



# Reconciling Asymmetric Bilateral Trade Statistics In the Construction of Global SUTs

*Presented*

*by*

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## Agenda

- Problems of Proportional Adjustment
- Weighted Adjustment by Reporter Reliability Index



## Problems of Proportional Adjustment in National Income Account

(Components of U.S. GDP, 2002, US\$ in Billion)

| GDI Components                             | Value   | Value Share | Adjustment by proportion | CV    |
|--|---------|-------------|--------------------------|-------|
| Compensation of employees                  | 5977.4  | 0.575       | 32.97                    | 0.95  |
| Indirect business tax and nontax liability | 800.4   | 0.077       | 4.41                     | 2.31  |
| Private consumption of fixed capital       | 1163.9  | 0.112       | 6.42                     | 3.56  |
| Nonfarm proprietors' income                | 743.7   | 0.072       | 4.10                     | 3.74  |
| Net interest                               | 684.2   | 0.066       | 3.77                     | 5.86  |
| Corporate profits                          | 787.4   | 0.076       | 4.34                     | 8.35  |
| Business transfer payments                 | 44.1    | 0.004       | 0.24                     | 19.86 |
| Rental income of persons                   | 142.4   | 0.014       | 0.79                     | 23.45 |
| Subsidies                                  | 32.5    | 0.003       | 0.18                     | 26.51 |
| Farm proprietors' income                   | 12.9    | 0.001       | 0.07                     | 48.89 |
| Sum  | 10388.9 | 1           | 57.30                    |       |
| Gross domestic product                     | 10446.2 |             |                          |       |
| Difference                                 | 57.3    |             |                          |       |



## Problems of Proportional Adjustment in International Trade Statistics

(China & Hong Kong reported exports and partner reported imports, 2004, \$ in Million)

| Partner Country | China reported Exports to Partner country | Hong Kong reported domestic exports to partner country | China re-exports to partner country via Hong Kong | Partner country reported imports from China and Hong Kong | Statistical discrepancy % |
|-----------------|---|--|---|---|---------------------------|
| Malta           | 273                                       | 5  | 20  | 92  | -200.4                    |
| Russia          | 9,102                                     | 119  | 361   | 4,744   | -110.4                    |
| Korea           | 27,810                                    | 2,111  | 2,832   | 32,853  | -1.8                      |
| Japan           | 73,222                                    | 4,268  | 11,977  | 94,911  | 3.4                       |



## Alternative:

### Weighted Adjustment with Reporter Reliability

- An indicator of **reporter reliability** is a measure of how consistent a country reports its trade statistics relative to all its trading partners.
- The indicator needs to address three issues:
  - The difference of reporting countries in reported bilateral trade;
  - What should be captured by the measure;
  - Sector- and country-specific reliability information for each country as an exporter and importer.
- The indicator should be able to capture the strength and weakness of a country's ability to consistently report its trade for each end use categories in different commodities.



## Reporter Reliability Index (RRI)

- Gehlhar (1996) developed the Reporter Reliability Index, which was also used in Wang et al. (2010), and Tsigas et. Al. (2012).
- RRI is calculated as the share of accurately reported trade in a reporter's total trade for a particular end use category in a sector using a threshold level (e.g. less than 20 percent discrepancies in mirrored data).
- Constructing RRI uses all available bilateral trade data and assesses reporter reliability from a complete set of global reporting partners.
- It has a value between 0 and 1. The larger the value is, the relatively more reliable the reporting country is in reporting trade statistics.
- **Using RRI will encourage the reconciliation model to adjust those unreliable data more than those reliable ones in the reconciliation process.**



## Average Exporter Relative Reliability Index (1995-2007, China)

| Commodity                        | MEAN | CV   | MIN  | MAX  |
|----------------------------------|------|------|------|------|
| Food and beverages (15)          | 0.81 | 0.06 | 0.71 | 0.88 |
| Chemicals (24)                   | 0.78 | 0.12 | 0.63 | 0.88 |
| Basic metals (27)                | 0.72 | 0.17 | 0.46 | 0.89 |
| Wood and products (20)           | 0.60 | 0.39 | 0.29 | 0.87 |
| Paper and paper products (21)    | 0.53 | 0.31 | 0.22 | 0.80 |
| Wearing apparel (18)             | 0.24 | 0.56 | 0.04 | 0.42 |
| Rubber and plastic products (25) | 0.14 | 0.65 | 0.07 | 0.39 |
| Auto and Parts (34)              | 0.09 | 1.08 | 0.02 | 0.36 |
| Leather products (19)            | 0.09 | 0.24 | 0.05 | 0.14 |
| Electrical machinery (31)        | 0.07 | 1.09 | 0.03 | 0.33 |



## Average Importer Relative Reliability Index

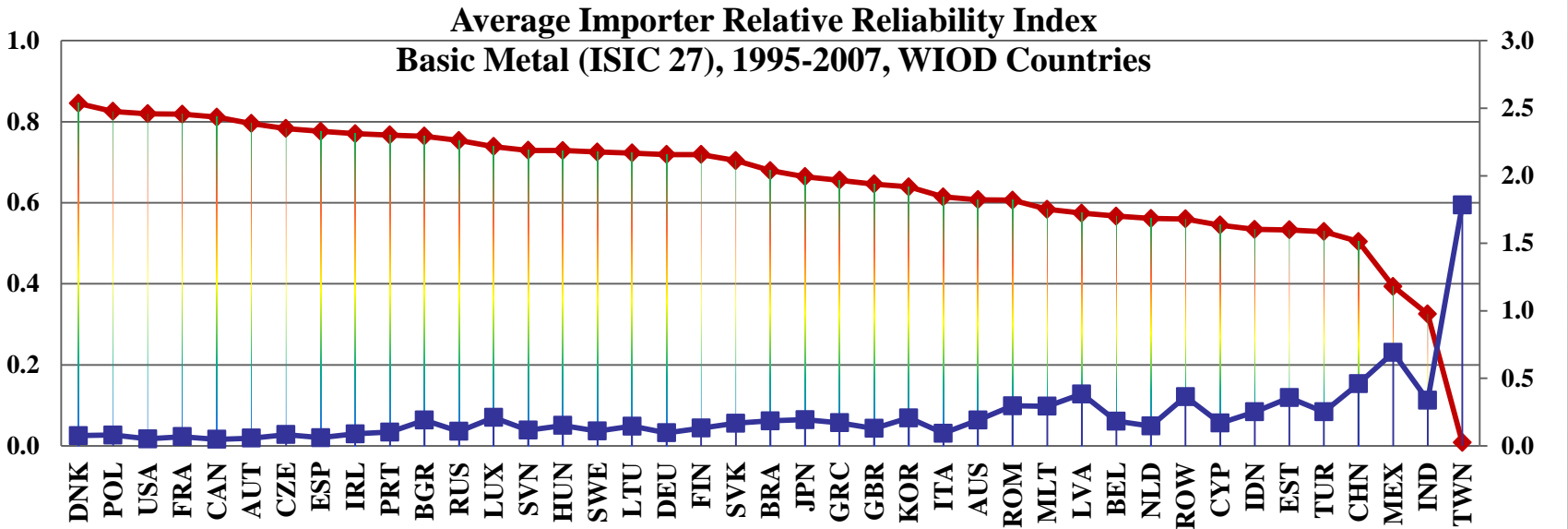
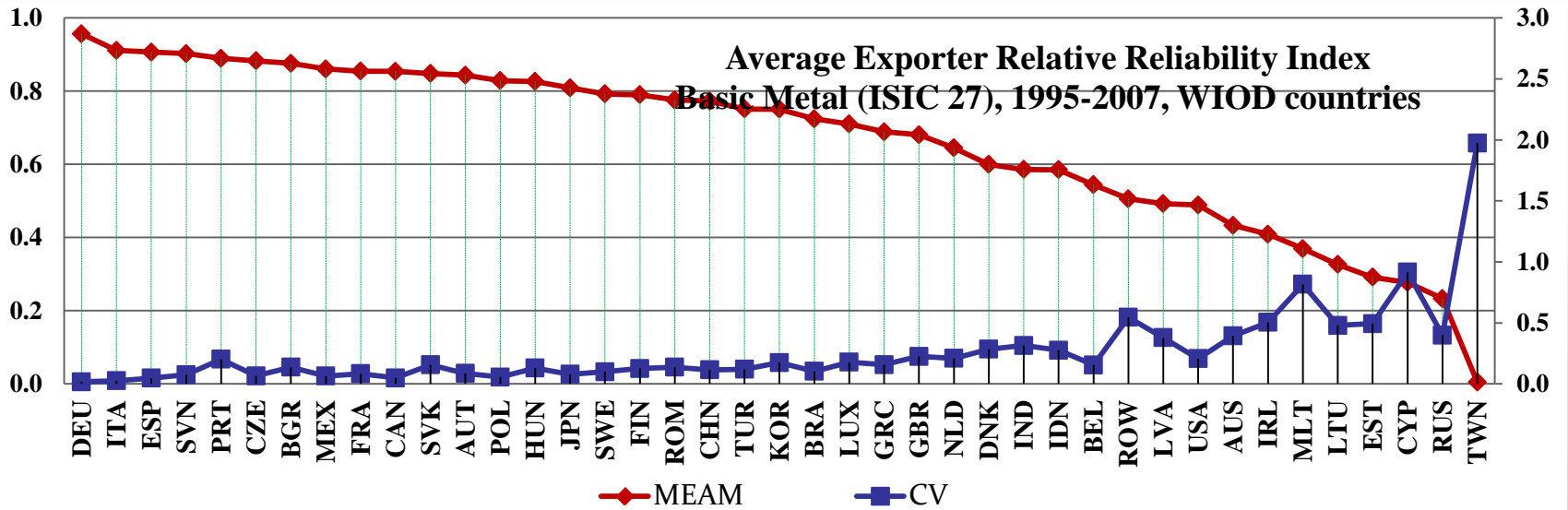
(1995-2007, the United States)

| Commodity                        | MEAN | CV   | MIN  | MAX  |
|----------------------------------|------|------|------|------|
| Auto and Parts (34)              | 0.95 | 0.02 | 0.92 | 0.97 |
| Wood products (20)               | 0.92 | 0.05 | 0.83 | 0.97 |
| Machinery and equipment (29)     | 0.91 | 0.06 | 0.77 | 0.97 |
| Paper and paper products (21)    | 0.91 | 0.06 | 0.79 | 0.95 |
| Food and beverages (15)          | 0.85 | 0.04 | 0.80 | 0.90 |
| Textiles (17)                    | 0.55 | 0.19 | 0.39 | 0.71 |
| Wearing apparel (18)             | 0.54 | 0.10 | 0.43 | 0.61 |
| Tobacco products (16)            | 0.50 | 0.34 | 0.17 | 0.71 |
| Leather products (19)            | 0.30 | 0.34 | 0.16 | 0.48 |
| Printed and recorded matter (22) | 0.16 | 0.60 | 0.05 | 0.40 |



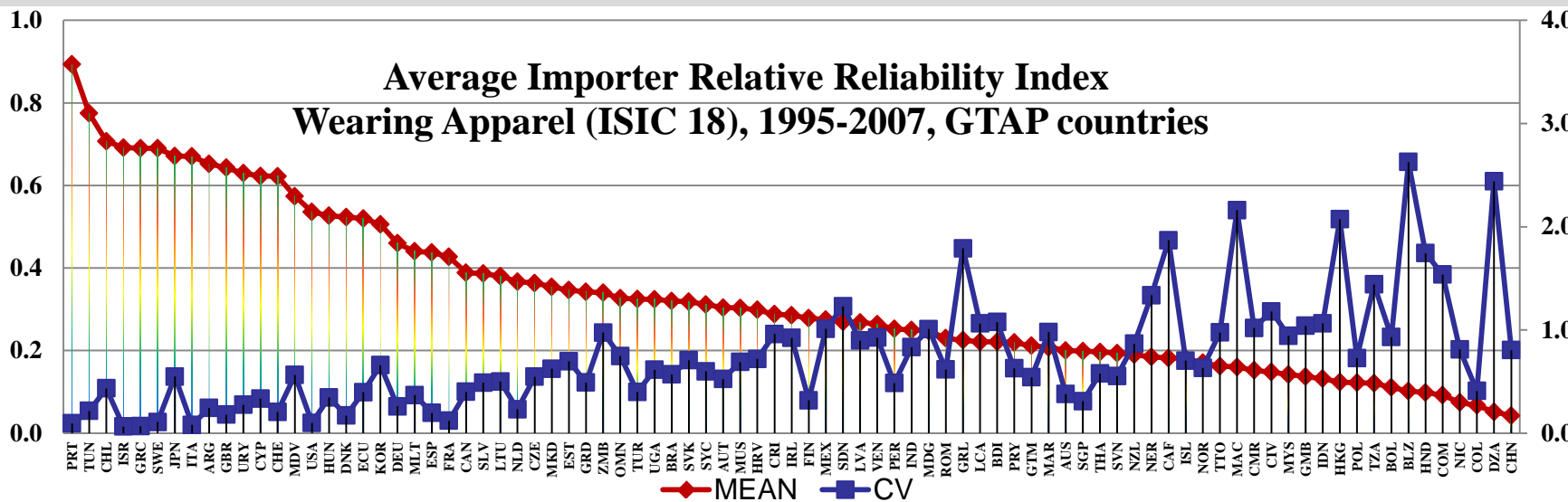
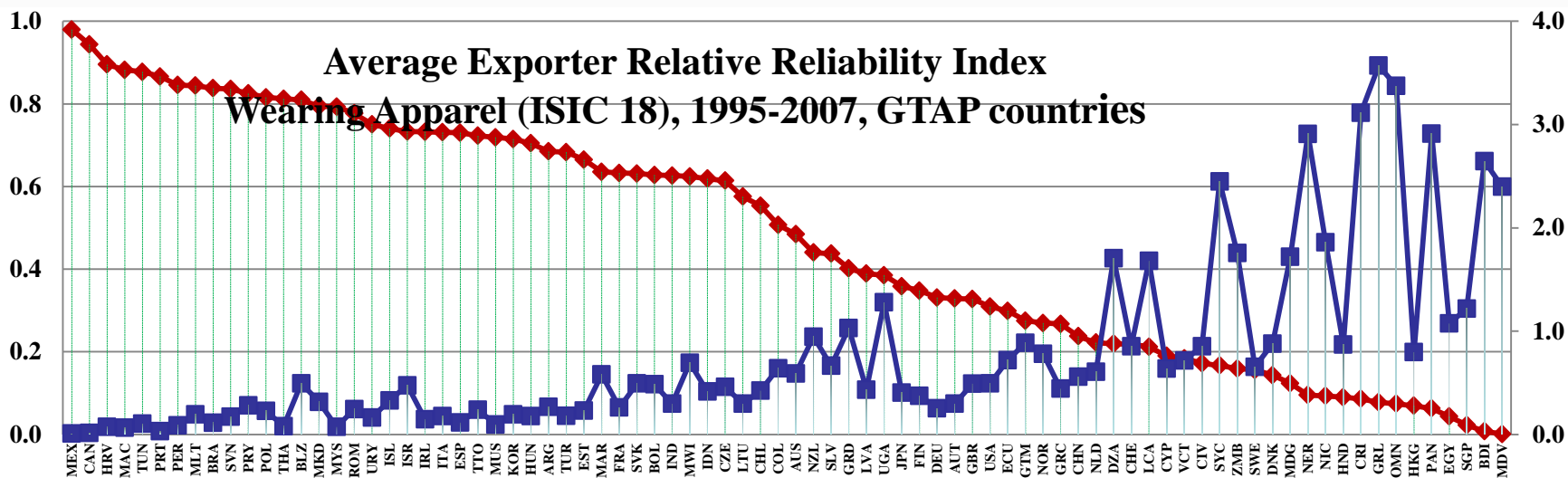


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# Source

- Gehlhar (1996). “Reconciling Bilateral Trade Data for Use in GTAP.”
- Wang, Gehlhar, and Yao (2010). “A Globally Consistent Framework for Reliability-based Trade Statistics Reconciliation in the Presence of an Entrepot.”
- Tsigas, Wang, and Gehlhar (2012). “How a Global Inter-Country Input-Output Table with Processing Trade Account Can be Constructed from GTAP Database.”



Thank You!