Box 1

A New Exercise Disaggregating Real Exports

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Based on the World Economic Outlook Report[1] of the International Monetary Fund, foreign demand was revitalized and there were significant increases in the prices of commodities throughout last year. This, added to relatively extensive conditions of foreign financing, contributed to the growth of most of the economies in the region, particularly the ones of the countries that export raw materials. The Colombian economy was not isolated in this context and, as a result, its foreign trade accounts benefited from better conditions on the global scenario. Thus, Chapter 1 and previous versions of this report explained how large part of the correction in the level of the current account deficit was primarily due to an increase in revenue that resulted from a better performance of dollar-denominated exports, which more than offset the increase in imports.

Indeed, the increase of sales abroad in 2017 (19.1%, in US dollars) was the result of increases in traditional exports (25%), non-traditional exports (5.9%), and services (8.5%). The former benefited from higher international prices for the main commodities, in particular oil and coal, while the second and third groups were driven by the higher growth of our main trading partners. These trends have been confirmed so far this year and are expected to continue in the medium term. In fact, the assumptions with regard to the foreign context for 2018, which are implicit in the forecasts for the balance of payments and the economic growth as presented in Chapters 1 and 4 of this Report, consider increases in the prices of the commodities exported by Colombia and expansions in the economies of our main trading partners. This makes it possible to anticipate a positive performance of both export areas in US dollars, which would continue contributing to the reduction of the trade deficit in 2018.

Despite the positive performance of the dollar-denominated sales abroad, this outcome was not equally clear with respect to the accounts denominated in constant pesos. Based on the information contained in the national accounts published by DANE, in 2017 real exports fell 0.6%. Although this figure revealed a recovery with respect to the -1.2% figure registered in 2016, this percentage is far from the results seen for the total dollar-denominated exports. This poses two challenges for analyzing and forecasting GDP. First, DANE does not break down the trade figures in the national accounts and, therefore, it is not possible to identify the origin of the outcome of real exports for last year. Second, given that the technical staff at *Banco de la República* assumes that improvement in the foreign context might act as a source of economic growth in 2018, it is important to understand the channels through which such an improvement translates into an impetus for exports denominated in constant pesos.

Due to the above, this Box analyzes the recent trends and forecasts for the main components of exports in real terms. The classification between traditional and non-traditional exports, measured in constant pesos, is relevant insofar as their trends would have different but complementary implications on GDP growth for the tradable sectors and on the productive linkages among them. Note that the results presented here correspond to the authors' own estimates rather than to official figures published by DANE, and that it is not the intention of the authors to duplicate precisely the methodology employed in the national accounts.

Using the updated version of the International Standard Industrial Classification, revision 3 (ISIC R.3 A.C.), for exports in FOB dollars published by DANE and the monthly average of the nominal exchange rate for the peso (COP) with respect to the US dollar (USD), historical series were calculated based on the proceeds from exports denominated in current pesos. Subsequently, an appropriate deflator was identified for every series using the PPI series (ISIC classification, revision 4, with December 2014 as the base) for each one of the products exported. In the cases of oil and its refined products, coffee, and coal, in particular, the implicit prices were used as a deflator and were calculated based on the series of exported value in pesos and the total quantities exported (in net kilograms) under ISIC classification R.3 A.C. In the case of services, the series in US dollars comes from the balance of payments and the deflator used is the CPI for services. The aggregate corresponds to the sum of each one of the real export series calculated by type of product. The period under analysis ran from January 2007 to December 2017. The results of this

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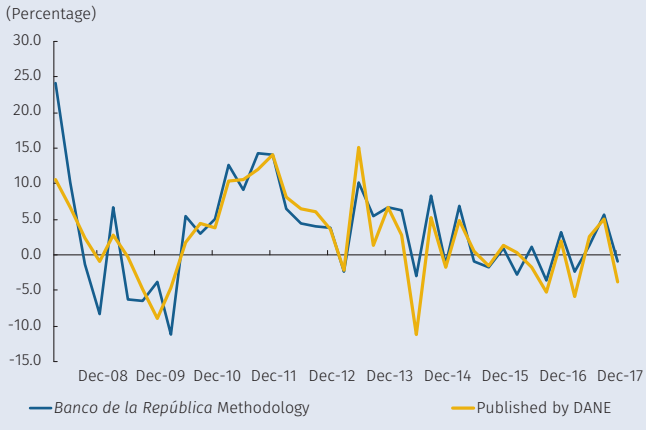
1 See the World Economic Outlook, published by the International Monetary Fund in April 2018 (accessed on line May 10, 2018).

exercise suggest a satisfactory approximation of the performance in the series of real exports used in the national accounts published by DANE (Graph B1.1).

Graph B1.1
Total Exports
(Constant pesos, annual change quarterly series)



Source DANE, authors' calculations.

An important contribution of this exercise is that it enables the analysis of real exports by groups. In addition to the traditional and non-traditional exports as well as services, it is possible to classify the sales abroad in constant pesos by type of product following the ISIC R.3 A.C nomenclature. In principle, the real exports of agricultural goods correspond to the products included in the ISIC R.3. A.C 011 to 050 accounts. In the case of mining, the products match the commodities in accounts 101 to 149. The category of "other exported products" corresponds to those included in accounts 00 and 401 to 930. The rest of the products have been classified in the category of real exports of manufactured goods (XM), in which the products listed in accounts 151 to 371 are included. It can be seen there that some of these products can be classified within the category of traditional goods although they have been transformed or are the result of some industrial process. This allows for the creation of two subcategories within the exports of manufactured products: real exports of traditional manufactured goods (XMT) and real exports of non-traditional manufactured products (XMNT). Within the latter, in turn, it is possible to distinguish three groups: agro-industrial goods, industrial products, and the rest. The accounts and the share of each one of these classifications within the total of real exports are shown in Table B1.1.

Table B1.1
Grouping of Manufactured Exports by ISIC Classification R.3 A.C and Share of the Total Exported
(goods and services 2017)

Annual variation, actual exports in pesos, seasonally adjusted				2014	2015	2016	2017
Total Exports	Agricultural exports (5.38%)			-1.14	2.54	5.25	3.49
	Mining exports (38.75%)			10.08	-4.19	-10.24	2.49
	Manufacturing exports (37.08%)	Traditional (17.14%)	Preparation of coffee products (account 156) (7.04%)	13.50	14.99	3.38	-2.42
			Manufacture of oil refining products (232)	-25.49	-14.94	83.91	-23.46
			Basic iron and steel industries (account 271) (1.37%)	-17.98	-3.78	-7.48	11.17
			Basic precious metal and non-ferrous metal industries (account 272) (4.13%)	-23.17	-23.77	17.94	13.84
			Agro-industrial manufacturing exports (accounts 151-155, 157-160) (3.68%)	13.33	-12.80	-4.33	14.14
		Non-traditional (19.94%)	Industrial manufacturing exports (accounts 171-192, 210, 231, 233-269, 273-361) (15.38%)	-4.60	-1.00	-7.00	1.84
			Other non-traditional manufacturing exports (accounts 193-209, 221-223, 369, 371) (0.88%)	-9.22	-2.29	-8.13	-0.92
	Other (0.04%)			58.67	-49.29	-68.72	-25.61
	Services (18.75%)			5.39	36.93	9.18	-0.02

Source: DANE, authors' calculations.

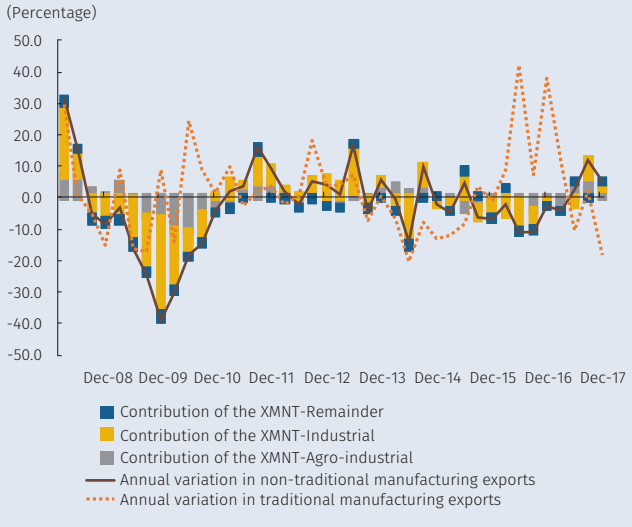
Furthermore, taking into account the fact that the technical staff forecasts greater growth for our main trading partners in 2018, the real XMs become especially significant due to the fact that their performance is closely related to that of the foreign demand. In addition, as is argued in economic theory, the XMs may also be favored (affected) by the profits (losses) of competitiveness that result from cumulative instances of depreciation (appreciation) of the exchange rate (both nominal and real), as was the case of the Colombian peso when the levels of the COP / USD rates are compared with those of mid-2014—the period prior to the shock to the terms of trade. That said, the question arises as to which of the two phenomena would have the greatest impact on the growth of the XM in 2018.

The empirical evidence suggests that the XMs have lost momentum in real terms during the last decade, which meant a reduction of their share in the total exports as they went from 53.8% in the first quarter of 2007 to 36.5% in the fourth quarter of 2017. This took place in a context where the growth of the worldwide economy, particularly that of the advanced economies, was severely battered by the effects of the international financial crisis of 2008 and it took several years to recover. Indeed, the XMs declined between the first quarter of 2008 and the last quarter of 2010 by an annual -5.78% on average, mainly due to the XMNT (-9.71%). It is just after the first quarter of 2011 that a recovery, albeit slow, of the XMs is seen and, it was supported by improvements in both the XMTs and the XMNTs. Since 2011, the average growth for these items has been 1.14%, 1.87%, and 1.07% respectively (Graph B1.2).

The combined analysis of XM growth, foreign demand, and the real exchange rate shows mixed results, even different from what was expected. On one hand, in recent quarters the XMs did not respond to the real depreciation as had been anticipated. After 2014, the real exchange rate index (RERI) depreciated 22.1% while the XMs barely grew 4.1% (9.9% for the XMTs and a drop of 0.23% for the XMNTs). On the other, it can be seen that the increases in the XMs, XMTs, and XMNTs are preceded by positive variations in the GDP of the trading partners (Graph B1.3).

In effect, an analysis of these variables using time series models suggests that positive variations in the foreign demand have a greater impact on the growth of the XMs, XMTs, and XMNTs than a depreciation of the real exchange rate would have. The variables are entered through annual variations (of the logarithm), and the specification tests of the models of autoregressive vectors (VAR) suggest a number of optimal lags equal to 1. In addition, they are stable, and the assumption of normality of residuals is met.

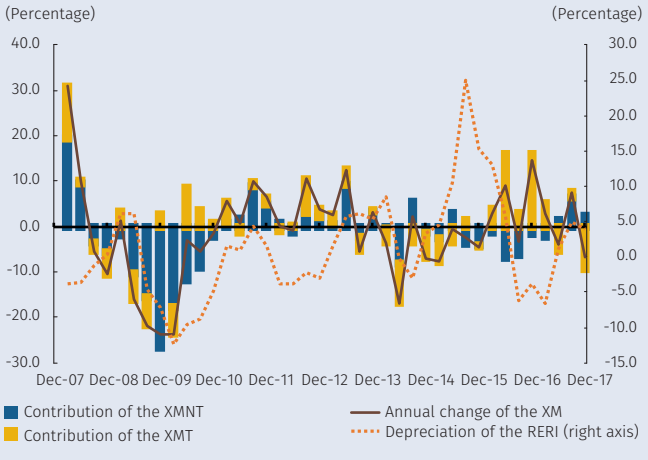
Graph B1.2
Performance of Disaggregated Non-traditional Manufacturing Exports



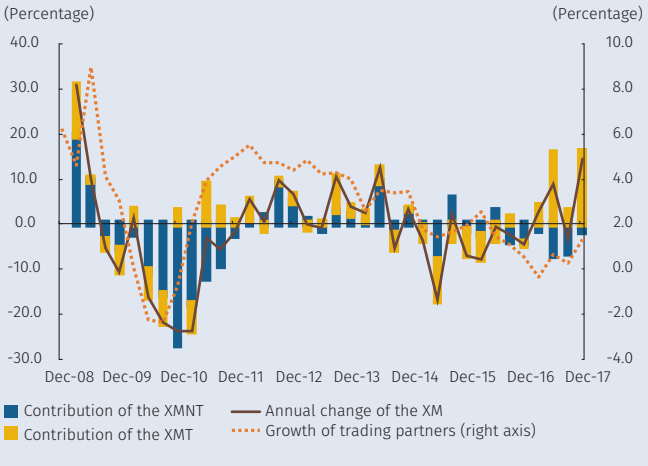
Source: DANE, authors' calculations.

Graph B1.3

A. Manufacturing Exports and Real Depreciation



B. Manufacturing Exports and Growth of Trading Partners



Sources: Bloomberg and DANE, authors' calculations.

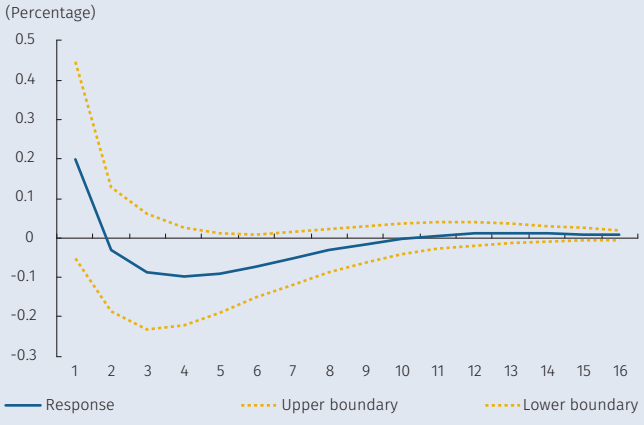
Graph B1.4 shows the responses of the XMs, XMTs, and XMNTs to positive shocks to our trading partners' growth and to a real depreciation. In every case, the answers move in the direction expected, but the results differ in magnitude and statistical significance. First, the foreign demand shock seems to be more important for the XMNTs than for the XMTs. Granger causality tests (not reported in this box) show significant results to the extent that foreign demand causes, in the Granger sense, growth of the XMs, XMTs, and XMNTs. In contrast, although its sign is the expected one, the response of these variables to a depreciation shock to the RERI is not significant. Furthermore, the same exercise suggests that the RERI does not have causal effects, in the Granger sense, on the growth of these types of exports.

In conclusion, an alternative calculation of the level of real exports is presented in this box. Using DANE information on export figures in US dollars by type of product—ISIC R.3. A.C classification—and applying appropriate deflators in each case, it is possible to achieve a fairly satisfactory approximation of the actual export figures given in the national accounts. In addition to the above, the methodology allows for a detailed breakdown of actual exports into their main components. The results for sales abroad of both traditional goods and manufactured products are presented. Exports of products from the areas of traditional manufactured, agro-industrial, industrial, and others are Included within the latter group.

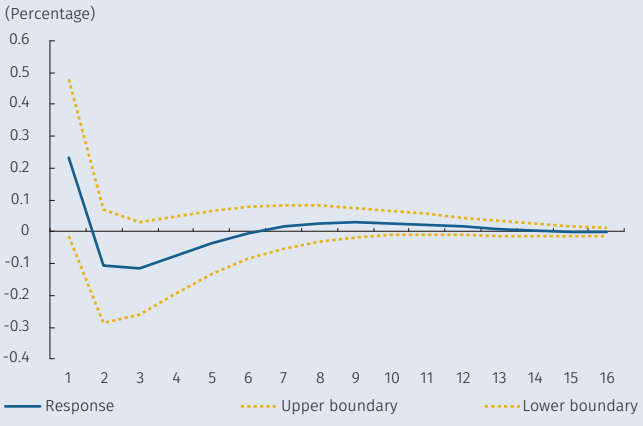
Moreover, the results of a time-series exercise that confirm the existence of a positive and significant relationship between the growth of trading partners and that of manufacturing exports are presented as well. A positive relationship between the growth of manufacturing exports and the depreciation of the real exchange rate is also confirmed, although in this last case the magnitude of the response is lower.

Graph B1.4
Impulse response functions of manufacturing exports with respect to 1.0% shocks to the growth of trading partners and the RERI

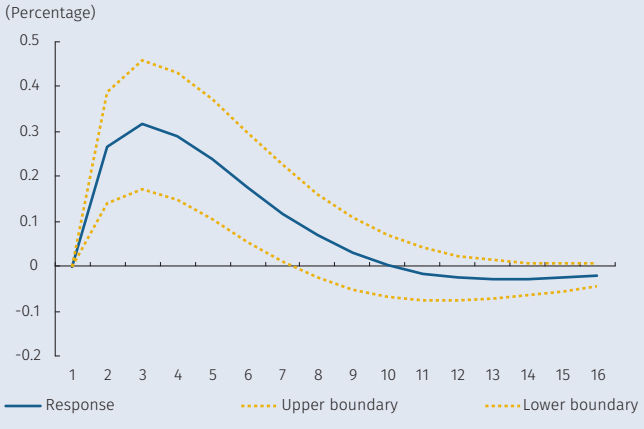
A. Response of-traditional manufacturing exports in the event of a shock to the growth of the trading partners.



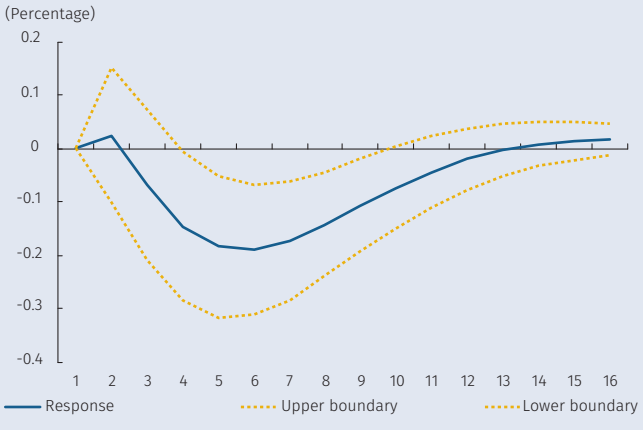
B. Response of traditional manufacturing exports in the event of a shock to the real exchange rate index.



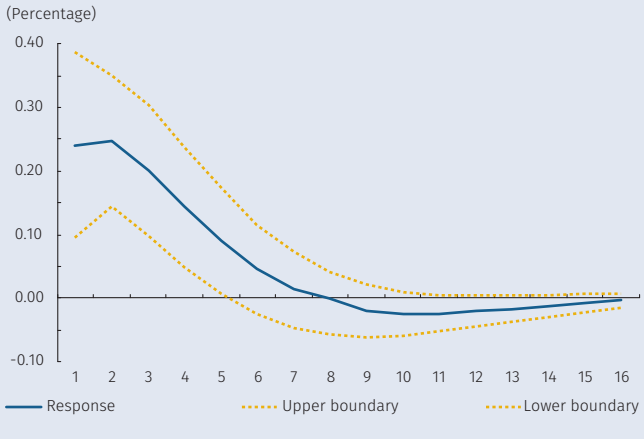
C. Response of non-traditional manufacturing exports in the event of a shock to the growth of the trading partners.



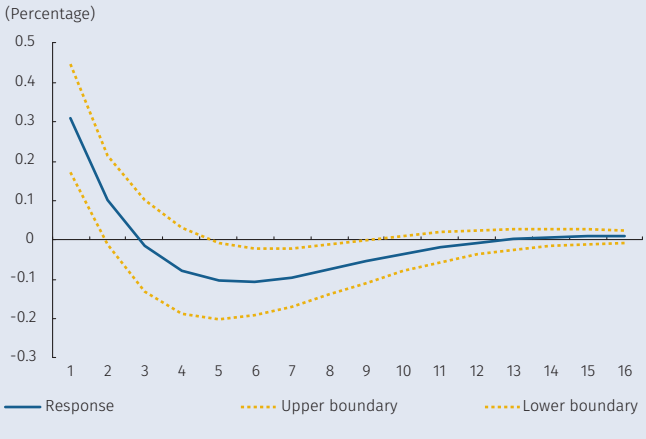
D. Response of non-traditional manufacturing exports in the event of a shock to the real exchange rate index.



E. Response of total manufacturing exports in the event of a shock to the growth of the trading partners.



F. Response of total manufacturing exports in the event of a shock to the real exchange rate index.



Source: authors' calculations.