

# The Social Impact of Price Volatility in Papua New Guinea

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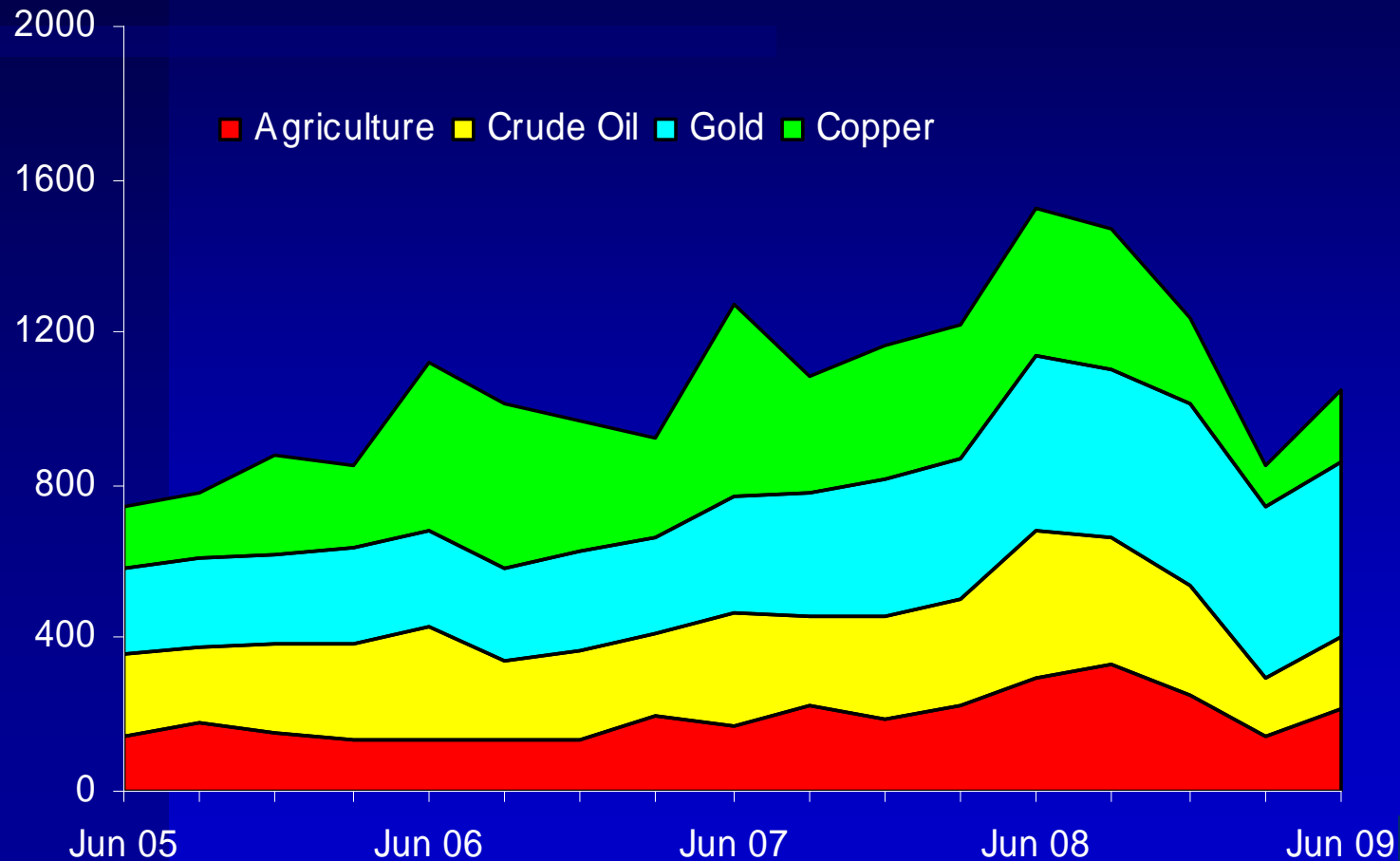
**THE IMPACT OF THE GLOBAL ECONOMIC  
SLOWDOWN ON POVERTY AND SUSTAINABLE  
DEVELOPMENT IN ASIA AND THE PACIFIC**

**Hanoi, 28-30 Sept 2009**

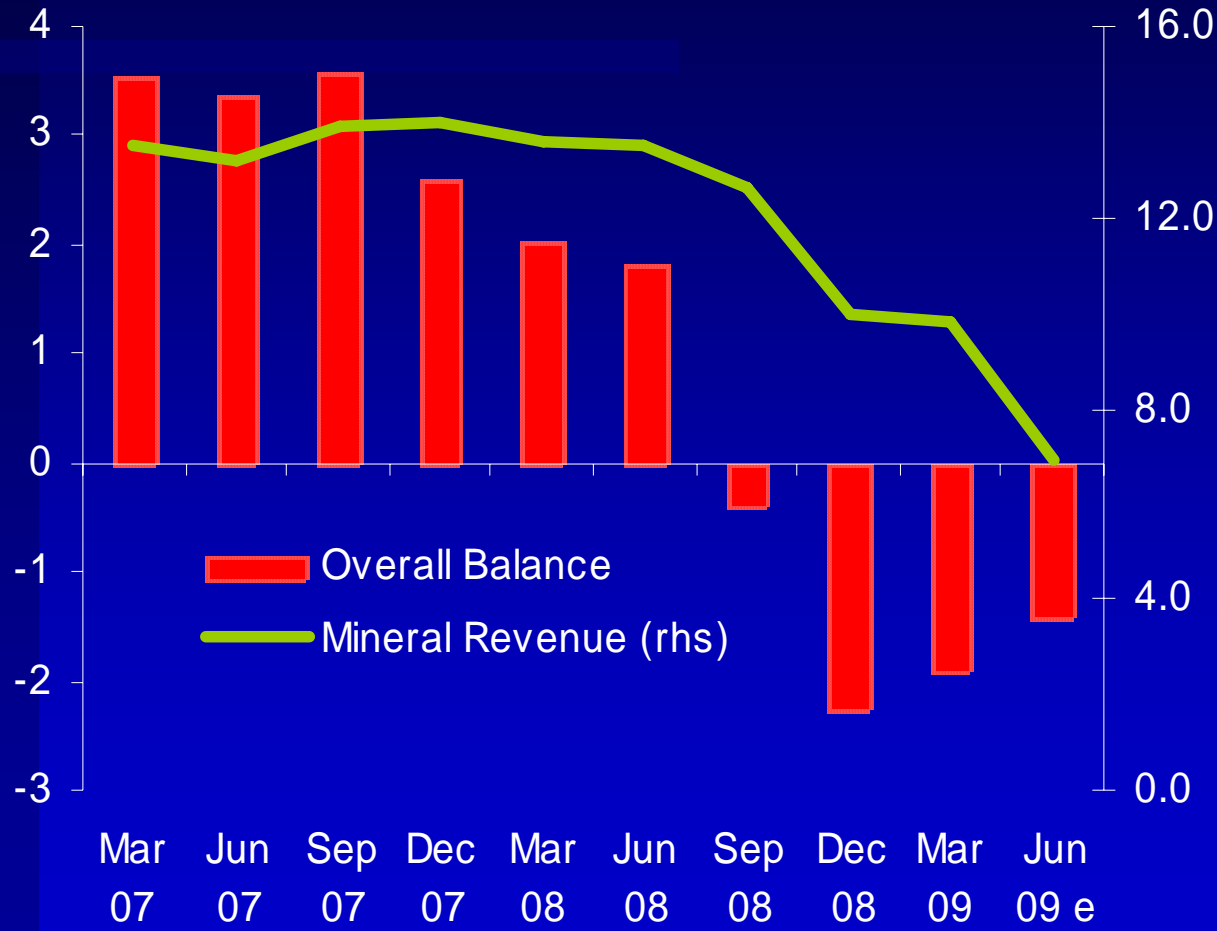
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# As a resource rich country, PNG exports have been hit .....

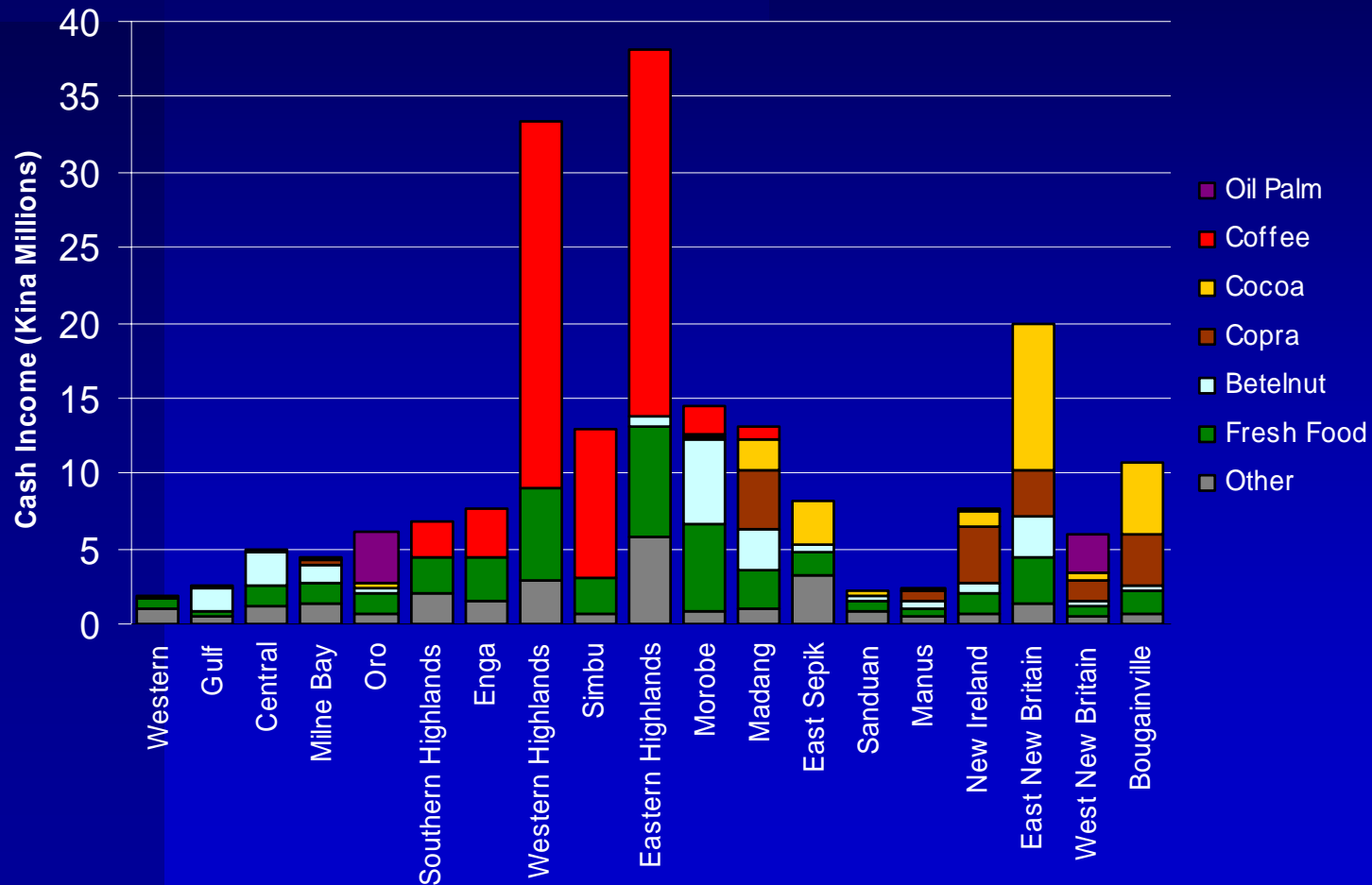


# Declining government revenues may affect service delivery.....



# Agricultural income is main source of income for 81% of population...

## Cash Crop Income by Province



Source: Mapping Agricultural Systems of Papua New Guinea Project (MASP)

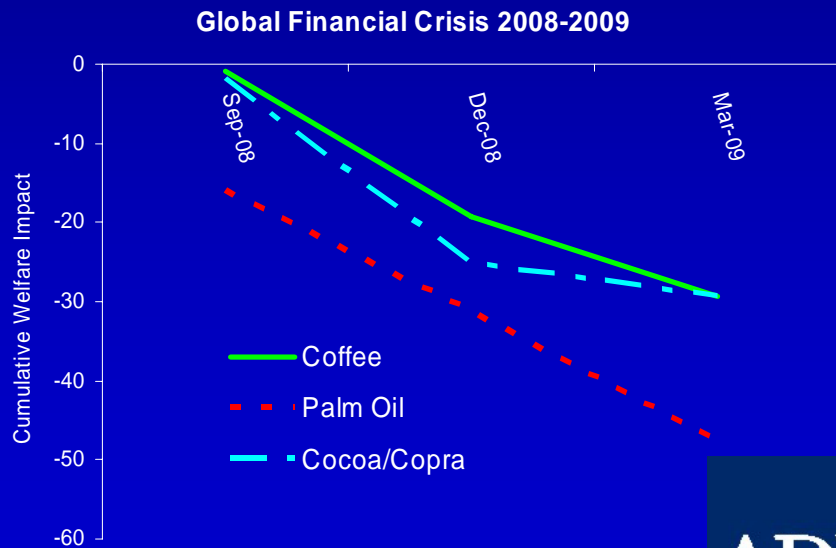
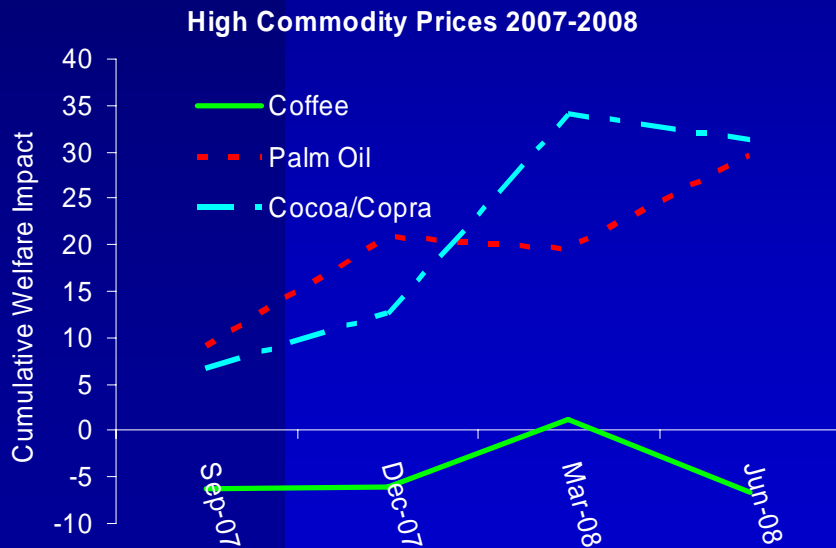
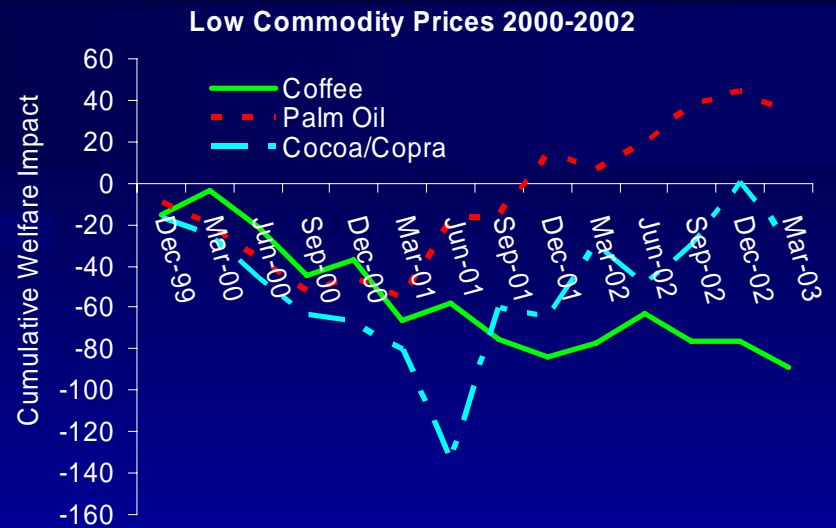
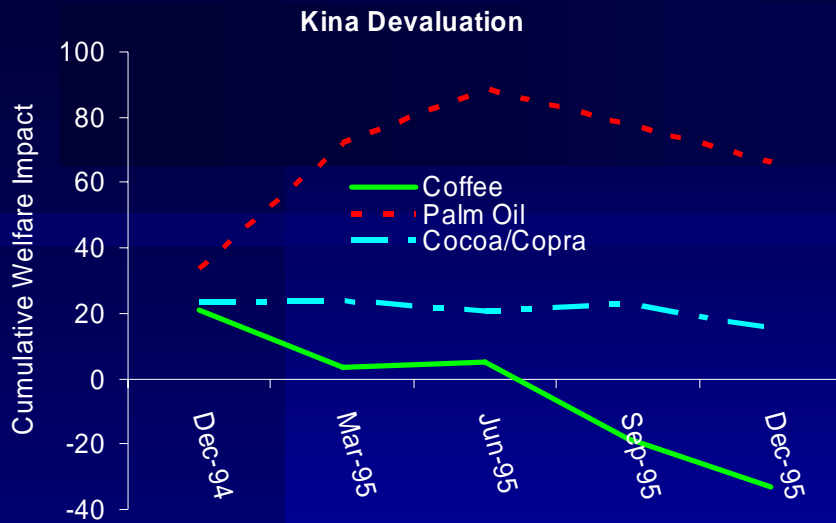
# Government Response and Existing Social Protection

- Expansionary post-crisis Budget but concerns over size and rate of expenditure.
- Public social protection mostly non-existent.
- Social protection largely provided by traditional mechanisms, however, these are becoming stretched due to urban drift.

# Analytical Framework

- Income Effect
  - Welfare analysis of how episodes of terms of trade shock impact on welfare of different cash crop groups.
- Substitution Effect
  - Dynamic analysis of the extent of substitution between imported and domestic market goods.
- Case Survey

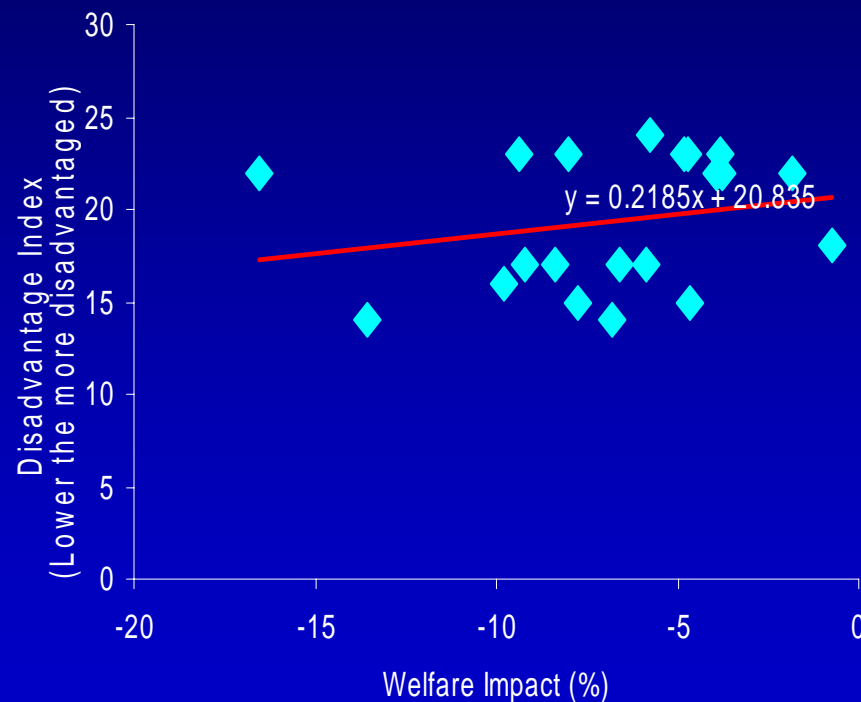
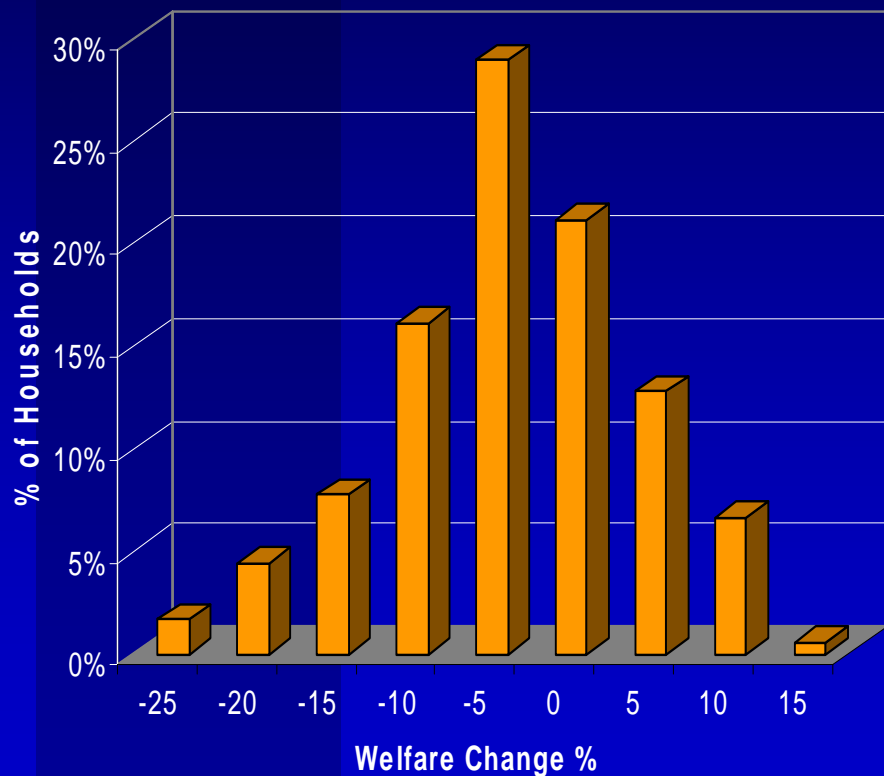
# Sub-regional populations may be more vulnerable ...



Source: Computed using Consumer Price Index, MASP, Household Survey, and Quarterly Economic Bulletin Data

# Remote communities may be more vulnerable ...

## Welfare Distribution of Households and Districts in Coffee Cash Crop Region During High Commodity Prices



Source: Computed using Consumer Price Index, MASP, Household Survey, and Quarterly Economic Bulletin Data

# Income Effect

## Remarks:

1. Sub-regional population groups may be more vulnerable e.g. Palm Oil industry during GFC
2. Vulnerability depends on diversity of alternative cash crops income sources. Coffee and Palm Oil regions are particularly vulnerable.
3. Great variation in household welfare impact within region. Remote communities may be more vulnerable.

# Substitution Effect

## Model and Estimation Method

### 1. Ordinary Least Squares (OLS) Model

$$a) \quad \Delta INF_t = \sum_{i=1}^3 \gamma_i D_{i,t} + \gamma_4 VAT_t + \beta_1(L) \Delta XR_t + \beta_2(L) \Pi_t^F + \varepsilon_t$$

$$b) \quad \Delta DOM_t = \sum_{i=1}^3 \gamma_i D_{i,t} + \beta_1(L) \Delta IMP_t + \varepsilon_t$$

### 2. Vector Autoregressive (VAR) Model

$$c) \quad \Delta XR_t = \sum_{i=1}^n \alpha_{1i} \Delta IMP_{t-i} + \sum_{i=1}^n \alpha_{2i} \Delta DOM_{t-i} + \varepsilon_{XR_t}$$

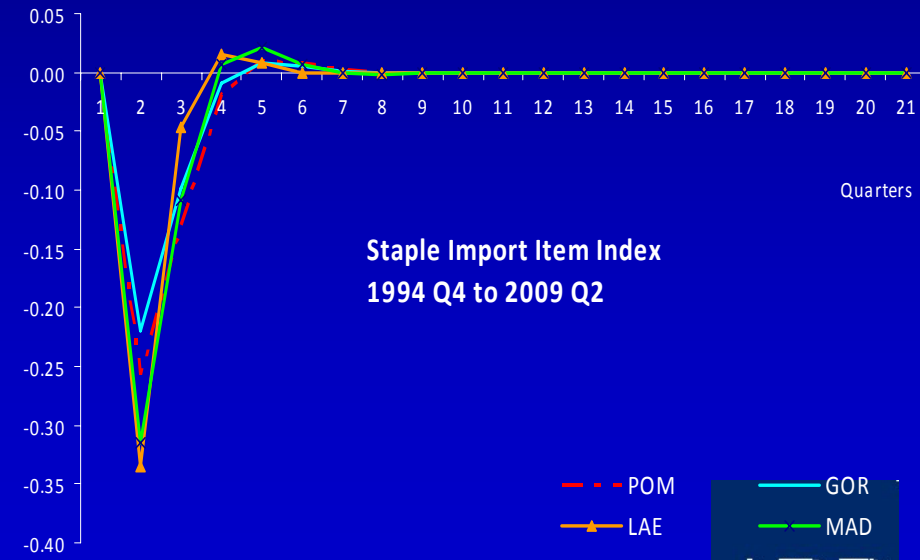
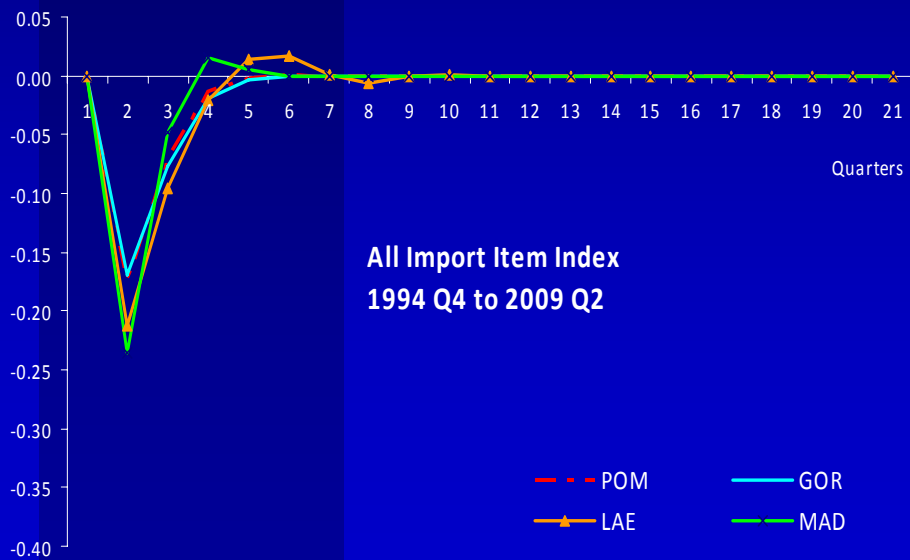
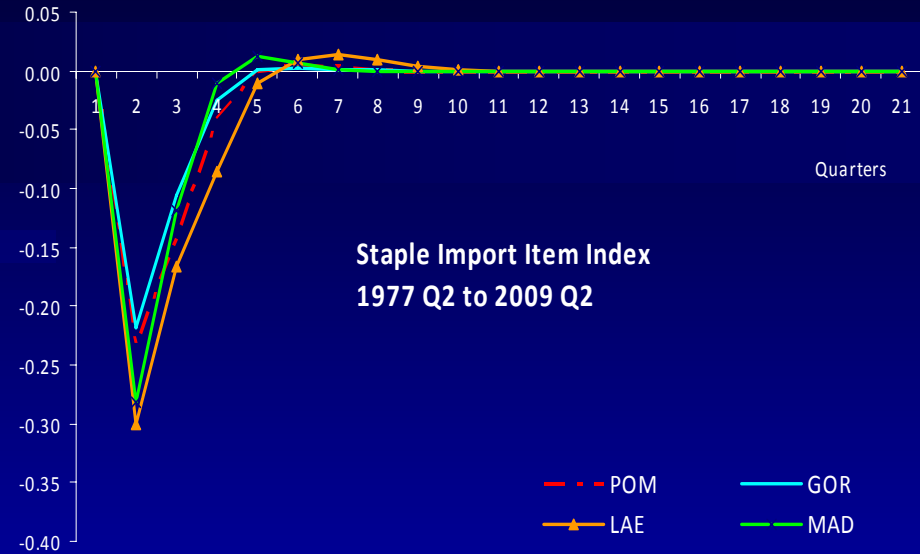
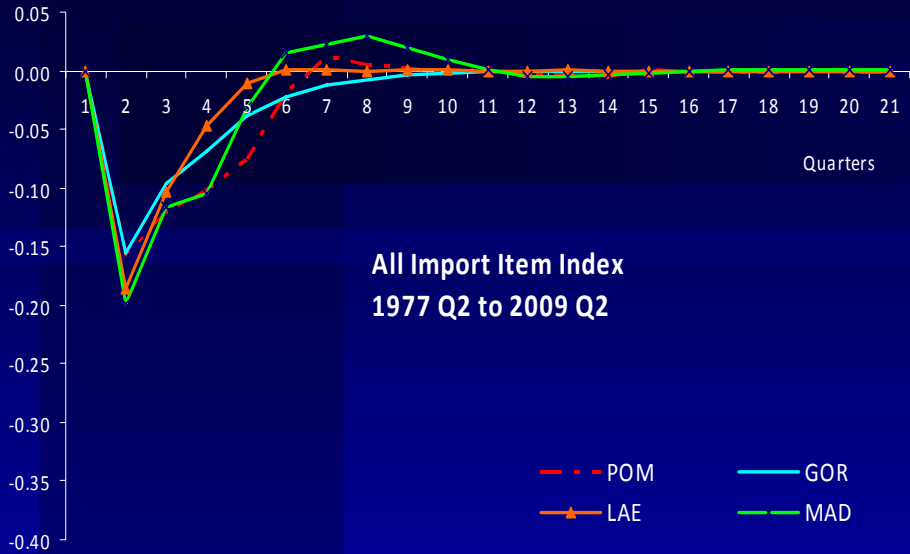
$$d) \quad \Delta IMP_t = \sum_{i=1}^n \alpha_{3i} \Delta XR_{t-i} + \sum_{i=1}^n \alpha_{4i} \Delta DOM_{t-i} + \varepsilon_{IMP_t}$$

$$e) \quad \Delta DOM_t = \sum_{i=1}^n \alpha_{5i} \Delta XR_{t-i} + \sum_{i=1}^n \alpha_{6i} \Delta IMP_{t-i} + \varepsilon_{DOM_t}$$

Exchange rate (XR) is set as exogenous as PNG is a small open economy

### 3. Impulse Reaction Function (IRF)

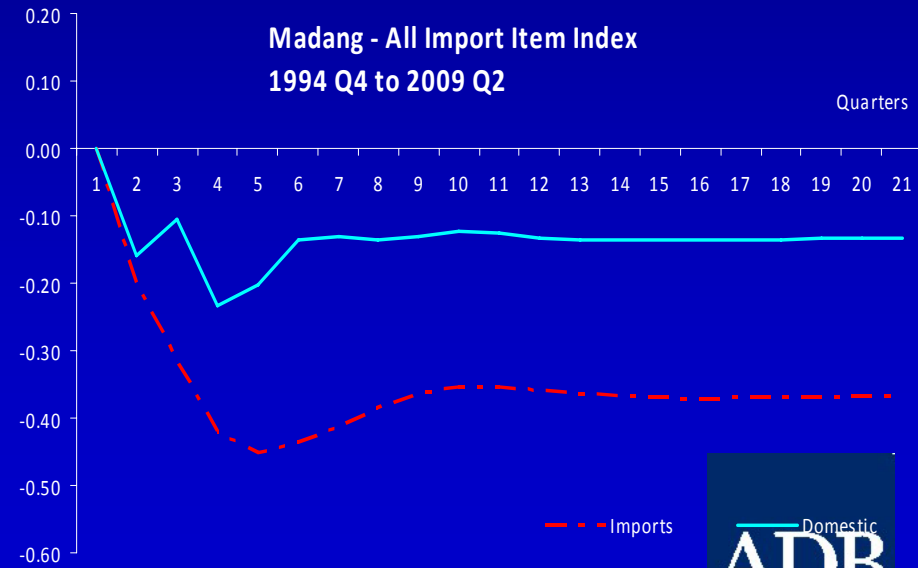
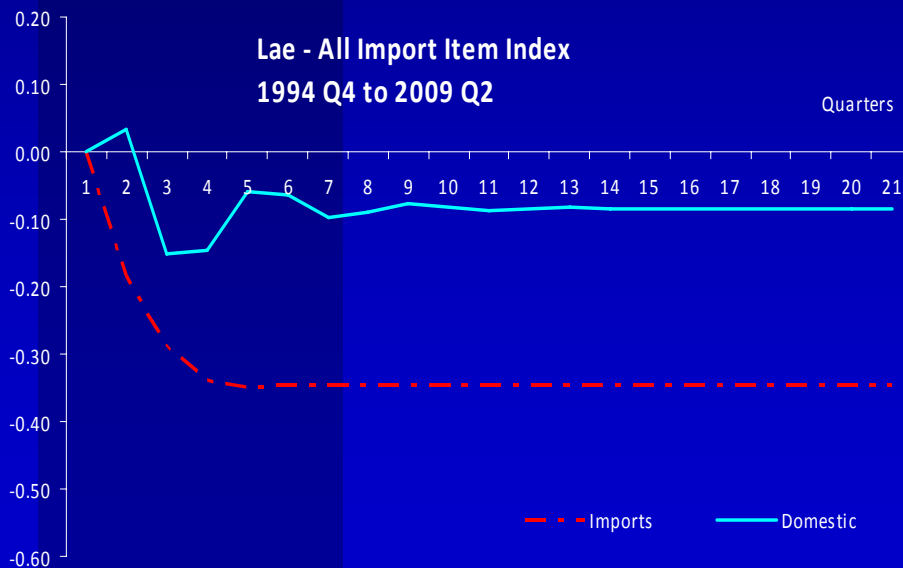
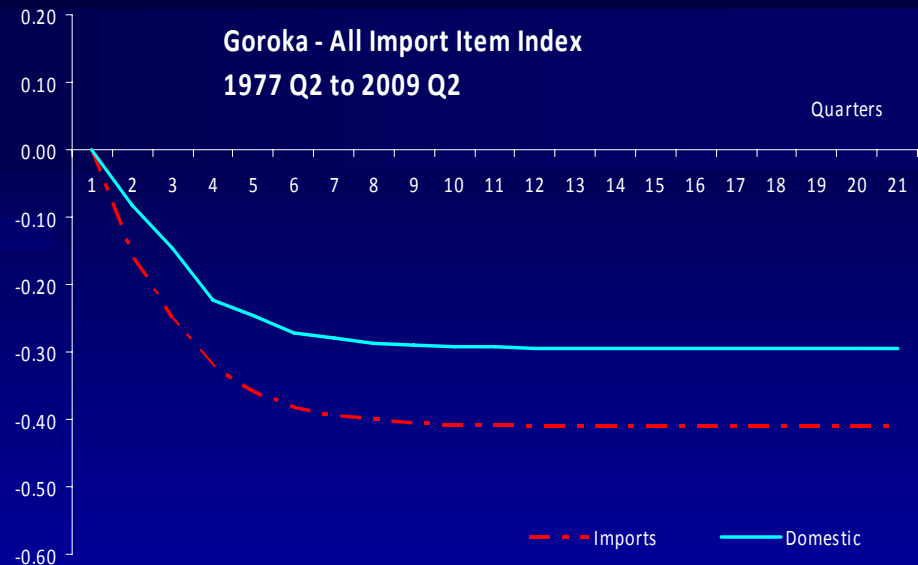
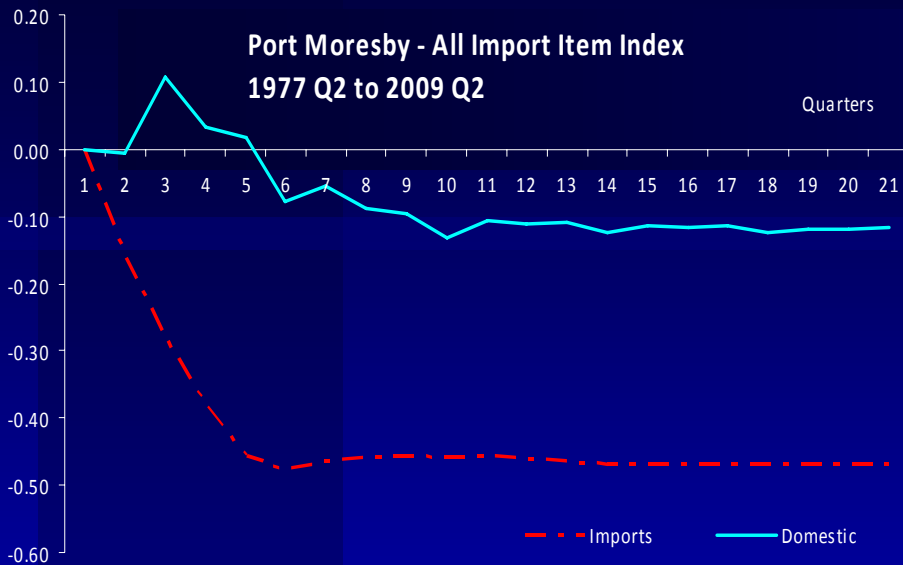
# High pass-through to imported staple goods ...



Source: Author's Calculations



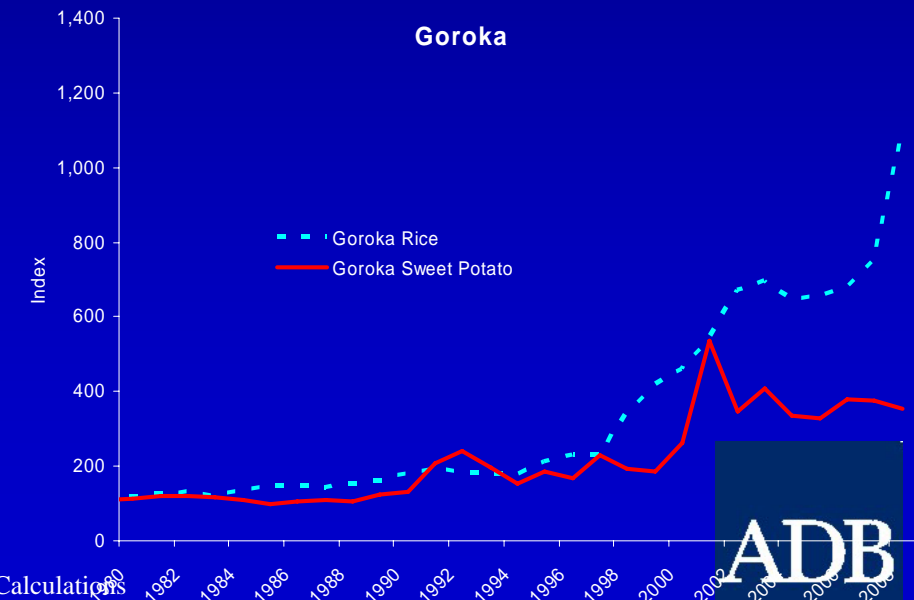
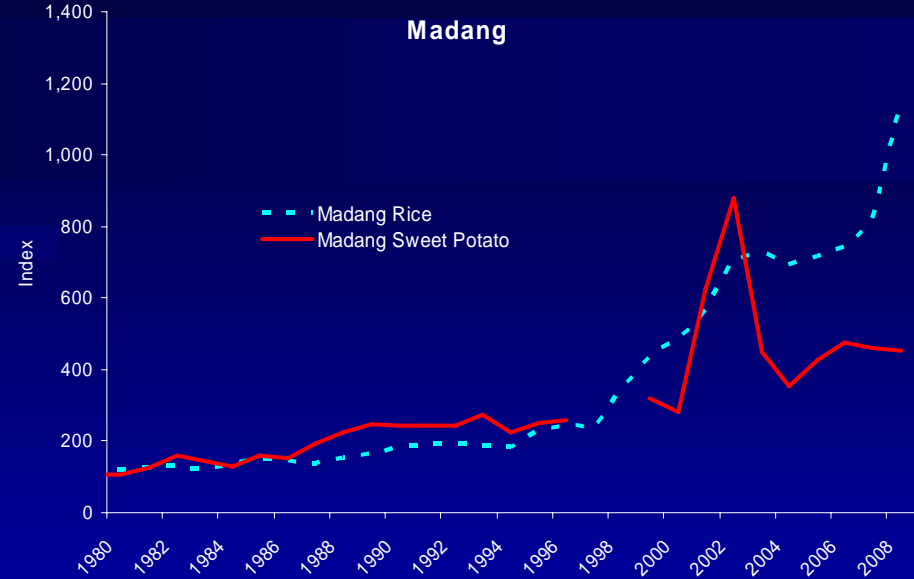
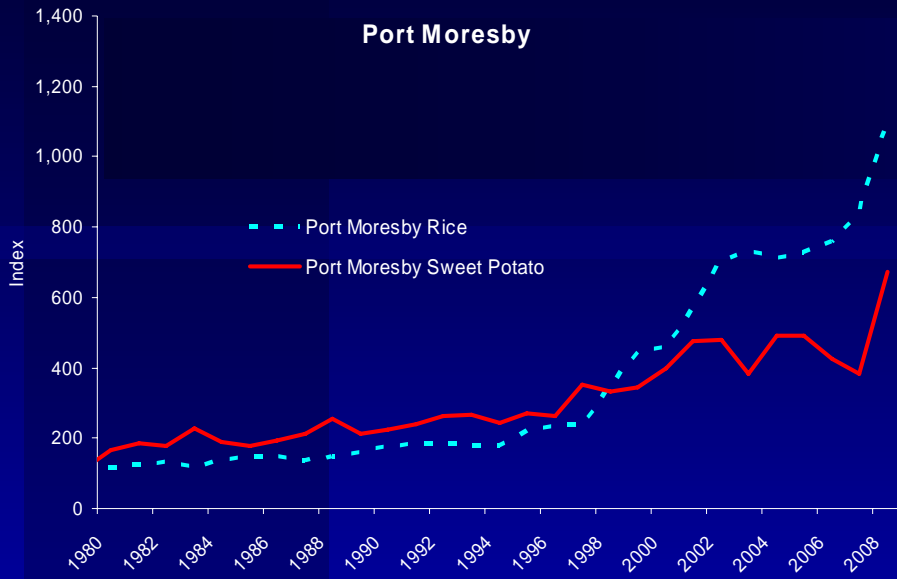
# Low pass-through to domestic market goods ...



Source: Author's Calculations



# Substitution from rice to sweet potato ...



Source: Author's Calculations



# Case Study of Oro, A Palm Oil Province

	Before Crisis	After Crisis
Palm Oil Price	>K300/tonne	K137/tonne
Visits to Town	1-2 times/week	Every fortnight
Store Goods	Trade Store: Significant decline in revenues but sales volume on staple goods holding up Households: Less rice, more garden foods. Decline in protein consumption	
School Fees	School: Choose not to pay, other priorities. Parents: More difficult, borrow more.	
New Developments	Expanded mobile telecommunication network. Higher consumption of credit	

# Conclusion

- Sub-regional populations may be more vulnerable. E.g. Palm Oil during GFC.
- Vulnerability may depend on (i) diversification of income sources, and (ii) remoteness.
- Resilience from strong substitution effect.
- Low-income, landless settlement populations are more vulnerable as less able to substitute.
- Government may consider more targeted support, especially as traditional systems are stretched.