



TAX AND COMMERCIAL ILLICIT FINANCIAL FLOWS

Part II – Methods Price Filter Method

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Trade misinvoicing: PFM +

- Concept and assumptions
 - Bottom-up method
 - Detect abnormal prices, deviating from arm's length
 - Price filter – range
 - Transaction-level national data

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Trade misinvoicing: PFM +

- Limitations
 - Endogeneity of statistical price filters (IQR)
 - Heterogeneity of products
 - Inability to identify legitimate unusual prices
 - Long-term contracts
 - Volatile prices
 - Inability to detect with small differences
 - Not capturing mis-recording of quantities

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Trade misinvoicing: PFM +

- Overcoming limitations
 - Set price filter at a detailed level
 - Lowest level of classification
 - Description of the commodity
 - Use free-market prices for the filter
 - Avoid endogeneity
 - Alt: moving averages of observed prices
 - Consult experts

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Trade misinvoicing: PFM +

- Source data
 - International trade flows (flows, price, quantity, value, products, trading partners)
 - Customs or other national authorities
 - Transaction-level data
 - Use microdata before adjustments
 - International sources:
 - UNCTAD commodity prices
 - World Bank commodity market prices
 - UN Comtrade Standard Unit Value

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Trade misinvoicing: PFM +

- Calculation – explore data
 - Focused, narrowed down analysis
 - Exploratory data analysis and preparation of data
 - Unit of observation: daily aggregated transactions, 8-digit HS
 - Further aggregation into groups of similar trade (by commodity, partners, time)
 - Data outliers inspection, involve experts

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Trade misinvoicing: PFM +

- Calculation – involve experts
 - Include experts of international trade
 - Different commodities, different experts

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Trade misinvoicing: PFM +

- Calculation – defining price filter

$$\text{price filter} = \text{central price} \pm \alpha$$

- Observed prices vs free-market prices
- Most detailed product classification level

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Trade misinvoicing: PFM +

CASE STUDY

- Calculation – defining price filter

Case study 9. Calculating benchmark prices for gold

Gold is identified as a commodity with variations in its characteristic, the contents of gold, or other metals. In their application of PFM to gold imports to Switzerland, Carbonnier and Mehrotra (2020) use free market price to determine the arm's length price range, concretely the London Bullion Market Association (LBMA)'s daily spot price series for refined gold bars. As they note, according to the Metals Focus Gold Silver Dore Service database, gold doré bars produced and traded internally can contain between 2-95 per cent pure gold by weight, silver (ranging between 0-92% by weight) and other impurities (up to 5 per cent by weight). Consequently, they use the country-level gold and silver content in doré produced, and use formulas to calculate a maximum and minimum benchmark prices:

Maximum benchmark price =

$$(daily\ price\ of\ gold * maximum\ gold\ content\ in\ doré) + (price\ of\ silver * minimum\ silver\ content)$$

Minimum benchmark price =

$$(daily\ price\ of\ silver * maximum\ silver\ content\ in\ doré) + (price\ of\ gold * minimum\ gold\ content)$$

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Trade misinvoicing: PFM +

- Calculation – defining price filter
 - Time dimension
 - Which timeframe? Current or longer period?
 - Rolling-value or one fixed value for the entire timeframe?
 - > moving average
 - Reporting and partner companies (transfer mispricing or free-market circumstances)
 - Market conditions
 - Long-term contracts
 - Triangular trade through intermediaries in tax havens

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Trade misinvoicing: PFM +

CASE STUDY

- Calculation – defining price filter

Case study 10. Price Filter Method for the Soya Bean exports in Brazil

Amaral and Barcarolo (2020) applied the PFM to Brazilian soya bean exports. In Brazilian market the soya bean price is composed of the commodity future market quoted price and a premium basis, that is paid to the exporters. The soya bean price filter is therefore calculated as:

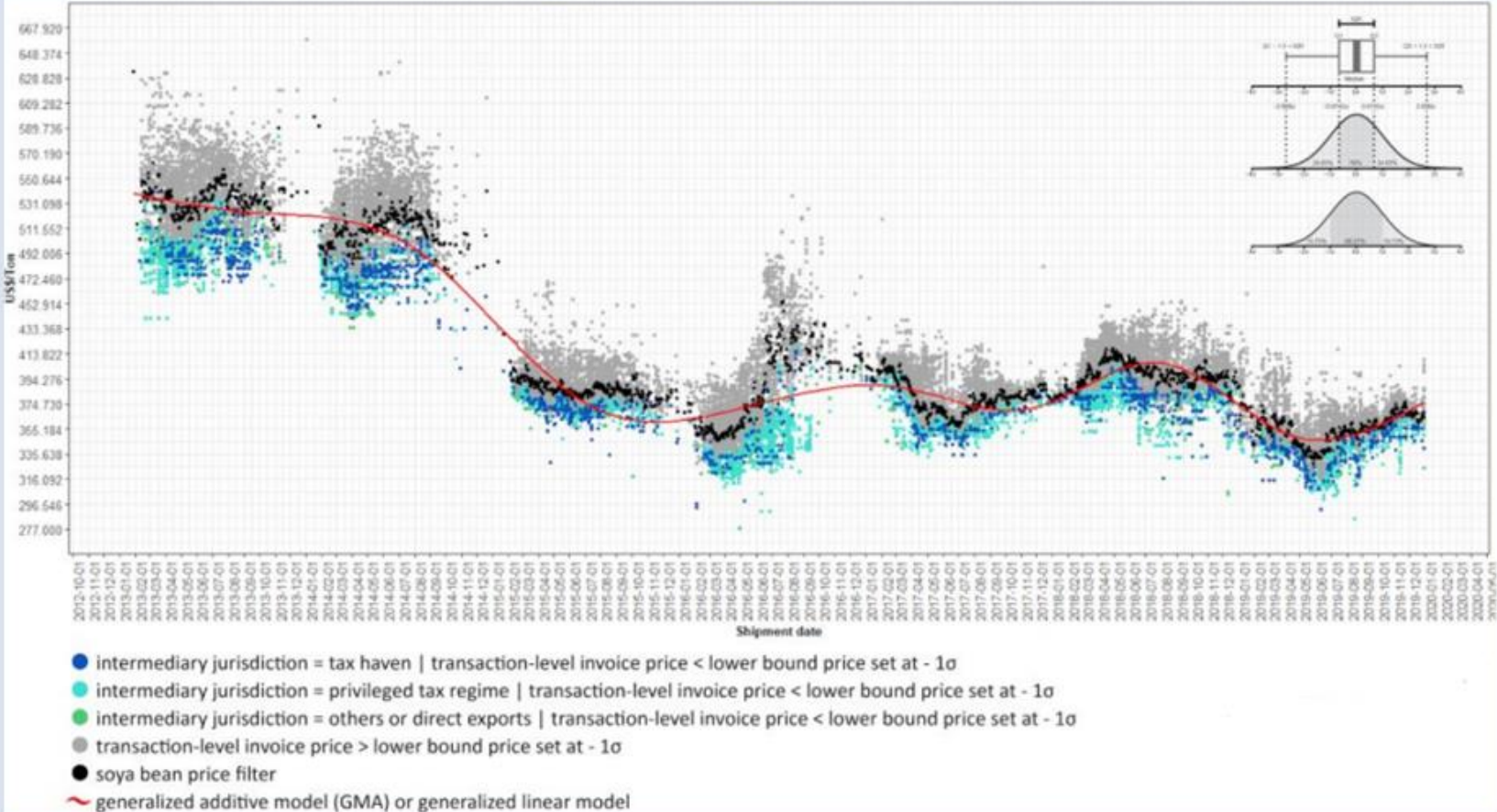
$$\text{SOYA BEAN PRICE FILTER} = [\text{QUOTED PRICE} + \text{PREMIUM BASIS}] \pm \alpha (\%)$$

Price filter was statistically estimated using a three-day weighted moving average price, based on the transaction-level data collected by the Customs Bureau. Outlier treatment was applied using IQR before estimating the weighted moving average price.

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CASE STUDY

Invoice prices at transactions level, by jurisdiction of acquisition and estimated risk exposure to BEPS, 2012-2020



Source: SISCOMEX Customs Database, Amaral and Barcarolo (2020)

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Trade misinvoicing: PFM +

- Calculation – defining price filter

$$\text{price filter} = \text{central price} \pm \alpha$$

- Lower- and upper-bound prices
 - Statistical price filter: Inter-quartile range:
 - LP = 25th percentile
 - UP = 75th percentile

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Trade misinvoicing: PFM +

- Calculation – defining price filter
 - Variation around central price
 - Free-market price filter
 - $LP = cp - \alpha$
 - $UP = cp + \alpha$
 - α
 - Experts
 - Product-specific circumstances
 - Price volatility
 - Contractual terms
 - Transportation costs
 - Political, economic, environmental shocks

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Trade misinvoicing: PFM +

- Calculation – Over- and under-pricing

$$\textit{Undervalued amount} = Q * \max(0, LP - P)$$

$$\textit{Overvalued amount} = Q * \max(0, P - UP)$$

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Trade misinvoicing: PFM +

- Calculation – inward and outward IFFs

$$\text{Inward IFFs} = \text{Overvalued amount}^{EX} + \text{Undervalued amount}^{IM}$$

$$\text{Outward IFFs} = \text{Undervalued amount}^{EX} + \text{Overvalued amount}^{IM}$$