
New Phenomena in the Price Movement of Manufactured Goods in Contemporary International Trade

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Abstract:

Purpose: The purpose of the article is to identify trends in the movement of processed goods prices in international trade in 2014-2020 and to explain them in the context of structural transformations occurring in the exports' sector of the countries under study.

Design/Methodology/Approach: The research on export price trends was conducted based on the export price indices of processed goods and indices of manufacture to manufacture terms of trade. Then, the analysis of changes in the structure of exports of processed goods by the degree of processing of the countries and groups of countries studied was made.

Findings: The results indicate the existence of relatively high dynamics of export prices of processed goods of China and India, i.e., developing countries, so far competing with low prices in exports. This phenomenon occurred under the conditions of an apparent increase in the share of high-skill and technology-intensive manufactures in the total exports of these countries in the last quarter of a century, as shown in the study.

Practical Implications: The results of this research have important implications for economic policy-making in developing countries. They confirm that goods characteristics (export structure) are still an important determinant of export prices.

Originality/Value: The present study demonstrates new phenomena in the price movement of manufactured goods in international trade that deviate from previous trends analyzed and reported in the literature. The findings contribute to the ongoing discussion on the increasing technological sophistication of developing countries' exports improving their terms of trade.

Keywords: International trade, manufactured goods, export prices, terms of trade.

JEL codes: F10, F40, O57.

Paper Type: Research paper.

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1. Introduction

The formation of prices in international trade has long aroused considerable interest, both in the world literature and from practical implications. Recently, the question of the movement of export prices of manufactured goods, both in terms of changes in the product structure and the geographical structure of world exports, has attracted attention. The problems of the direction of changes in the relationship of prices of manufactured goods in the trade of developing countries with developed economies (the so-called manufacture to manufacture terms of trade) began to raise interest already in the second half of the last century. This is evidenced by a relatively large number of publications on the topic. The importance of this issue has increased significantly due to the predominance of processed goods in the exports of many of these countries and the growing role of developing economies in the global export of processed goods. The best expression of this is that China has obtained and maintained - for over a decade now - first in the ranking of the world's leading exporters.

This paper aims to identify new price trends observed in manufacturers' price movements, which have not yet been analyzed in detail in the literature. The analysis of price movements was carried out against the background of structural transformations in the countries' exports under study, treated in theory as determinants of price changes. The research was carried out based on the dynamics of export price indices of manufactured goods and the indices of manufacture-to-manufacture terms of trade (MTOT), which, as indicated in the literature, reflect the fundamental changes in the prices of manufactured goods and their actual impact on the economies of countries and regions.

The first part of the paper analyzes the past trends in the price movement of processed goods. Based on their empirical research, the second part presents new price phenomena and their determinants, visible in the second half of the last decade.

2. Changes in Prices of Manufactured Goods in International Trade - Literature Review

The author of the first work devoted to changes in relative export prices of manufactured goods of countries and regions is Keesing (1979). His research covered the period 1960-1976. The author observed a significant decline in the price indices of exports of developing countries. This was particularly true for the prices of highly labor-intensive goods: textiles, clothing, and electronics.

In another of the most critical studies on MTOT changes, Sakar and Singer found that between 1965 and 1987, prices in exports of processed goods from developing countries declined at an average rate of 1% per year, relative to the prices of these products in exports of economically developed countries (Sakar and Singer, 1991).

Studies that Minford, Riley, and Nowell conducted also indicate a phenomenon of deterioration of MTOT to the disadvantage of developing countries during the 1960s to 1990s. However, it was pretty irregular. It was most pronounced in the 1960s and 1985-1990 (Minford *et al.*, 1997).

Further research on the phenomenon in question by Maizels, Palaskas, and Crowe concerned the period 1979-1994. The analysis covered the unit value index in exports and imports of European Union countries with developing countries (Maizels *et al.*, 1998). They confirmed the hypothesis of deteriorating MTOT to the disadvantage of developing countries. These authors strongly emphasized the impact of scientific and technological progress on the occurrence of this phenomenon.

Maizels presents similar results, analyzing new price data not previously published by the U.S. Bureau of Labour Statistics. The author shows that MTOT of developing countries in trade with the U.S. fell significantly in the first half of the 1980s and then showed a steady downward trend. A different trend was observed for economically developed countries. Their MTOTs in trade with the U.S. showed an upward trend since the second half of the 1990s (Maizels, 2000).

Similar conclusions are reached in a paper on South Korea's MTOT between 1976 and 1995 (Berge and Crowe, 1997). While the country's MTOT did not change significantly in its trade with economically developed countries, there was a marked improvement in MTOT in its trade with developing countries.

The research conducted by Zhihai and Yumin shows that between 1993 and 2000, China's MTOT deteriorated by 14%. The decline was more significant in trade with developed countries than with developing ones. The authors of the study also point out that the most significant reduction in MTOT was recorded in labor-intensive products in trade with the USA and Japan (Zhihai and Yumin, 2002).

In a comprehensive study of the MTOT issue, Chakraborty also presents the results of his research on the subject. They show that between 1975 and 2000, there was a declining trend of MTOT in developing countries trade with economically developed countries averaging 0.91% per year (Chakraborty, 2012).

Also, of interest are the research results presented in the 2002 UNCTAD report, which analyzed the prices of electronic products in U.S. foreign trade from 1980 to 2000 (UNCTAD, 2002). Based on an analysis of the geographic structure of U.S. trade in these products, it simplifies the assumption that the U.S. export price index can be taken as a price index for trade between developed countries and the U.S. import price index as an index for export prices of developing countries. Using U.S. import prices as a proxy, it is shown that export prices of the products analyzed in developing countries experienced more rapid declines than export prices of the same products of developed countries during the period under study.

Summing up the presented results of research on the formation of MTOT in the last century, one can clearly state that in the second half of the twentieth century, there was a clear downward trend in this indicator, to the disadvantage of developing countries. This gave rise to opinions expressed in the literature that the views derived from the Preibish-Singer hypothesis (Preibish, 1950; Singer, 1950) about the need for industrialization and diversification of exports of developing countries as a way to "escape from the deteriorating terms of trade" are no longer valid in today's economy (Ocampo and Parra, 2007; Chakraborty, 2012; Saadi, 2012). It was also pointed out that price relations in international trade today are not determined by the export structure of countries (commodity characteristics), but rather by their level of development (country characteristics), such as market power, place in the global supply chain, and organization of the labor market (Ziesmer, 2010; Grancay *et al.*, 2015).

Studies for the 21st century have emphasized that in economically developed countries (except Japan), MTOTs are above 100, i.e., they have improved over the period analyzed. Of particular note is that Switzerland's MTOT improved by more than 20% in a relatively short period of eight years. In contrast, Asian developing countries (and Japan) recorded a deterioration in MTOT, with China, Taiwan, and South Korea being the most affected, i.e., countries with a substantial share of processed goods in total exports (over 90%). In this context, Japan's situation is similar to that of developing rather than economically developed countries (Dudziński, 2016).

Thus, the analysis conducted in this section of the paper allows us to conclude that the process of MTOT deterioration to the disadvantage of developing countries continued in the 21st century. However, it varied across countries. It also affected to a considerable extent Japan classified as an economically developed country.

Traditionally, the theory of international economic relations distinguishes between two primary groups of goods, raw materials and food (so-called primary goods) and manufactured goods. Exposing the differences between these groups of goods, attention is drawn to the influence of natural conditions and the involvement of usually simple, unskilled labor in the case of the first group of goods, and the rapidly increasing technical progress and involvement of often highly skilled labor in the production of manufactured goods. These factors have also been seen as justifying the process of long-term deterioration of terms of trade to the detriment of raw materials and foodstuffs ("price scissors").

The literature on MTOT currently adopts a similar approach to explain the phenomenon of worsening price relations to the disadvantage of developing countries in the group of manufactured goods alone (Mayer, 2003; UNCTAD 2005; Chakraborty, 2012). It is emphasized that within the category of processed goods, two subgroups can be distinguished, differing in the level of scientific and technological progress and the scale of individualization of functional characteristics (individualized and standard goods). The first of these is so-called high-tech goods,

with high scientific and technological progress produced by skilled workers. They are produced in economically developed countries. The second includes standars, labor-intensive goods produced on a large scale, using low-skilled labor, usually produced in developing countries. The mentioned characteristics of these products enable them to be produced at low unit costs and offered at highly competitive export prices. This explains the profitability of production and export in a constant deterioration of the terms of trade. In addition, the presence of an ample supply of low-educated and poorly organized workers and the high flexibility of labor markets in developing countries are also emphasized, which favors the development of the above-characterized production. These features make the production of manufacturers in developing countries resemble the production of raw materials and food.

3. Material and Methods

The study aims to identify trends in the movement of manufactured goods prices in international trade in 2014-2020 and to try to explain them in the context of structural transformations taking place in the exports of the countries and groups of countries studied. The first stage of the applied research procedure consisted of studying the dynamics of absolute prices in manufactured goods exports of selected countries and regions. The analysis was carried out on processed goods export price indices, calculated annually, with January 2005=100, downloaded from the WTO database (WTO, 2021). The indices for India, not included in the WTO database, were taken from the UN Monthly Bulletin of Statistics (UN, 2021).

In the next phase, the development of a specific indicator, the so-called manufacture to manufacture terms of trade (MTOT), or net barter terms of trade in processed goods only, was examined. This index reflects changes in the relative export prices of manufactured goods of countries and regions. MTOT was calculated independently as the ratio of price indices of exports of manufactured goods to price indices of imports of manufactured goods of the countries (regions) under study. The export and import price indices of processed goods used to calculate MTOT were taken from the WTO statistical database (WTO, 2021). India was not included in the study due to the lack of data on India's processed goods import price developments, which prevented the calculation of MTOT.

In the third stage of research - after the analysis of export prices and MTOT - the structure of exports of manufactured goods of the studied countries and regions was examined according to the degree of their processing, and in particular - the nature of the inputs incurred in their production (high and straightforward skill). This factor was an important determinant of price movements (dynamics and relationship) of manufactured goods. The analyses used data published in the UNCTAD statistical database (UNCTAD, 2021).

In each of the three phases, all countries, and regions for which source data relating to export prices as well as import prices of manufactured goods were available to calculate MTOT were included in the study (the United States, Canada, China,

Taiwan, South Korea, Singapore, Switzerland, and the European Union). India is also included in parts one and three. As an aside, it should be added that while data on export prices, import prices, and terms of trade of individual countries and groups of countries in their total trade are standardly published in international trade statistics, the data in question relating only to trade in manufactured goods are minimal. This is a severe impediment to conducting systematic, in-depth studies of the discussed issues.

The temporal scope of the empirical analysis of export prices and MTOT (stages one and two) generally covers the period 2014-2020, a period for which the most recent data are available, not yet considered in more detail in the literature. The analysis of structural determinants (stage three) was carried out over a much more comprehensive range (the last 25 years) to show the long-term structural transformations reflected in the most recent price changes. The study employs a statistical-descriptive technique.

4. New Price Phenomena and Their Determinants - Research Results

4.1 Changes in Export Prices of Manufactured Goods

As shown in Table 1, in 2019, China's export price index for manufactured goods was 122 (2005=100), while prices in total world exports of these goods increased by 13% over the same period. This means that the growth rate of China's export prices exceeded the world average by as much as nearly two times. Throughout the 2014-2019 study period, prices in China's processed goods exports grew relatively steadily. Although there was a nominal decline in prices after 2015, it was associated with strengthening the USD exchange rate and occurred in all global exports (Table 1).

Table 1. Export price indices of manufactured goods in selected countries 2014-2020 (2005=100, %)

Countries/Regions	2014	2015	2016	2017	2018	2019	2020
World	120	112	105	106	116	113	113
Canada	124	119	110	115	120	117	118
China	130	134	120	116	123	122	.
EU	124	108	104	103	121	117	117
Japan	94	86	81	84	87	86	84
South Korea	80	75	67	72	77	72	67
Singapore	99	96	90	90	92	92	90
Switzerland	158	156	151	157	171	168	193
Taiwan	98	93	85	89	93	89	86
USA	121	116	110	112	115	116	117
India	.	.		159*	160*	152*	.

Note: *2000 = 100

Source: WTO, 2021; UN, 2021.

The export price dynamics of the analyzed goods in China were second only to Switzerland (index as high as 193). Price dynamics indices were higher than 100 only in Canada and the EU (117) and in the USA (116), exceeding the world average (113).

Similar remarks can be made about India's export prices of processed goods. In 2019 (Q2), for which the latest data are now available, the price growth index was as high as 152 (with a base of 2000=100) (UN, 2021). In the same period, the export price index for all global exports of manufactured goods was 124, and for economically developed countries, it was 144 (2000=100). This means that prices of processed goods grew in India at a rate twice as high as the world average. At the same time, it is worth emphasizing the higher dynamics of export prices of processed goods in China compared to the EU. The economy and exports of this group of countries are dominated by highly developed economies traditionally exporting manufactured goods (such as Germany).

Also noteworthy is the absolute decline in nominal export prices of the group of products in question in other Asian countries, especially in economically highly developed Japan (a 16% decline). An extreme absolute decline in prices of processed goods was recorded in exports of South Korea (over the 15 years by as much as 35%). In Singapore and Taiwan, the decrease was 10% and 14%, respectively. Indicated phenomena occurring in China and India, therefore, require adequate emphasis, especially against the background of previous trends in the formation of export prices of processed goods and comments made in the first part of the article, including those of a theoretical nature.

4.2 Manufacture to Manufacture Terms of Trade Changes

As already mentioned, the movement of nominal price indices is affected by changes in the purchasing power of individual currencies and their exchange rates to the USD. Hence, the literature emphasizes that it seems more appropriate to analyze the MTOT indices to study the actual price trends. The MTOT indices presented in Table 2 confirm the trends of export price indices indicated in section 2.1.

Table 2. *MTOT of selected countries 2014-2020 (2005=100; %)*

Countries/Regions	2014	2015	2016	2017	2018	2019	2020
Canada	103	104	101	103	105	102	102
China	100	110	109	105	100	102	.
EU	101	99	100	98	98	98	99
Japan	95	93	92	95	95	95	97
South Korea	81	81	77	81	83	78	75
Singapore	95	97	97	97	94	94	93
Switzerland	111	119	121	121	121	123	126
Taiwan	92	95	94	94	94	93	91
USA	104	103	102	101	104	105	105

Source: Own calculations based on WTO, 2021.

The most significant increase in MTOT indices occurred in Switzerland (126, 2005=100), but it was lower than nominal prices (193). The only visible change compared to the export price movement is a slightly higher MTOT index in the USA (105) than in China and Canada (102). It is worth noting here that only these four countries recorded an actual increase in export prices of the analyzed goods (increase in MTOT index). All the remaining countries (for which data on these prices are published) recorded an absolute price decrease in trade in processed goods. In the EU, the decrease in the MTOT index was minimal (only by 1%), but it should be noted that this phenomenon was permanent (only in 2014 and in 2016 MTOT = 100). A significant reduction of MTOT in South Korea (by as much as 25%) should also be noted. However, as in other countries, the reduction scale was significantly lower than in the case of export prices alone.

Summing up the considerations carried out in the second part of the study, it should be concluded that the research results are different from the previous trends in the formation of export prices of processed goods analyzed and described in the literature.

4.3 Determinants of Changes in Export Prices of Manufactured Goods

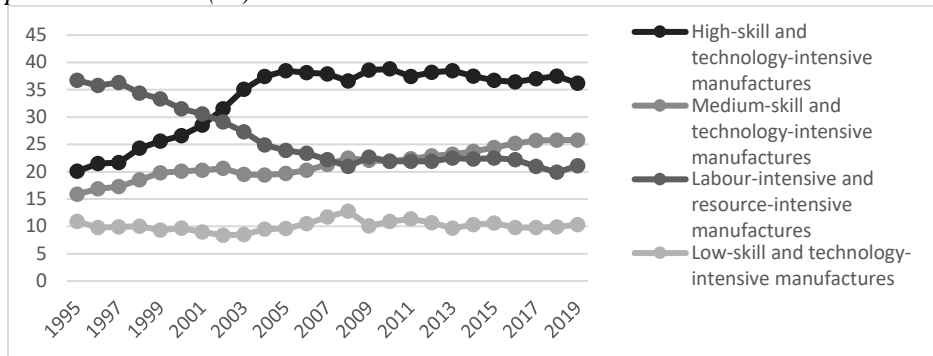
As it follows from the considerations carried out in the first part of the article, an essential factor determining the movement of export prices of processed goods is the commodity structure of exports, considered from the point of view of the nature of the inputs incurred (simple versus complex labor). In this aspect, the data in Figure 1, showing the transformation of China's exports, are interesting. Over the past quarter-century, the share of labor-intensive and resource-intensive manufactured has fallen from nearly 40% to 21%, almost halving. In contrast, the percentage attributable to high-skill and technology-intensive manufactures rose by the same proportion, from 20% to 40% in 2019.

There was also an apparent increase in the share of medium-skill and technology-intensive manufactures, which saw an increase of 10 percentage points (from 16% to 26%). It is also worth noting that the current share of high-skill and technology-intensive manufactures in China's exports (36.2%) is similar to that of South Korea (42.3%) and exceeds the share of these products in the exports of Japan (26.9%) and the USA (30.2%). It is also significantly higher than the share of these products in the exports of the European Union (28.9%). Similar trends could also be observed in India's exports. The share of high-skill and technology-intensive manufactures increased during the period under review from 12% in 1995 to over 24% in 2019 (own calculations based on UNCTAD, 2021). So, a doubling of it has been recorded, as in China's exports.

It should also be noted that many economically more developed countries, on the other hand, observed a decline in the share of high-skill and technology-intensive manufactures in their total exports. In the analyzed period in the USA, this share decreased from 39% to 30%, in Japan from 38% to 27%, in Singapore from 62% to

53%, and in Canada, it remained stable (about 15%). However, an increase in the percentage was observed in Switzerland (by seven percentage points, from 46% to 53%) and Taiwan (from 38% to 61%). However, the scale of this increase was much lower than for China and India (own calculations based on UNCTAD, 2021).

Figure 1. Share of manufactured goods by degree of manufacturing in China's total exports 1995-2019 (%)



Source: Own work based on UNCTAD, 2021.

The analysis of export price changes carried out in the second part of the study, in the context of transformations in the commodity structure of exports, thus confirms the theoretical considerations presented earlier, indicating a close relationship between the dynamics of export prices and the share of high-skill and technology-intensive manufactures in the total exports of countries and regions.

5. Conclusions

The results of the research show new phenomena that have not yet been described in the literature. They are expressed in the relatively high export prices of processed goods of developing countries that previously competed with low export prices (China and India). These phenomena differ significantly from the trends noted so far and are widely described in the literature regarding structural determinants. These price developments should be treated as an external expression of significant structural transformations in these countries' exports (an apparent increase in the share of high-skill and technology-intensive manufactures in their total exports). These structural changes have been taking place in the exports of China and India for many years. Therefore, it can be concluded that the currently observed absolute and relative increase in export prices of manufactured goods in these countries is an external expression of the effect of quantitative transformations, clearly visible only in recent years.

The research results have a significant practical dimension for shaping the economic policy of developing countries. They confirm that the structure of exports (characteristics of goods) is still an important determinant of export prices. The condition for achieving benefits from industrialization and diversification of exports

as "an escape route from worsening terms of trade" is not, however, an increase in the share of processed goods in exports in general, but of sophisticated and innovative products, i.e., high-skill and technology-intensive manufactures.

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