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Agricultural Outlook Forum

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EXCHANGE RATES AND U.S. AGRICULTURE

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# Exchange Rates, Foreign Income, and U.S. Agriculture

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# Introduction

- Demand for U.S. agricultural exports are sensitive to
  - Growth in trade partner real per capita income
  - Evolution of real U.S. trade partner exchange rate
- Empirical evidence documenting these linkages is not available
- Our purpose is to:
  - Review the issues
  - Look at the key data
  - Present empirical results
  - Discuss implications

# Background

- The bundle of goods and services a currency can claim from another country is a broad measure of a country's “competitiveness.”
  - In principle: A country whose economic “efficiency” is growing relative to its trade partners tend to experience an *appreciating* real exchange rate;
    - Consumers can claim more foreign goods
    - Producers face increased competition in foreign markets
    - Functioning capital markets cause currency exchange rates to equilibrate across countries (law of one price)

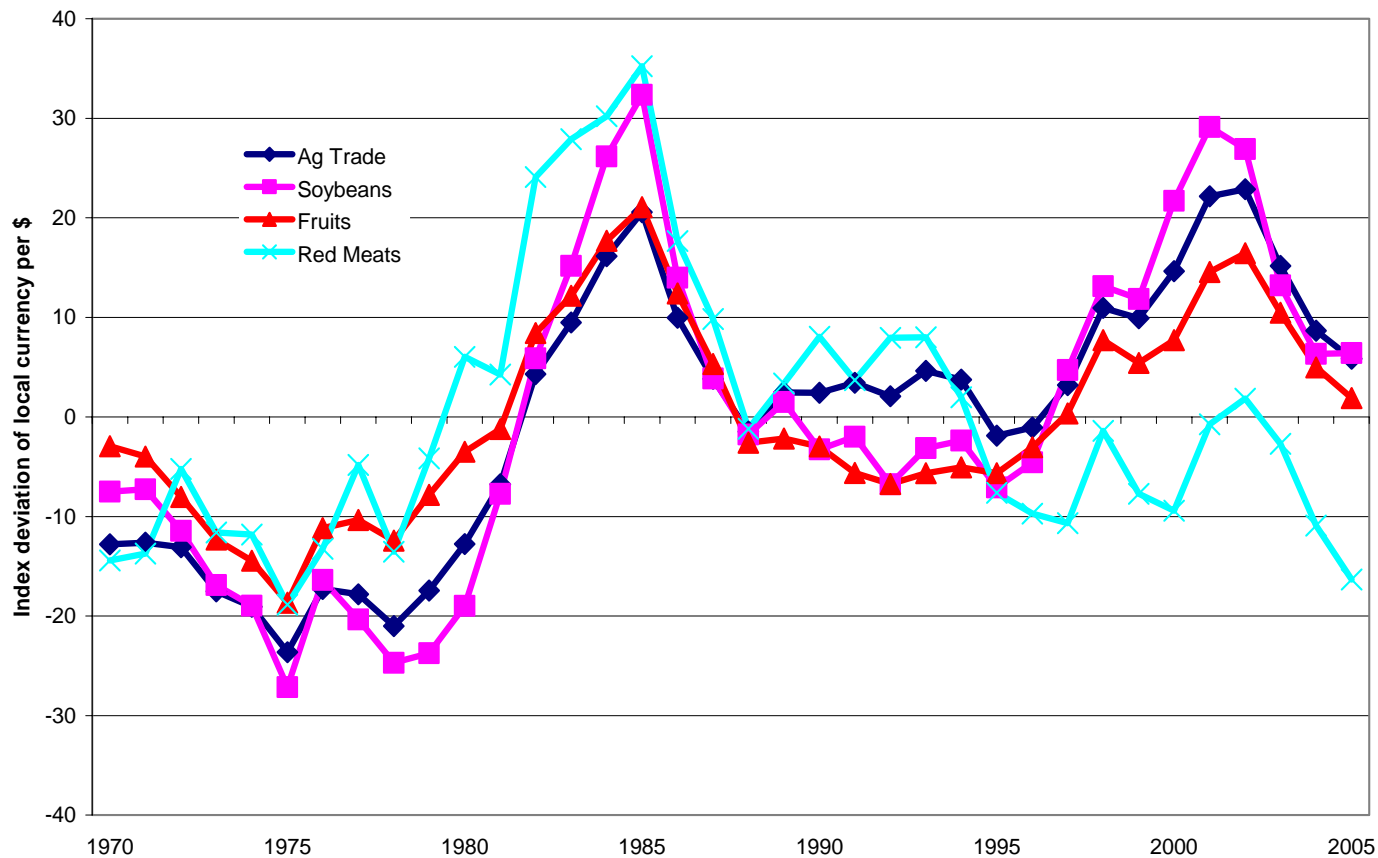
- Market imperfections and policy interventions subvert these basic forces
  - Schuh (1974): Major component of the farm problem of the 1950's was an “overvalued” dollar
  - The Betton Woods agricultural export boom of the 1970s attributed to a “devaluation” of the dollar linked to monetary expansion in response to energy shock
  - Literature: Monetary shocks, over – under shooting
  - Current: Major macroeconomic imbalances
    - The dollar as numeraire currency
    - Excessive savings
    - Budget deficits (U.S. spent 57% more than it earned on world markets)
    - Portfolio balances

# Implications

- Underlying the basic economic forces and the market imperfections and policies tending to subvert them are:
  - Trade partner “peculiarities.”
    - Differences in trade partner traded-weighted real exchange rate
    - Differences in growth in trade partner real income

- Evolution of trade partner real exchange rates vary by commodity (Source: USDA real traded weighted exchange rate series)

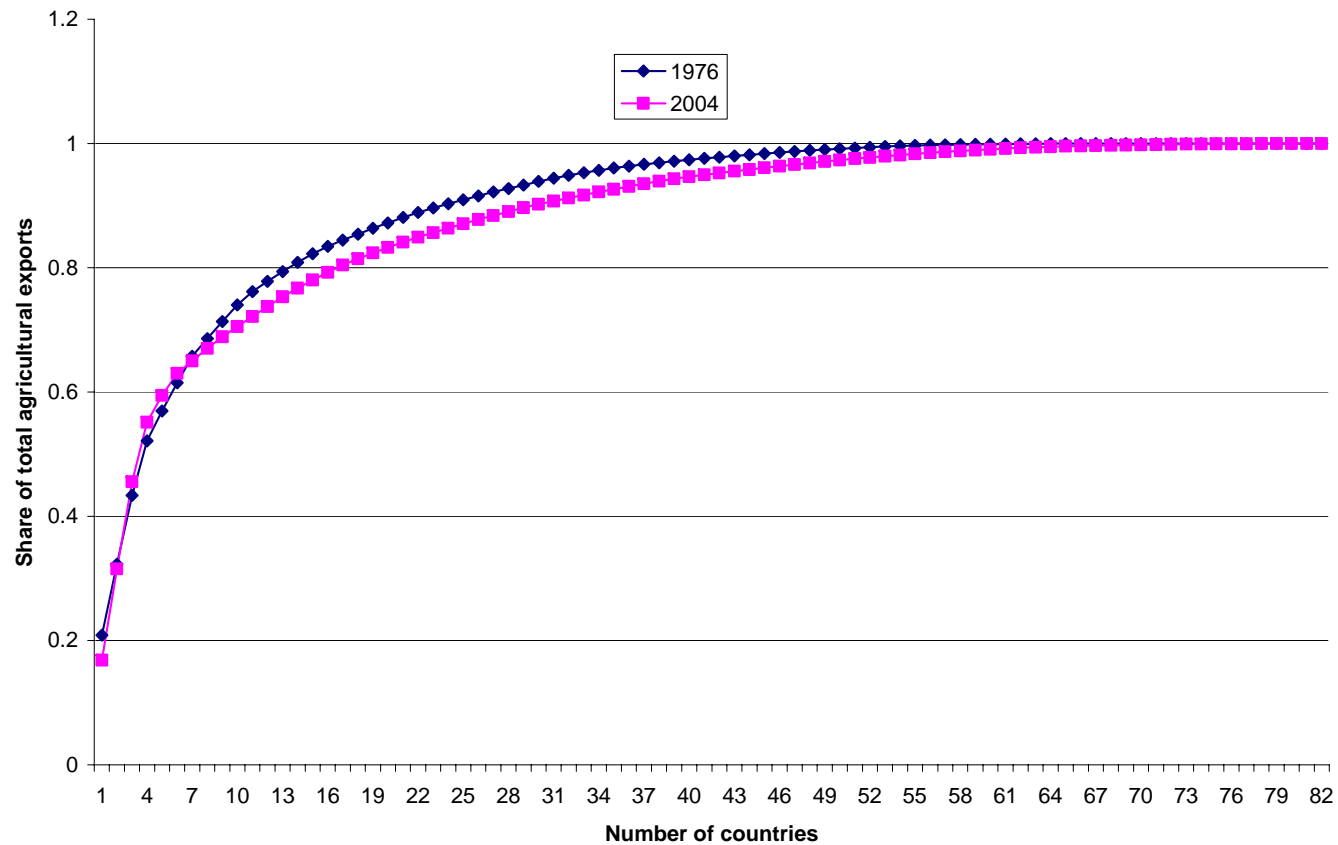
Fig. 1 Deviation from mean of the trade weighted local currency to the dollar exchange rate, selected commodities



- U.S. Agricultural exports are concentrated

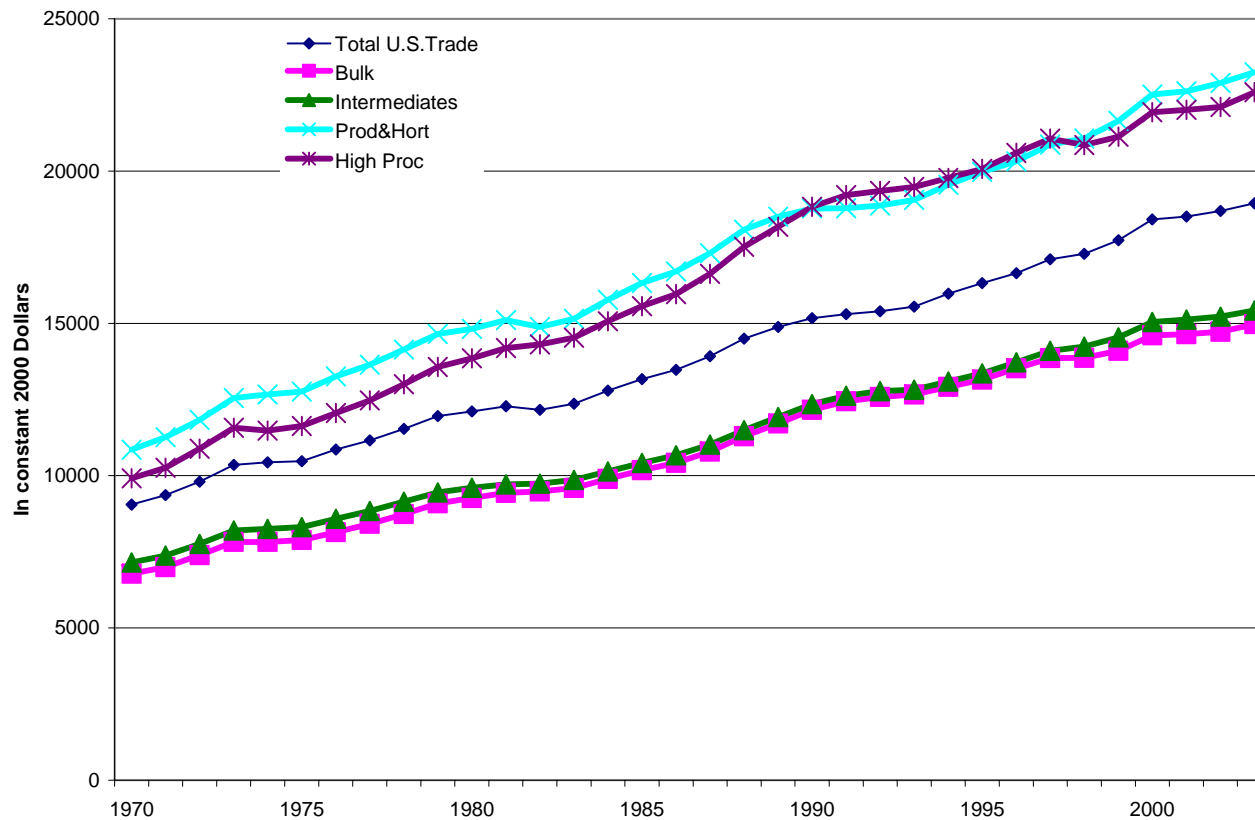
(Source: U.S.D.A origin – destination trade data)

Fig. 2 Cumulative distribution of total U.S. agricultural exports to trading partners, 1976 and 2004



- Bulk and high value commodities are imported by countries of different income levels/capita

Fig. 3 Trade weighted per capita income of U.S. agriculture importing countries



# Econometric Results: Overview

Summary of Estimation Results: Exchange rate and Real GDP of Trade Partners

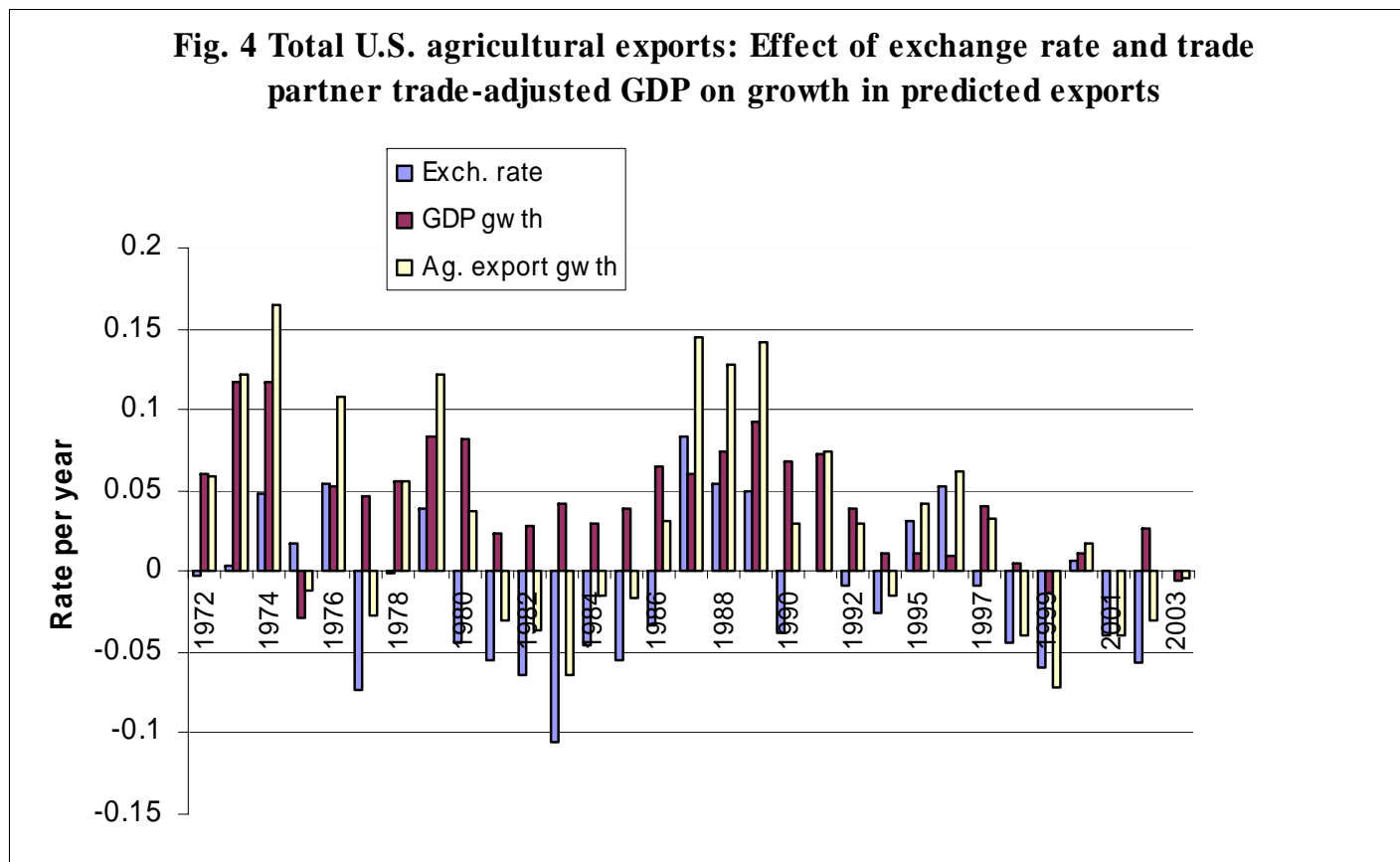
Dependent variable	Intercept	Elasticity		R2
		Exchange Rate	Real GDP (Trade wt.)	
<b>Total Ag. Exports</b>	4.322	-0.799**	1.598***	0.947
<b>Corn</b>	8.277	-1.073**	0.486*	0.396
<b>Cotton</b>	3.864	-0.558	1.267**	0.431
<b>Rice</b>	4.496	-0.406	0.92***	0.579
<b>Soybean</b>	5.669	-0.154	0.684*	0.74
<b>Wheat</b>	7.669	-0.429	0.231	0.315
<b>Soymeal</b>	4.059	-1.158***	1.975***	0.549
<b>Soyoil</b>	5.198	-1.229*	1.337*	0.263
<b>Fresh Fruit</b>	1.934	-0.407*	1.853***	0.969
<b>Fresh Vegetables</b>	0.471	-0.292	2.27**	0.912
<b>Poultry</b>	-12.164	-0.839**	7.6***	0.946
<b>Red Meat</b>	-9.527	-0.269	4.796***	0.99

\*, \*\*, \*\*\* Statistically significant at 10%, 5% and 1% respectively

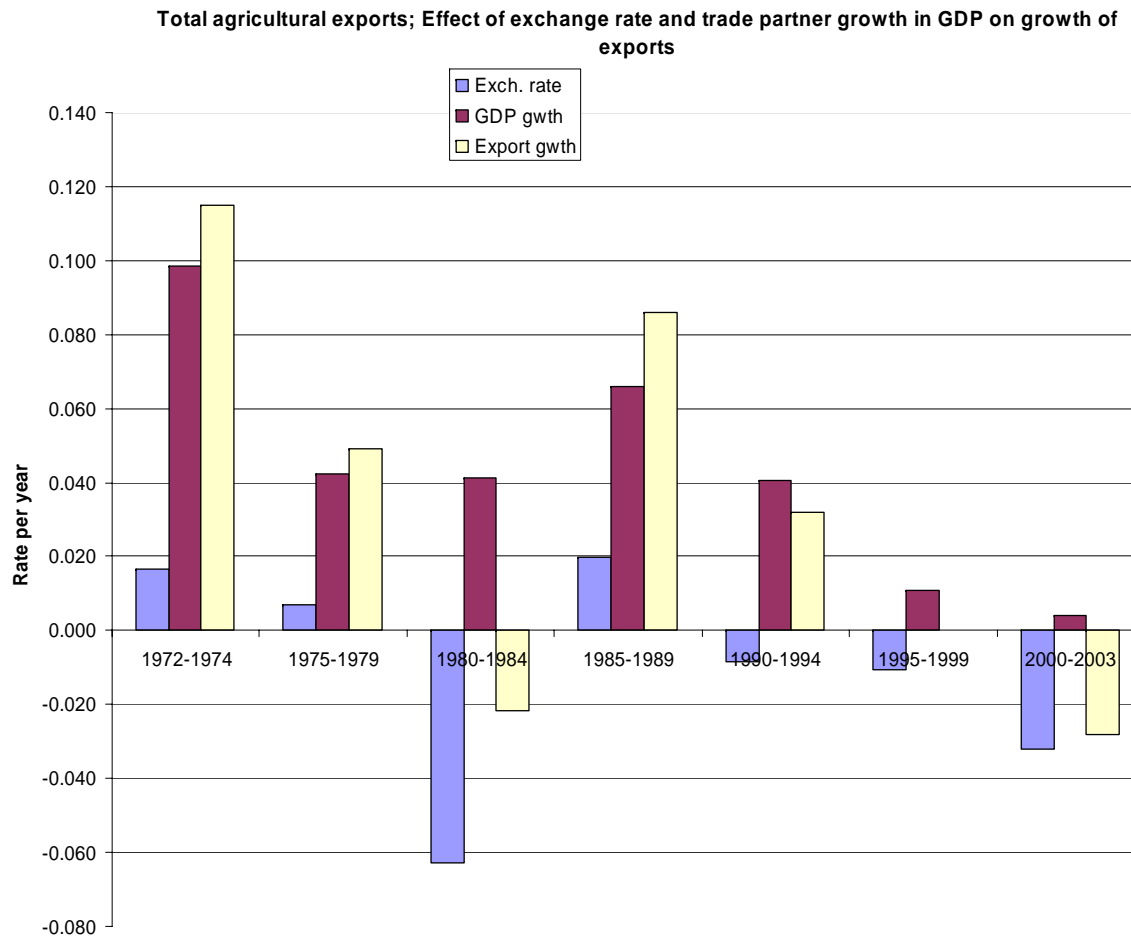
Source: Shane, M., T. Roe and A. Somwaru, 2006

# Empirical Results

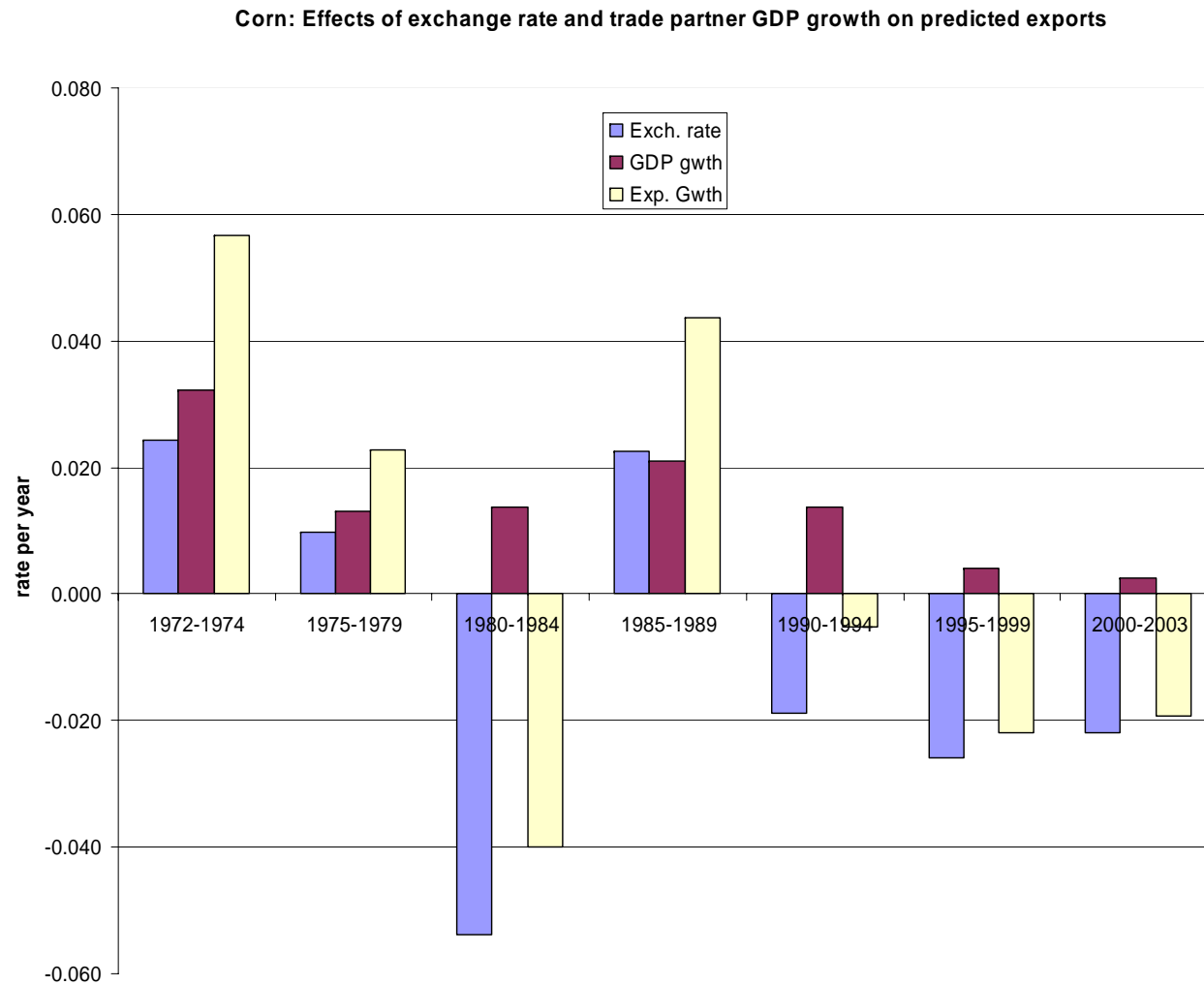
- Total U.S. agricultural exports:
  - Growth in trade partner real GDP was the main driver of export growth



## - A more aggregate perspective



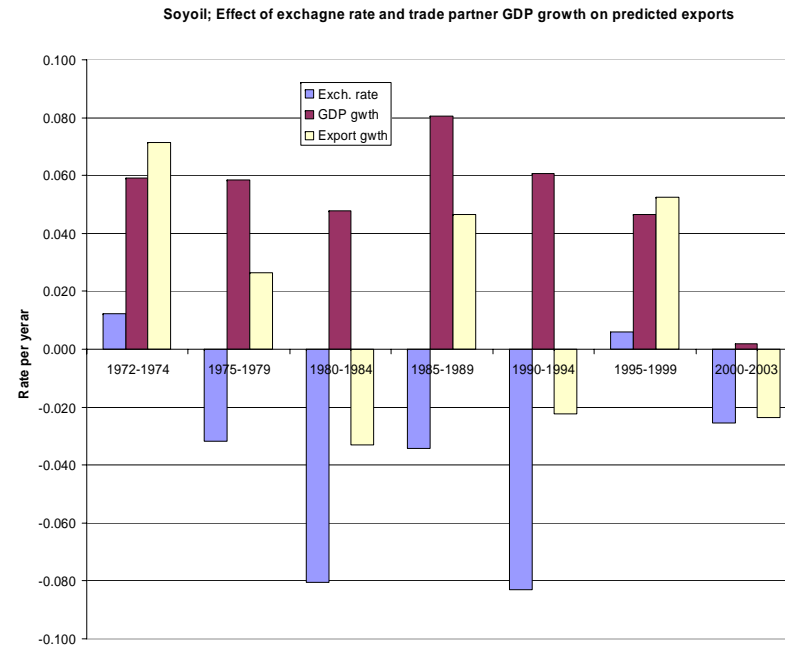
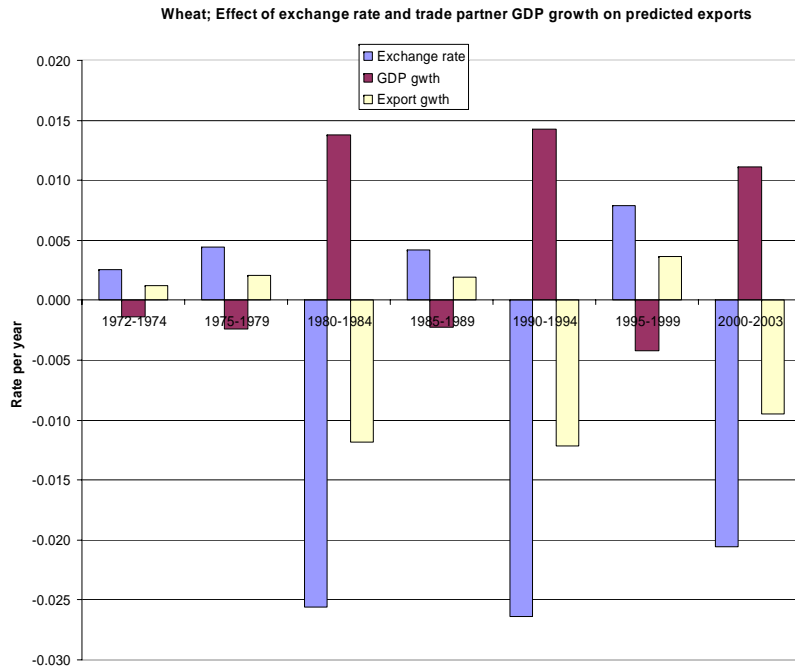
- Commodity specific effects
- Corn: Appreciating exchange domination most pronounced



- soybeans, **wheat**, soymeal and **soyoil** similar to corn

(-0.43; 0.23)

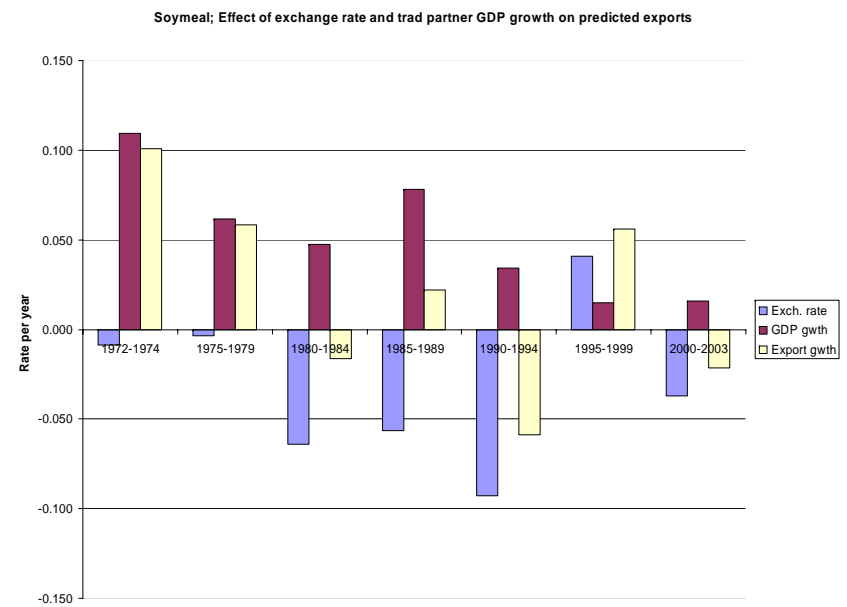
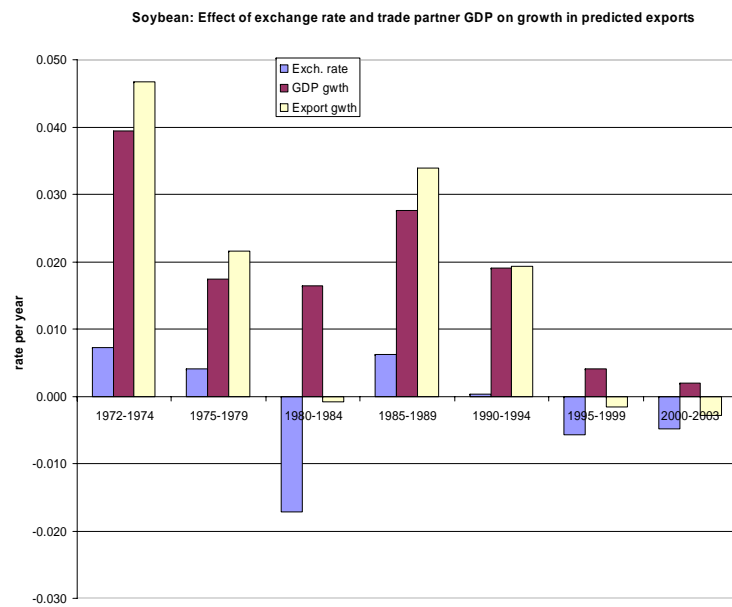
(-1.2; 1.3)



- Soybeans, Soymeal

(-0.15; 0.68)

(-1.16; 1.97)

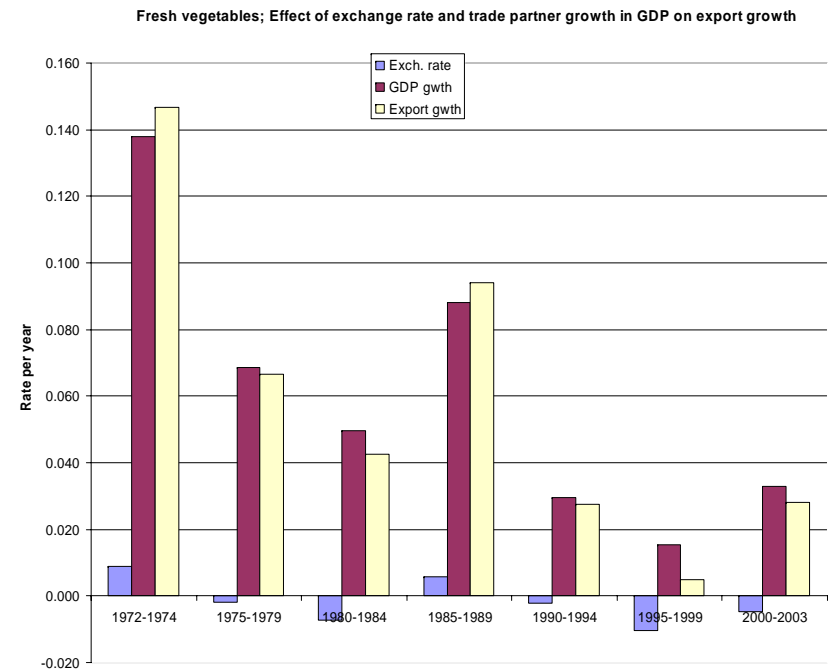
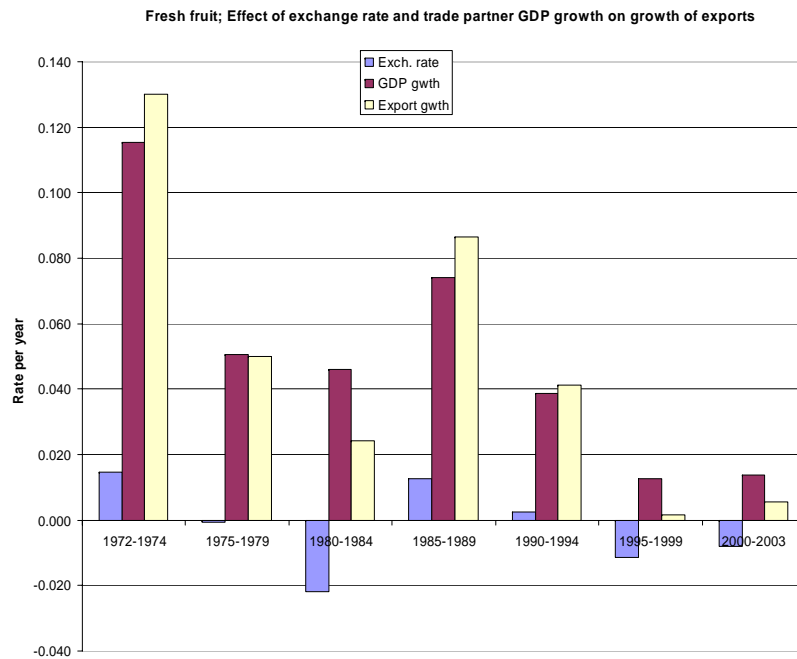


- Noted that
- High value commodities tend to be exported to higher income countries than bulk commodities
- Higher income countries tend to have larger income elasticities
- These include: fresh fruit, fresh vegetables, poultry and meat

- Fresh Fruit and Fresh Vegetables

(-0.41; 1.9)

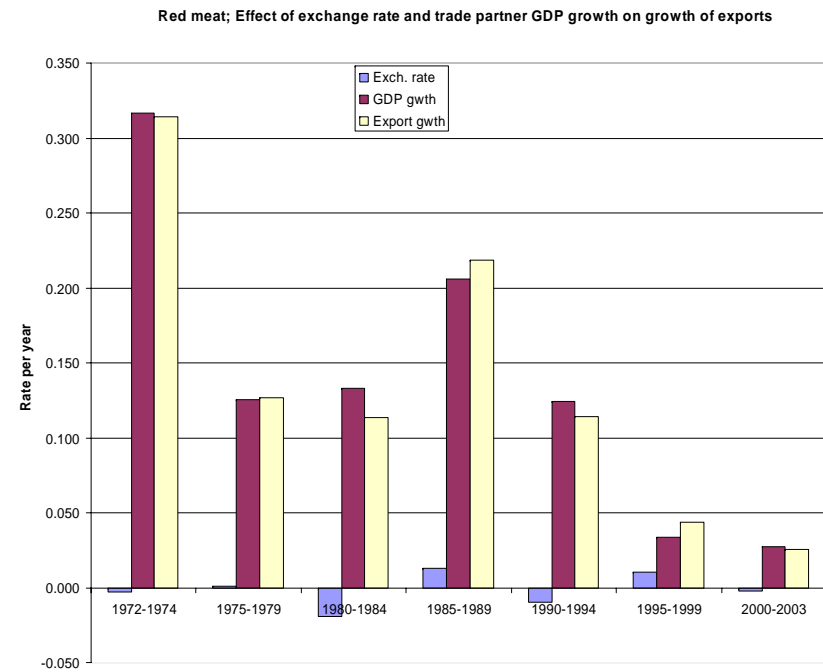
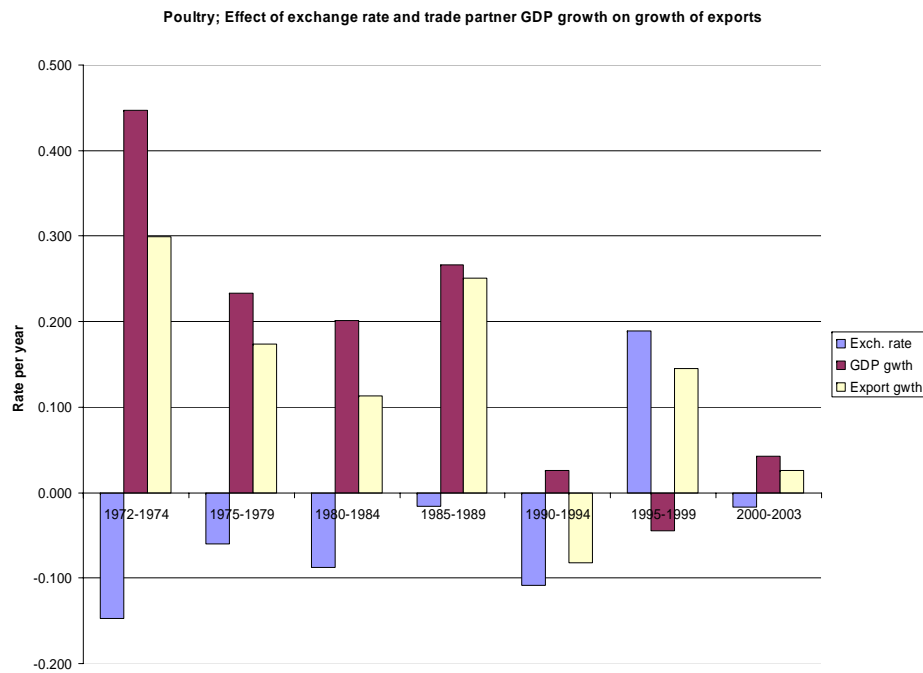
(-0.29; 2.27)



- # Poultry and Meat

(-0.84; 7.6)

(-0.27; 4.8)



# Conclusions

- Major economic forces are deriving world capital markets and real exchange rates, forces which are “subverted” by market imperfections and policy; more “efficient” (e.g., TFP growth) countries tend to experience appreciation
- Exchange rate appreciation and income growth of trading partners strongly affect growth in U.S. agricultural exports,
  - effects may be exacerbated by concentration
  - Appreciation often dominates positive GDP growth
- Country differences affect commodities differently because:
  - Bulk commodity trade partners tend to have lower income and hence the profile of their transition growth is different than for higher value commodities
  - Appreciation and slow GDP growth affected all commodities in recent years