After the Main Price Risk is Hedged

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Paul Nicholson,
General Manager Rice Research and Risk Management

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There are three broad baskets of risk to manage in commodity procurement

Price (how much to spend at what quality delivered where?):

- (1) Underlying Price Risk
- (2) Premium/Discount (Basis) Risk
- (3) Transportation/Milling/Insurance Price Risk

Physical Supply Chain (where is it available, where do I need it to go?):

- (1) Quality mismatch (Origin to Destination)
- (2) Quantity mismatch (Origin to Destination)
- (3) Weather/Labor/Port Issues (delays = availability versus timeline)
  - a) Crop specific
  - b) Capital required for transporting/loading/unloading
- (4) Credit/Liquidity issues

Legal (what do I/they owe and what actually happened?):

1) Contract Default
   - a) Opportunistic
   - b) Force Majeure
2) Policy changes
   - a) Environment shift

Typical industry contract "component price" mechanism:

Wheat Flour Example:

Price is determined by:

(1) Wheat (some grade and quality at some geographic point)	$8.00
(2) Byproducts credit	-$3.00
(3) Conversion	$0.50
(4) Delivery	$0.25
(5) Total	$5.75

*Totally fictitious numbers

Even if the price portion of the contract is covered through Futures contracts it leaves open exposure to four other potential price risks

Wheat Flour Example:

Bulk of price risk hedged by futures

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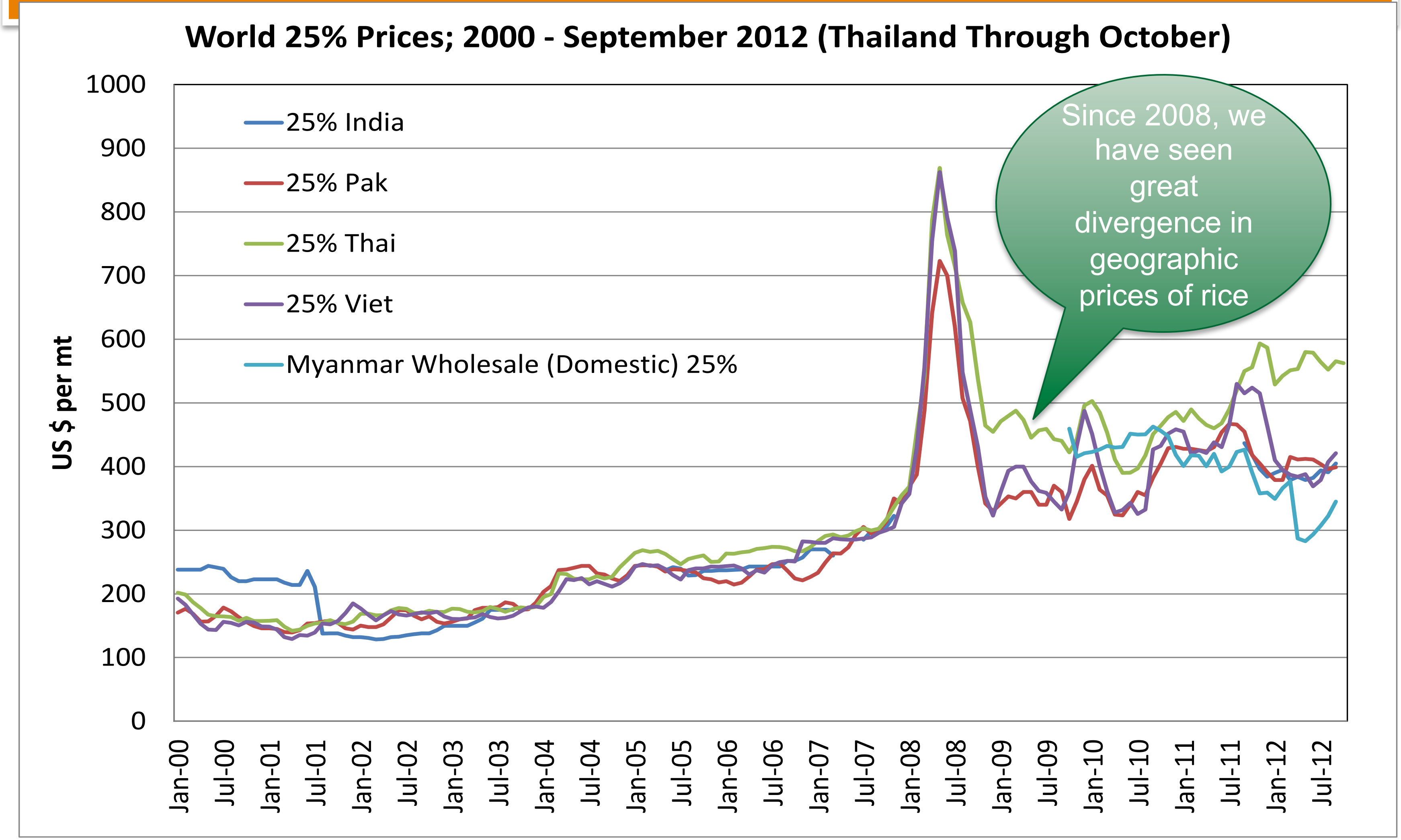
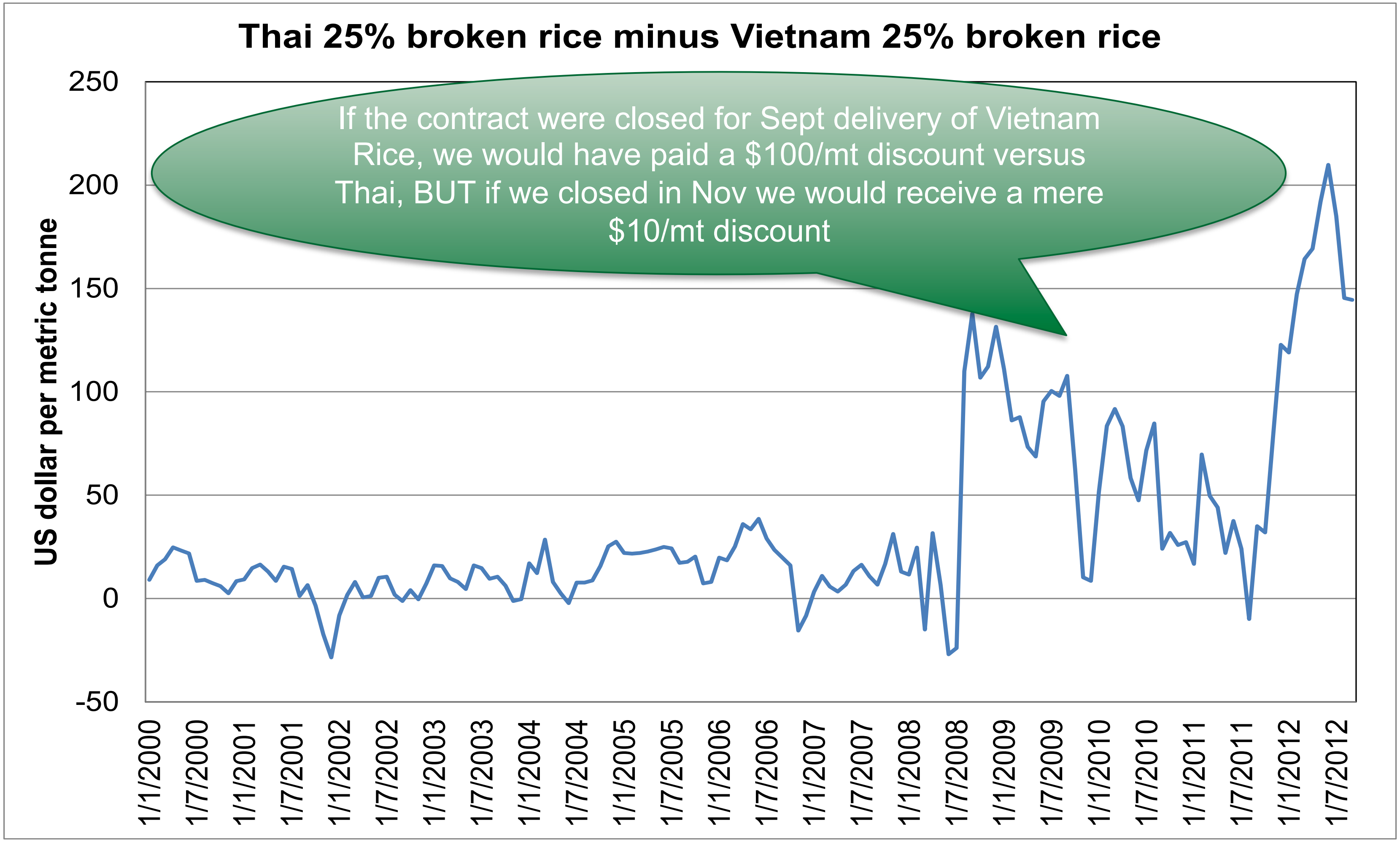
Basis Risk (the difference between the contracted underlier and the physically delivered commodity)



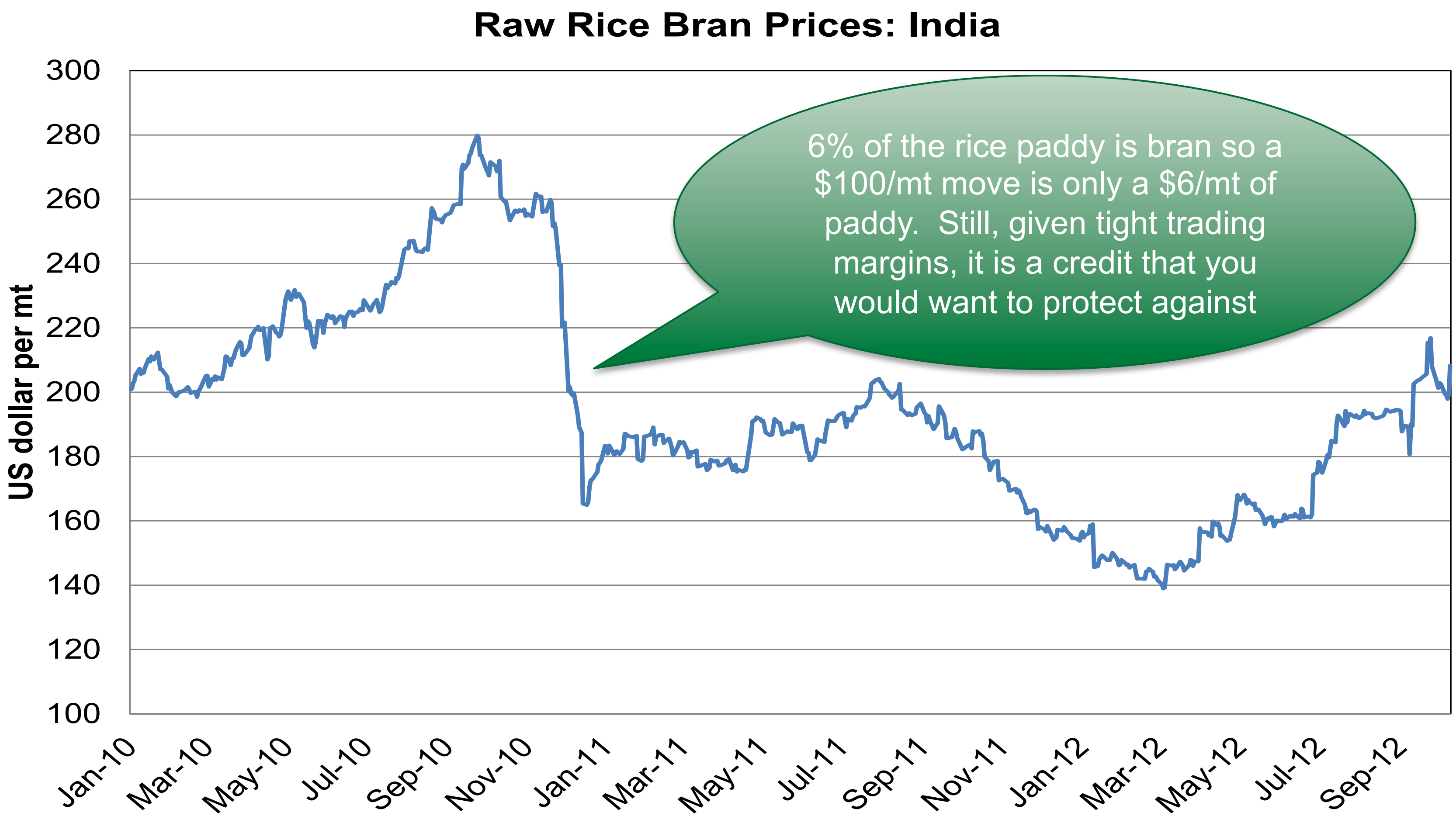
Source: FAO GIEWS Price Database

Basis Risk (cont): In two months the basis (differential) between Thailand and Vietnamese prices fell about $100/mt



Source: FAO GIEWS Price Database

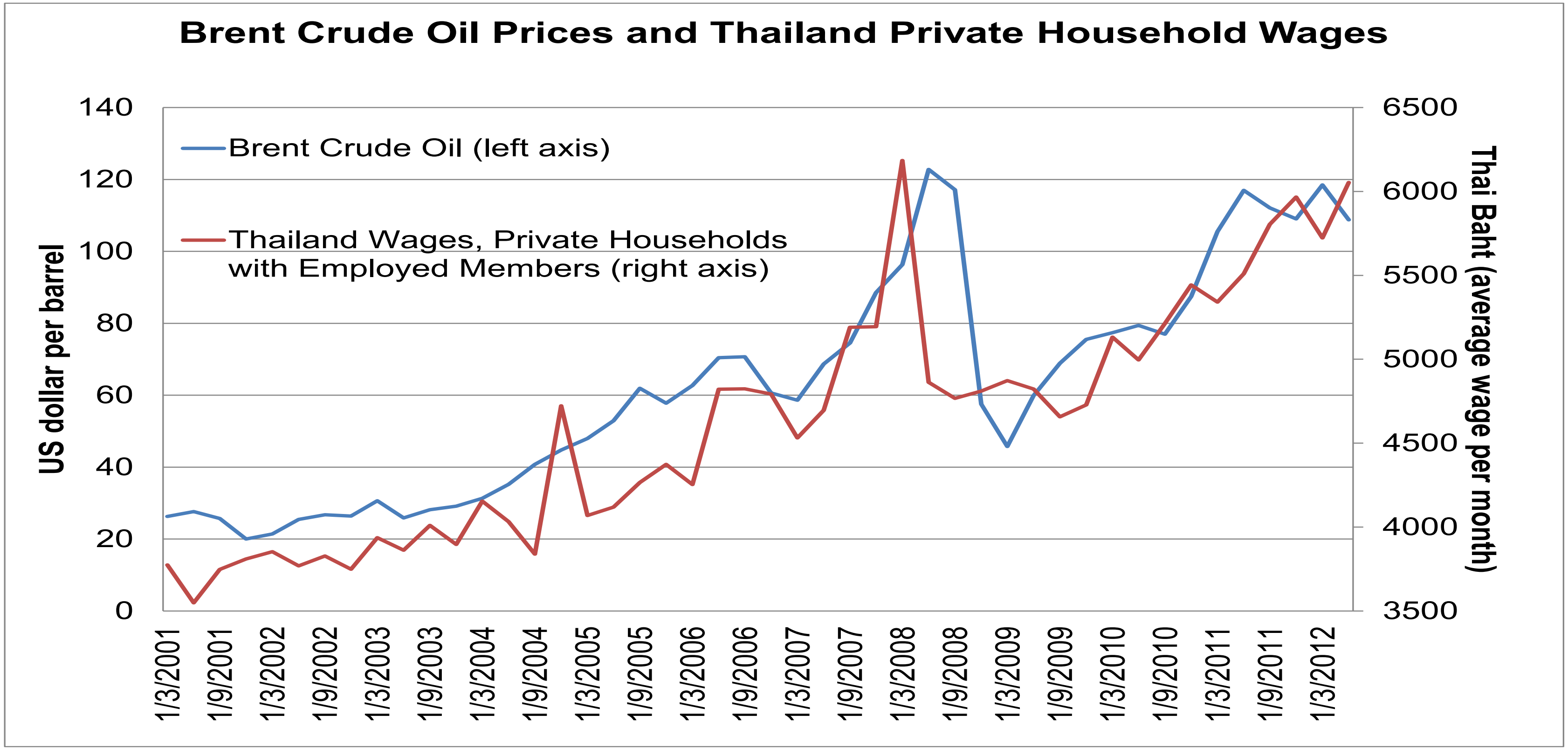
Byproducts credit Risk (the difference between the contracted underlier and the portion earned from the processing of the commodity into a final good)



Source: Bloomberg (SEAPRICR Index; Mumbai Raw Rice Bran price)

Conversion cost risk: Input Cost increases

When energy and labor costs increase, the manufacturer can not always pass these through, reducing margin



Source: Bloomberg; Brent (CO1, US dollar per barrel; Quarterly average), Thai Wages (TH.Wages.HHDP THCB Index; Average monthly wage of households with members employed, Bank of Thailand)

Other Conversion cost risks (risks in negotiated position):

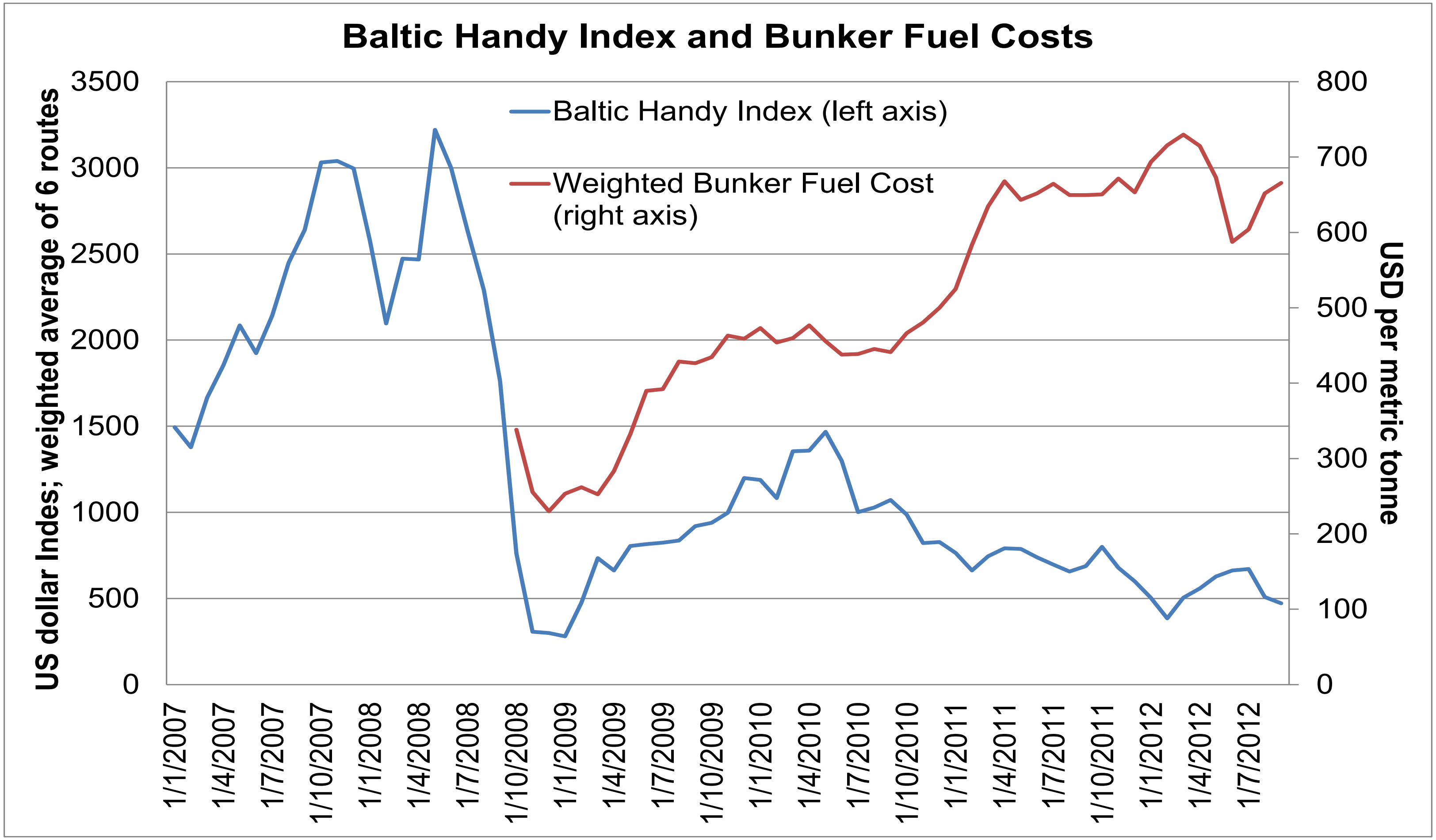
For Buyer:

1) Lack of processing capacity will limit alternative vendors
2) Quality audit risk: Pre-designated mill shuts down capacity due to quality issues
3) Unforeseen maintenance issues change timing
4) Decreasing cost base of labor and energy not passed through

For Seller:

1) Slack in amount of processing capacity
2) Ability to expand through margin enhancement
3) Quality costs climb as consumers shift preferences to higher grades
4) Unforeseen maintenance issues change timing
5) Increasing cost base of labor and energy not passed through

Delivery cost risk: Freight rate and Fuel surcharge



Source: Bloomberg; Baltic Handy Index (BHSI), Average Bunker Fuel cost (BUNKI380 Index; monthly average)

Supply Chain (Physical) risk

Supply Chain:

(1) Quality mismatch (not what I ordered)
  - (1) Bigger risk for branded (retail food) products carry a more specific consumer expectation
    - a) Quality and Quantity concerns are the highest because margin is enhanced as the consumer pays for value-added
    - b) Higher threshold of risk of refusal: taking discount on unaccepted portion
  - (2) Commodity products carry a broad expectation because they are generally an ingredient to a larger product
    - a) Quality and quantity matter, right of refusal of whole/part of shipment

(2) Quantity mismatch (shipping/yield loss)
  - (1) Quality issues can become quantity issues
    - a) Refusal to accept delivery at origin
    - b) Breakage in transit (quality of bagging)
  - (2) Quantity loss
    - a) Pilfering/theft can become problematic
    - b) Shipping losses (difference between what was loaded and what was delivered)

Supply Chain (Physical) risk (cont)

(1) Weather/Labor/Port Issues (delays = availability versus timeline)

a) Delays
   1) Demurrage fees
   2) Broken timelines
   3) Longer gap to delivery (may lose sale)

b) Capital required for transporting/loading/unloading
   1) Instruments: Broken cranes, boat repairs
   2) Crime: Theft of capital equipment (e.g. trucks, parts, fuel)

Supply Chain (Currency/Credit) risk

Supply Chain:

(3) Credit/Liquidity issues

(a) Currency

(1) Translation (Book) risk: Risk that profit or inventory will change in value based on swings in the currency market (hold cash in currency X but quote Profit in currency Y)

(2) Transactional (Cash Flow) risk: Risk that the expected margin from a physical trade will change based on swings in the currency market (bought in currency X but will receive currency Y for the sale)

(a cont) in both cases a hedge may help but if the currency limits the number of counterparties; default becomes its own separate risk

(b) Interest/Inflation: Jump risk, the risk that Interest rates will jump/fall more than expected and financing needs will change; risk that inflation at one end of the transaction will move in unpredictable fashion (reducing value of trade)

(c) Counterparty default risk

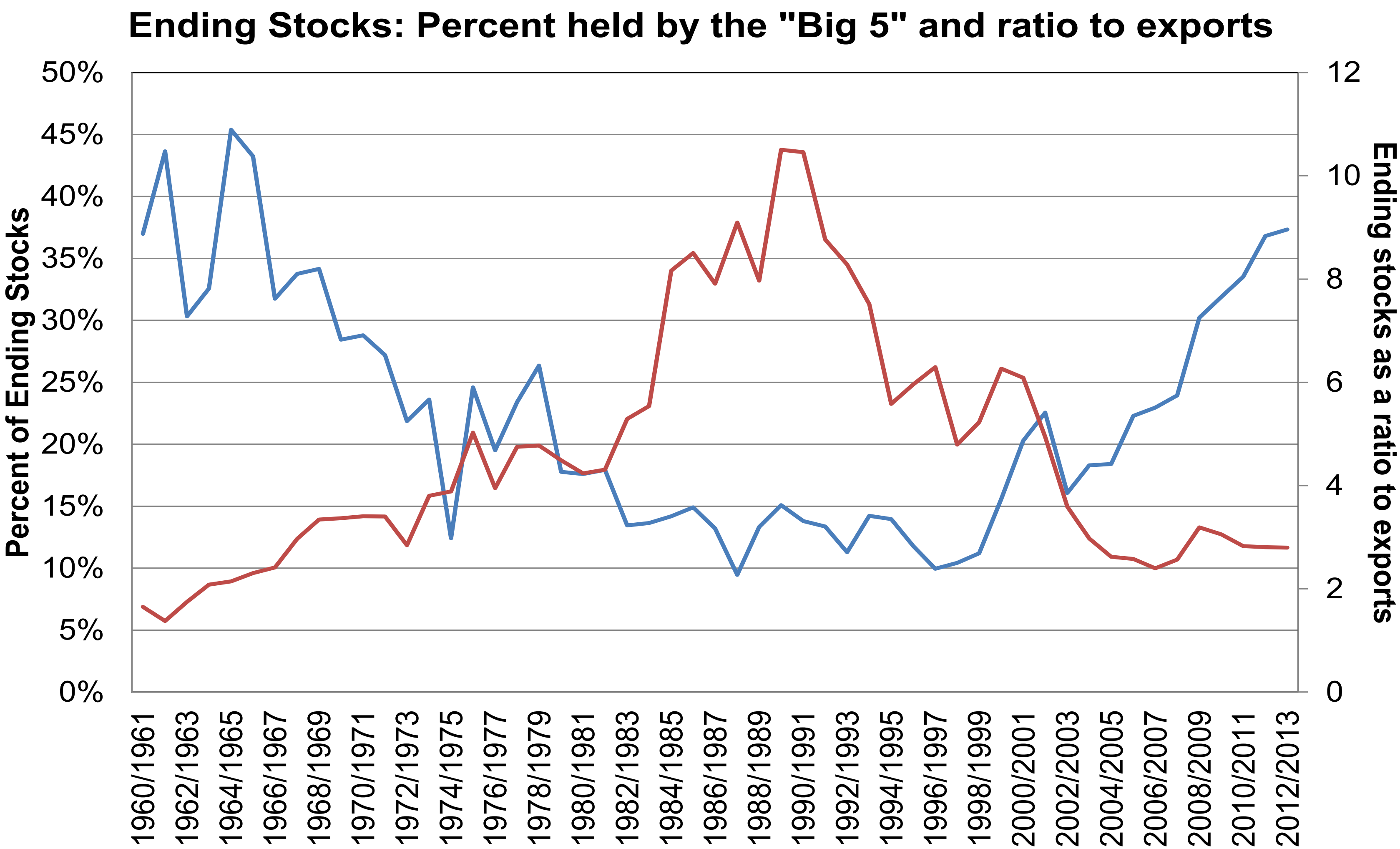
Legal or Policy-Oriented risk

Legal:

(1) Contract Default
  a) Opportunistic
    1) There are times when it is economically efficient to default on a contract
      a) Risk to counterparty that their costs will increase
      b) Risk to counterparty that physical goods will not be delivered
      c) Risk to creditor that debt will go unpaid
  b) Force Majeure
    1) Unforeseen large event (natural disaster or large political turmoil) makes contract terms impossible

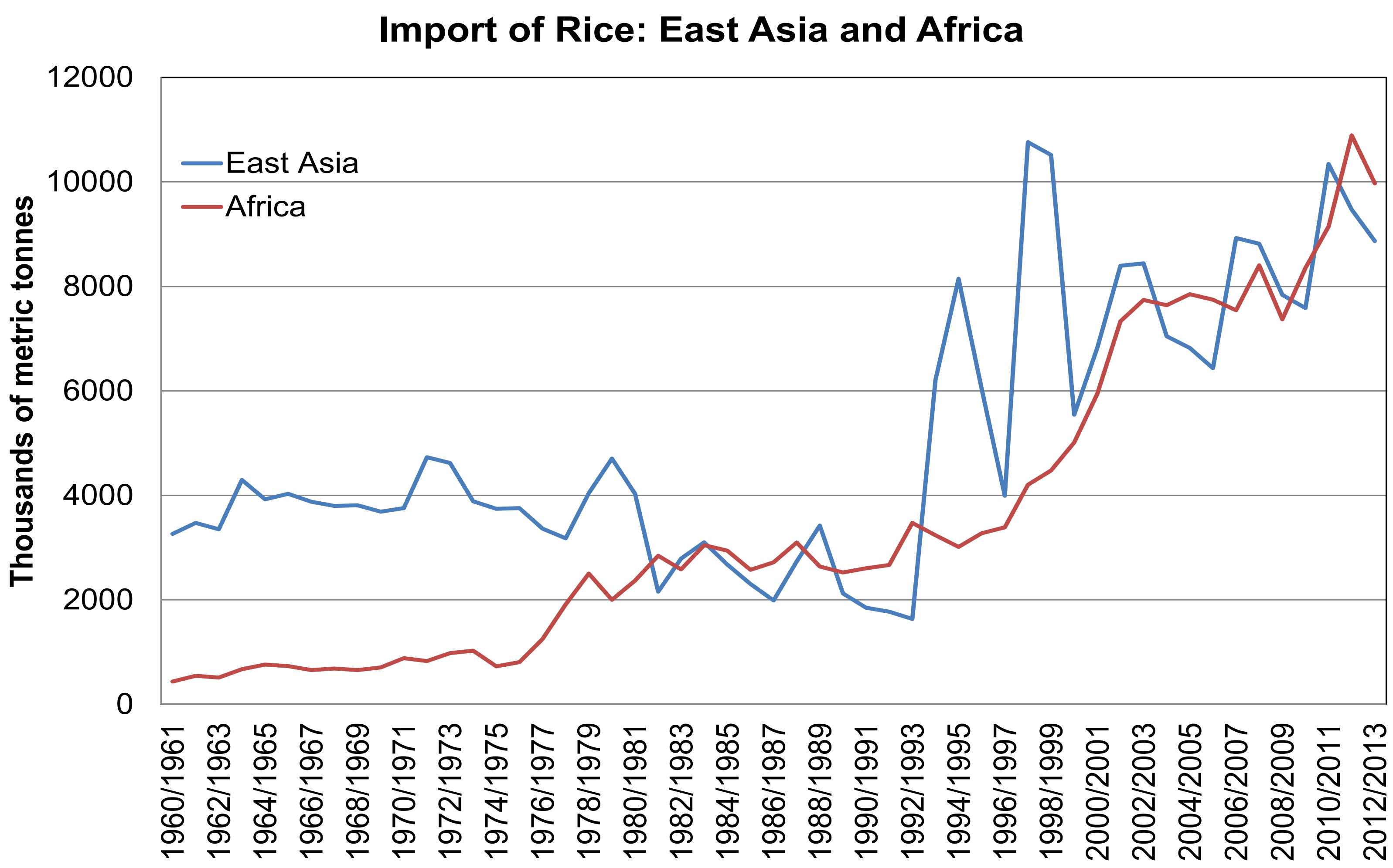
(2) Policy changes
  a) Environment shift
    1) Assumed policies that informed the initial trade change due to government policy changes
      a) Examples
        1) Trade ban
        2) Tariff increases
        3) Other general form of taxation
        4) Uncertain purchasing

When Ending Stocks are low as a percentage to exports, they tend to remain in origin countries



Source: USDA PS&D

Africa is as large an importer as Asia, their preferences are moving to higher-quality imports



Select risk management techniques

Industry agreements for drafting contracts:
(1) Contract norms
(2) Arbitration panels
(3) Internal Contingency Plan

International agreements for enforcement of contracts and protecting against government policy changes:
(1) Contract norms
(2) Limitations on trade policies

Market mechanisms to offset other price risks:
(1) Exchange-traded
(2) Bank structured products
(3) Bilateral agreements
    a) long-term contracts
    b) consolidate order to increase attractiveness of offer
    c) fixed rate
    d) forward contracts (generally, only for a portion of the contract)
(4) Insurance
(5) Inventory build
(6) Vertical Integration