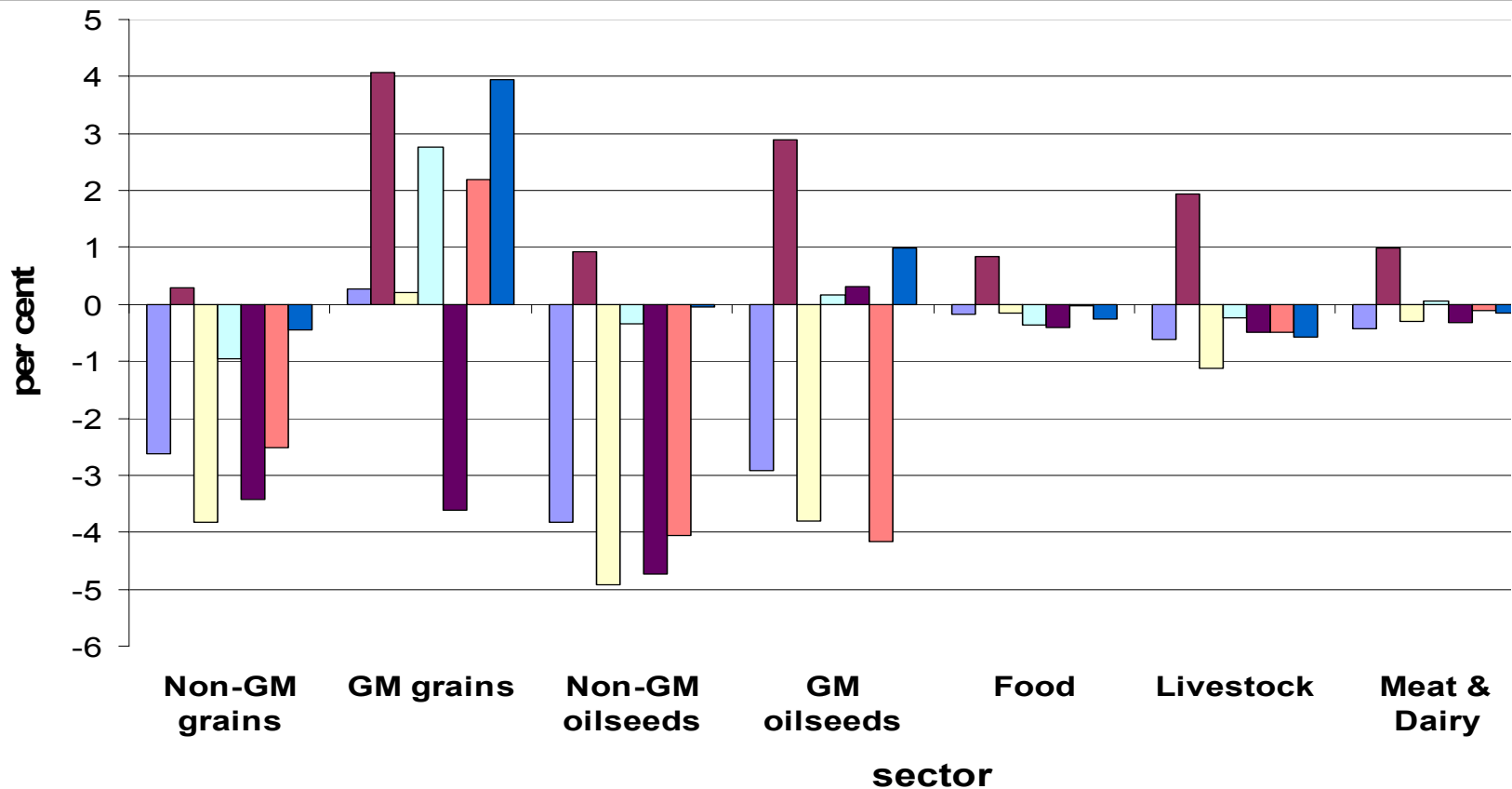


Regulatory Shock Results

Change in Output

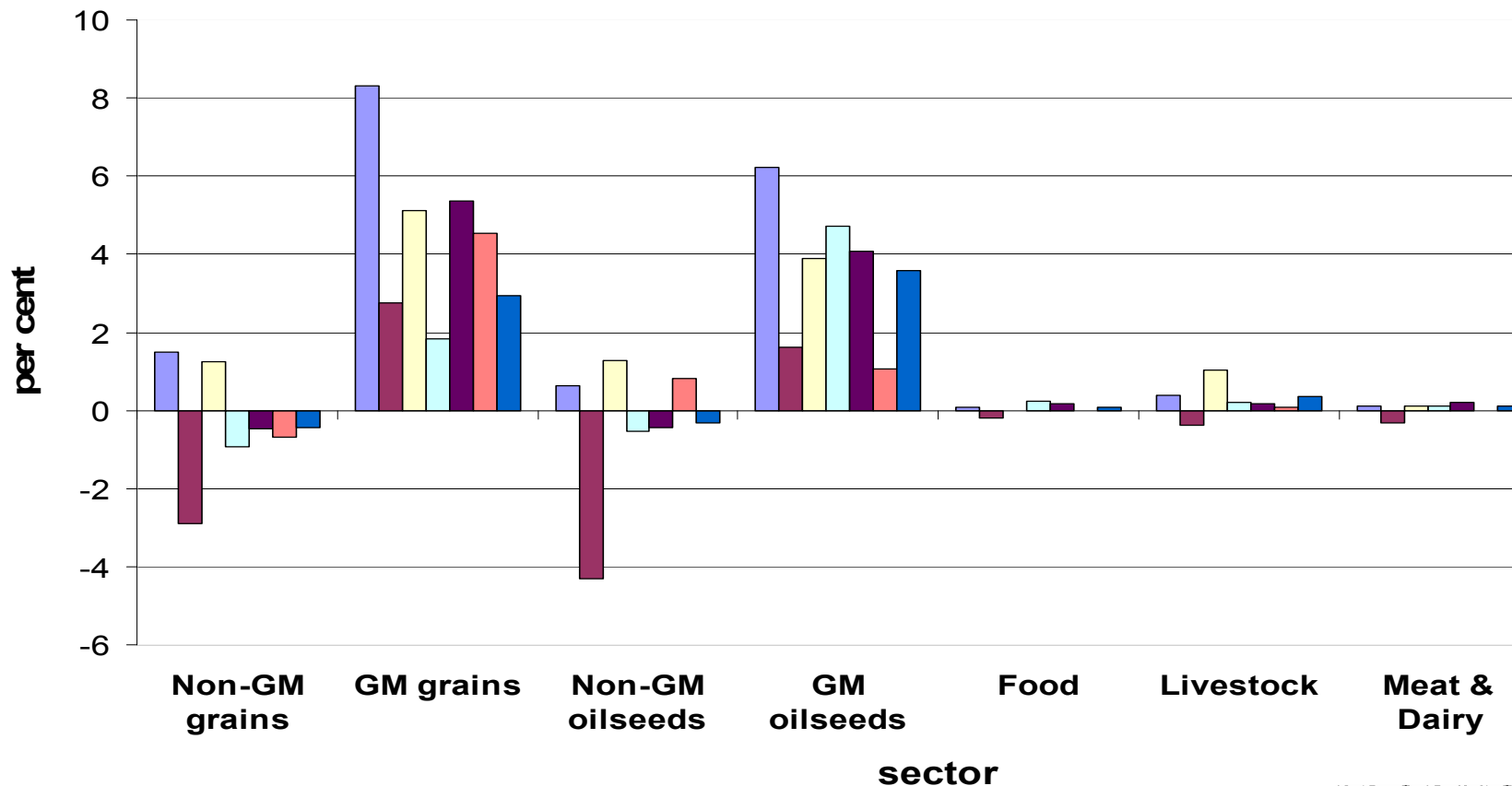


Change in Exports Regulatory Shock



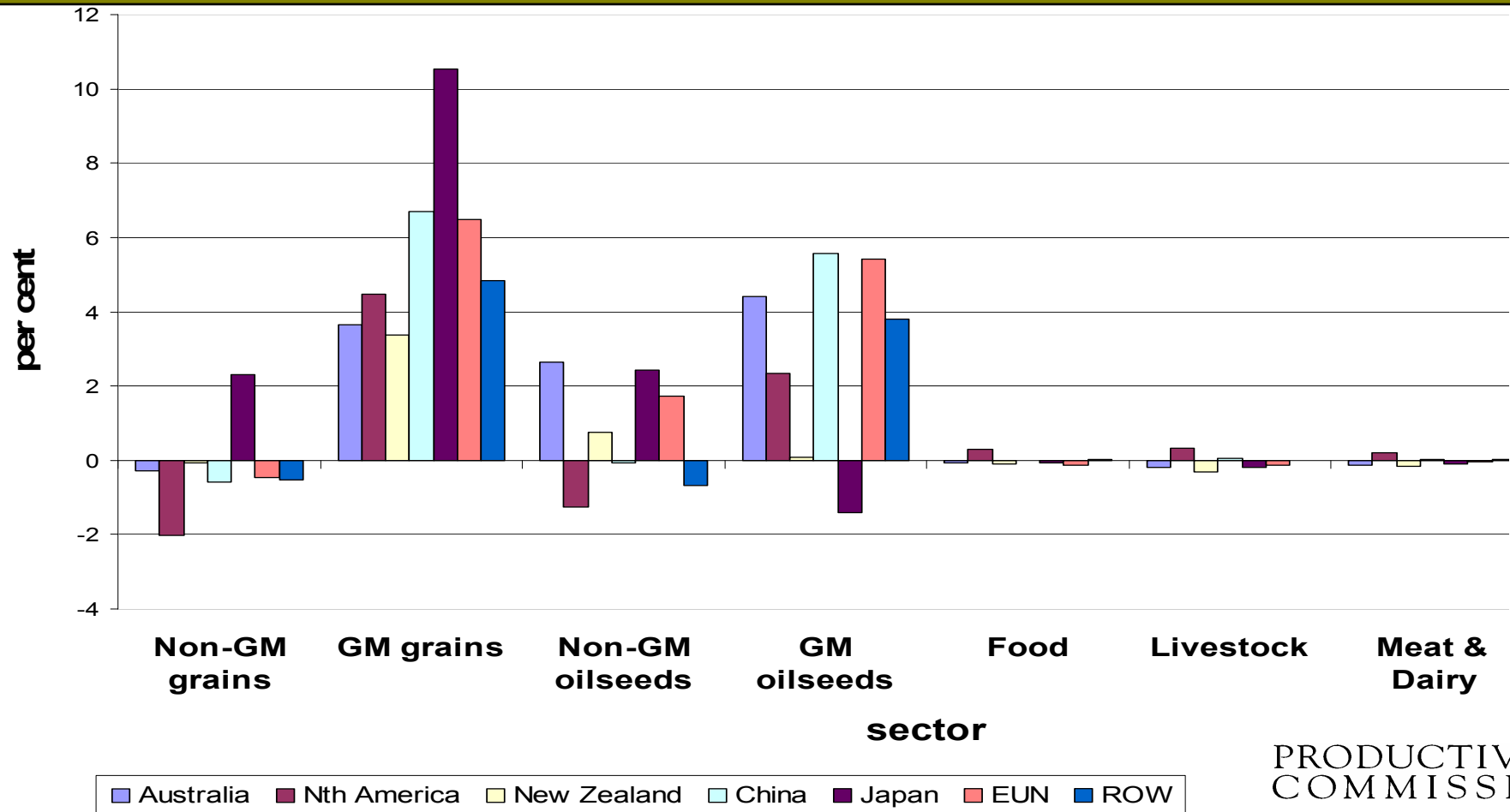
■ Australia
 ■ Nth America
 ■ New Zealand
 ■ China
 ■ Japan
 ■ EUN
 ■ ROW

Change in Imports Regulatory Shock



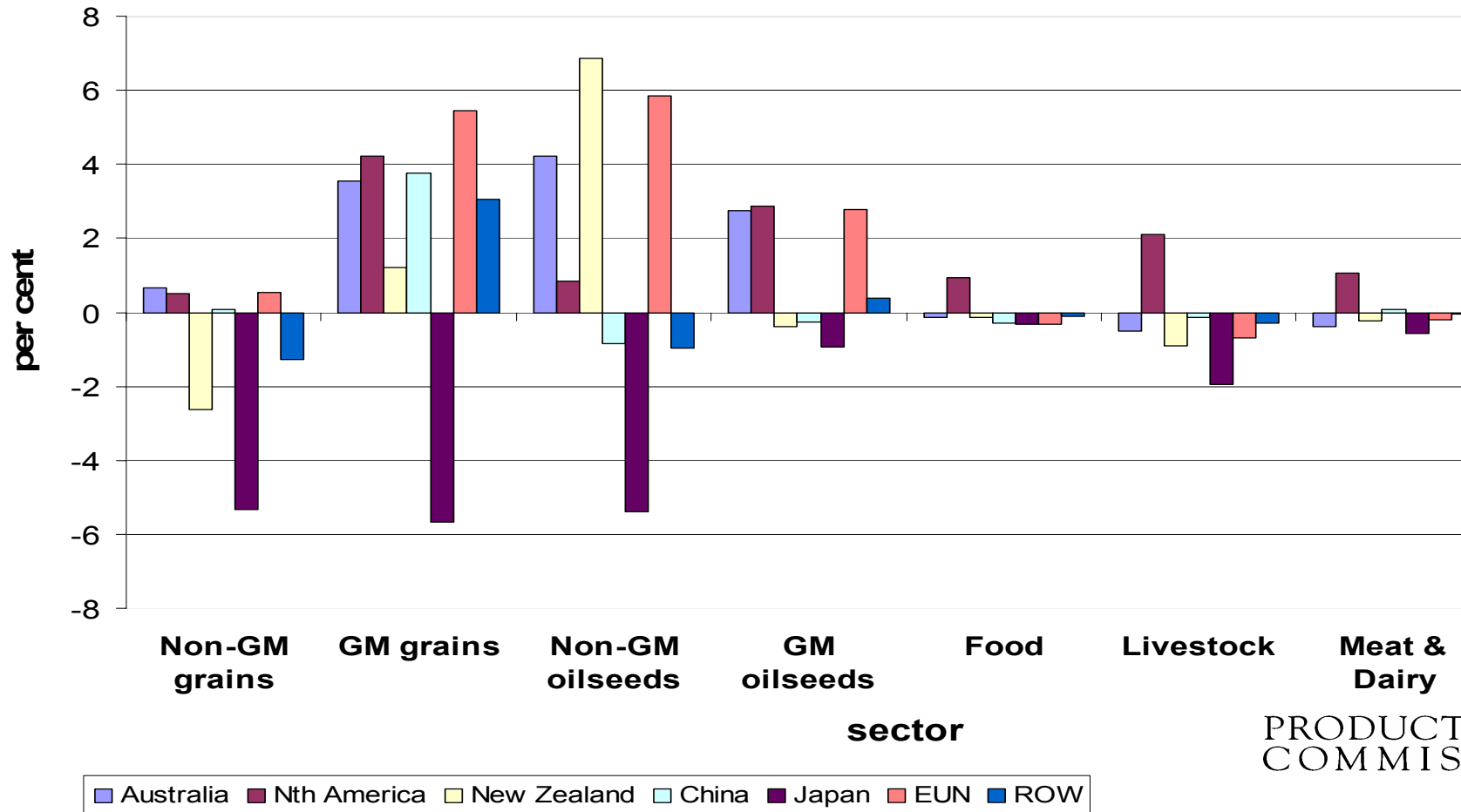
Adding Regulation to Imports

Change in Output



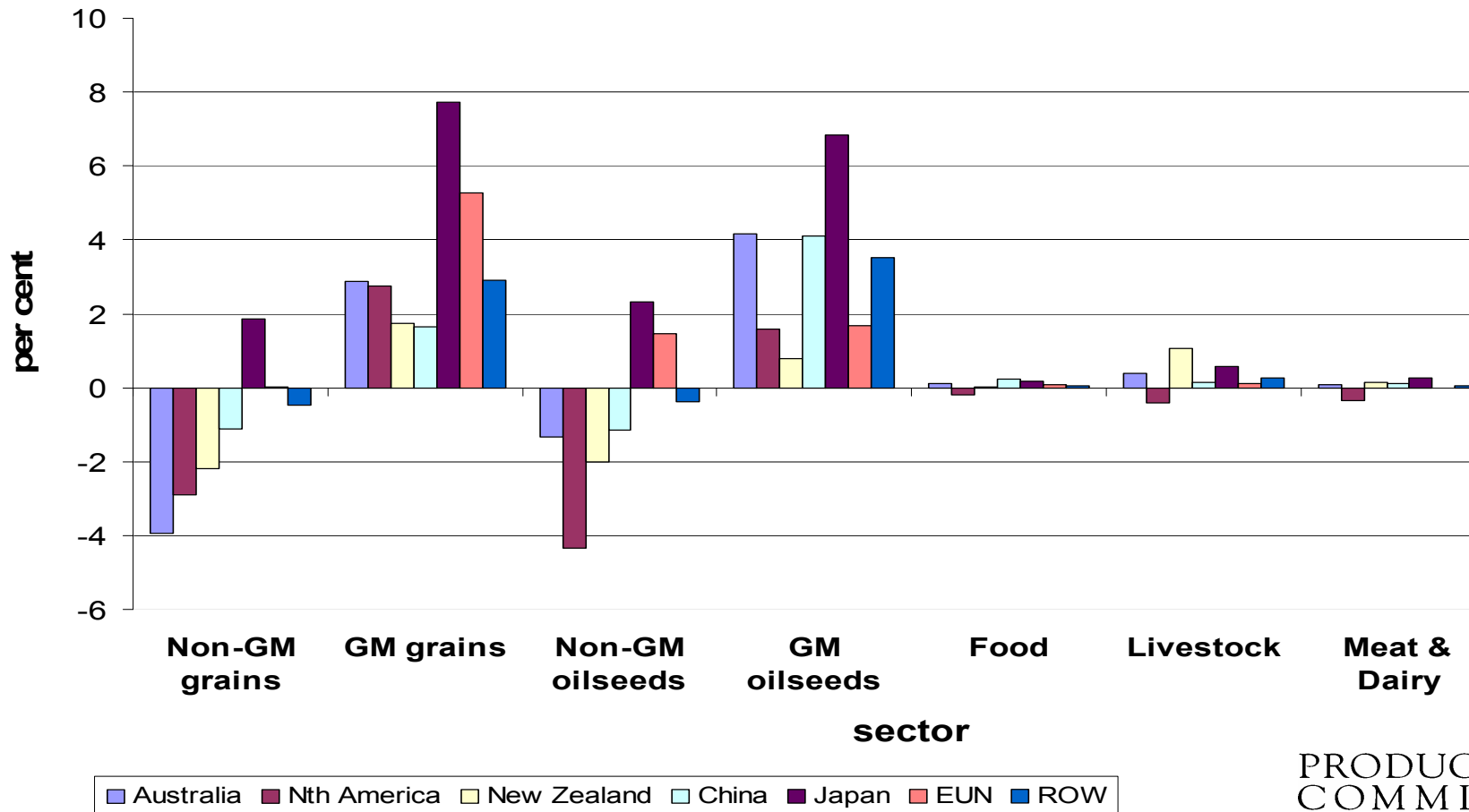
Change in Exports

Regulation added to Imports



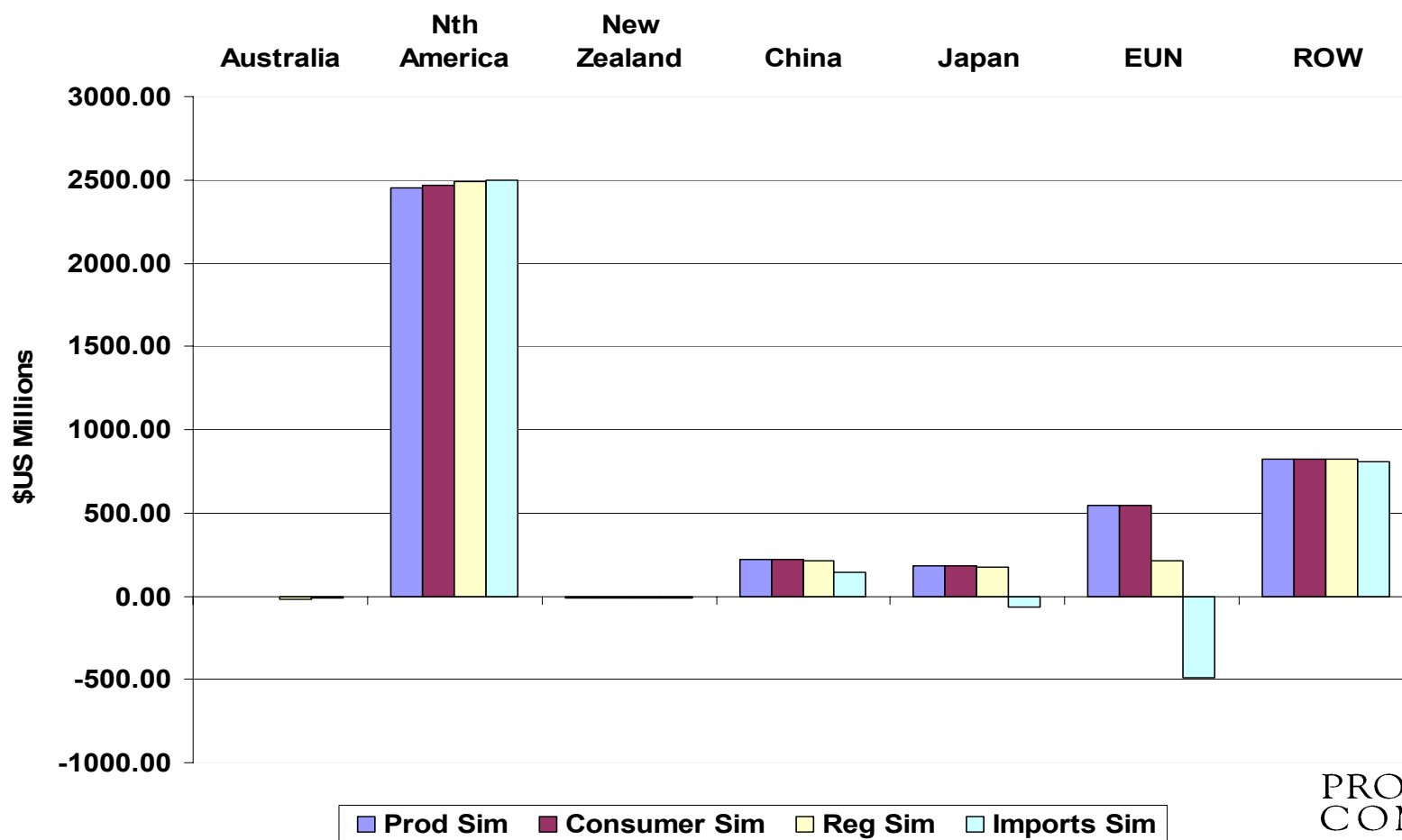
Change in Imports

Regulation added to Imports





Welfare Changes





Still to come...

- Policy evolution simulation
- GM processed food
- Add wheat
- Diversity in consumer response
- Environmental ‘module’