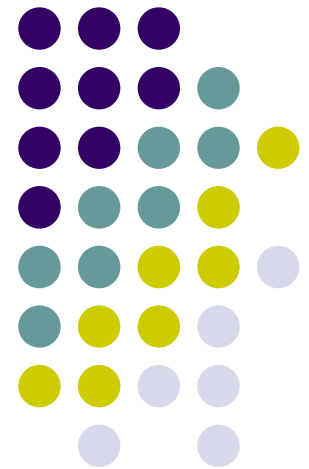


Food Price Inflation: Markets, Households and Policy Implications

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Outline

Determination of Market Prices

- Domestic and international prices (import and export parity)
- Accounting for macro-economic inflation

Implications of supply and demand response:
Multi-market analysis

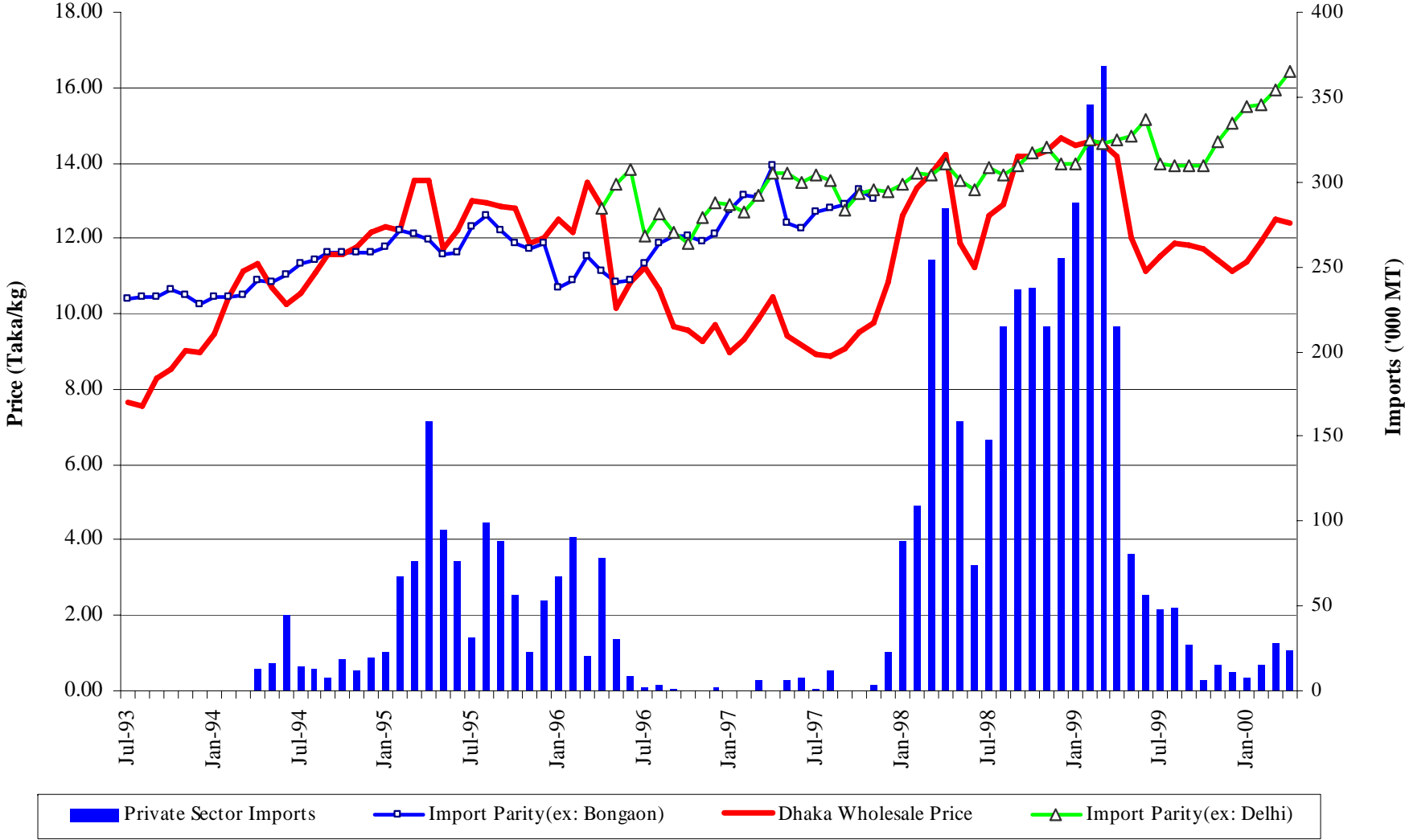
Policy Implications

Markets: What Determines the Domestic Price?



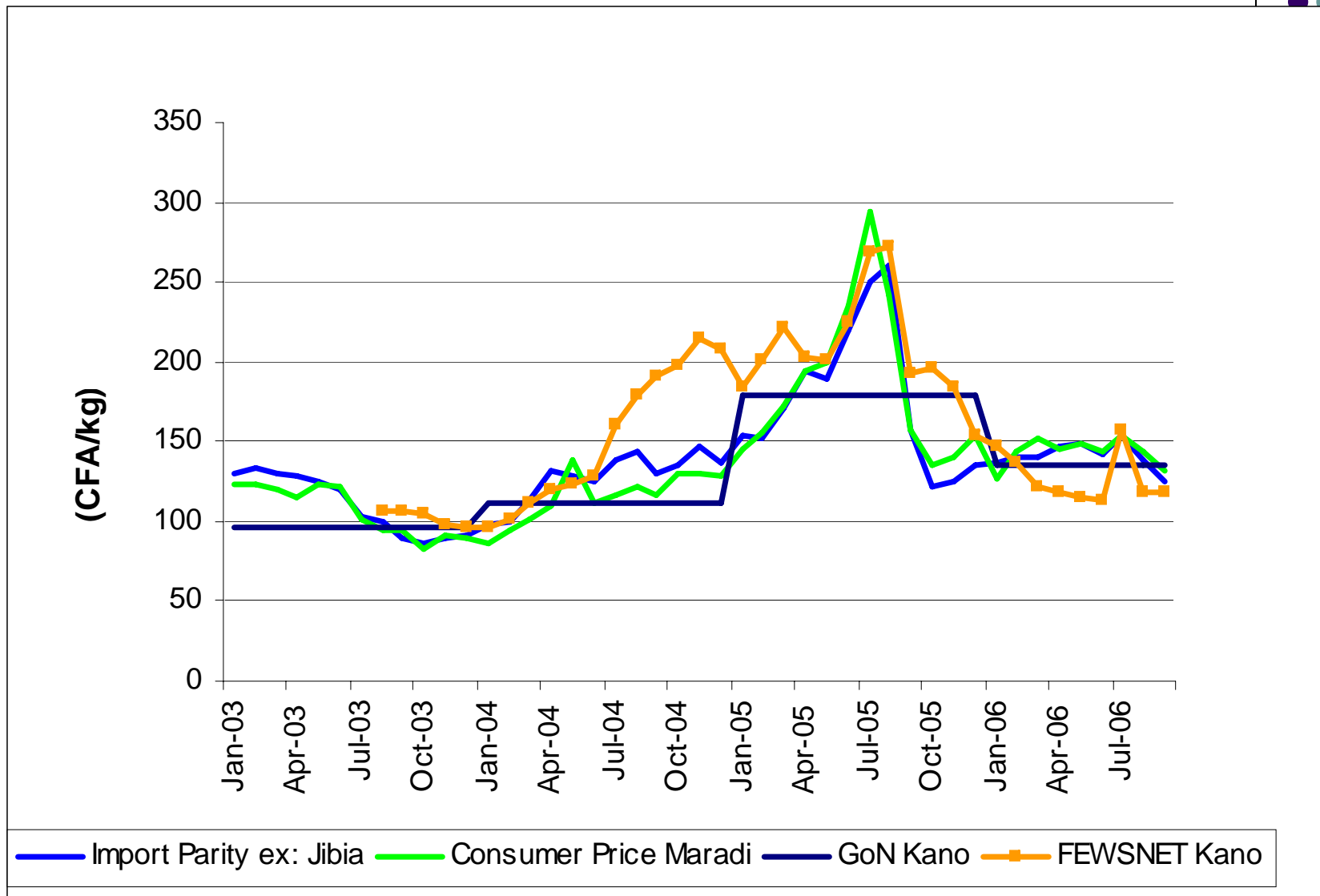
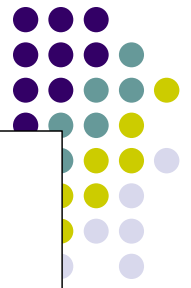
- Comparisons of monthly domestic wholesale prices with import parity (inclusive of taxes and marketing costs)
 - Indicate incentives for private sector trade
 - Provide an indication of whether border prices determine domestic prices (e.g. Bangladesh 1998-99)
 - In some cases, it is not possible to prevent pass-through of border prices to domestic markets (Niger-Nigeria)
- Domestic prices above import parity border prices in periods of substantial imports suggests the presence of binding quotas (e.g. El Salvador 2007)
- Domestic prices within import-export band indicate domestic prices not directly affected by world prices
 - In this case, changes in domestic supply and demand determine movements in domestic market prices (Ethiopia maize 2007)

Rice Prices and Quantity of Private Rice Imports in Bangladesh, 1993-2000



Source : Dorosh (2001).

Maradi (Niger) and Kano (Nigeria) Millet Prices, 2003-06

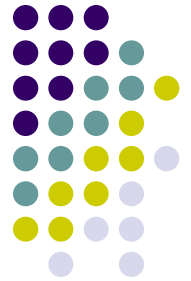


Quotas can be an important determinant of market prices



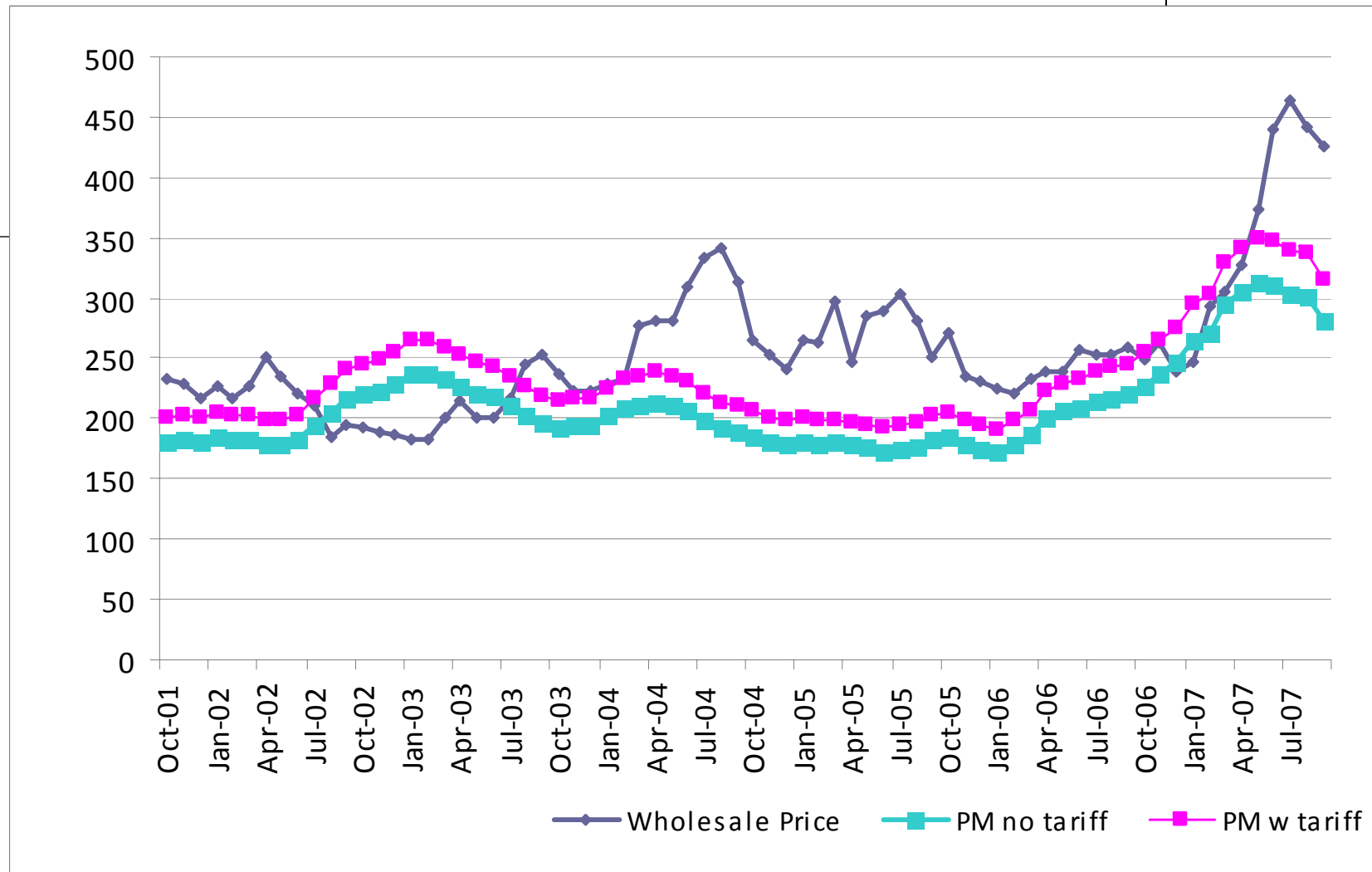
- In Central America, there are substantial imports of cereals from outside the region, but prices are not always at import parity → quantitative restrictions (quotas) are important
- Since start of DR CAFTA (e.g. March 2006 for El Salvador, others later), zero tariff on white maize imports for quantities up to DR CAFTA quota
- Divergences between import parity and domestic prices indicate quotas are binding: (quotas volumes are less than import demand in absence of quota)

El Salvador: White maize prices and international trade

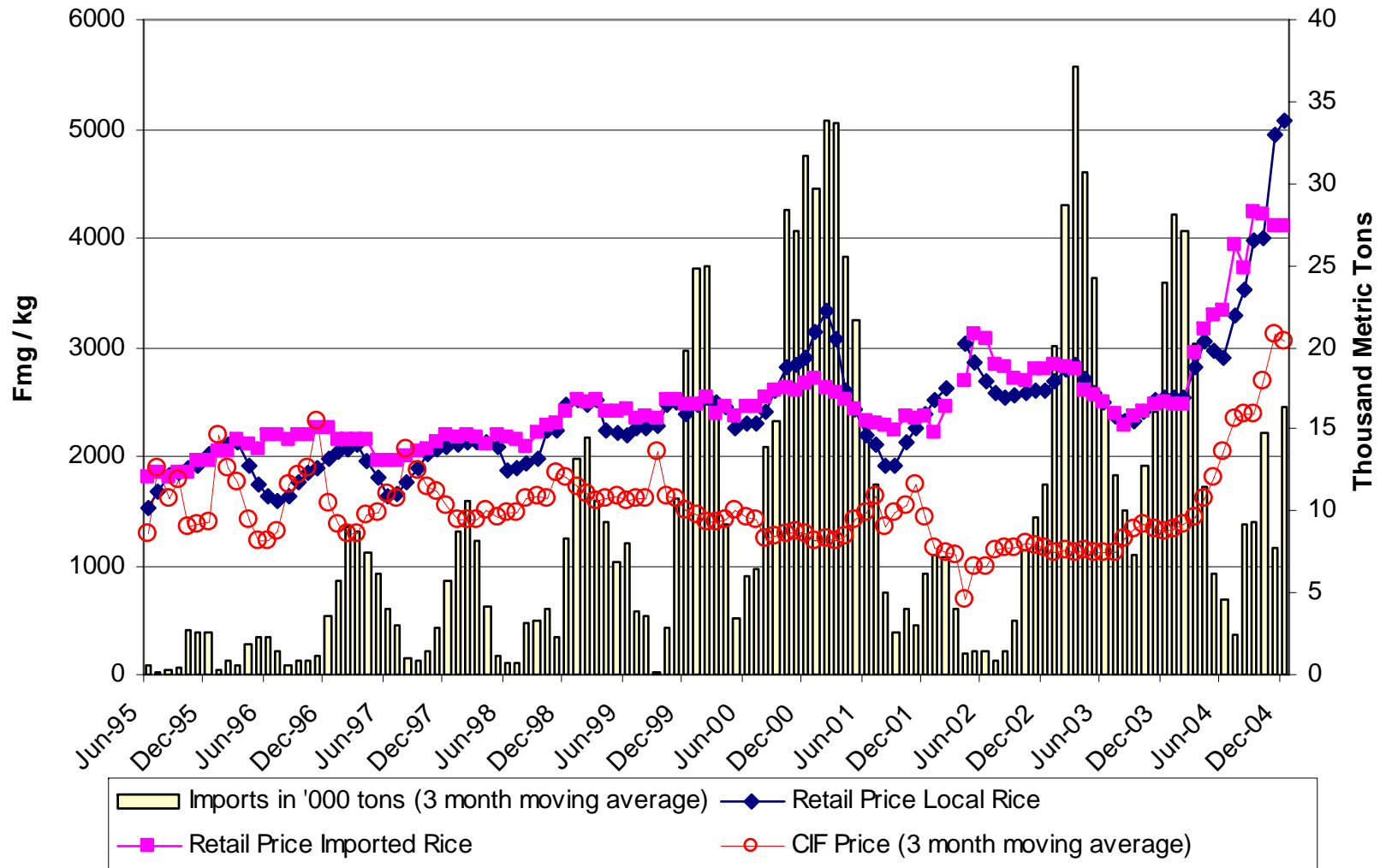


- El Salvador: DR CAFTA zero tariff import quota of 35,700 tons;
 - 2006-07 imports: 134,000 tons – “shortfall quotas allow further duty-free imports; otherwise 20% import tariff)
 - March 2006 – April 2007, domestic prices close to import parity (large shortfall quotas – non-binding?)
 - May 2007- September 2007: prices higher than import parity... “shortfall quota was increased but may still be binding
- Implication: market actors expect supply shortfall (production shortfall with insufficient “shortfall quota” imports)?

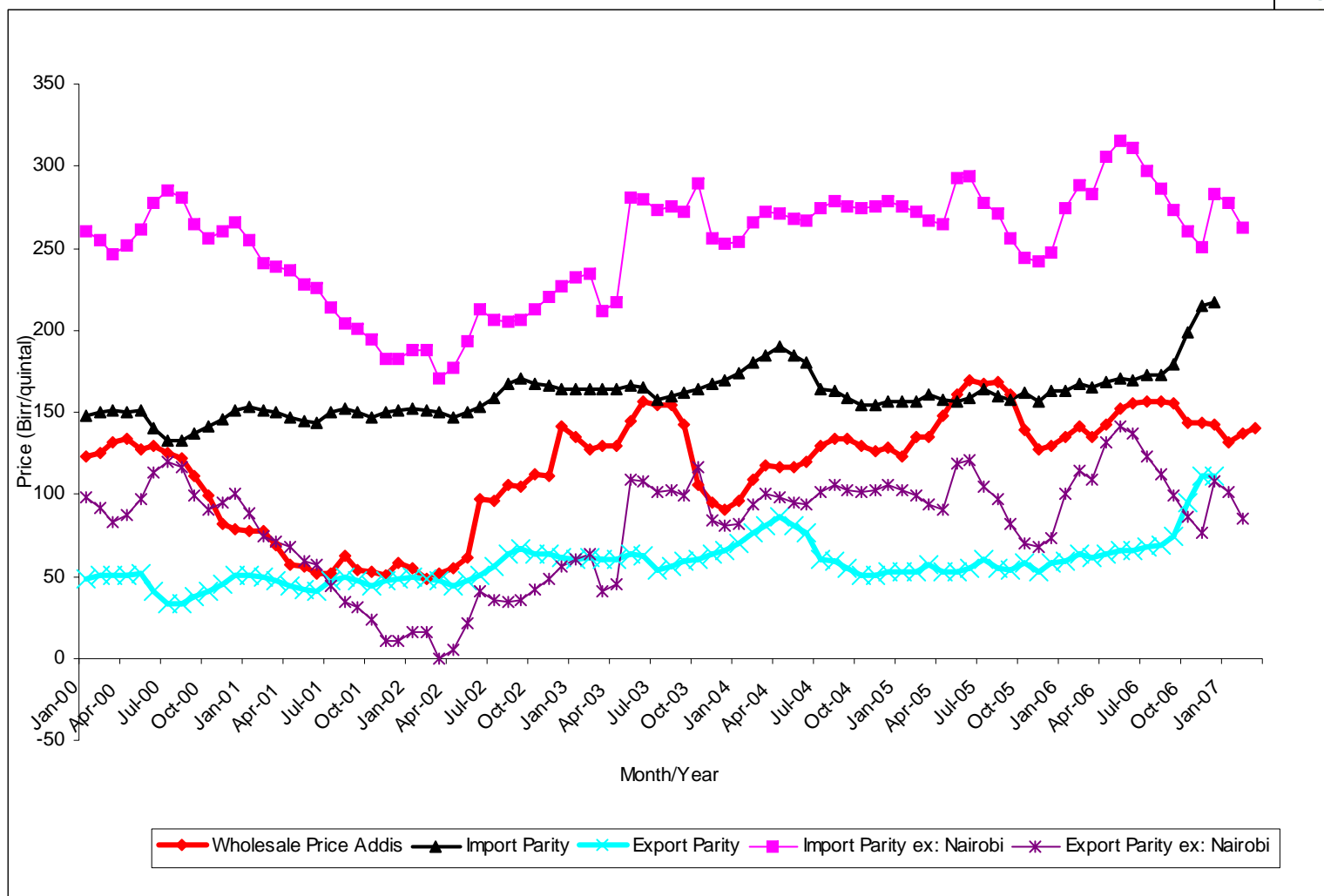
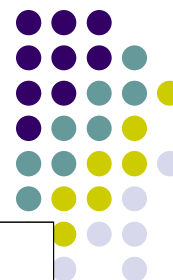
El Salvador: precios de maiz, 2001-07



Madagascar: Rice Prices and Imports, 1995-2004



Ethiopia: Maize Border Prices (with Kenya)



Notes: Import and export parity (\$/ton) estimated using transport and marketing cost of \$100/ton between Nairobi, Kenya and Addis. Import parity is calculated without taxes.

Source: FEWSNET data and World Bank staff

Separating Out Effects of Macro-Inflation



- Macro-economic inflation caused by increases in money supply in excess of real GDP growth and other factors), by definition, implies an increase in the average price of all goods and services in the economy
- Food prices will also rise (unless controlled by the government or determined by border prices (with fixed world prices and nominal exchange rates)
- In the context of macro-economic inflation, understanding what drives domestic prices requires analysis of real prices of food (the nominal price of food relative to a measure of overall inflation)



Nominal and Real Prices

- Overall price inflation confounds interpretation of nominal market prices; since most or all prices and incomes are rising:
 - Increases in nominal prices do not necessarily indicate increases in demand relative to supply
 - Increases in nominal incomes do not necessarily indicate increases in purchasing power or welfare
 - Difficulty in interpreting price signals are one of the costs of inflation; other costs include loss of welfare to those with incomes in nominal terms and to those who are holding cash



Nominal and Real Prices (2)

- Standard neo-classical micro-economic theory: only relative prices matter
 - Consumer demand: if all prices and incomes are doubled, quantity of consumed of each good and service is unchanged (homogeneity of degree zero in prices and income)
 - Production: prices of all outputs and factor inputs double than profit-maximizing levels of output are unchanged (homogeneity of degree zero in input and output prices)
- Appropriate deflator for demand analysis is the overall consumer price index: P_i / CPI

Ethiopia Food Price Inflation



- The Ethiopian context
 - High overall inflation
 - Large increases in food prices
 - Substantial increases in food production
- Are markets working well? How would we know?
- Nominal vs real food prices
- Time frame for the analysis: annual price changes vs monthly price fluctuations

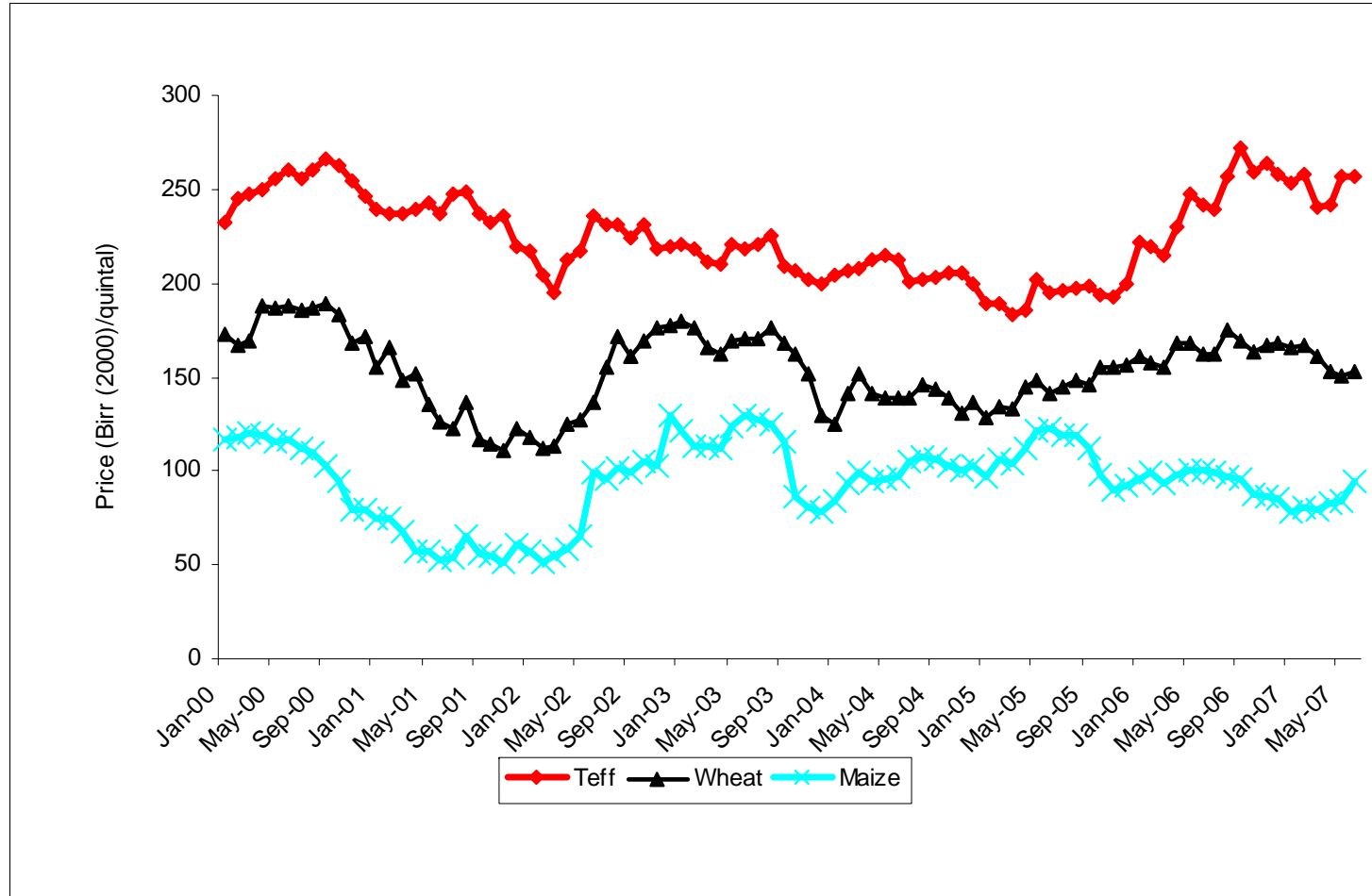
Are Markets Performing Well?



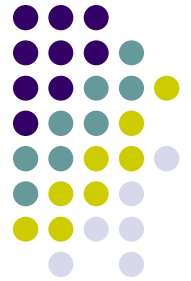
- The food price puzzle: production increases with price increases
- Step 1: Analyze real prices (nominal prices divided by an appropriate price index) to remove the effects of overall inflation
- Step 2: Compute total supply, shifts in demand, and expected changes in real prices
- Step 3: Compare with actual real price movements
- Time frame for analysis: 1 crop marketing year



Real price trends, 2000 - 2007



Notes: EGTE wholesale cereal prices (Addis) deflated using CSA Consumer Price Index.



Basic Model Equations

Demand (Consumption):

$$D_i = \alpha_{0i} * C_{0i} * (P_i/P_{0i})^{**} ED_{ii} \\ * (P_j/P_{0j})^{**} ED_{ij} \\ * (Y/Y_0)^{**} EDY_i$$

Production:

$$X_i = \underline{X}_i \text{ (Exogenous Production)}$$

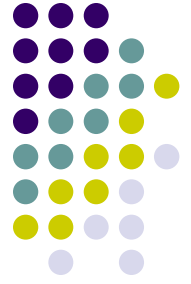
Supply:

$$S_i = X_i - LOSS_i + \underline{ChGovStk}_i + \underline{M}_i - \underline{E}_i$$

Market Clearing:

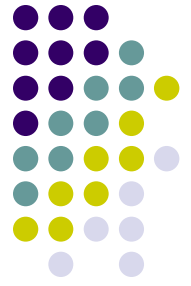
$$S_i = D_i$$

Medium-term Cereal Supply, Demand and Real Prices



- Production of teff, wheat and maize increased by 14, 17 and 15 percent, respectively between 2003/04 and 2005/06 (trend growth rates).
- Net supply of wheat grew by an average of 11 percent since net imports declined over this period
- Estimated demand for these foods rose by about 9 percent per year due to population growth and per capita income growth

Medium-term Cereal Supply, Demand and Real Prices



- With supply increasing faster than demand, model simulations show real price declines of all three cereals of magnitudes similar to those actually observed
- More refined simulations are needed to take into account effects of differential income growth across households (especially urban and rural)

Trend Growth in Supply, Demand and Real Prices of Major Cereals, 2003/04 to 2005/06



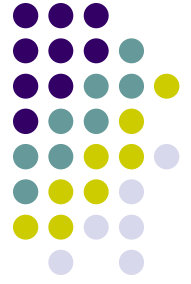
	Production	Supply	Demand*	Real Sim Price*	Real Addis Price
Teff	14%	14%	9.0%	-7.3%	-6.6%
Wheat	17%	11%	8.6%	-4.3%	-9.0%
Maize	15%	14%	8.6%	-10.8%	-4.2%

Note: Simulations do not include cross-price effects or effects of rural-urban income growth differentials

* Denotes simulated variable.

Source: Model simulations.

Sudan: Cereal Imports, Exports and Food Aid



- Domestic wholesale prices of sorghum and wheat have risen by 25 and 49 percent in real terms, respectively (2008 vs 2007)
 - Sorghum prices are still far lower in real (and nominal) terms than in 2005
- Domestic sorghum prices have risen mainly because of a 22 percent production decline (equivalent to 1.0 million tons net) and 300-400 thousand tons of private sector exports
 - Note that food aid sorghum imports for 2008 are projected to be about 300 thousand tons.
- Wheat prices have risen along with world prices (import parity)

Sudan: Food Aid, Production and Real Prices, 2003-08



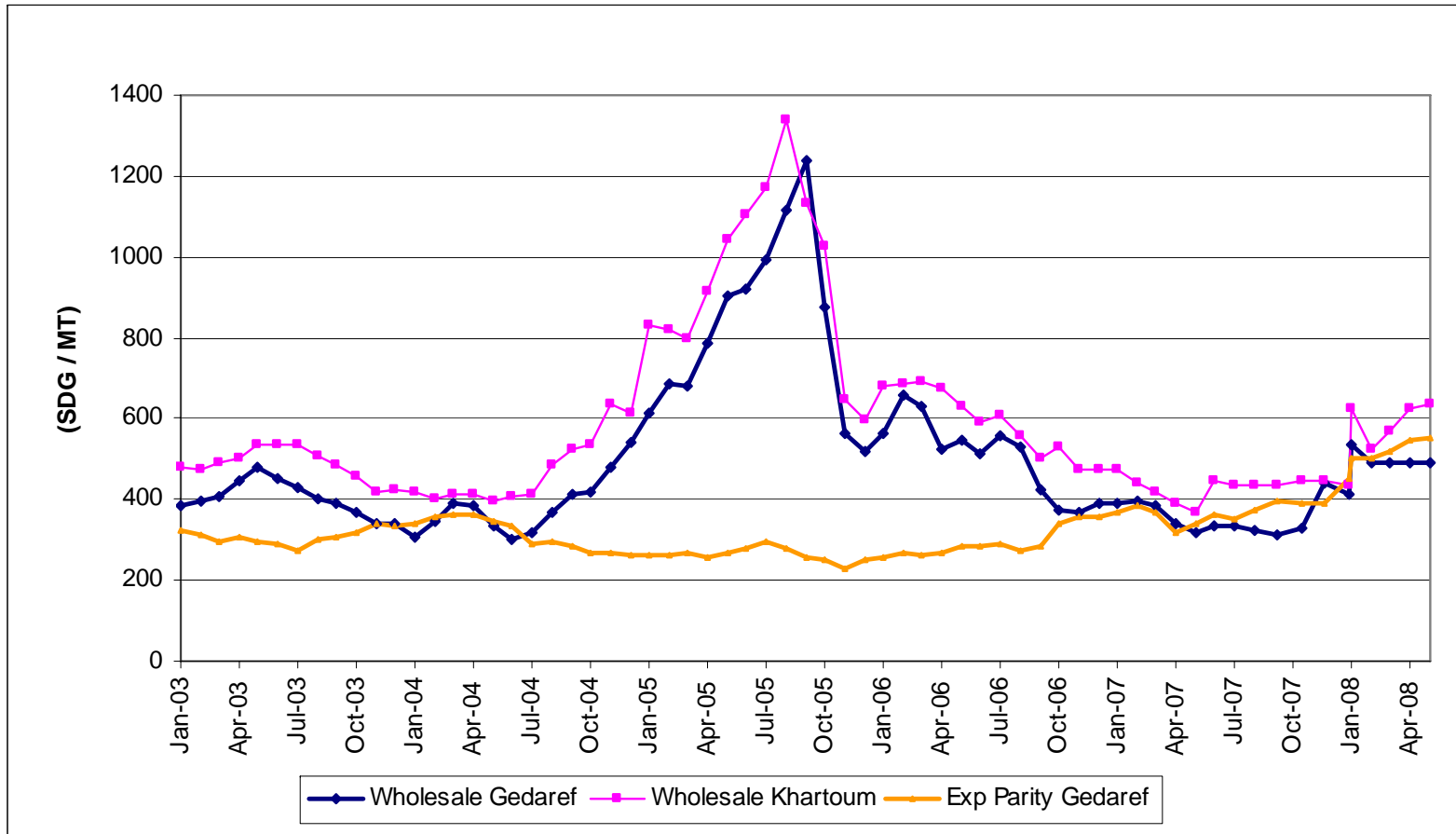
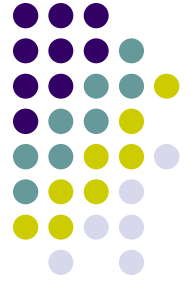
	Food Aid Sorghum (mn tons)	Food Aid Wheat (mn tons)	Production Sorghum (mn tons)	Production Other Cereals (mn tons)	Real Price Sorghum ('2003 SDP per ton)	Real Price Wheat ('2003 SDP per ton)	Ratio P Sorghum / P Wheat
2003	0.135	0.072	2.825	0.915	474	789	0.61
2004	0.219	0.063	4.691	1.166	421	788	0.53
2005	0.196	0.445	2.678	0.947	783	875	0.90
2006	0.330	0.153	4.327	1.090	461	562	0.82
2007	0.364	0.021	4.989	1.464	307	616	0.51
2008*	0.381	0.000	3.906	1.546	384	919	0.42
Average 2003-08*	0.271	0.125	3.903	1.188	472	758	0.63

* 2008 data is for January through May, 2008.

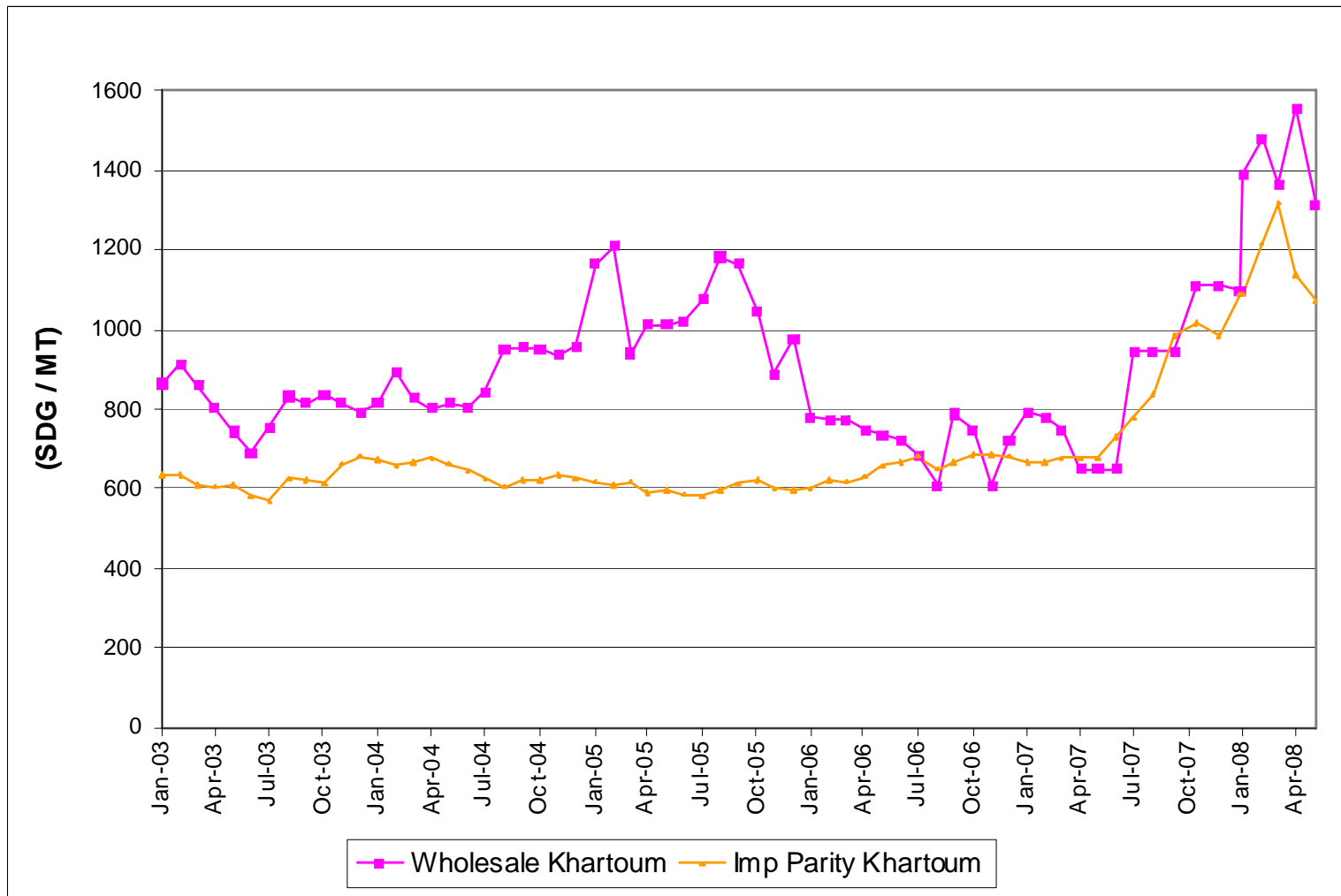
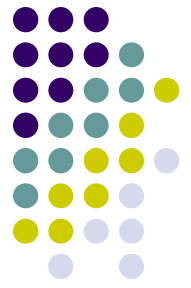
Note: Real prices are calculated using wholesale prices in Khartoum deflated by the middle-income CPI.

Source: Calculated from WFP and Sudan Ministry of Agriculture data.

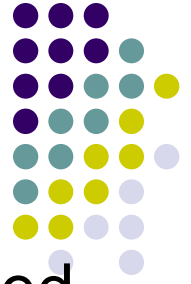
Sudan: Domestic and Export Parity Prices of Sorghum



Sudan: Domestic and Import Parity Prices of Wheat



Summary



Analysis of domestic market prices

- Determine whether domestic prices are determined by market forces: domestic supply and demand; import or export parity; or government controls
- In many cases, domestic trade policies worsen or mitigate effects of world price changes (e.g. high import tariffs; export bans)

Overall inflation and household effects

- Where there is general inflation, prices of non-food and nominal incomes are also likely to rise
- Assuming no change in nominal incomes may overstate effects of food price changes