A note on updating price indices and terms of trade for primary commodities

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Introduction

Enzo Grilli and Maw Cheng Yang (Grilli and Yang, 1988) developed price indices for primary commodities (not including energy) covering the period 1900-1986 using the weighted nominal prices of 24 primary commodities. The terms of trade indicator for primary commodities examined in this paper considers the unit value index of manufactured goods, referred to as the MUV (manufacture unit value), as a deflator. This database has been used in a number of different works (Cuddington and Urzua, 1989; Léon and Soto, 1997; Bleaney and Greenaway, 2001; Kim et al, 2003; Couharde et al, 2012; etc.) for the purposes of analysing long-term price fluctuations for primary commodities and, in particular, was called on in several attempts to prove, in empirical terms, Prebisch and Singer's 1950 hypothesis that the terms of trade for primary commodities had been deteriorating for many years.

The aim of this paper is to review and updated the previous work (Geronimi, Anani, Taranco, 2017) of presentation of the solutions adopted in order to update Pfaffenzeller's (2013) estimated changes in the Grilli and Yang Commodity Price Index, or GYCPI, through to 2018 using new data available while remaining as faithful as possible to the solutions identified by Pfaffenzeller et al (2007). In the first section, we will therefore present the sources used to update primary commodities' prices over the period 2014-2018. We will then present the methodology underpinning the update before concluding with a presentation of the changing terms of trade index for primary commodities over the period 1900-2018. The present paper, which takes some large sections of the previous note (Geronimi, Anani, Taranco, 2017), makes transparent use of the data collected in the Excel file available on the Cemotev website (**http://www.cemotev.uvsq.fr/**).

1. Presentation and data sources

In their original version, Grilli and Yang used the nominal prices of 24 primary commodities. Within the framework of our update, we also consider the prices of these same primary commodities (table 1).

Of the 24 primary commodities examined, 18 (lamb, aluminium, silver, banana, cocoa, coffee, rubber, cotton, copper, tin, palm oil, corn, lead, rice, sugar, tobacco, tea and zinc) are taken from the World Bank commodity price database ("*The Pink Sheet*"[1]). The prices of 3 primary commodities (beef, hides and wool) are taken from the Internal Monetary Fund's database[2] while the prices of the 3

[1] World Bank Commodity Price Data, "The Pink Sheet" annual prices, 1960 to present, nominal US dollars.
[2] IMF Primary Commodity Prices

remaining primary commodities (wheat, wood and jute) call on other sources. The jute market is now limited to India and Bangladesh.

Table 1 below summarises the sources of the prices of all 24 primary commodities considered in the Grilli and Yang index.

Table 1: Presentation of the data and sources used for updating

Primary commodities	***Weight[a]***	***Source: World Bank Commodity Price Data (Pink Sheet)***
Lamb[1]	0.009	Price of sheep meat, (New Zealand), frozen whole carcasses Prime Medium (PM) wholesale, Smithfield, London beginning January 2006; previously Prime Light (PL).
Aluminium	0.051	London Metal Exchange (LME), unalloyed primary ingots, high grade, minimum 99.7% purity, settlement price beginning 2005; previously cash price.
Silver	0.017	(UK), 99.9% refined, London afternoon fixing; prior to July 1976 Handy & Harman. Grade prior to 1962 unrefined silver.
Banana	0.009	(Central & South America), major brands, US import price, free on truck (f.o.t.) US Gulf ports.
Cocoa	0.027	(ICCO), International Cocoa Organization daily price, average of the first three positions on the terminal markets of New York and London, nearest three future trading months.
Coffee	0.103	(ICO), International Coffee Organization indicator price, other mild Arabicas, average New York and Bremen/Hamburg markets, ex-dock.
Rubber	0.028	For 2014-2016, application of the change in rubber prices, SGP/MYS (rubber (Asia), RSS3 grade, Singapore Commodity Exchange Ltd (SICOM) nearby contract beginning 2004; during 2000 to 2003, Singapore RSS1; previously Malaysia RSS1) at the 2013 value given by Pfaffenzeller.
Cotton	0.043	Cotton Outlook "Cotlook A index", middling 1-3/32 inch, traded in Far East, C/F beginning 2006; previously Northern Europe, c.i.f.
Copper	0.059	(LME), grade A, minimum 99.9935% purity, cathodes and wire bar shapes, settlement price
Tin	0.022	(LME), refined, 99.85% purity, settlement price.
Palm oil	0.083	(Malaysia), 5% bulk, c.i.f. Rotterdam From 2016, series updated by 2 new sources: application of the growth rate of the new series to the values of the UPD 2016.
Corn	0.068	(US), no. 2, yellow, f.o.b. US Gull ports.
Lead	0.013	(LME), refined, 99.97% purity, settlement price.
Rice	0.03	(Thailand), 5% broken, white rice (WR), milled, indicative price based on weekly surveys of export transactions, government standard, f.o.b. Bangkok.
Sugar	0.073	(World), International Sugar Agreement (ISA) daily price, raw, f.o.b. and stowed at greater Caribbean ports.
Tobacco	0.029	(Any origin), unmanufactured, general import, cif, US.
Tea	0.016	Average three auctions, arithmetic average of quotations at Kolkata, Colombo and Mombasa/Nairobi.
Zinc	0.016	(LME), high grade, minimum 99.95% purity, settlement price beginning April 1990; previously special high grade, minimum 99.995%, cash prices.
Primary commodities	***Weight***	**Source: IMF Primary Commodity Prices**
Beef	0.051	Beef, Australian and New Zealand 85% lean fores, CIF U.S. import price, US cents per pound.

Hides	0.023	Hides, heavy native steers, over 53 pounds wholesale dealer's price, US, Chicago, fob Shipping Point, US cents per pound. As of 2010, data change from the 2016 Update. Application of the growth rate of the new series to the values of Update 2016.
Wool	0.027	Wool, coarse, 23 micron, Australian Wool Exchange spot quote, US cents per kilogram. From 2010, data change from the 2016 Update: 1.3% difference for 2014 compared to the 2016 Update. Less than 1% difference in other years. Application of the growth rate of the new series to the values of Update 2016.
Primary commodities	***Weight***	**Other sources**
Wheat	0.081	Customs data (Canada), no. 1, Western Red Spring (CWRS), in store, St. Lawrence, export price.
Wood[2]	0.12	Data reconstructed using UK forestry data for sawn conifer wood, QJ2.
Jute[3]	0.002	From 2016 onwards, change of source from Update 2016, a new serie from the UNCETADSTAT database. For 2017, data reconstituted from the graph "*Jute export prices (BTD f.o.b. Bangladesh Port)*" of the *Food and Agriculture Organization of the United Nation* website

Sources: Grilli and Yang, 1988; Pfaffenzeller et al., 2007 and Pfaffenzeller, 2013. See the Cemotev website for a detailed description of and access to the data. Note: a- Weighting based on the average relative shares (1977-1979) of each primary commodity in global exports (Grilli and Yang, 1988).

2. Methodology for updating the terms of trade index for primary commodities

Our proposed update of the GYCPI until 2018 is conducted in accordance with the method used by Geronimi V., Edem T. G. Anani, Armand Taranco (2017) to update the Grilli and Yang indices until 2006. The series of price indices for primary commodities are calculated in the same way as in previous works by considering the same weights for the 24 primary commodities based on an annual average for the period 1977-1979 (Grilli and Yang, 1988; Cashin and Mc Dermott, 2002; Pfaffenzeller et al, 2007).

The terms of trade index for the primary commodities on date "t" considered by Grilli and Yang (1988) and used here is noted GY_t. It is defined as the ratio between the composite price index of the 24 basic commodities ($GYCPI_t$) and the manufacture unit value (MUV_t):

$$GY_t = \frac{GYCPI_t}{MUV_t}$$

The composite price index for primary commodities is defined as follows:

$$GYCPI_t = \sum_{i=1}^{24} \alpha_i P_{t,i},$$

where α_i represents the weight of each commodity in the $GYCPI_t$ and $P_{t,i}$ the nominal price of the basic commodity.

The unit value index for exports of manufactured goods, "MUV_t" is a weighted index of exports of manufactured goods from the countries of the G5 (France, Germany, Japan, United Kingdom, United States) towards developing countries.

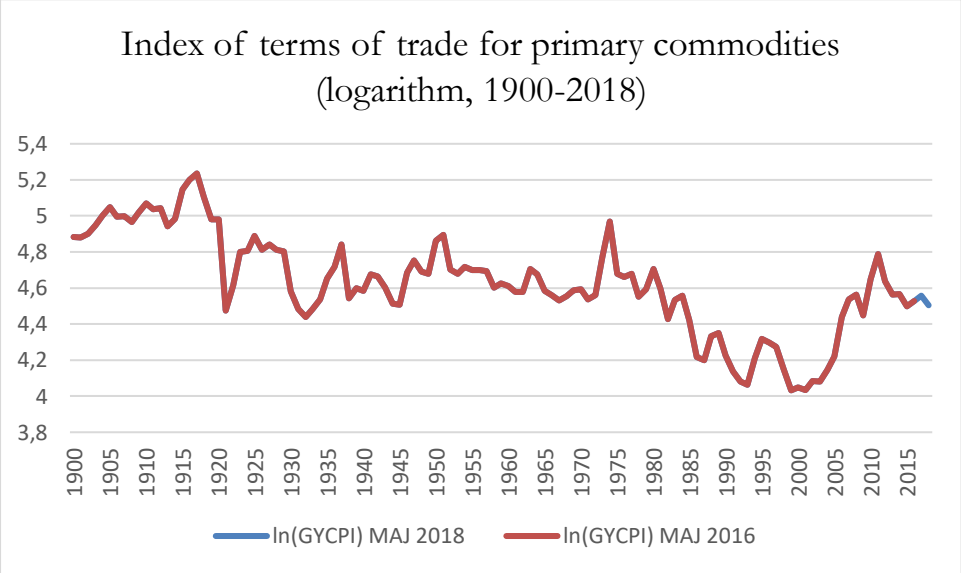
From 2011, the World Bank no longer calculates MUV_t on the basis of 5 countries but on the basis of 15 countries. Thus, when updating this index, we retained the data updated by Pfaffenzeller until 2013 while, for 2014-2018, applying the rate of growth of the World Bank price index for manufactured goods (15 countries) to the data retained by Pfaffenzeller for 2013 (in line with the 2017 previous update to 2016).

3. Presentation of the updated terms of trade index for primary commodities 1900-2018

This section presents only the change in the Grilli and Yang terms of trade for primary commodities (GY_t) updated until 2018.

The different updated prices indices for each basic commodity and the "MUV_t" are available in Excel format on the CEMOTEV website (Centre d'études sur la mondialisation, les conflits, les territoires et les vulnérabilités): **http://www.cemotev.uvsq.fr/**

Figure 1: The terms of trade for primary commodities (GY_t) updated until 2018



Source: authors' update for the period 2016-2018 based on the data of 2016 Update, partially revised. Notes: logarithm of terms of trade for primary commodities (Log (GY_t)); see text for a more detailed explanation.

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