Agenda – Special Safeguard Mechanism

- Megan & Enrique
  - land mobility
- Danielle & Menaka
  - trade liberalization of the wheat sector in China
- Sachin
  - effects of productivity decline in the context of SSM: a case study of China and South Asia

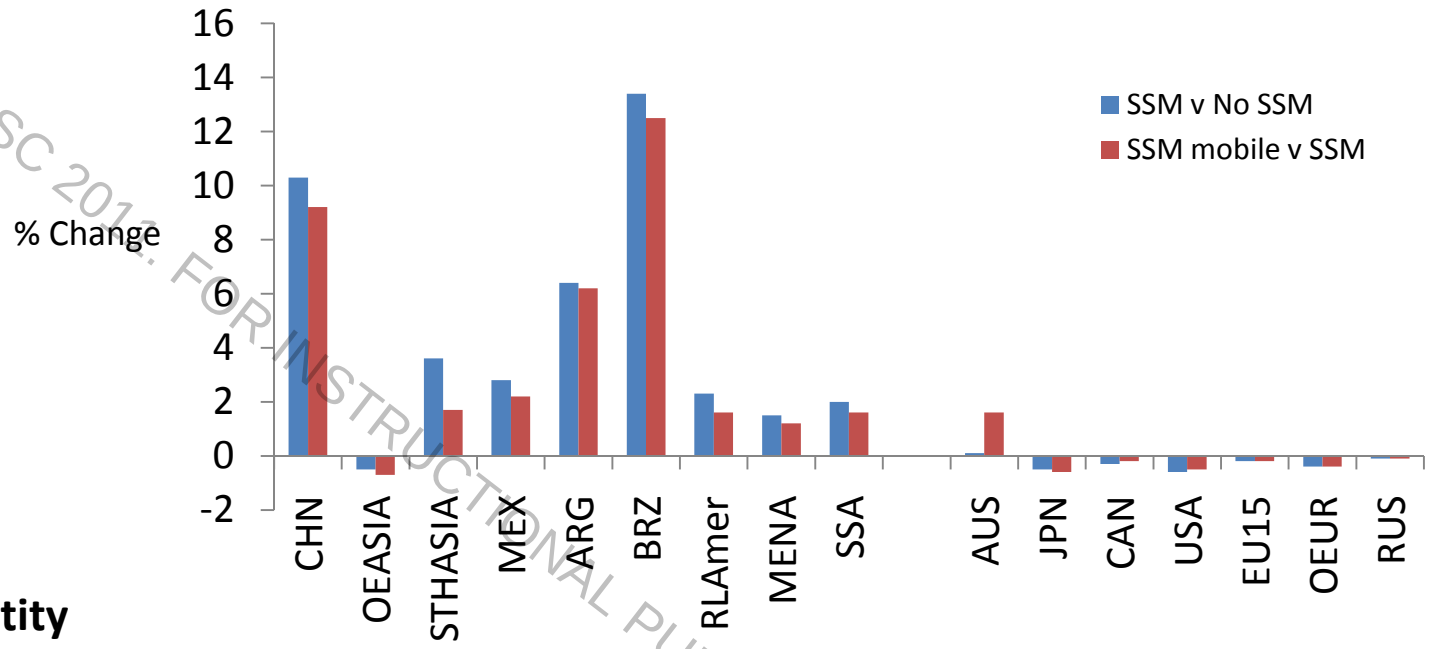
Agenda

- Guanghua
  - effects of GDP growth in China on wheat trade
- Beth & Nihan
  - the impact of regional agricultural technology shifts upon wheat markets

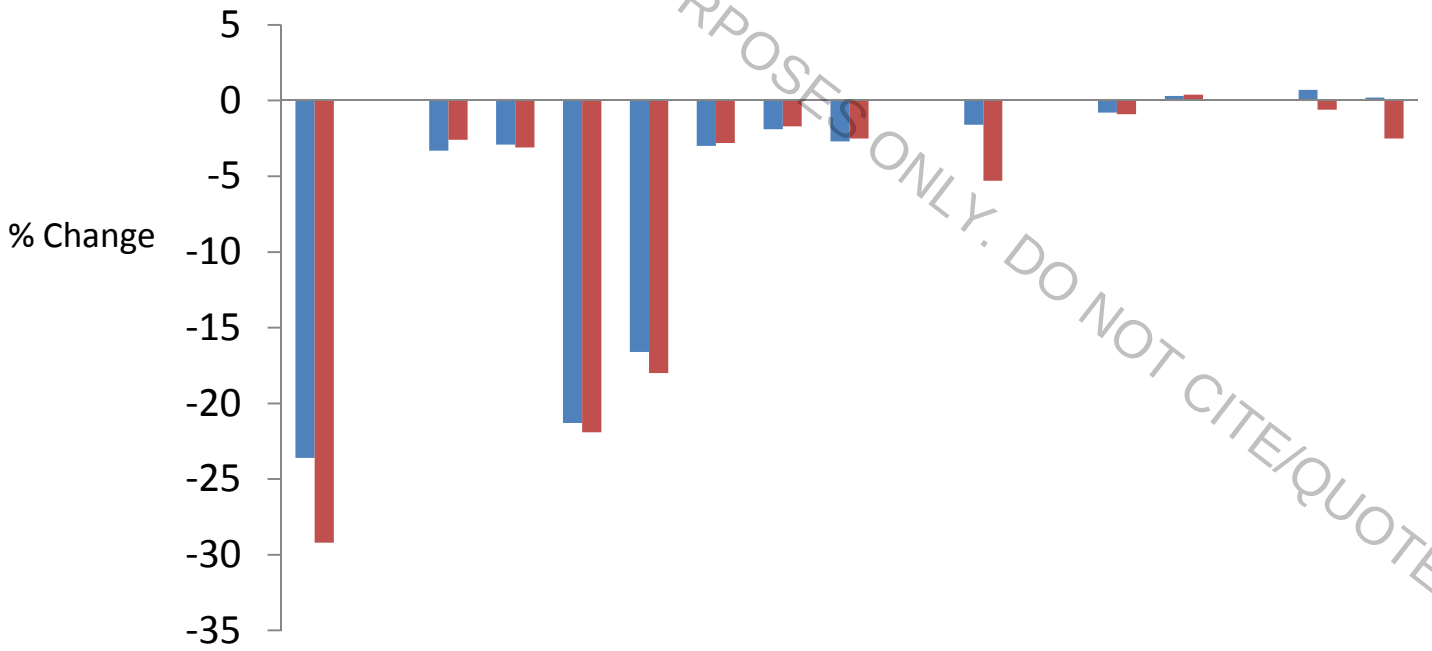
Extension

- The original model did not allow land mobility.
- We allow the elasticity of transformation for land to change by setting ETRAE to -1 for every region.
- This allows land to produce other crops.

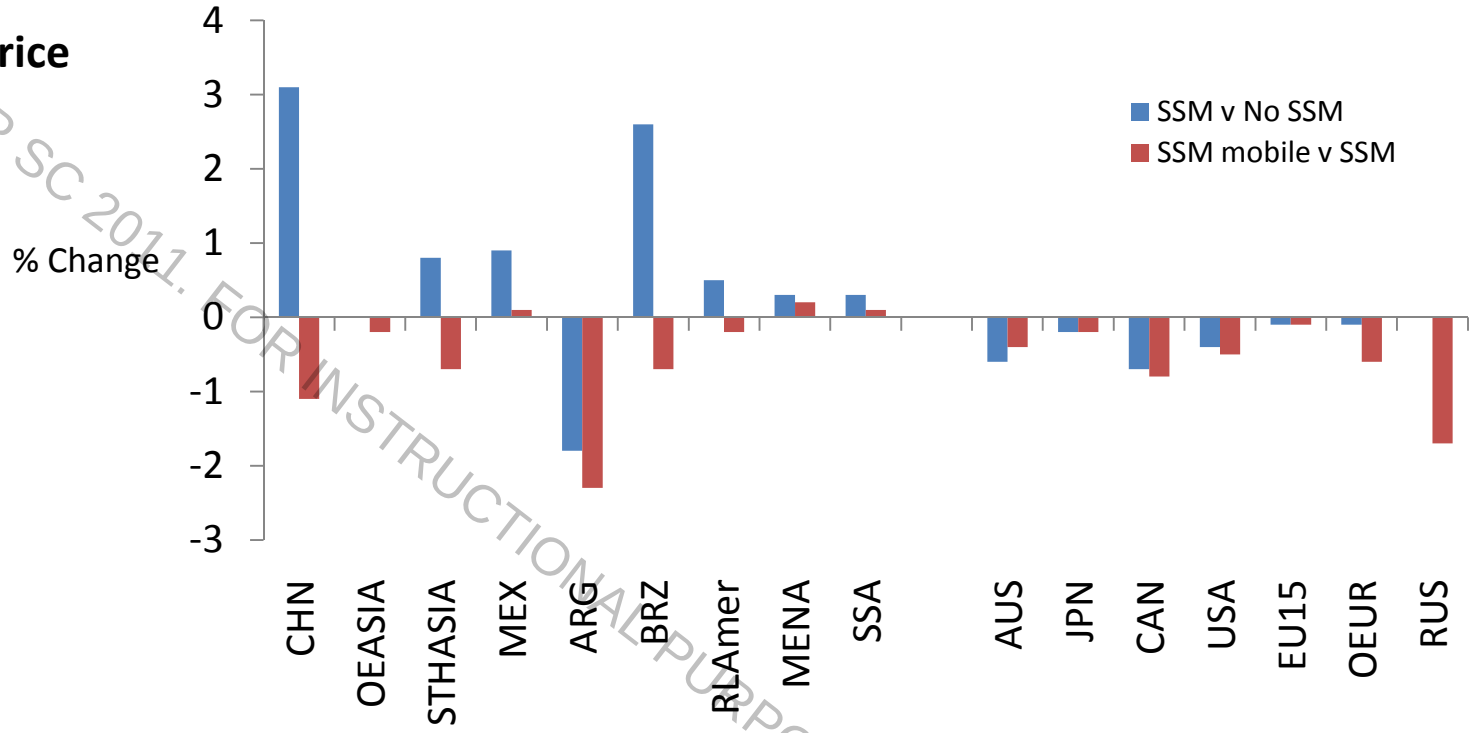
Import Price



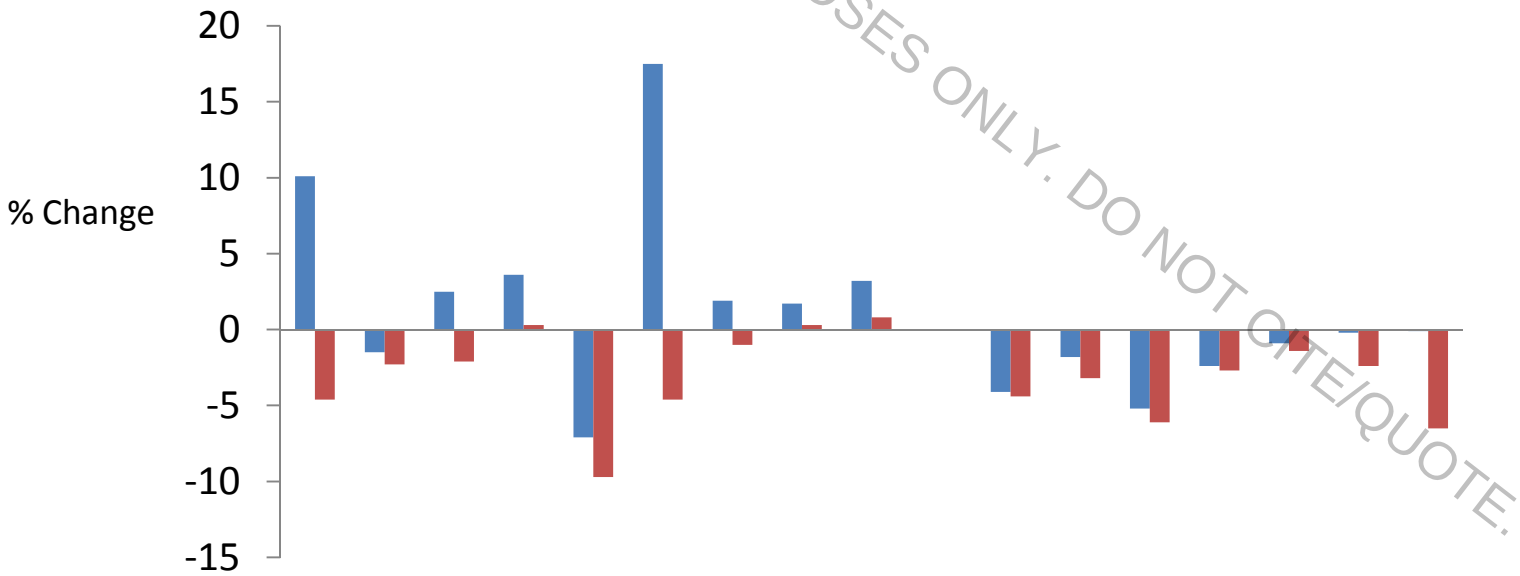
Import Quantity

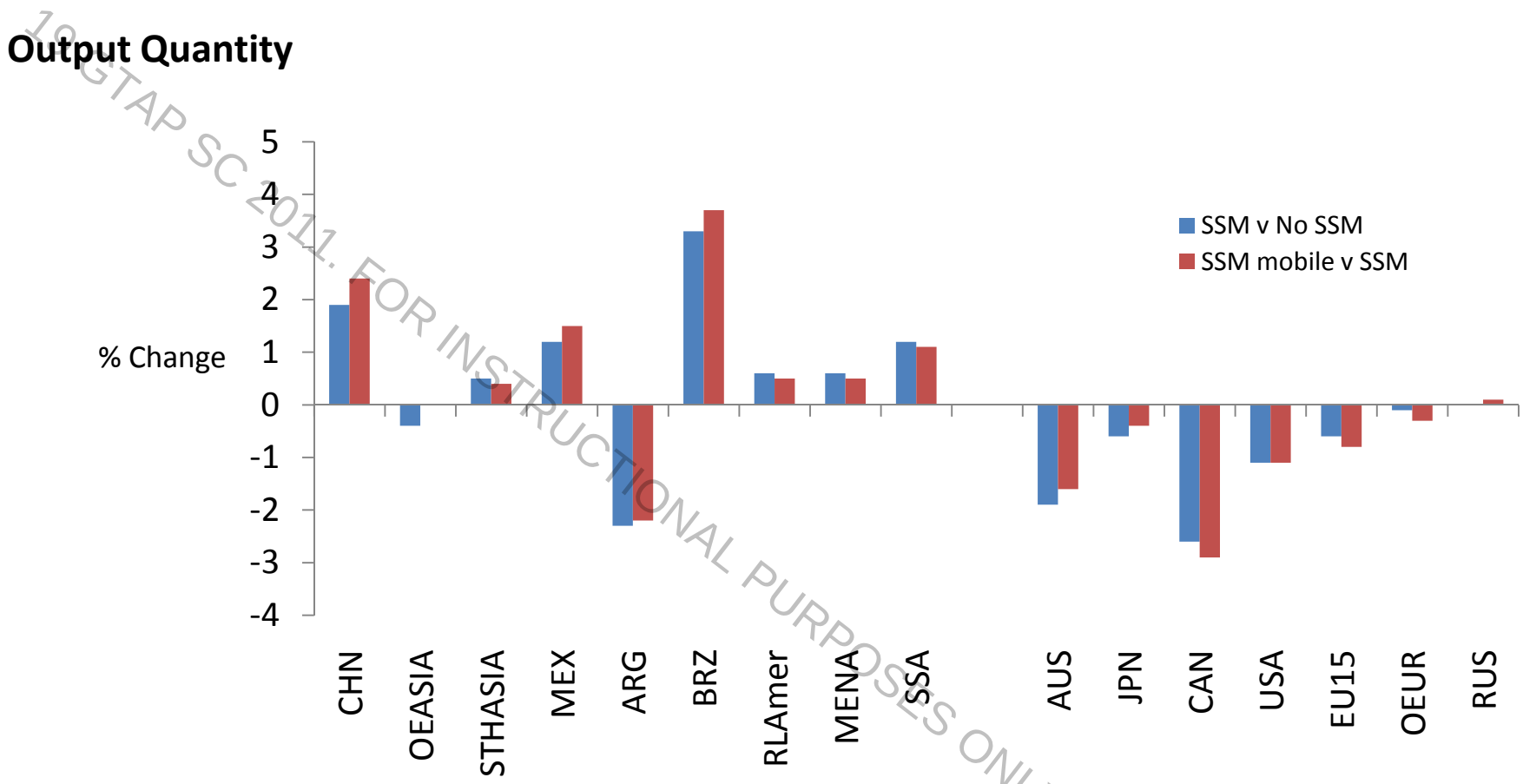


Domestic Price



Land Rents





Conclusions

- Import prices of wheat increase after SSM across developing economies (mainly Brazil and China), although mitigated by land mobility.

- Land mobility permits Brazil and China to produce more wheat. Countries will also import comparatively less wheat with land mobility.

- Domestic prices of wheat and corresponding land rents decrease following land mobility in Brazil and China.

LIBERALIZATION OF THE WHEAT SECTOR IN CHINA WITH SSM

FOCUS ON EMPLOYMENT EFFECTS

EXPLANATION OF EXPERIMENT

Shock: Remove China's tariffs on wheat from all regions

- Shock tms("wht",REG,"CHN") = target% 0

Modify closure: Allow for unemployment of skilled and unskilled labor in China

- swap qo("unsklab", "CHN") = pfactreal("unsklab", "CHN");
  swap qo("sklab", "CHN") = pfactreal("sklab","CHN");

Analyze: Find employment and welfare effects with and without the SSM

LIBERALIZATION WITH THE SSM: OFFSETTING TARIFF EFFECTS

- **Initial tariffs are brought to zero and the level of imports in China increases enough to trigger the Q-SSM. *Every exporter now faces the Q-SSM rates.***

- **Price response in China: Import prices, *pms*, decrease in most regions as expected. The market price of wheat in China, *pm*, decreases by 7.9%. This results in a 7.9% decrease in the supply price, *ps*.**

Region	Initial Tariff (%)	Initial imports (million $)	Tariff Removal (%)	Final Tariff (%)	Final imports (million $)
1 AUS	114	53	0	30	127
3 JPN	114	0	0	30	0
4 OEASIA	87	0	0	30	0
5 STHASIA	0	0	0	30	0
6 CAN	114	258	0	30	606
7 USA	114	41	0	30	100
8 MEX	0	0	0	30	0
9 ARG	114	4	0	30	11
10 BRZ	0	0	0	30	0
11 RLAmer	0	0	0	30	0
12 EU15	114	9	0	30	22
13 OEUR	111	3	0	30	6
14 RUS	0	0	0	30	0
15 MENA	0	2	0	30	0
16 SSA	0	0	0	30	0
17 ROW	0	0	0	30	0

LIBERALIZATION WITHOUT THE SSM

- Initial tariffs are brought to zero.
- Price response in China: Import prices, *pms*, decrease in most regions as expected. The market price of wheat in China, *pm*, decreases by 8.3%. This results in a 8.3% decrease in the supply price, *ps*.
- Both import and market price effects are greater *without the SSM.*

Region	Initial Tariff (%)	Initial imports (million $)	Final Tariff (%)	Final imports (million $)
1 AUS	114	53	0	177
3 JPN	114	0	0	0
4 OEASIA	87	0	0	0
5 STHASIA	0	0	0	0
6 CAN	114	258	0	836
7 USA	114	41	0	140
8 MEX	0	0	0	0
9 ARG	114	4	0	15
10 BRZ	0	0	0	0
11 RLAmer	0	0	0	0
12 EU15	114	9	0	32
13 OEUR	111	3	0	9
14 RUS	0	0	0	0
15 MENA	0	2	0	0
16 SSA	0	0	0	0
17 ROW	0	0	0	0

THE TRADE BALANCE AND THE WHEAT SECTOR IN CHINA

In both simulations:

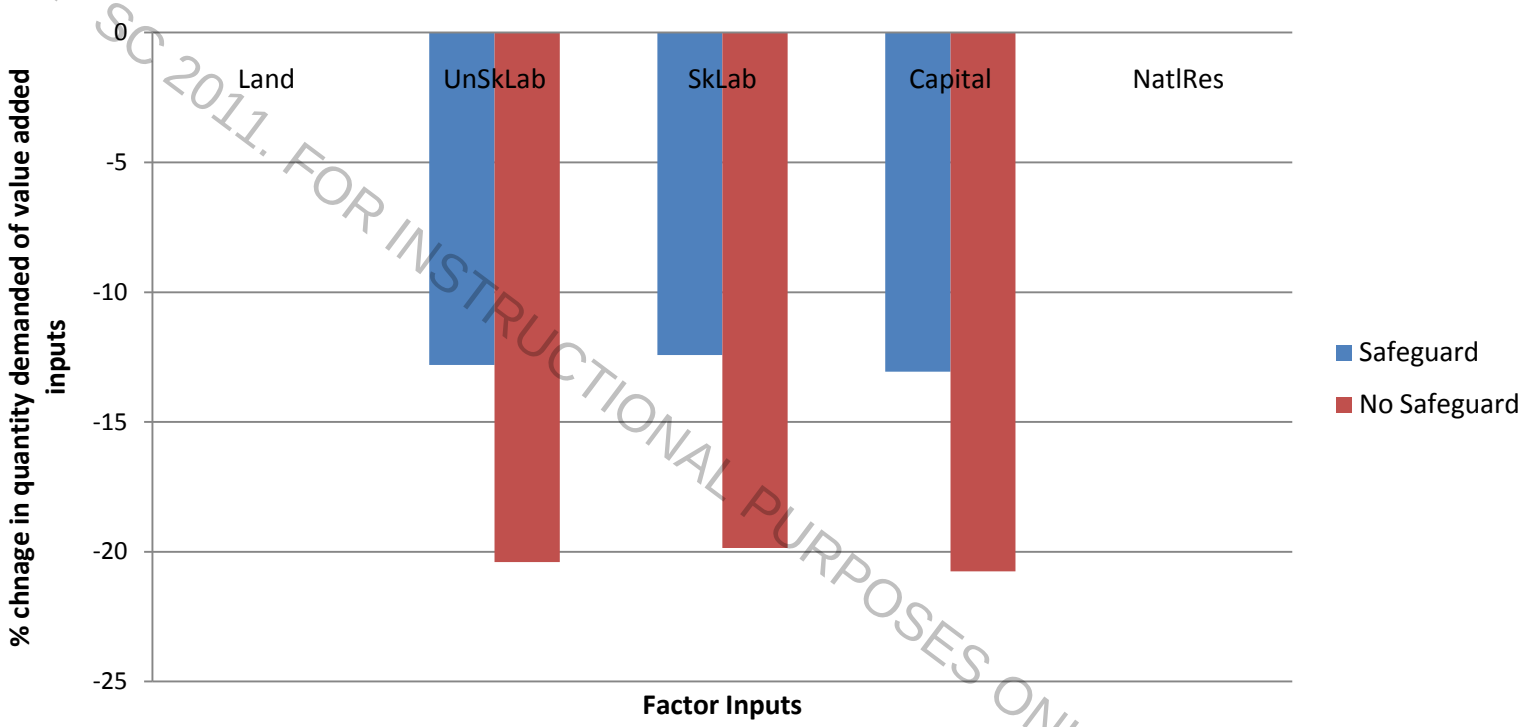
- **The price of wheat imports into China decreases due to the removal of the tariff.**
- **The price of wheat sourced from China also decreases.**
- **The resulting increase in exports of Chinese wheat to other regions overpowers the increase of imports of wheat into China, resulting in a positive change in the volume of the trade balance for China with most regions.**

These effects are larger without the SSM.

FACTOR INPUTS USED IN THE PRODUCTION OF WHEAT

Factor Inputs	Proportion of factor inputs
1 Land	0.2900
2 UnSkLab	0.5853
3 SkLab	0.0047
4 Capital	0.1200
5 NatlRes	0.0000

CHANGE IN QUANTITY DEMANDED OF FACTOR INPUTS



CHANGES IN OUTPUT AND FACTOR DEMAND IN OTHER SECTORS

Sectors	With Safeguard	Without Safeguard
1 wheat	-9.9	-16.0
2 othrcrps	0.5	0.7
3 natres	0.1	0.2
4 lvstk	0.4	0.7
5 pfood	0.5	0.8

othrcrps		
	With Safeguard	Without Safeguard
UnSkLab	0.87	1.37
SkLab	1.32	2.07
Capital	0.58	0.92

pfood		
	With Safeguard	Without Safeguard
UnSkLab	0.64	1.02
SkLab	0.97	1.53
Capital	0.42	0.66

nagr		
	With Safeguard	Without Safeguard
UnSkLab	0.23	0.29
SkLab	0.62	0.74
Capital	-0.03	-0.03

WELFARE DECOMPOSITION

Welfare	With safeguard	Without safeguard
1 alloc_A1	501.74	681.49
2 endw_B1	1203.32	1883.1
3 tech_C1	0	0
4 pop_D1	0	0
5 tot_E1	-139.49	-204.05
6 IS_F1	7.61	10.25
7 pref_G1	0	0
Total	1573.18	2370.79

CONCLUSION

- **Price and quantity effects are smaller under the simulation with safeguards .**
- **Change s in factor inputs used in production is greater under the simulation without safeguards .**
- **Welfare increases under both simulations , but is greater under the simulation with no safeguards.**
- **In this model any tariff reduction will result in an increase in welfare due to allocative efficiency.**

Effect of Productivity Decline in the Context of SSM: A Case Study of China and South Asia

SACHIN KUMAR SHARMA

INTRODUCTION

- Assume Wheat productivity decline in China and South Asia.
- Aggregation: 17 region (9 Developing region + 7 Developed Region + 1 ROW)
- China and South Asia are developing or least developing countries.
- In Doha round, developing countries can impose SSM in case of import surge.
- SSM may be invoked on the basis of quantity or price.
- In this particular example, quantity based SSM is considered.
- Wheat Productivity Shocks (aoall):
  China: -20%
  South Asia: -15%

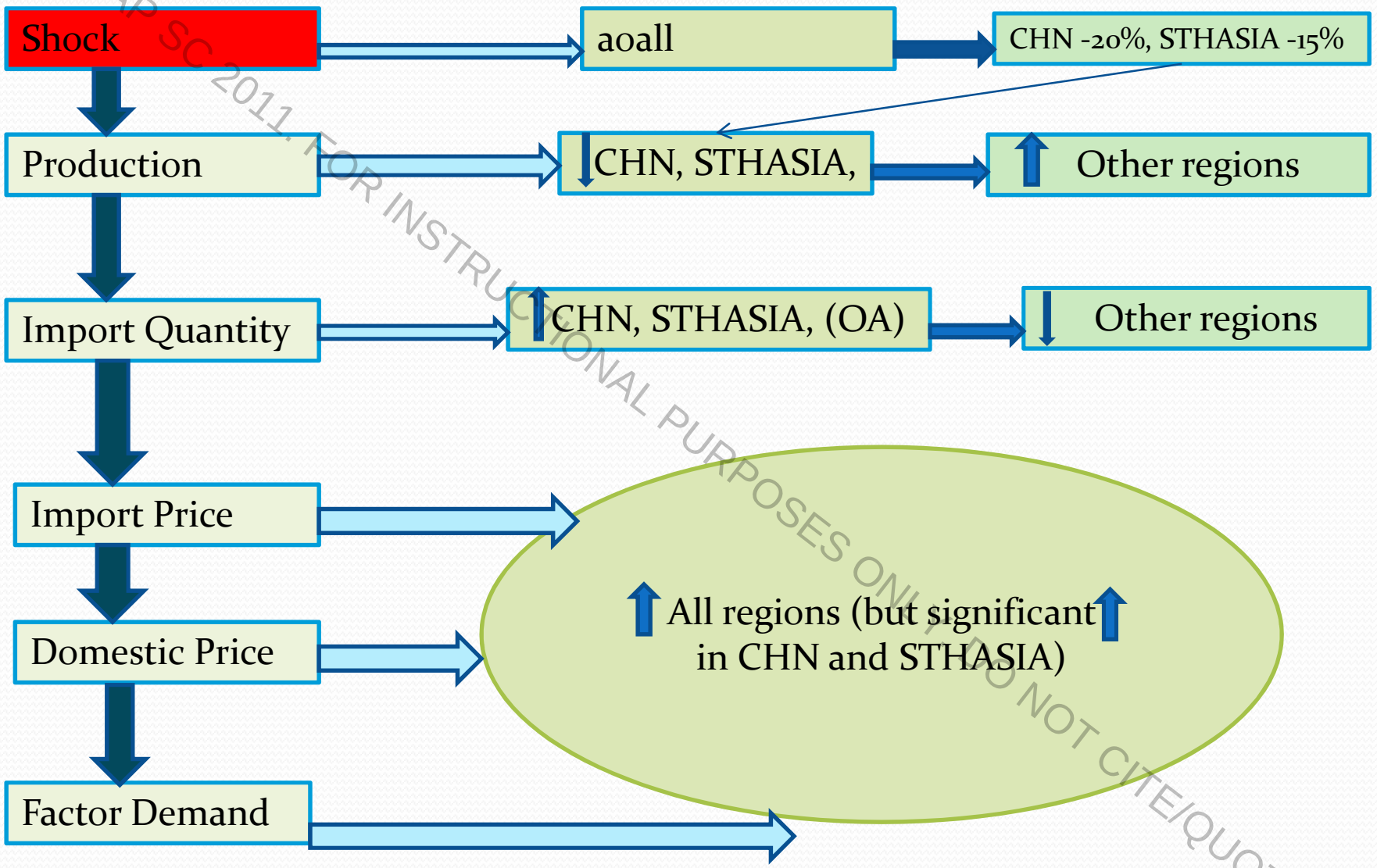
DEVELOPING COUNTRIES: QUANTITY BASED SSM TRIGGER

Developing Countries	Tier1	Tier 2
CHN	25	4
OEASIA	0	0
STHASIA	20.72	0
MEX	0	0
ARG	0	0
BRZ	0	0
RLAmer	0	0
MENA	0	0
SSA	0	0

EFFECT OF PRODUCTIVITY DECLINE IN THE CONTEXT OF SSM

Countries/ Region	Import Price	Import quantity	Output (Wheat)	Domestic Price	Land Rent
	pim (wheat)	qim(wheat)	qo (wheat)	pm (wheat)	pfe (land, wht, i)
DEVELOPING COUNTRIES					
CHN	31.76	87.9	-3.04	81.57	113.4
OEASIA	1.15	0.06	0.76	0.75	2.83
STHASIA	22.4	10.01	-2.9	36.05	50.9
MEX	1.13	-0.86	0.49	0.52	1.5
ARG	2.25	-3.16	0.54	0.74	1.82
BRZ	0.82	-0.57	0.27	0.37	0.92
RLAmer	1.02	-0.68	0.37	0.53	1.28
MENA	1.05	-0.87	0.35	0.45	1.15
SSA	0.86	-0.72	0.46	0.33	1.26
DEVELOPED COUNTRIES					
AUS	6.81	-9.87	4.1	1.84	9.36
JPN	1.29	-0.09	1.2	0.68	4.13
CAN	2.23	-1.57	4.82	1.48	9.57
USA	1.71	-1.38	1.67	0.95	3.88
EU15	0.65	-0.21	0.77	0.38	1.46
OEUR	0.73	-0.83	0.17	0.27	0.49
RUS	0.33	-0.24	0.07	0.19	0.26

IMPLICATION



The Impact of China's Growth on the Wheat Sector in Australia

Guanghua Wan

Australian Wheat Export Board

The Research Question

- **Average growth: China's 10% vs 5% for RoW**
- **By 2017-19, 50% more income for Chinese**
- **What are the impacts on the Aussie wheat industry??**

The GTAP Model

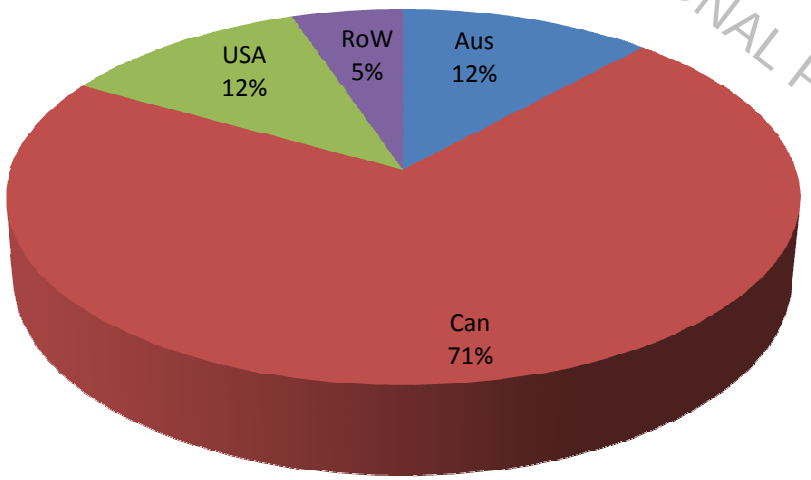
- **GTAP_SSM: 17 Regions/Countries, and 6 Sectors**
  - Need to shock China's GDP by 50%
  - But GDP is endogenous =>
  - Swap qgdp("chn")=aoall("nagr","chn");
  - Shock qgdp("chn")=50 => 89.45% shock to nagr
- **Shock aoall("nagr","chn") = 89.45%**

Results (1): Welfare Impact

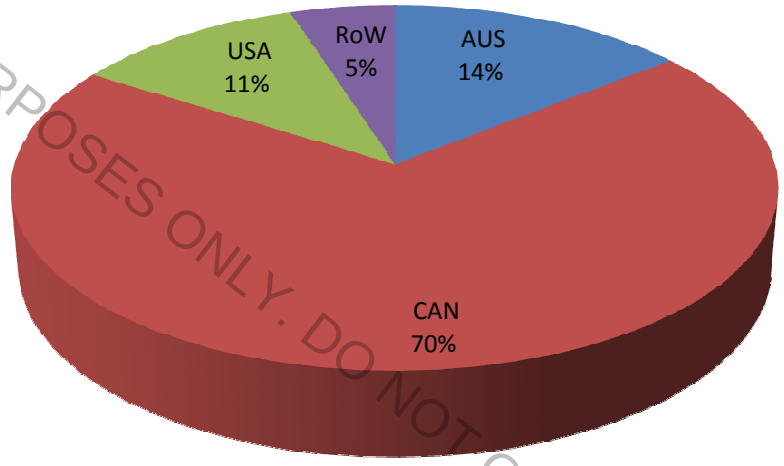
Country	Utility (unit)
1 AUS	15136.29
2 CHN	1407992.25
3 JPN	-70832.52
4 OEASIA	-8397.19
5 STHASIA	6819.52
6 CAN	6294.95
7 USA	-21185.48
8 MEX	-1230.32
9 ARG	4524.85
10 BRZ	6620.69
11 RLAme	11280.84
12 EU15	-67504.21
13 OEUR	-7191.56
14 RUS	3721.33
15 MENA	16853.97
16 SSA	12140.08
17 ROW	4511.51
Total	1319555.02

Results (2): Trade Impacts

The Chinese Market for Wheat Exporters: 50% GDP Rise



The Chinese Market for Wheat Exporters: Base

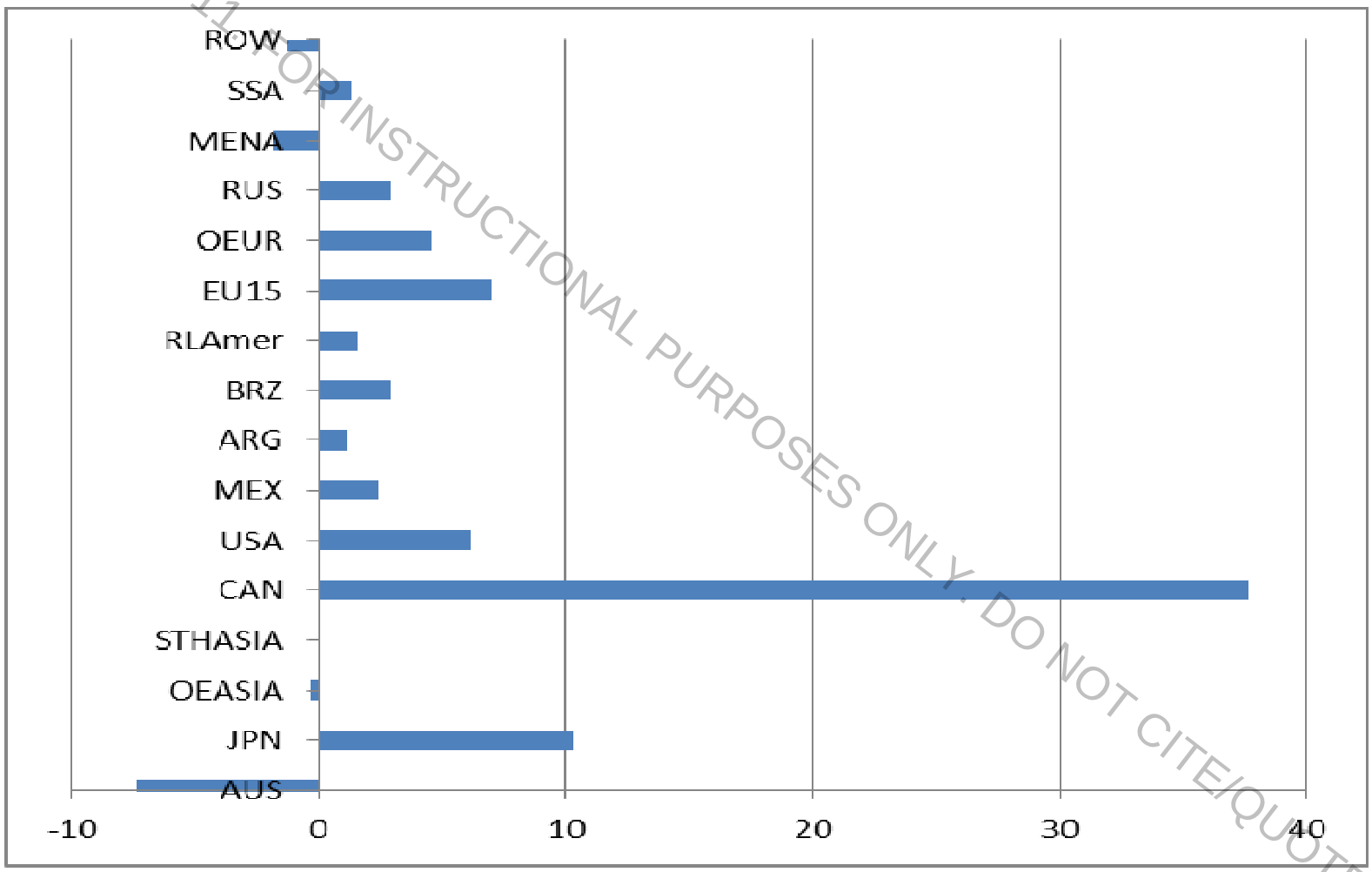


Results (3): Trade Impacts

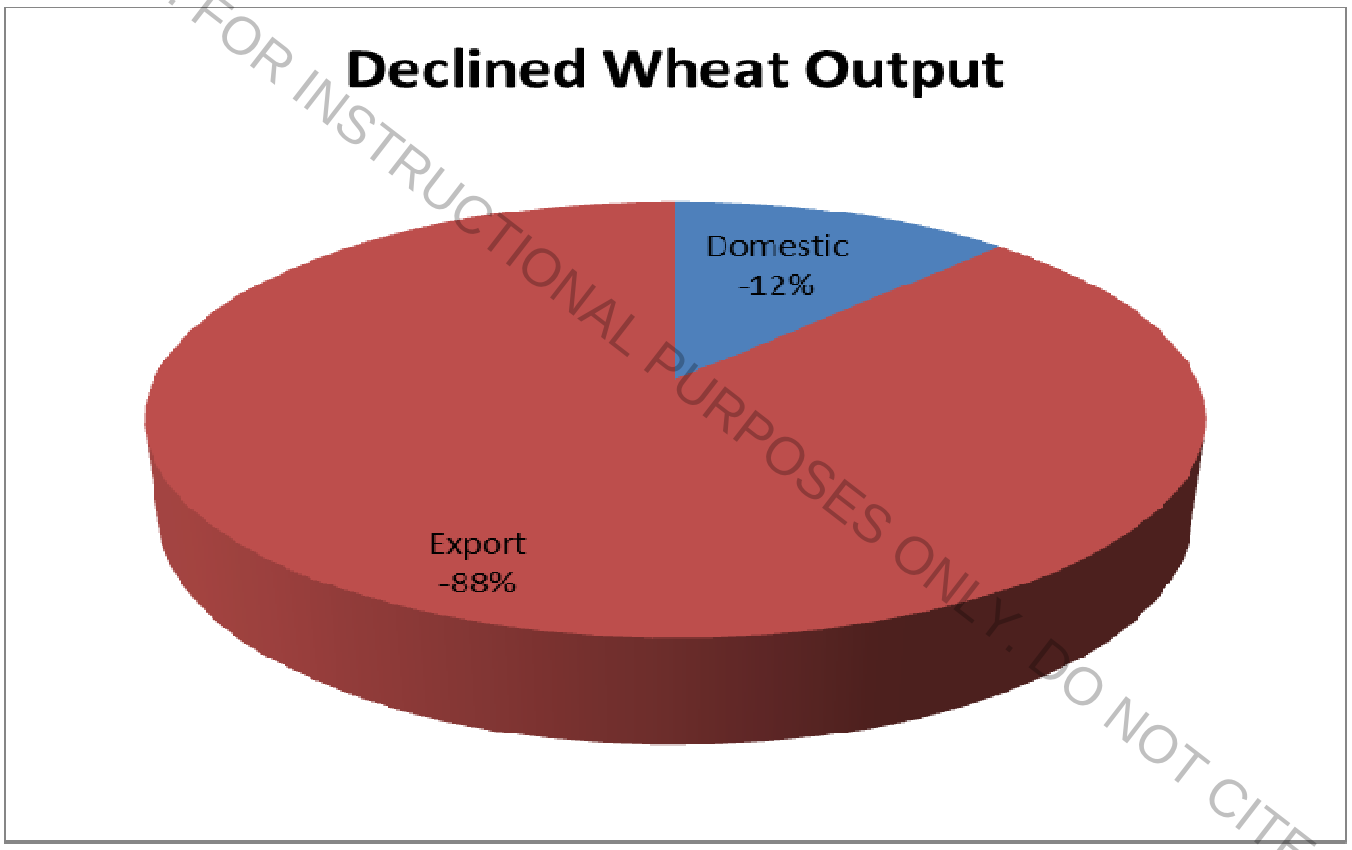
Changes in Wheat Export to China

Aus	430.07%
Can	605.31%
USA	632.86%

Results (4): Output Impacts



Results (5): Output Impacts

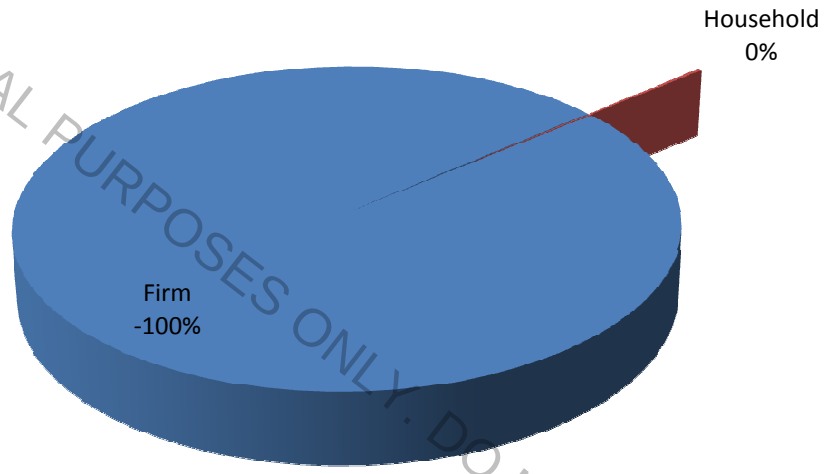


Results (6): Declined Output?

Changes in Export (%)

1 AUS	-23.44
2 CHN	430.07
3 JPN	-22.3
4 OEASIA	-25.16
5 STHASIA	-14.03
6 CAN	-31.24
7 USA	-28.81
8 MEX	-35.72
9 ARG	-7.28
10 BRZ	-9.2
11 RLAme	-16.15
12 EU15	-19.56
13 OEUR	-31.04
14 RUS	-37
15 MENA	-23.58
16 SSA	-26.2
17 ROW	-29.99

Drop in Domestic Demand (-4.6% vs 0)



Why, Why, Why???

Dig

Dig

.

.

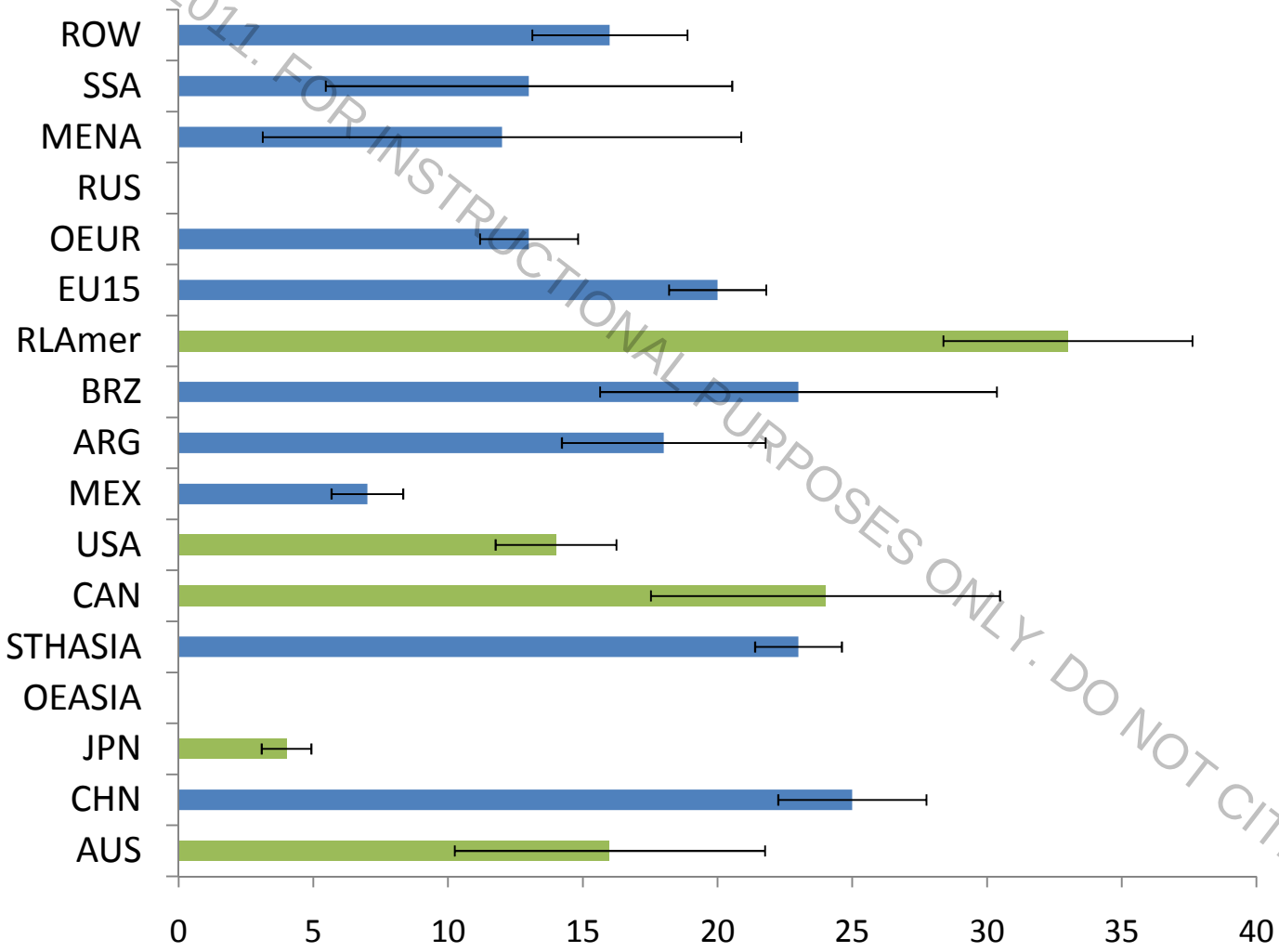
Dig!!!

Thank You

What is the impact of regional agricultural technology shifts upon wheat markets?

Nihan Odabasi
Beth Calabotta

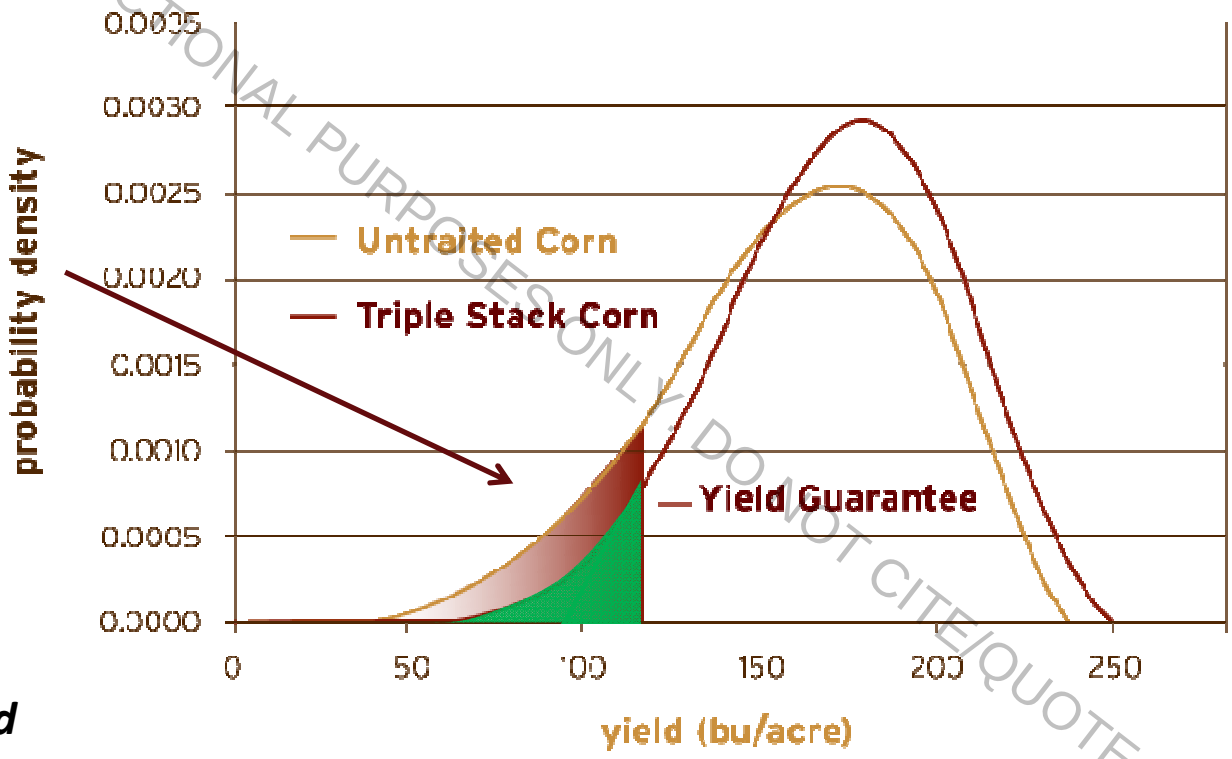
Yield shocks were not applied uniformly



Technology shifts like biotech traits have changed the shape and distribution of yield curves

- ***The area to the left of the yield guarantee line measures the probability of experiencing a yield below this level.***
- ***The area under the triple stack distribution (maroon) is less than the area under the non-traited distribution (orange) to the left of the yield guarantee.***
- ***The triple stack (maroon) distribution implies a <u>lower premium rate</u> for insuring against yields below the yield guarantee.***

The triple stack corn distribution has less downside yield risk



Two cases were analyzed

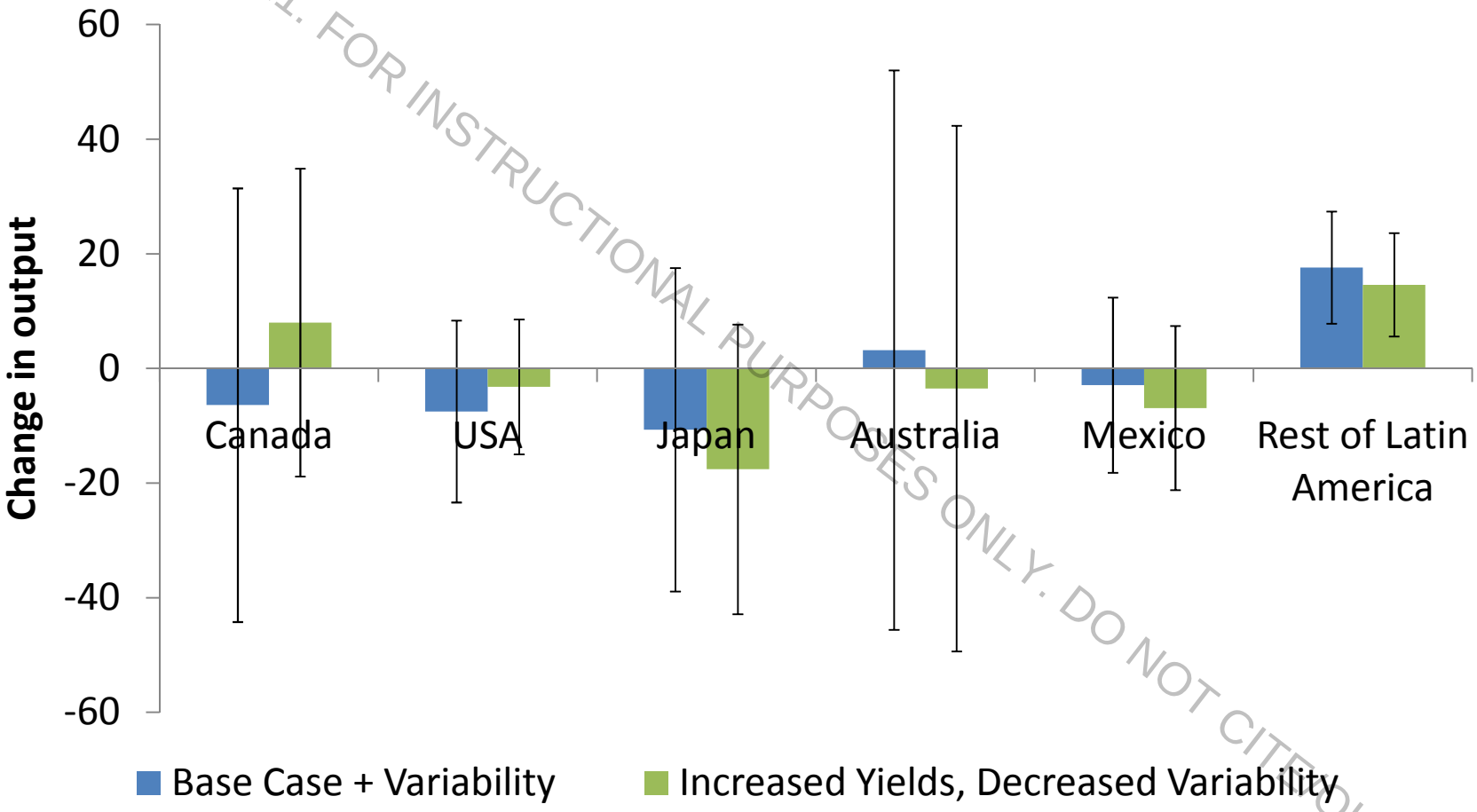
Base case

- 2011 trend line wheat productivity
- Variability calculated from historical data

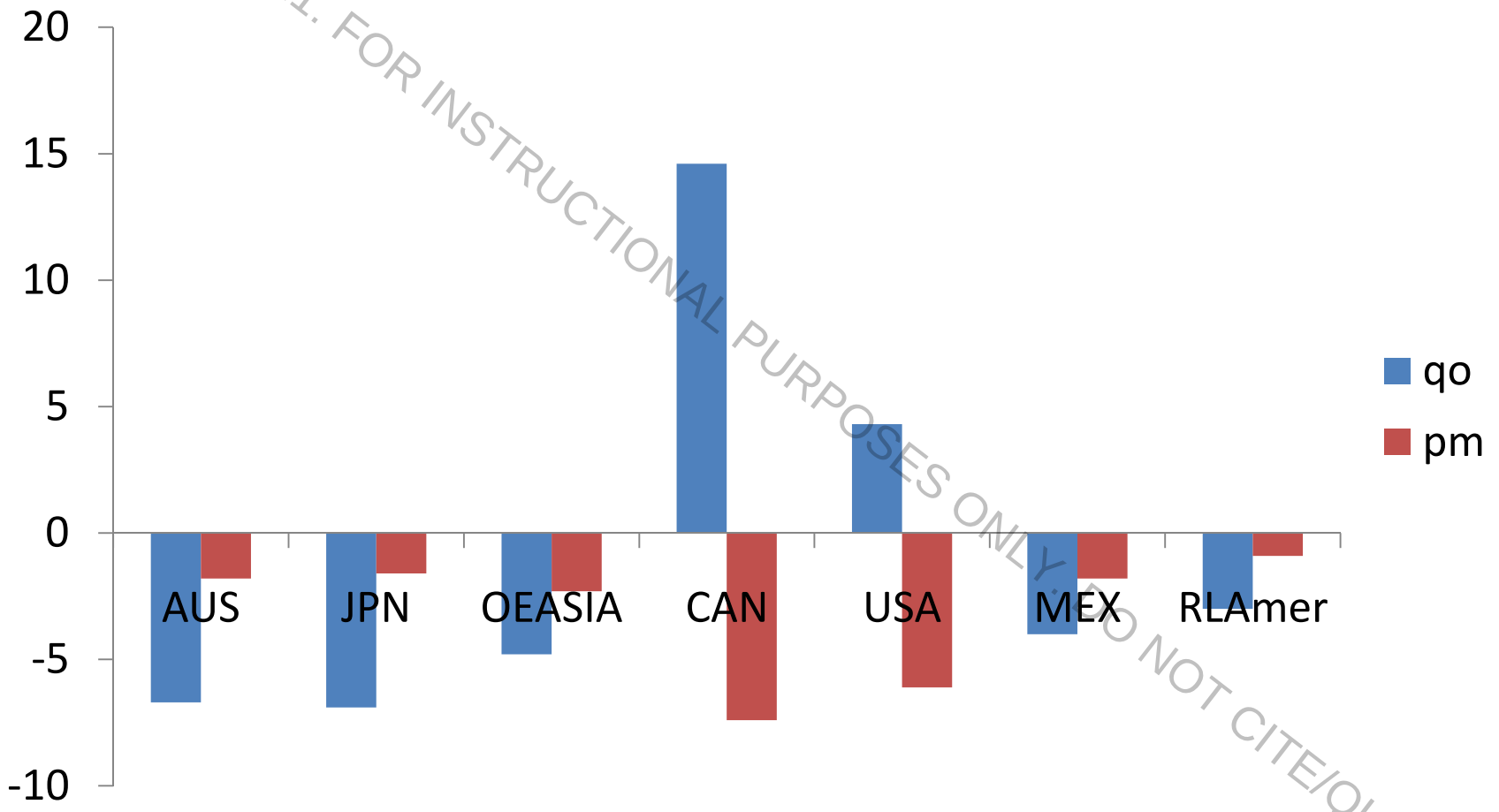
Biotech case

- 2011 trend line wheat productivity.
- Variability calculated from historical data
- U.S. and Canada have implemented technology that doubles the rate of yield gain.
- The yield variability has decreased by a factor of two.

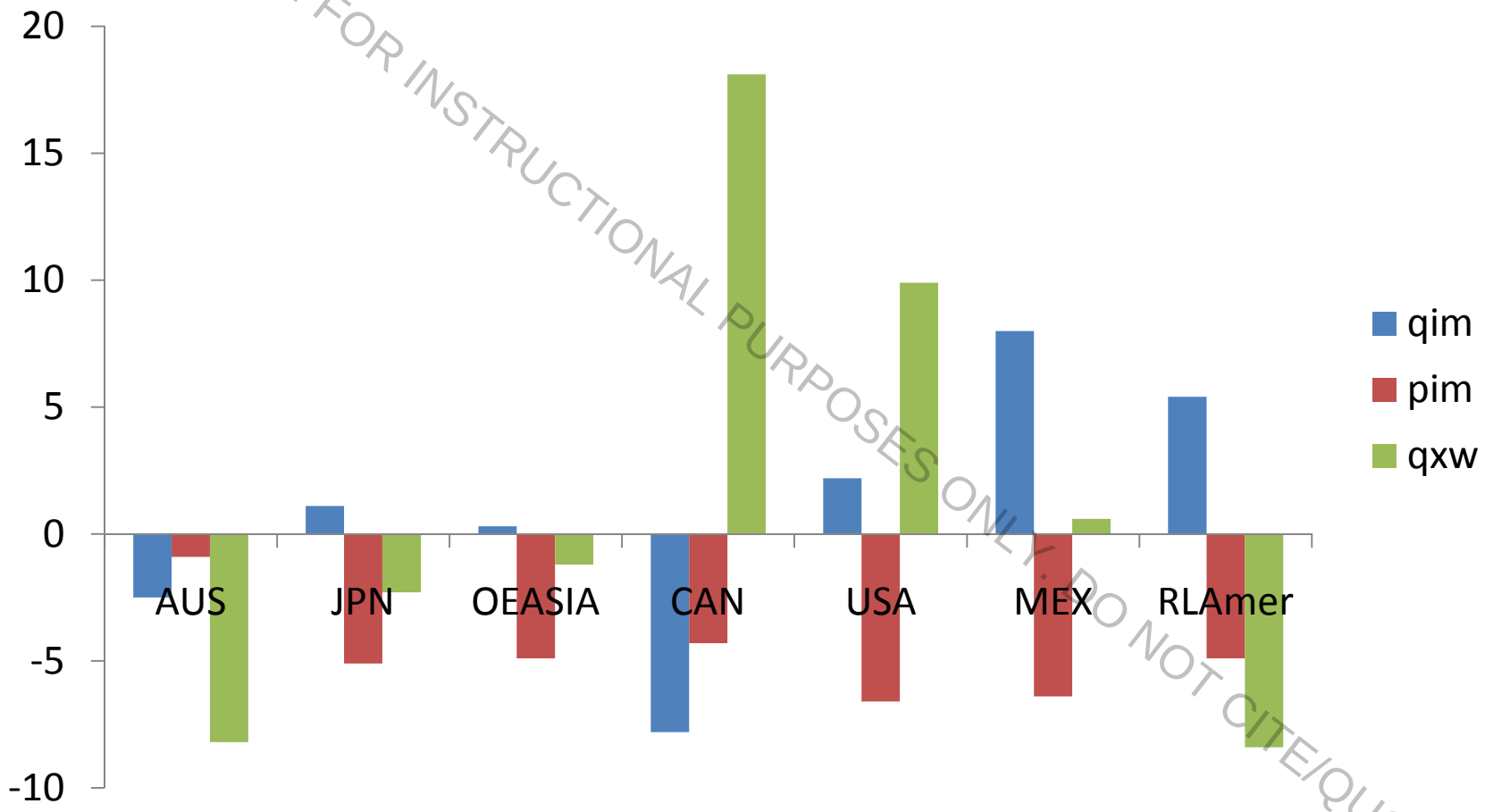
Quantities produced decrease in response to technology shift



Prices decline in response to increased production



Trade story



Conclusions

- Technology adoption in wheat in U.S. and Canada increase production and decreases variability.
- Prices decline globally in response to increased production.
- Trade patterns shift in response to the technology adoption in U.S. and Canada.