# Modeling OECD Agricultural Programs in a Global Context

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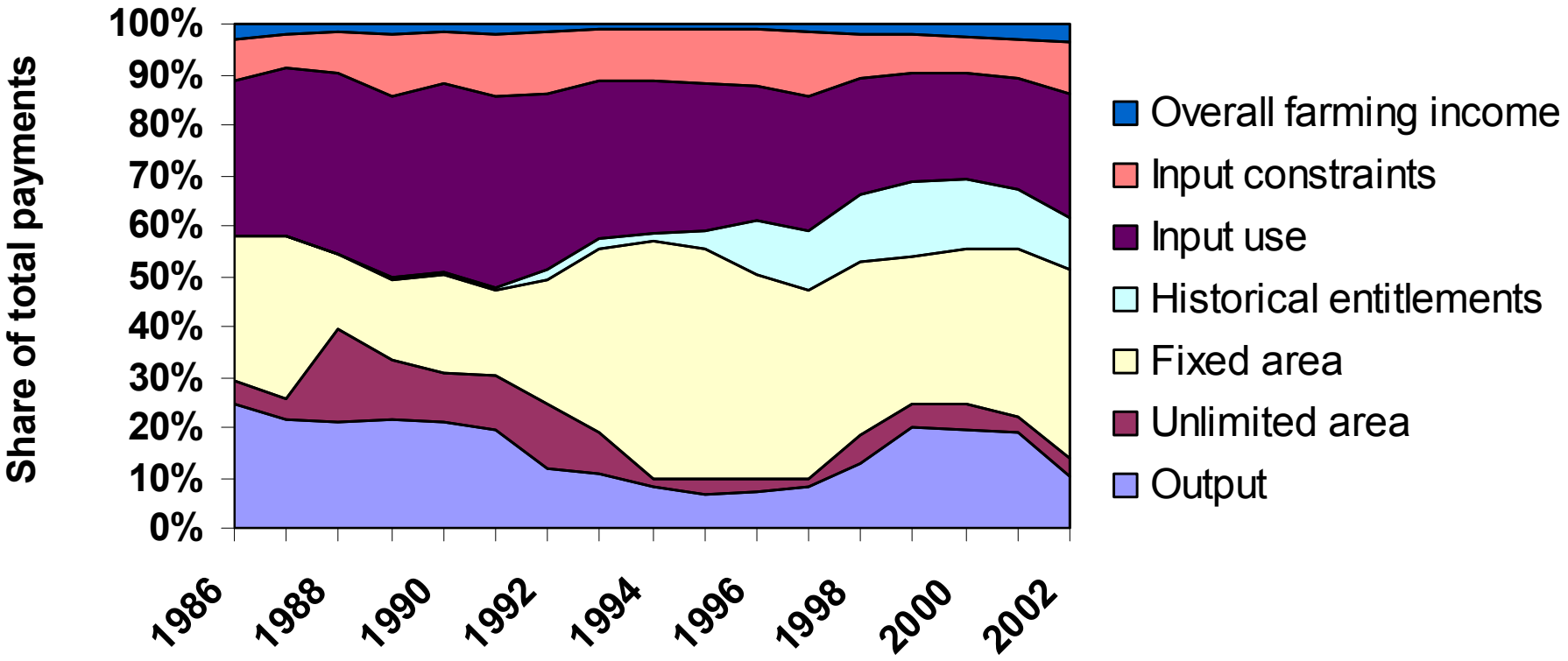
# Setting for Global Agricultural Policy Analysis

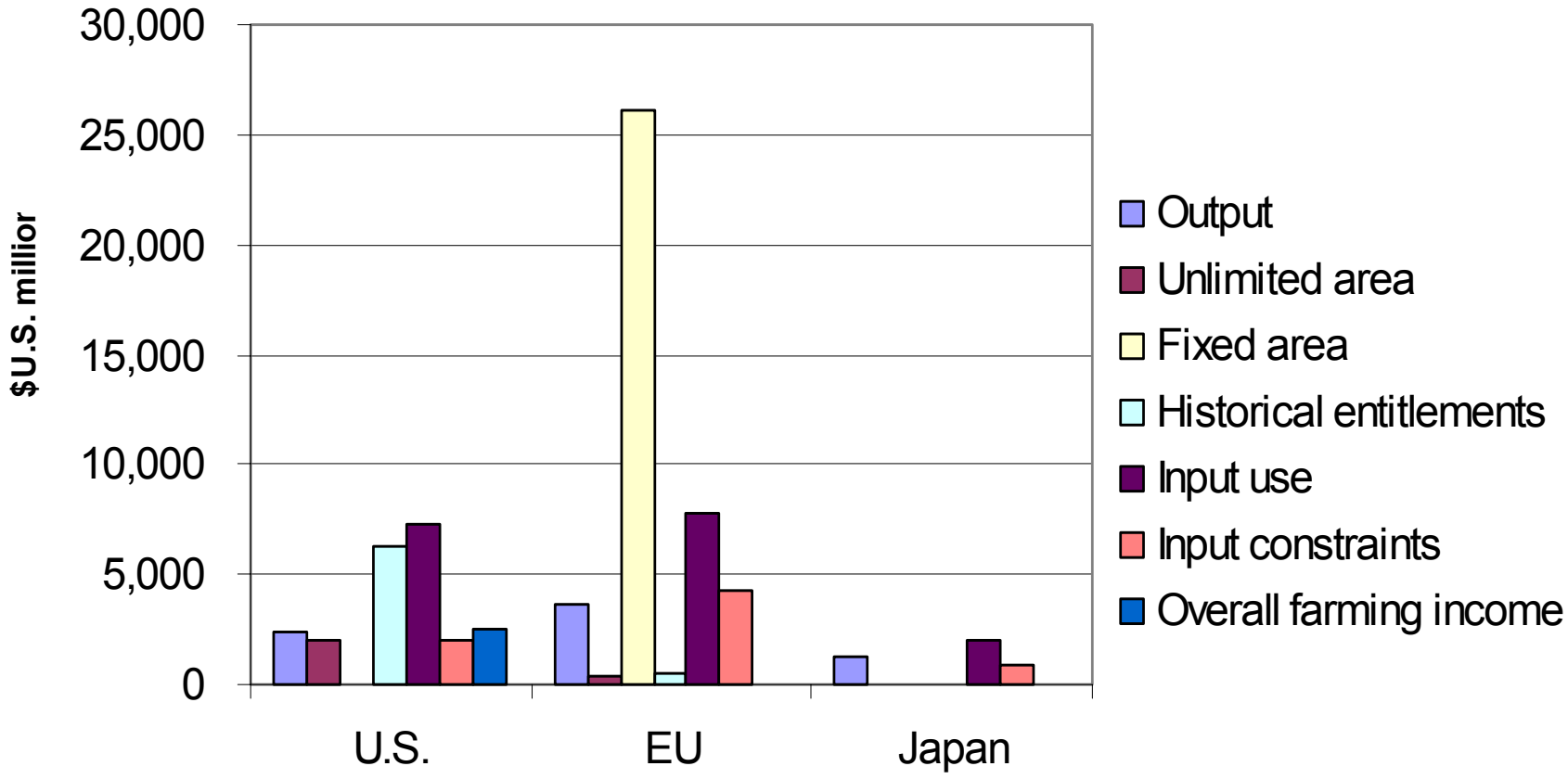
- Diverse national farm support policies
- Major OECD agricultural policy changes since the Uruguay Round
- Changes in incentive effects of newer programs
- Challenge: modeling the production incentives of diverse national farm programs

# Changing composition of subsidies to farmers: basis for payments in U.S., EU, Japan

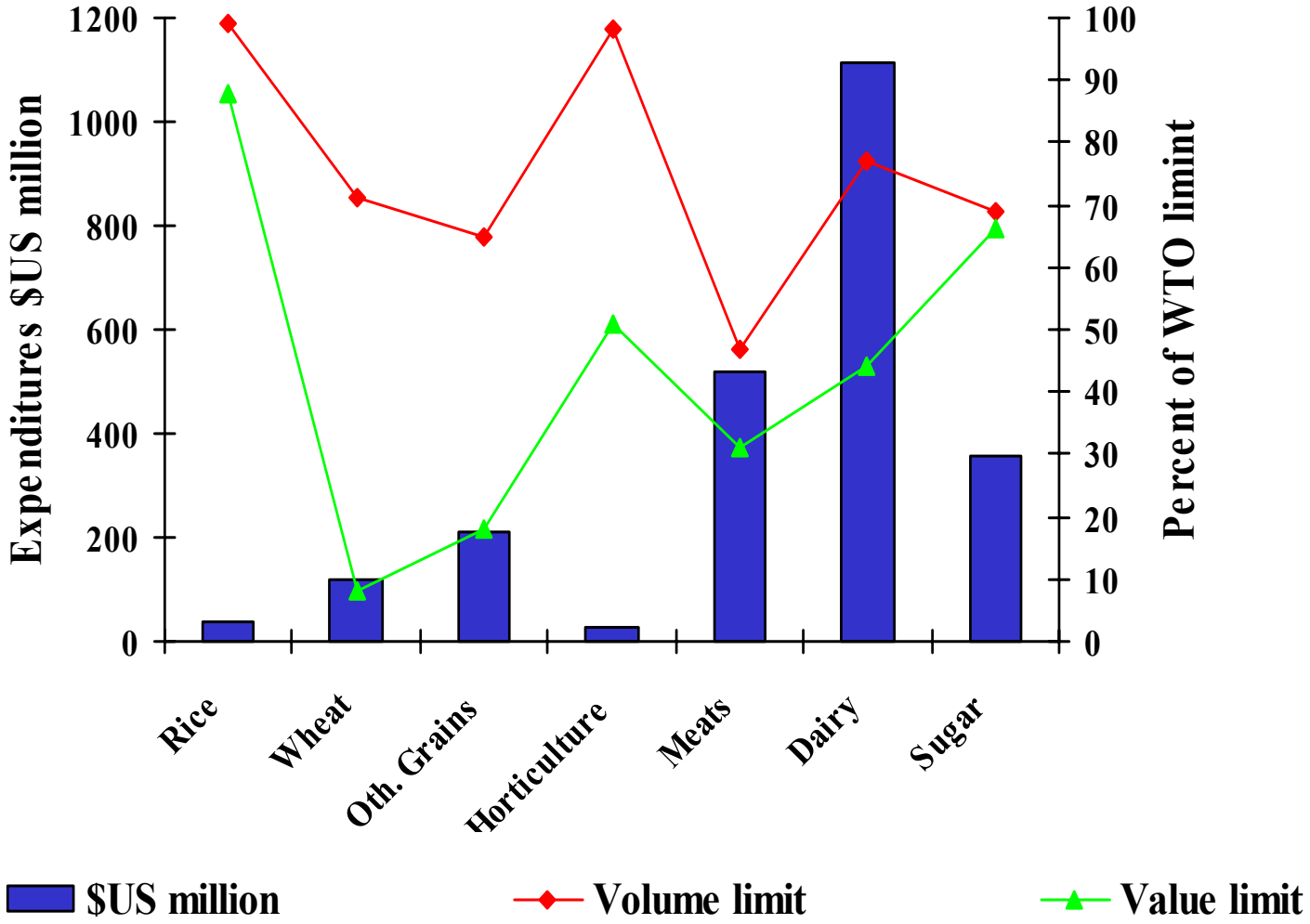



Source: OECD, 2003.

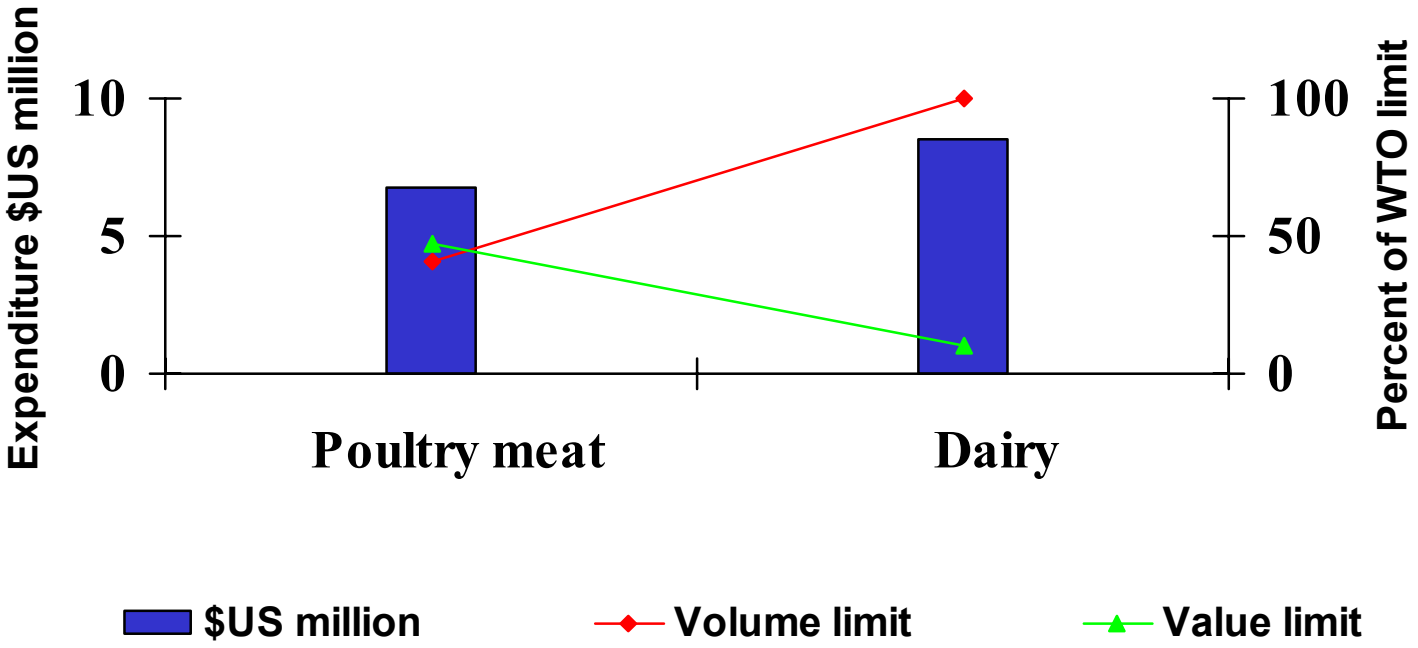
# Differences in structure of farm subsidies in U.S., EU, Japan, 2002



# EU Export Subsidy Expenditures and Fill Rates, 2000



# U.S. Export Subsidies and Fill Rates, 2000



# The Standard Modeling Approach

- Model all programs "as if" they are ad valorem price wedges
  - Incentive effect: increase returns, draw resources into that sector
  - Change relative prices
  - Program costs change proportionately with output

# The Standard Modeling Approach

- Problem: misrepresents incentive effects of some programs
  - Income support programs:
    - Full planting flexibility
    - Program costs generally fixed in aggregate
    - Affect household labor/leisure, and savings/consumption behavior

# The Standard Modeling Approach

- Problem: misrepresents incentive effects of some programs
  - Price support programs
    - Insulate producers from market price changes when the market price is below the target price
    - Program costs change with market price and output, within a range

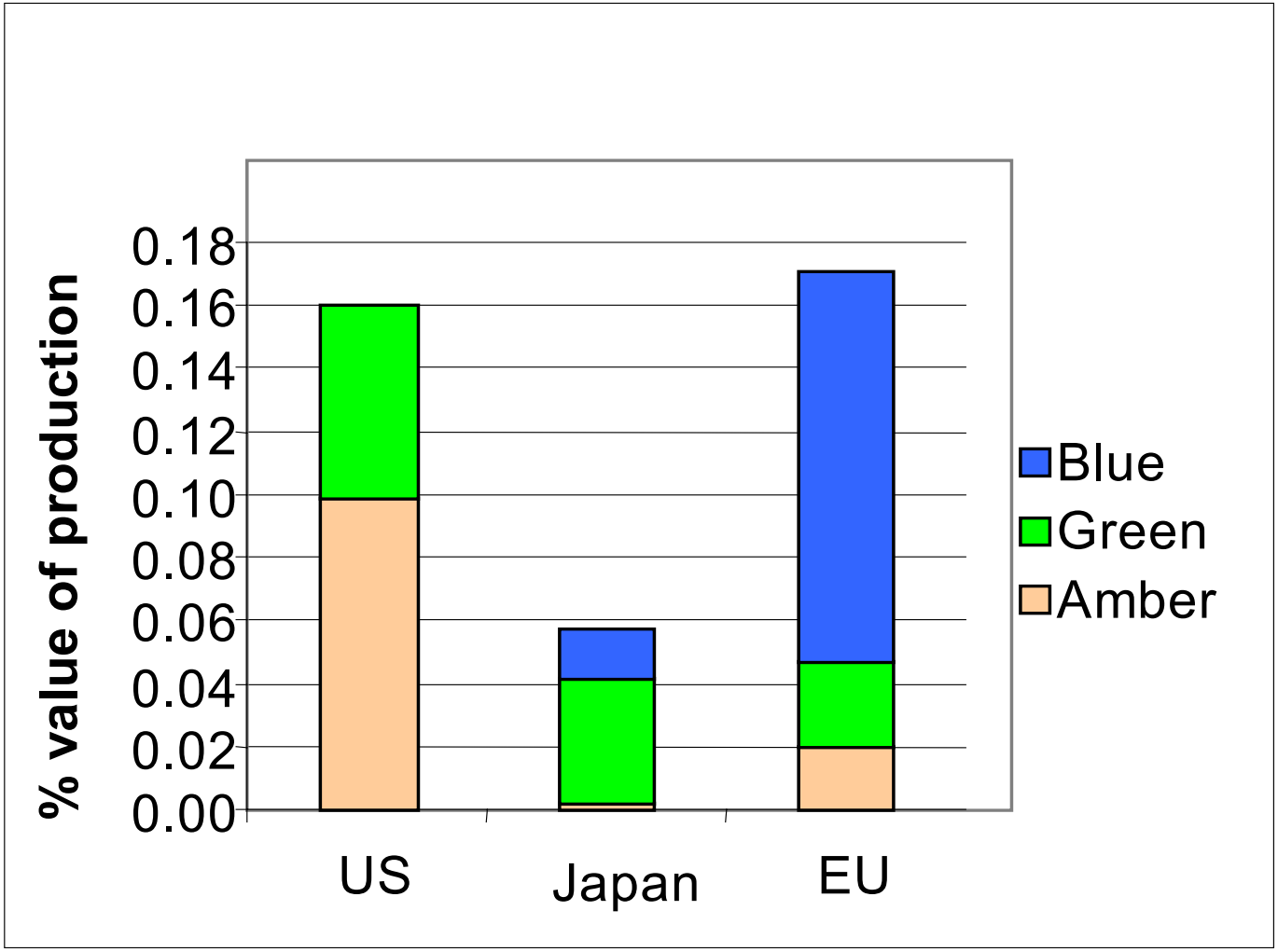
# Base CGE model

- GTAP 5.1 database
- GAMS multi-country software
- 16 countries/regions
- 18 commodities (15 are ag. and processed foods)
- Factors: land, capital, skilled and unskilled labor
- Agricultural policy database:
  - AMAD - agricultural tariffs and AVE of TRQs
  - OECD PSEs for 2000 farm budget outlays, by program
  - USDA 2001 for 1998 export subsidy rates

# Modeling Domestic Support

| Program | Example | Incentive effect | Program cost |
|---|---|---|---|
| **Input or output subsidies** | Crop insurance subsidy | Raises relative net returns | Changes proportionately with output |
| **Variable output subsidy** | EU compensatory payments | Raises returns, no marginal incentives | Fixed total cost |
| **Household income transfer** | Production flexibility contracts | No direct links to production | Fixed total cost |
| **Price support payment** | EU export subsidies, U.S. marketing loan benefits | Maintain price floor - EU intervention prices, U.S. loan rates | Per unit value changes with world prices; costs also change with quantity changes |

# WTO "Colors" of Domestic Support



# U.S. Short-run Supply Response

| | Endogenous price support | | Fixed, *ad valorem* price support | |
|---|---|---|---|---|
| | Own-price supply elasticity | Percent change in price support costs for commodity | Own-price supply elasticity | Percent change in farm price support costs |
| Wheat | -0.2 | -27.3 | 3.8 | 0.2 |
| Oilseeds | -0.3 | -23.4 | 3.5 | 0.2 |

# EU Short-run Supply Response

| | Endogenous export subsidies and intervention prices | | | Fixed, *ad valorem* export subsidies | | |
|---|---|---|---|---|---|---|
| | | Percent change from base | | Percent change from base | | |
| | Own-price supply elasticity | Export program costs for commodity | Exports | Own-price supply elasticity | Export program costs for commodity | Exports |
| Wheat | 1.2 | -100.0 | -9.0 | 6.7 | 0.3 | 0.5 |
| Dairy | - | 503.5 | 40.8 | 49.6 | 0.2 | 0.5 |

# Scenarios

- 25% reduction in global tariffs, sensitivity to ag program specification
- Unilateral vs. multilateral reform, with endogenous ag programs
- Remove OECD domestic support
- Remove OECD domestic support and global ag tariffs

# Trade and World Price Effects of 25% Cut in Global Ag. Tariffs (% change from base)

| | Base model | Model with fixed *ad valorem* domestic and export subsidies |
|---|---|---|
| World agricultural trade | 3.5 | 3.7 |
| World agricultural price | 2.1 | 1.8 |
| U.S. agricultural exports | 1.0 | 3.1 |
| U.S. farm program costs | -11.9 | 0.9 |
| EU agricultural exports | 6.4 | 5.2 |
| EU farm program costs | 2.6 | 0.7 |
| Note: The world agricultural price is the trade-weighted aggregate agricultural export price. Trade is reported in volume terms.<br>Source: Author calculations. | | |

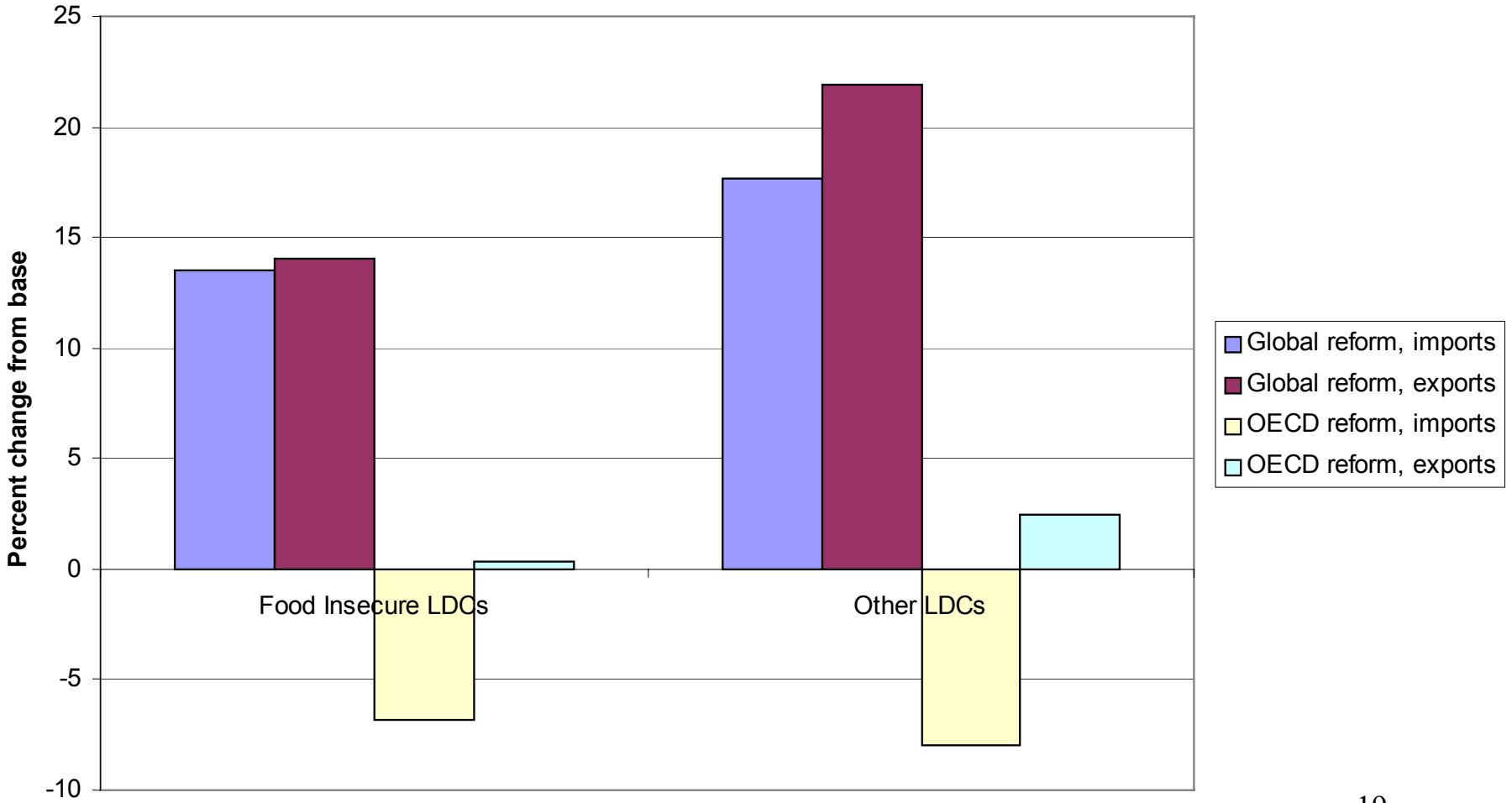
# Trade Effects of 25% Cut in Global Ag. Tariffs (% change from base)

| | Base model | Model with fixed *ad valorem* domestic and export subsidies |
|---|---|---|
| U.S. wheat exports | -1.1 | 3.9 |
| U.S. other grain exports | -6.1 | 2.2 |
| Canada wheat exports | 11.0 | 8.9 |
| Canada other grain exports | 12.1 | 3.3 |
| Argentina wheat exports | 2.3 | 2.1 |
| Argentina other grain exports | 5.4 | 3.5 |

# Unilateral vs. Multilateral Ag. Reform (% change from base)

| Effects on countries: | Total farm program costs | Variable program costs | Agric. output | Agric. exports |
|---|---|---|---|---|
| **U.S.** | | | | |
| Multilateral reform | -40.70 | -100.0 | -1.59 | 11.16 |
| U.S. reforms | -40.70 | -100.0 | -2.88 | -1.14 |
| EU reforms | -22.95 | -85.4 | -0.96 | 5.33 |
| **EU** | | | | |
| Multilateral reform | -85.25 | -100.0 | -6.01 | 4.03 |
| U.S. reforms | -2.25 | -36.14 | -0.11 | 2.00 |
| EU reforms | -85.25 | -100.0 | -6.53 | -1.80 |
| Note: Variable program costs refer to U.S. deficiency payments and EU exports subsidies. | | | | |

# Agricultural Trade and Policy Reform



# Terms of Trade Changes

| | OECD Ag Reform | Global Ag Reform |
|---|---|---|
| World ag price index | 103.4 | 112.5 |
| U.S. ag TOT | 109.4 | 109.9 |
| EU ag TOT | 117.9 | 117.7 |
| Food Insecure LDCs ag TOT | 100.1 | 100.4 |
| Other LDCs ag TOT | 100.4 | 100.0 |

# Conclusions

- Agricultural policies have evolved since URAA and more research the incentive effects of these policies is needed.
- Ad valorem specification is often incorrect.
- Supply response and trade policy analysis are sensitive to the specification of farm programs.
  - Different sign for supply elasticity
  - Different sign for trade and program cost changes following tariff reduction

# Conclusions

- Countries have incentives to reduce domestic support in a multilateral setting.
- Domestic ag reform by OECD countries reduces agricultural imports in developing countries.
- Domestic ag reform by OECD countries and global ag tariff removal expands ag exports and imports in developing countries.