

Analyzing Alternatives to Export Price Indexes

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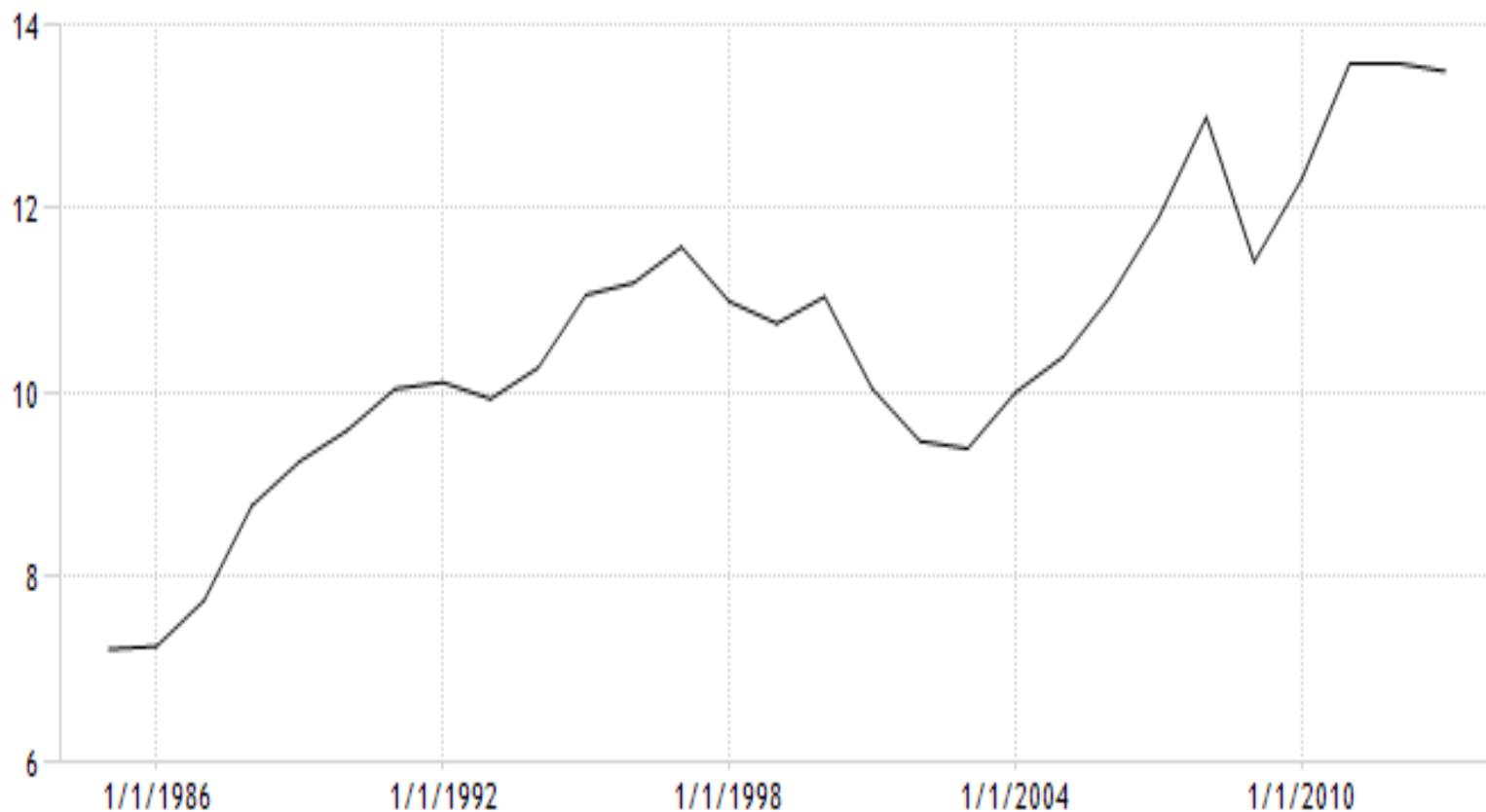
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The Importance of Exports



Value of Exports as a Percent of GDP (1985-2015)



BLS Export Price Indexes – Background

- BLS began producing a full set of export price indexes in 1983
- The Office of Management and Budget has designated the export price indexes as one of the Principle Economic Indicators
- Currently, there are 347 export price indexes published each month using 3 different classification systems

Uses for the Export Price Indexes

- Measuring the competitiveness of U.S. exports in foreign markets by measuring export prices in foreign currency terms
- Analyzing the impact of foreign trade policies and movements in exchange rates
- Measuring the U.S. real balance of trade for manufactured goods with other countries
- Negotiating trade and escalation contracts in international markets
- Analyzing the real value of exports by region of destination

Primary Use of Export Price Indexes

- Deflate other key economic data
 - ▶ Deriving the real value of the foreign trade sector for manufacturing in the quarterly Gross Domestic Product produced by the Bureau of Economic Analysis
 - ▶ Deriving the monthly real trade dollar values for manufactured goods produced by the Census Bureau

The Foreign Sector of GDP

- The GDP statistics produced by BEA can be broken down into the following formula:

$$\text{GDP} = C + I + G + (X - M)$$

Where,

C = Personal Consumption Spending

I = Gross Domestic Investment

G = Government Spending

X = Exports

M = Imports

The Foreign Sector of GDP

- In 2013, exports accounted for 12.9 percent of total GDP
- By comparison, government spending accounted for 16.3 percent of GDP and investment spending 18.4 percent
- Consumption spending is the largest component of GDP making up the remainder plus the value of imports (Roughly 70 percent of GDP)

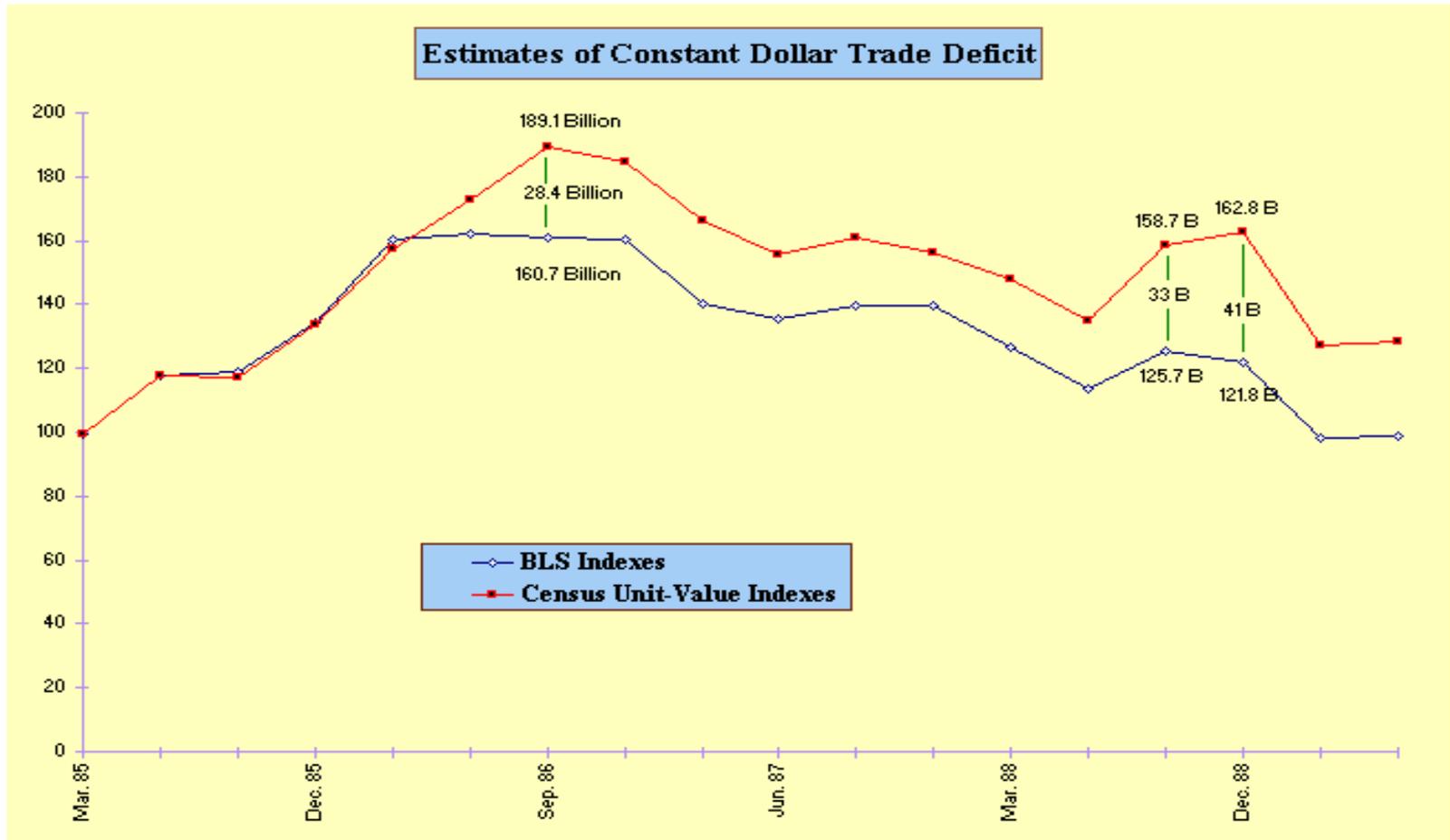
Why is Deflating Important?

- Between 2009 and 2013, export prices rose 12.0 percent
- Over the same period, the implicit price deflator derived by BEA to deflate overall GDP advanced just 6.7 percent
- Nominal GDP therefore overstated the value of exports because export price levels increased at a faster rate than the other components of GDP

Census Trade Data

- The other major data that is deflated using the export price indexes are the trade data produced by the Bureau of the Census
- The main impetus behind the BLS moving from quarterly to monthly indexes was the increasing trade deficit in the mid-1980s
- Prior to the introduction of the BLS indexes, the real trade deficit was derived using unit value indexes that Census created
- Those indexes actually overestimated the trade deficit

Real Trade in the 1980s using BLS Data Compared to Census Unit Value Indexes



Cost of Producing Export Price Indexes

- No organization outside the BLS produces export price indexes
- Derived by collecting a sample of export price data directly from companies
- Initiating items based on a sample and then collecting the data on a monthly basis is costly compared to the old unit value indexes
- Some of that cost is fixed so long as import price indexes are also being derived
- But approximately a third of the International Price Program budget is tied to producing export price indexes

Alternative Methods for Producing Export Price Indexes

- Using producer price indexes as a proxy for export prices
- Deriving unit value indexes at a low level of aggregation

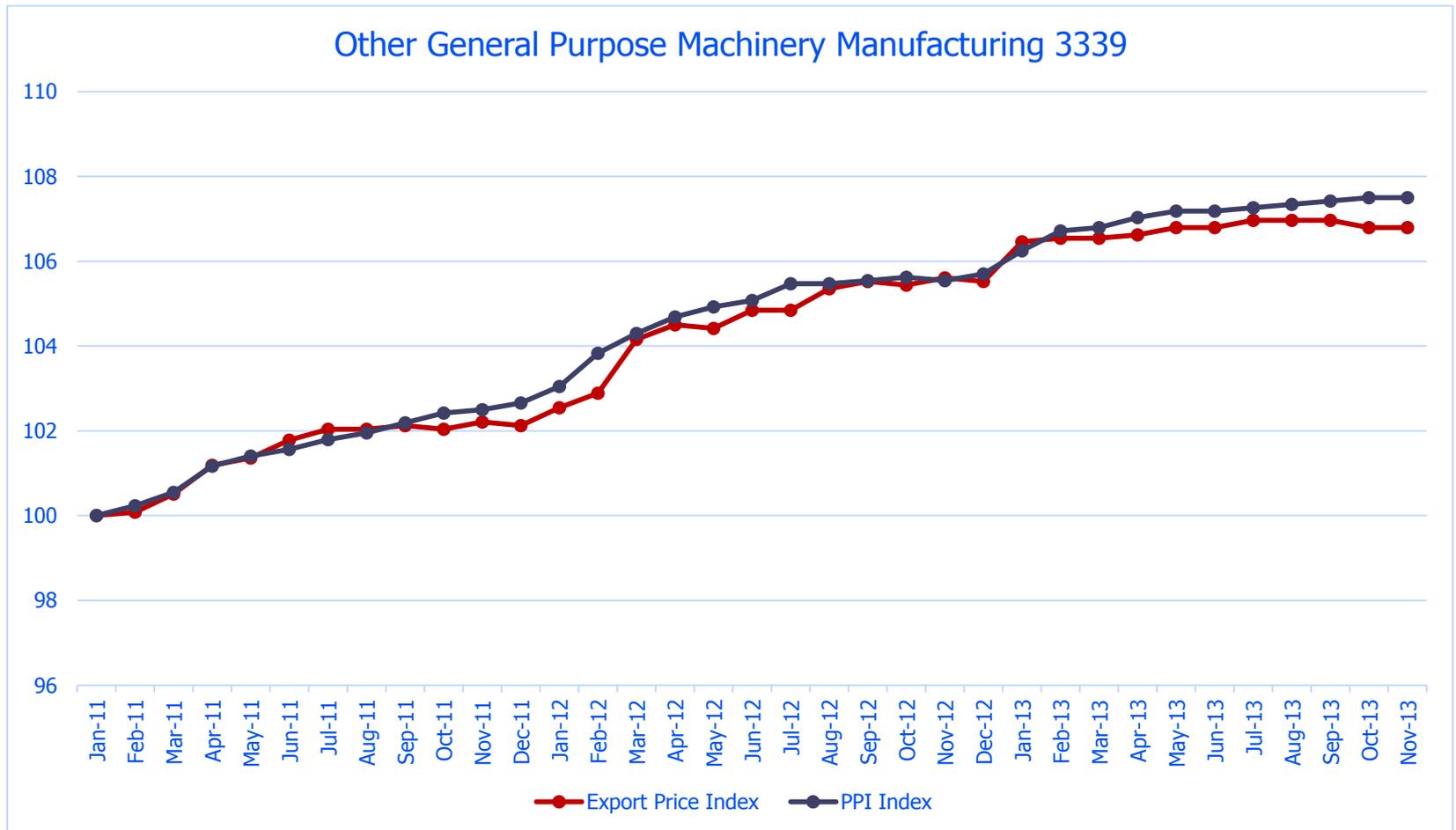
Using Producer Price Indexes as a Proxy for Exports

- The majority of items exported from the United States are also produced here
- Items produced in the United States are for the most part included within the scope of the PPI
- The law of one price states that items sold in different countries should be the same price when expressed in the same currency

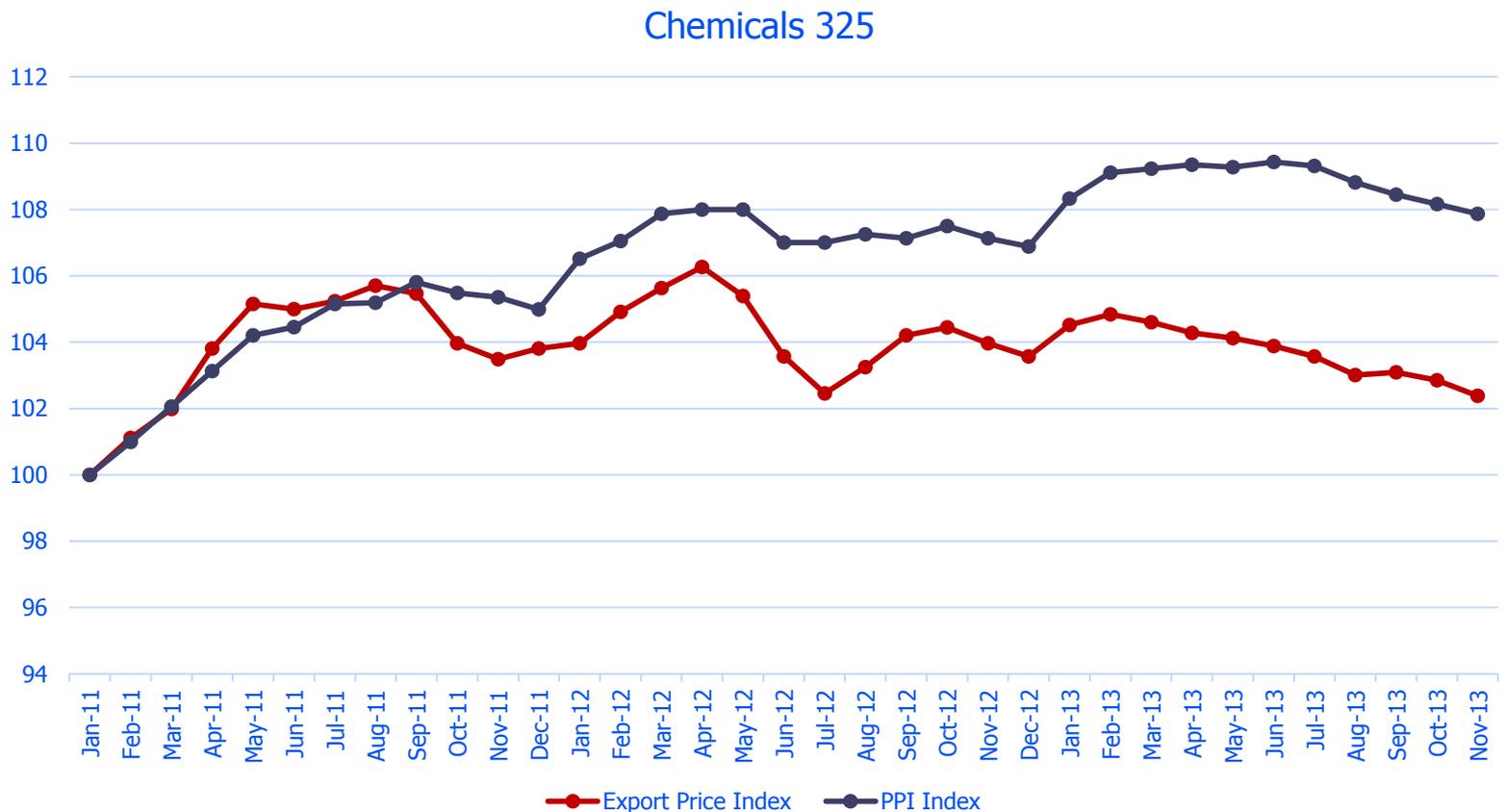
Using Producer Price Indexes as a Proxy for Exports

- Both the PPI and the export price indexes use the North American Industry Classification System (NAICS) allowing for comparison
- Looking at the period from 2011 to 2013, there were 72 indexes at the 3 to 5 digit classification level for which both a PPI and an export price index were both published
- Over that period, only 18 of the 72 indexes were relatively close

Example of an Index Where the Price Changes Were Close



Example of an Index Where the Price Changes Were Not Close



Why do Export and Domestic Prices Differ From Each Other?

- There are several Reasons the Law of One Price Fails

Why do Export and Domestic Prices Differ From Each Other?

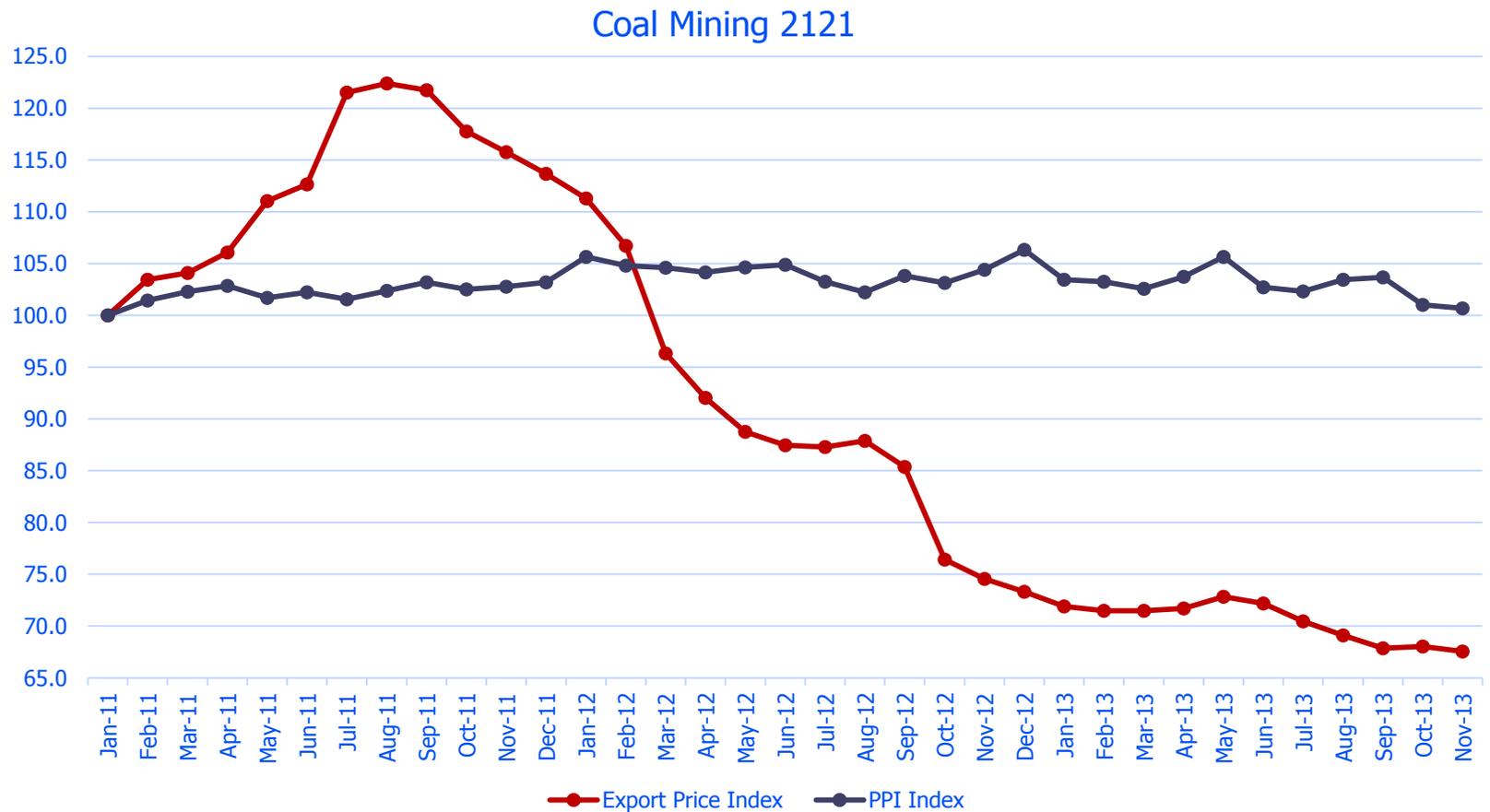
- There are several Reasons the Law of One Price Fails
 - ▶ Product mix, even at disaggregated levels can differ between what is exported and what is consumed domestically

Different Product Mix

■ Coal Industry

- ▶ The United States consumes almost 90 percent of coal produced
- ▶ Almost all of that is thermal coal used for electricity generation
- ▶ In contrast, approximately 77 percent of what is exported is metallurgical or coking coal used for the production of iron and steel

Different Product Mix



Why do Export and Domestic Prices Differ From Each Other?

- There are several Reasons the Law of One Price Fails
 - ▶ Product mix, even at disaggregated levels can differ between what is exported and what is consumed domestically
 - ▶ Companies do not use the same pricing strategies when selling in foreign markets

Different Price Strategies

- Reasons price strategy differs
 - ▶ Different competition in foreign markets
 - ▶ Varying transportation costs
 - ▶ Barriers to trade (tariffs)
 - ▶ Exchange rate fluctuations

Why do Export and Domestic Prices Differ From Each Other?

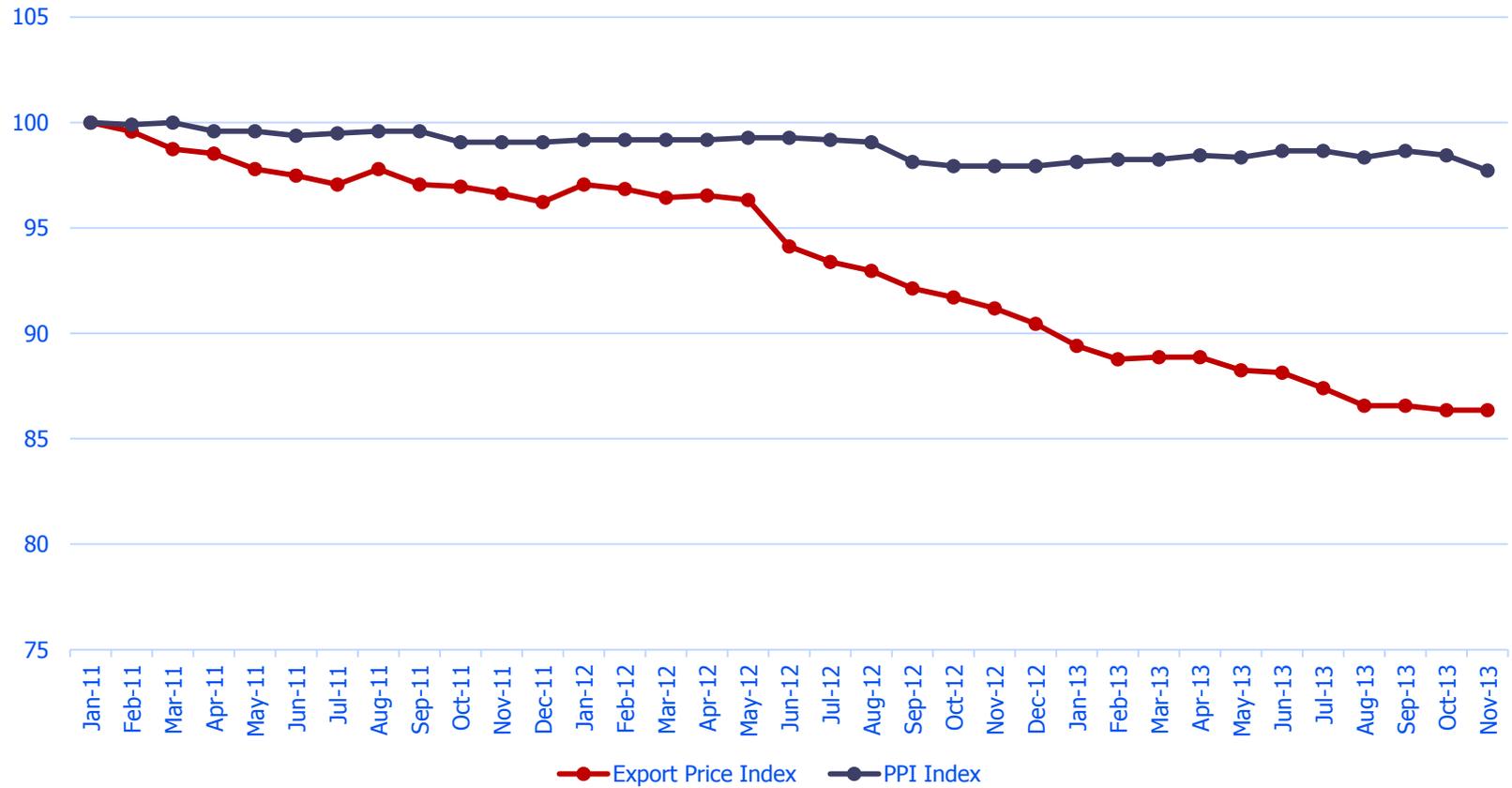
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 - ▶ Product mix, even at disaggregated levels can differ between what is exported and what is consumed domestically
 - ▶ Companies do not use the same pricing strategies when selling in foreign markets
 - ▶ Not all exports are produced in the United States

Re-exports

- While the majority of U.S. exports are produced in the United States, some are not
- Re-exports are items produced abroad, imported to the United States and then exported out to another country
- For some industries such as communication equipment and manufacturing, re-exports make up the majority of total exports

Re-exports

Communications equipment manufacturing 3342



Why do Export and Domestic Prices Differ From Each Other?

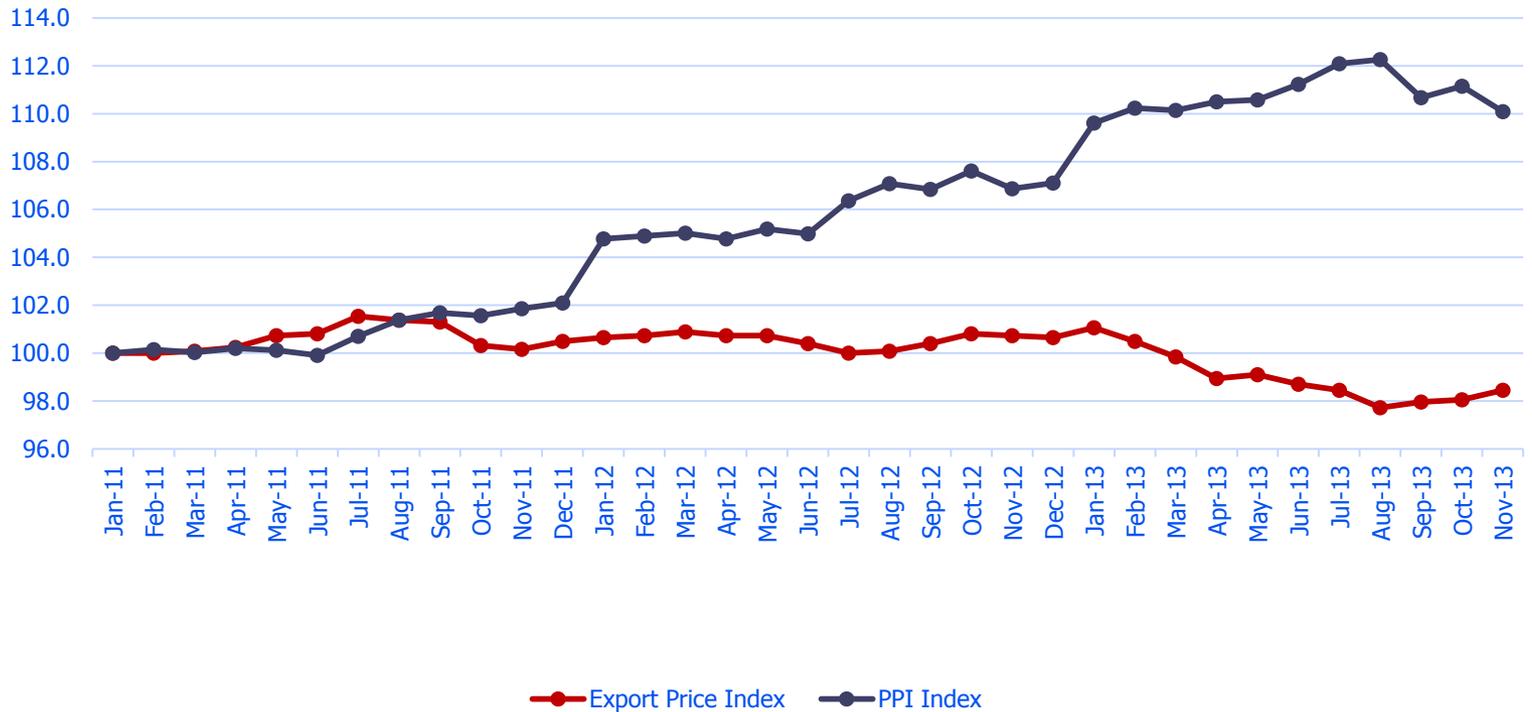
- There are several Reasons the Law of One Price Fails
 - ▶ Product mix, even at disaggregated levels can differ between what is exported and what is consumed domestically
 - ▶ Companies do not use the same pricing strategies when selling in foreign markets
 - ▶ Not all exports are produced in the United States
 - ▶ Many exported items are intercompany transfers between related firms, most of which is out of scope in the PPI

Transfer Prices

- 32.2 percent of U.S. exports are transfers between affiliated companies
- Most of those are not within the scope of the PPI
- For some industries, the percentage of intra-company transfers is even higher
- As an example, for pharmaceutical manufacturing, 71.7 percent of all exports are intra-company transfers

Transfer Prices

Pharmaceutical & Medicine Mfg 3254



Unit Value Indexes

- Unit value indexes produced by Census were used to deflate the trade statistics from 1919 until the early 1980s
- Those indexes suffered from a number of shortfalls
 - ▶ Indexes were only produced at a high level of aggregation
 - ▶ The indexes only covered about 46 percent of overall exports
 - ▶ There was no way to separate price change from changes to the mix of item specifications
 - ▶ There was no way to quality adjust the indexes to account for item improvements

Unit Value Indexes

- Census now calculates trade dollar values at the 10-digit Harmonized classification level
 - ▶ Although not all trade is covered, most export trade is now included
 - ▶ The indexes are produced at a lower level of detail meaning they are more homogenous than what was produced in the past
- 5-digit BEA end use indexes can be derived using the value and volume data from Census
- The mapping structure is the same as used by BLS to aggregate indexes derived from the price data collected by companies

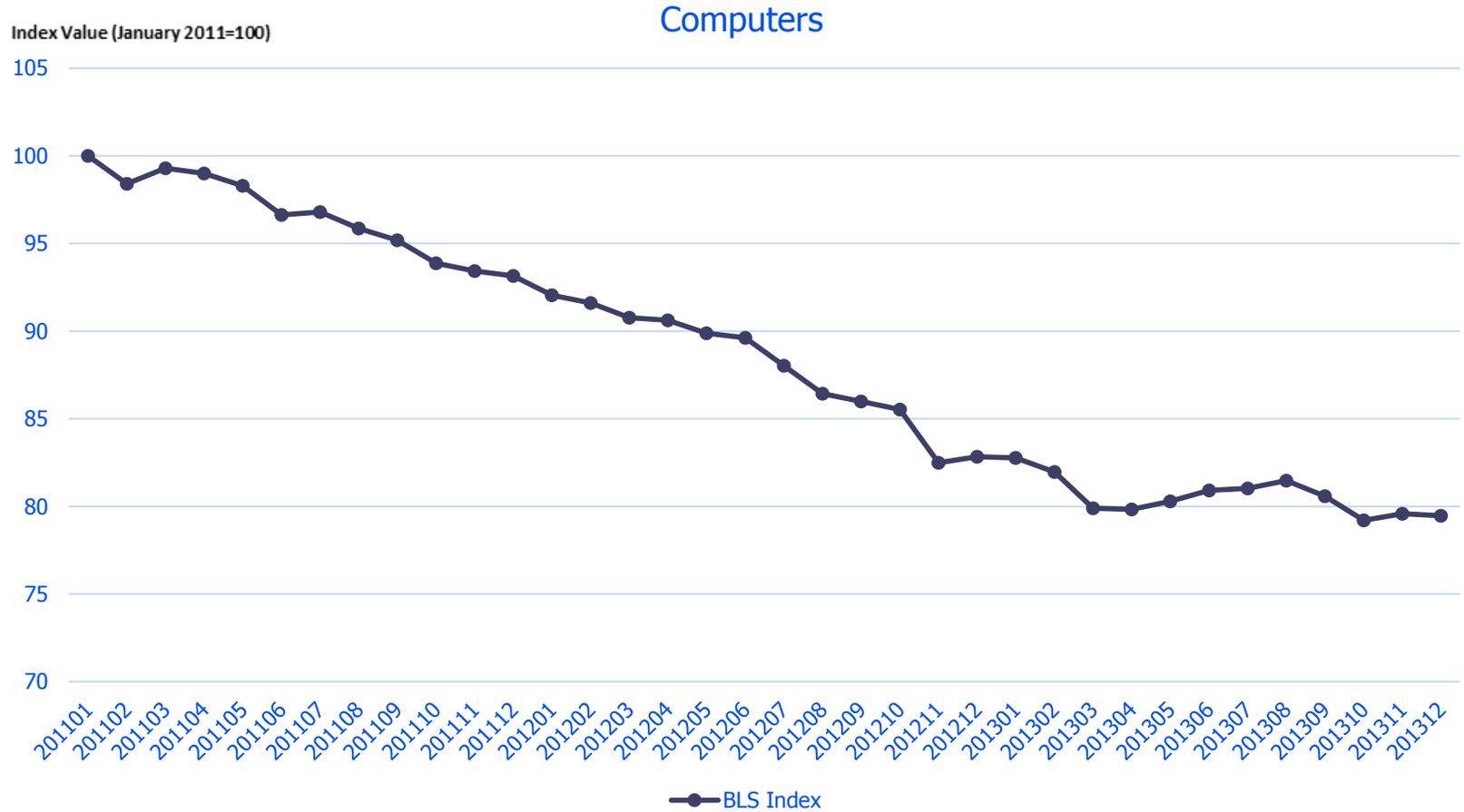
Unit Value Indexes

- There were some problems with trying to use the Census data to produce price indexes
 - ▶ Changing harmonized structure: This is problematic because index weights are lagged 2 years from when the prices come in meaning the index mappings do not always match
 - ▶ Missing volume data: Not every 10-digit index for which dollar value data is available also have volume data available
 - Primarily impacted parts indexes
 - As of 2011, 12.5 percent of classification group dollar value needed to be imputed
 - That number jumps to 24.5 percent if using unit value indexes
 - For capital goods, automotive vehicles and consumer goods that number goes to 35.4 percent

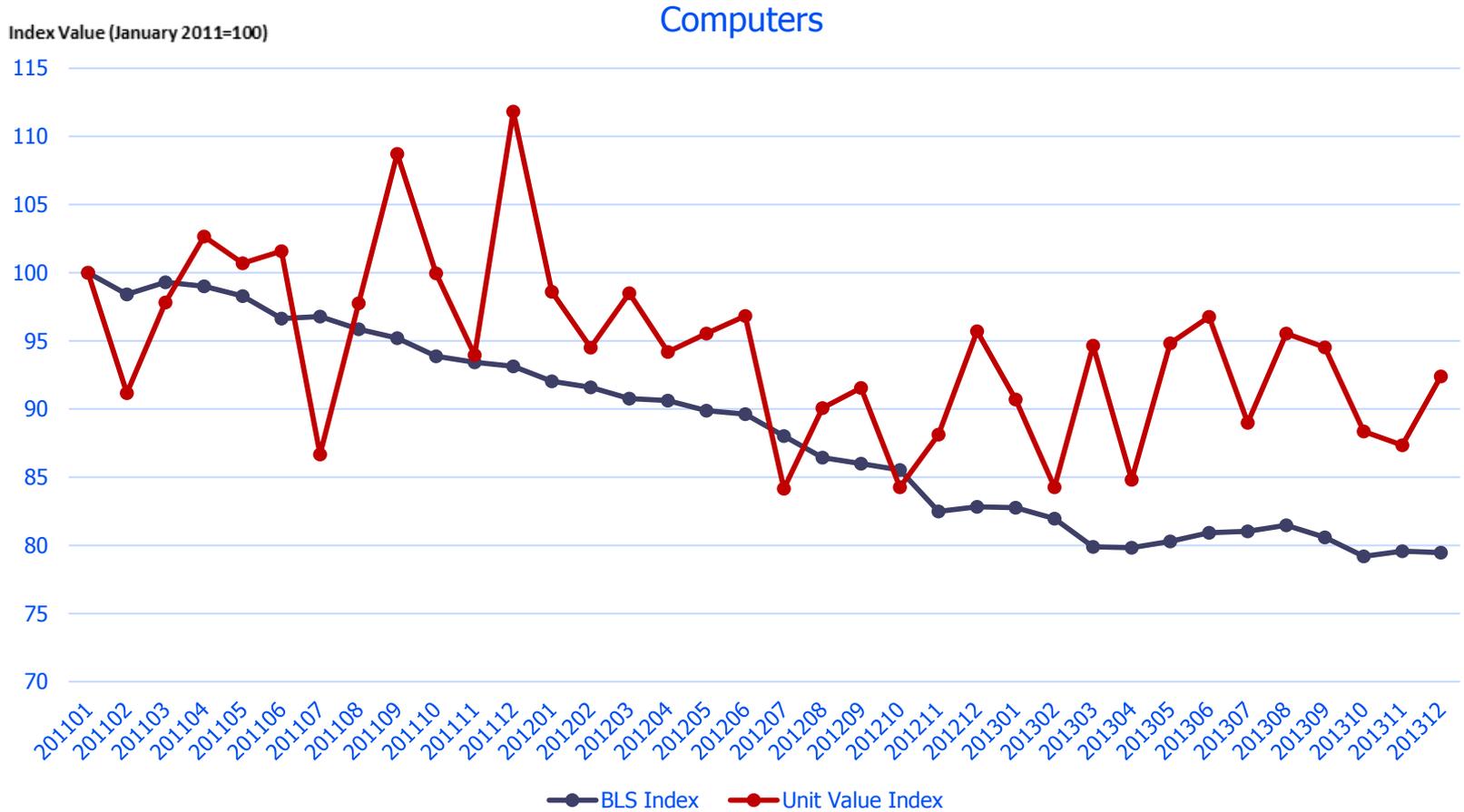
Unit Value Indexes

- Question is how closely do unit value indexes mimic the BLS price indexes
- In order to test, a subset of 4 areas was used:
 - ▶ Computers – High tech manufactured good
 - ▶ Food & tobacco machines – Low tech manufactured good
 - ▶ Coal – Non-manufactured industrial supply
 - ▶ Soybeans – Food commodity

Computers



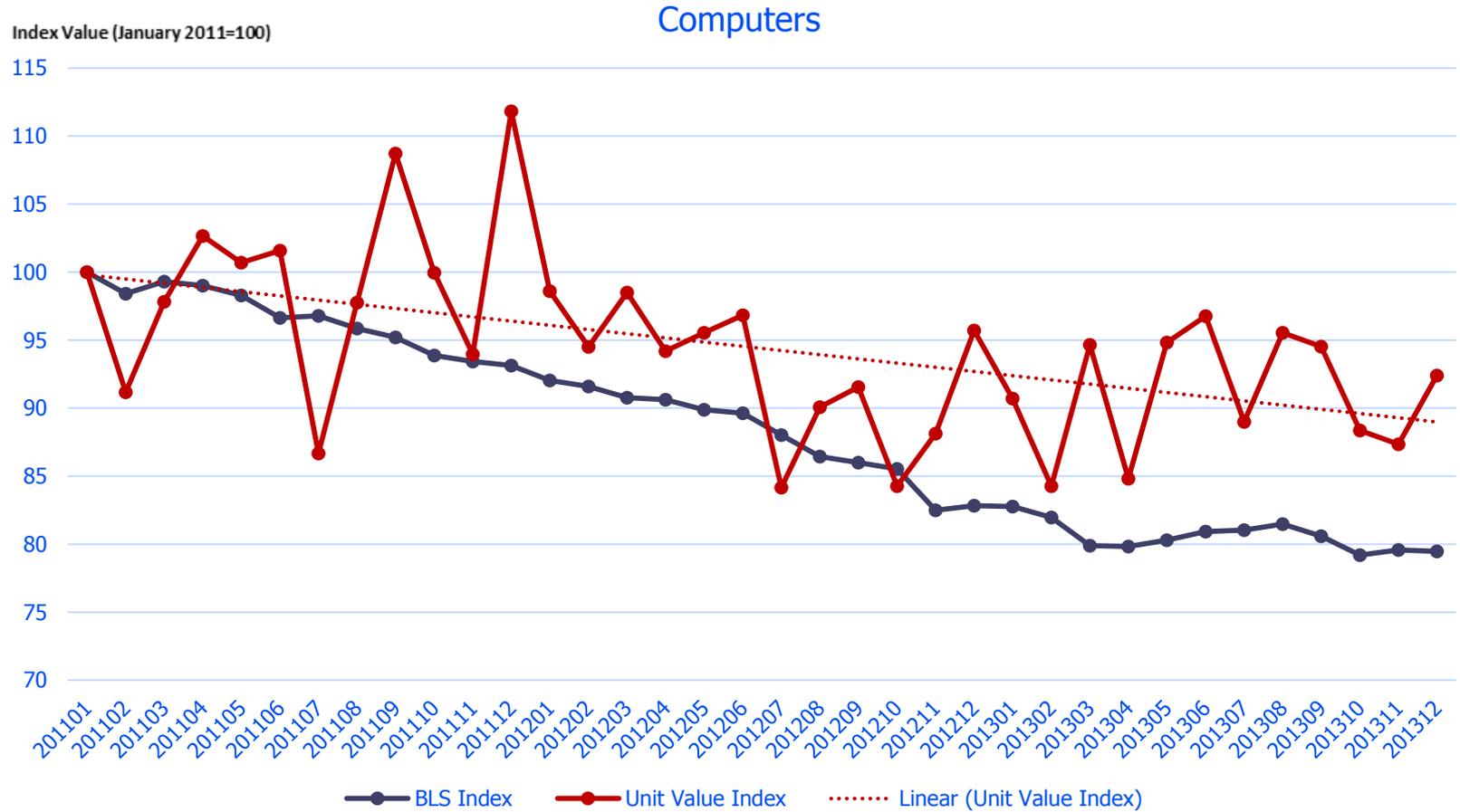
Computers



Computers

- The unit value index ranged between a monthly increase of 19.0 percent to a decline of 14.7 percent
- In comparison, the BLS index ranged from a 0.8-percent advance and a 2.5-percent decrease
- The two indexes also moved in opposite directions in 16 out of 36 months

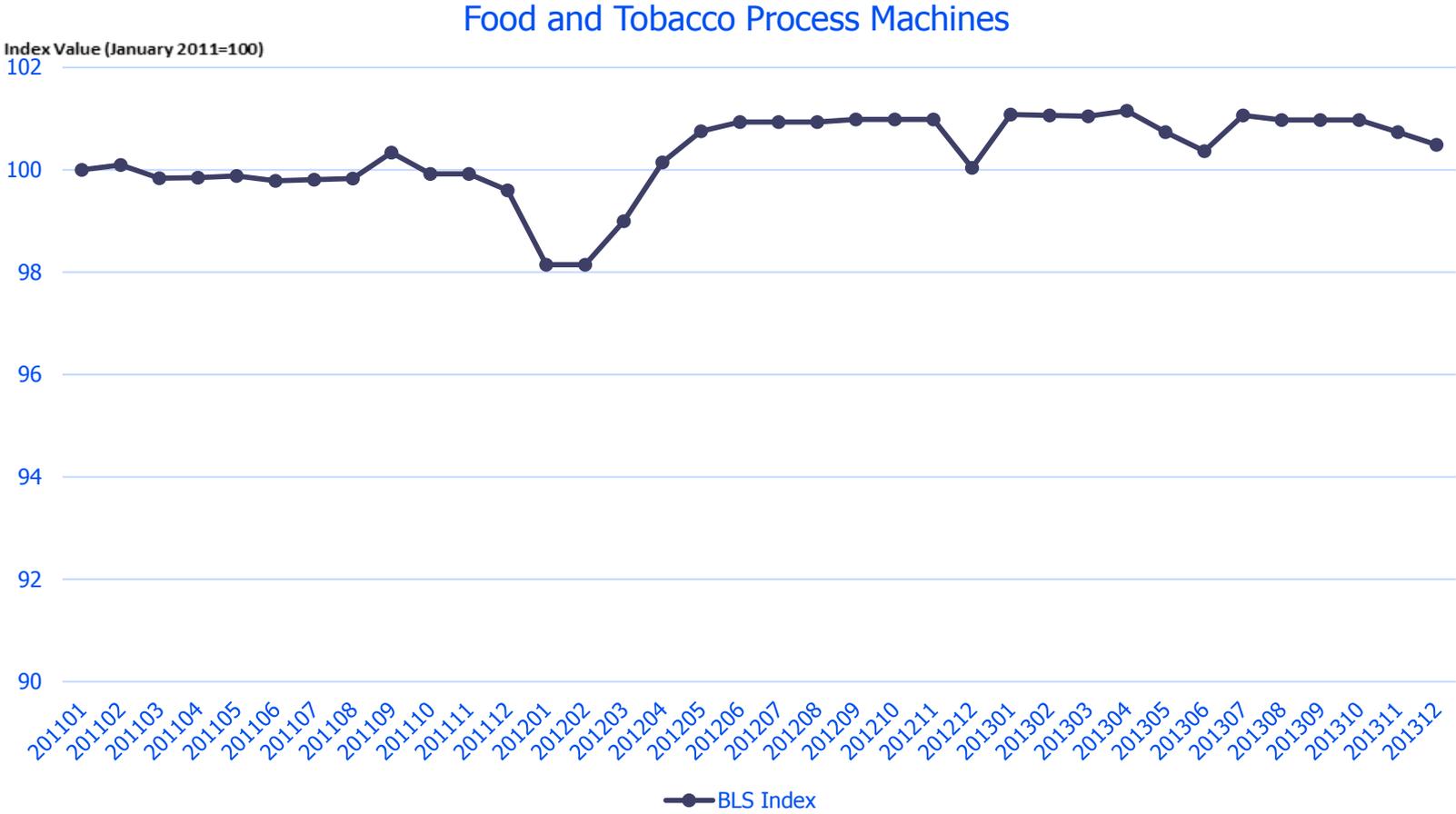
Computers



Computers

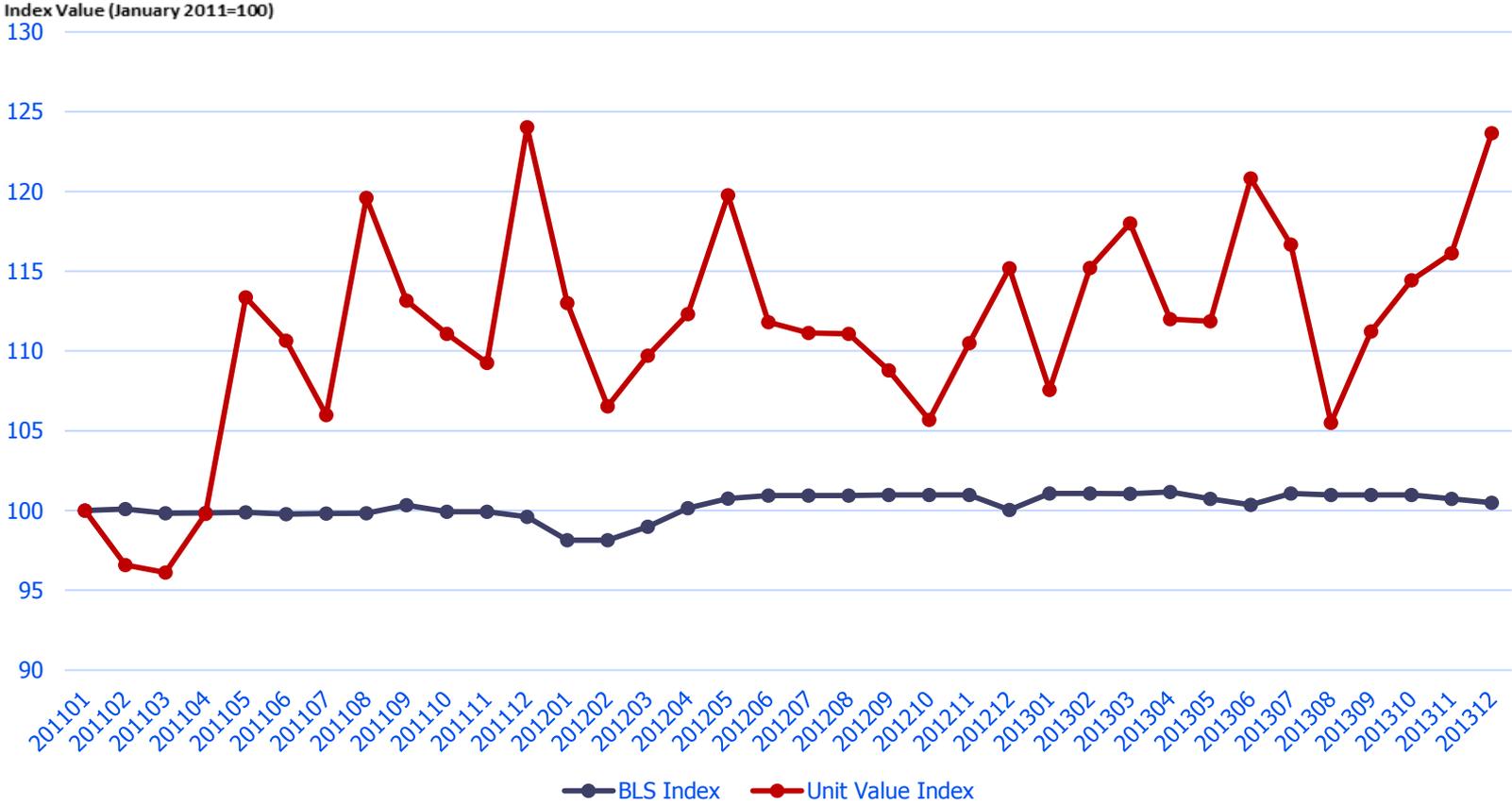
- Over time, in addition to being more volatile, the unit value indexes increasingly over-estimated the BLS price index
- Even at the disaggregated 10-digit Harmonized level, the range of products was too diverse
- For example, the classification group “digital processing machines under 10 kilograms” includes most laptops and all tablets

Food and Tobacco Processing Machinery



Food and Tobacco Processing Machinery

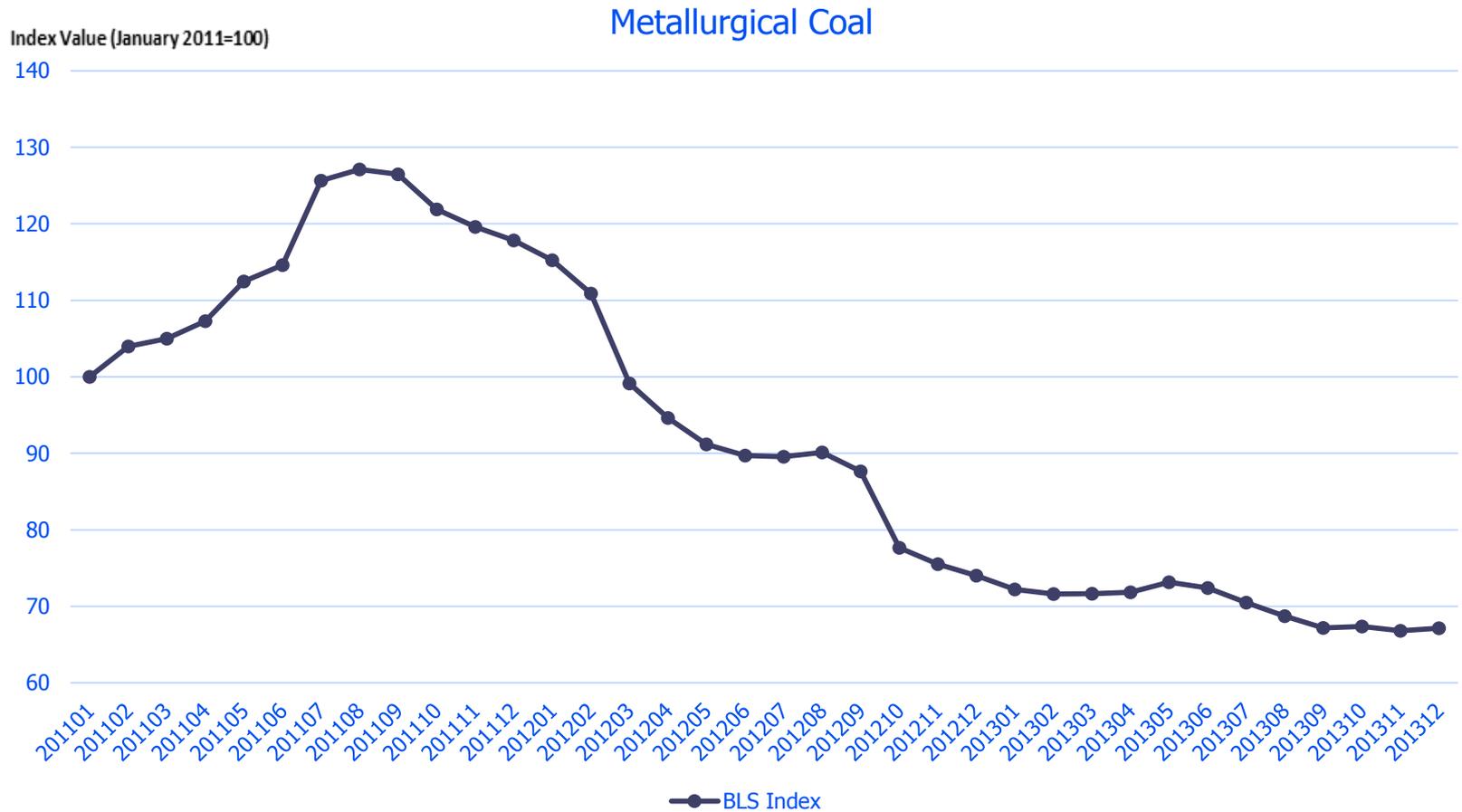
Food and Tobacco Process Machines



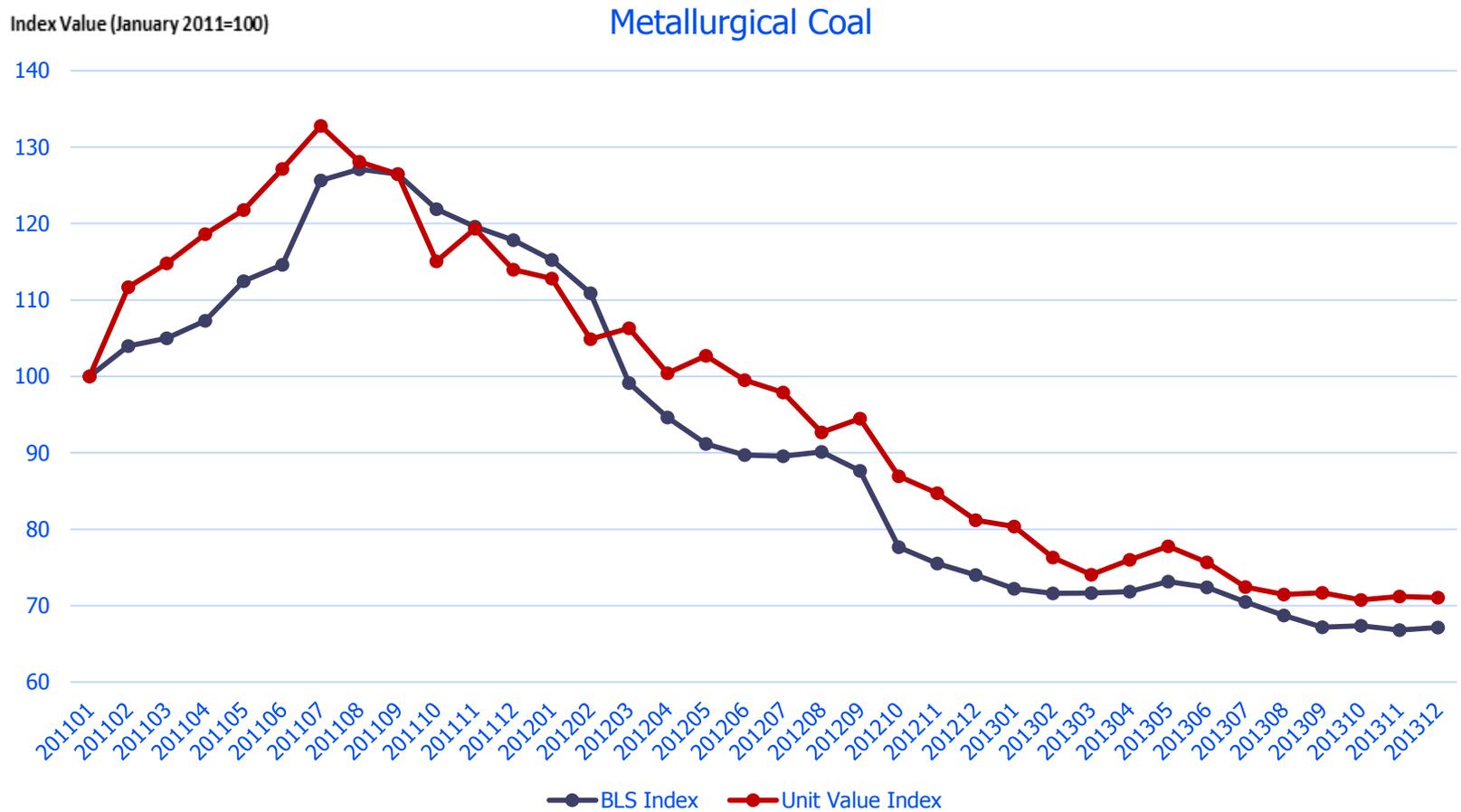
Food and Tobacco Processing Machinery

- The unit value index ranged between a monthly increase of 13.6 percent to a decline of 9.6 percent
- In comparison, the BLS index ranged from a 1.2-percent advance and a 1.5-percent decrease
- The two indexes also moved in the same direction in only 2 of the 36 months

Metallurgic Coal



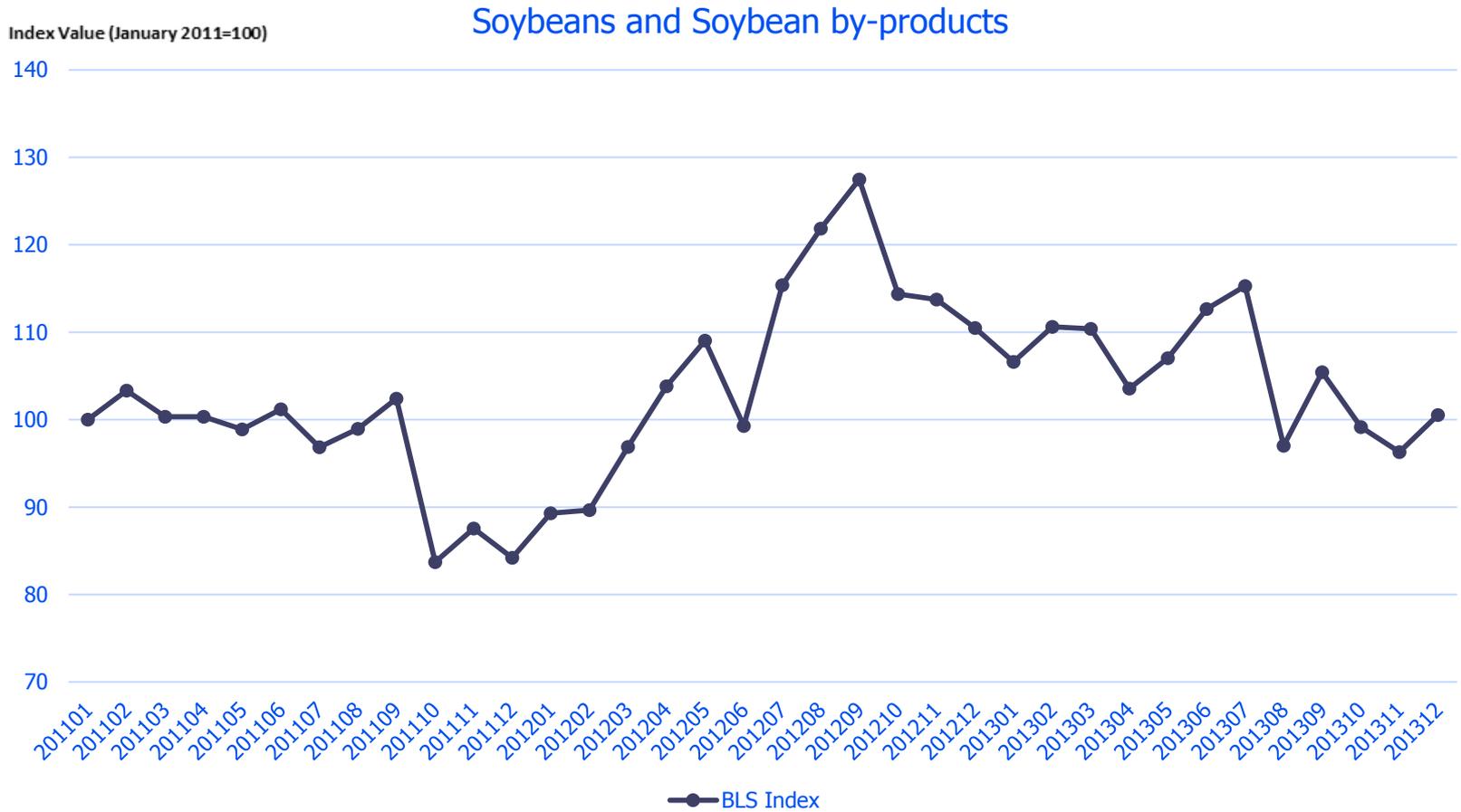
Metallurgic Coal



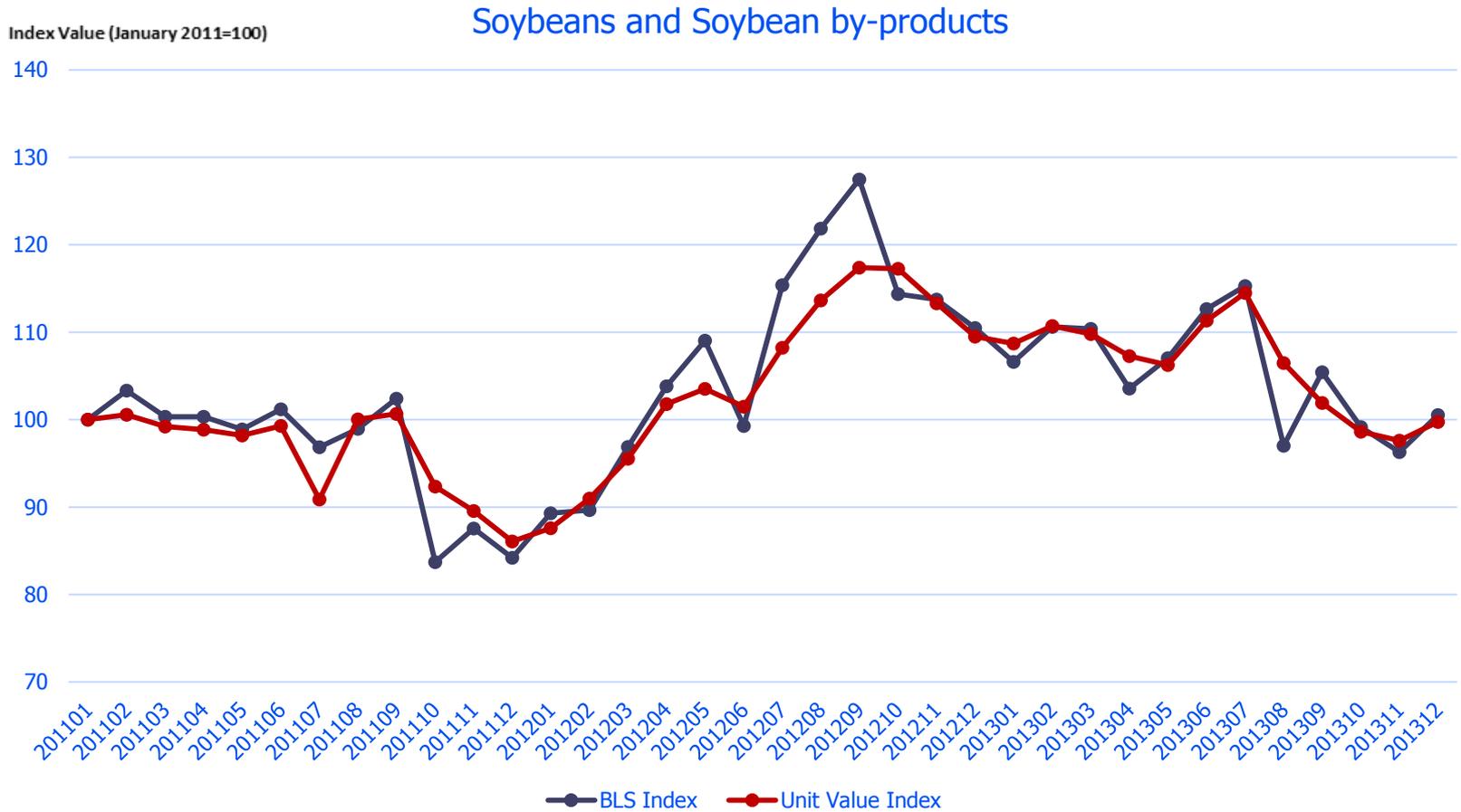
Metallurgic Coal

- While the indexes did not diverge as much, over the 3 years, the indexes did diverge by as much as 5 percent in 18 of the 36 months
- The two indexes also moved in opposite directions in 10 out of 36 months
- Even though the type of coal doesn't vary much from item to item, the grade of the coal can
- Higher grade coal costs more than low grade coal, and depending on the mix of high and low grade coal in the export trade from month to month, the average price can be impacted regardless of how prices are changing

Soybeans



Soybeans



Soybeans

- This is the one case where the unit value index does closely approximate the BLS index
- In only 3 months did the indexes move in opposite directions, and only in the fall of 2012 did the indexes diverge by more than 5 percent
- The cost savings though for this type of commodity would be minimal as that data is currently collected from a secondary source rather than by direct collection from a company

Contact Information

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