

Box 1: Negative Currency Mismatch of Colombia's Real Sector in 2021

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1. Introduction

In an increasingly globalized world, it is common for companies, governments, and households to make transactions in currencies other than those of their own economy. This type of capital movement makes it possible, for example, to increase current spending, finance capital expansion projects, and even restructure the financial assets and liabilities of the various economic agents. However, when the difference between assets and liabilities in foreign currency widens, a phenomenon known as currency mismatch which can be positive if these assets are greater than the liabilities and negative in the opposite case, the dynamics of the exchange rate may generate substantial changes in the balance sheets of real sector companies and, in turn, increase the economy's foreign vulnerability through investment, growth, liquidity, and capital adequacy.

In view of the above, different papers study the effect of the currency mismatch on different economic variables. Calvo, Izquierdo, and Mejía (2004) find that the presence of a recurring current account deficit and a high dollarization of liabilities increases the probability of exchange rate and economic crises. Along the same lines, Geczy, Minton, and Schrand (1997), Céspedes, Chang, and Velasco (2000), Allayanis and Ofeck (2001), and Cowan et al. (2005) conclude that when companies' liabilities are dollarized, a real depreciation has a detrimental effect on equity and results in a contraction of investment. In the case of Colombia, Restrepo, Niño, and Montes (2014) as well as Barajas et al. (2017) found that a depreciation of the real exchange rate is associated with a reduction in the rate of investment in fixed assets of those companies that have more than half of their liabilities in foreign currency.

As described above, the implications of a negative currency mismatch, i.e., liabilities in foreign currency (f/c) are greater than assets in f/c for both companies and the economy as a whole, imply that monitoring it, studying its determinants, and its measurement and impact are of vital importance for economic policy makers. In order to classify this phenomenon and have an overview of the private and public real sector companies that are affected by it, the exercise in this box first describes the sources of information and the methodology used to calculate the negative currency mismatch and, subsequently, the description of the recent trends of this phenomenon.

The second stage of this analytical exercise involves quantifying the impact of the negative currency mismatch on companies' balance sheets and the risk they could transmit to the financial sector. In order to complete this step, it is necessary to incorporate the financial statements up to 2021, information which, at the time of writing, is not available, and will therefore be presented in the next *Financial Stability Report*.

2. Methodology for calculating the mismatch

As established in the first part of this document, following the Restrepo, Niño, and Montes (2014) definition, the currency mismatch is calculated as the difference between assets and liabilities in foreign currency:

$$Dc_{i,t}(\$US) = Ame_{i,t} - Pme_{i,t}$$

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Where $Ame_{i,t}$ are the foreign currency assets of company i in period t (deposits, loans, portfolio investments, and *forwards* when the net position is long) and $Pme_{i,t}$ are the total foreign currency liabilities (foreign debt, foreign currency debt with local banks, commercial loans, and *forwards* when the net position is short). However, since the literature mainly assesses the impact of depreciation on companies' balance sheets and income, this paper focuses on the analysis of the negative currency mismatch, i.e., when the following

$$Pme > Ame$$

For this test, the data source used is the reports of the foreign exchange declarations received by the Department of International Exchanges and Payments (DCIP in Spanish) of *Banco de la República*, where both asset and liability transactions in f/c are identified, namely: deposits, foreign debt, foreign currency debt with local banks, active loans, portfolio investment, and net position of *forwards*.

In order to provide a more exhaustive description of real sector companies with a negative mismatch, the exchange rate data are supplemented with company-level information on exports of goods from the National Bureau of Statistics (DANE in Spanish) and on imports from the National Revenue and Customs Bureau (DIAN in Spanish). Finally, for public sector companies, the reports made by these companies to the Ministry of the Treasury and Public Credit are used in addition to all of the above sources.

3. Results of negative currency mismatches

3.1. Real Colombian private sector companies

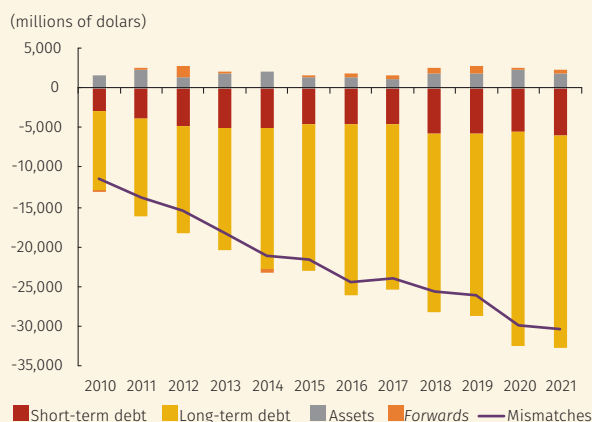
The results of the negative mismatch of private companies in the Colombian real sector are described below. This analysis does not include companies in the financial sector, neither depository (banks) nor non-depository (other financial companies). It also excludes some companies that have financial leasing liabilities because they are secured by a real asset (capital asset) of the same value. Including the latter could bias the foreign exchange risk analysis.

In the last ten years, the negative currency mismatch measured in dollars has shown a rising trend (more negative mismatch). This value is expressed in nominal terms and without scaling to some measurement of company size. This growing negative mismatch can be explained by the growth in economic activity, which means that companies require more working capital and have greater financing needs to make productive investments. Given the above, in addition to the greater ability of Colombian companies to get access to international financial markets, their foreign currency debt has been rising but their foreign currency assets have not been increasing to the same extent.

In 2021, 8,243 Colombian companies were estimated to have had USD 30 billion (b) in negative currency mismatches (Graph B1.1). This figure rose USD 619 millions (m) with respect to 2020 when 8,065 companies accumulated a negative mismatch of USD 29.78 b. 10% of the companies account for about 90% of the value of the negative mismatch (Graph B1.2). This characteristic of high concentration is recurring throughout the various years of the study.

Based on component, this annual increase (2021 vs. 2020) in the negative mismatch is mainly the result of the increase in short-term debt (USD 446 m) and the reduction in foreign currency financial

Graph B1.1
Recent Developments and Overview of Negative Exchange Rate Mismatches



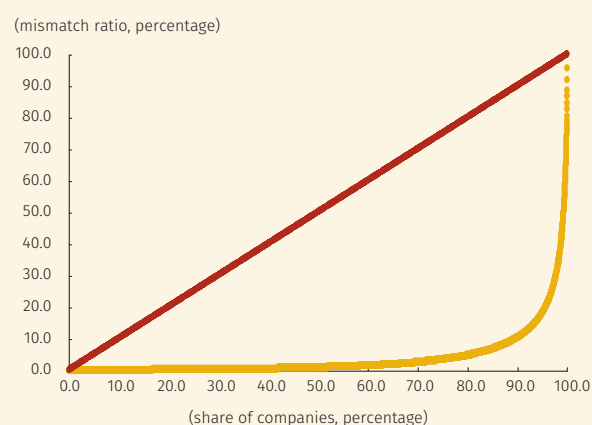
Source: Banco de la República, DANE, DIAN, MHCP, calculations by Banco de la República.

Table B1.1
Negative Currency Mismatch by Economic Sector

Economic Sector	Negative mismatch (millions of dollars)	Negative mismatch share (percentage)	Percentage of companies with FDI (percentage)
Transportation, Storage, and Communications	6,699	22.0	4.9
Manufacturing Industry	4,410	14.5	8.4
Commerce, hotels, and restaurants	3,491	11.5	4.4
Mining and Quarrying	2,957	9.7	23.3
Remaining sectors	12,843	42.2	4.9

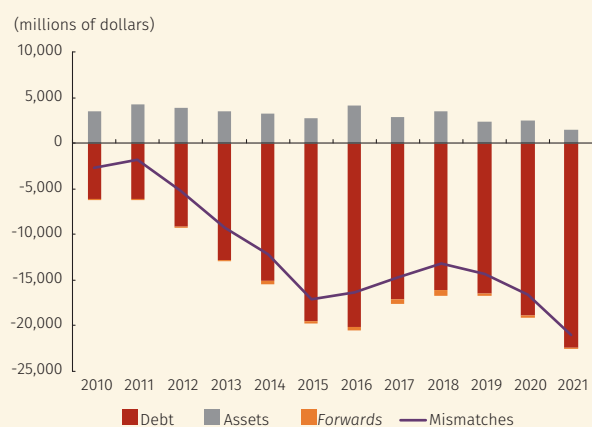
Source: Author's calculations based on the sources described in number 2.

Graph B1.2
Lorenz Curve Negative Currency Mismatch Real Private Sector Companies



Source: Banco de la República, DANE, DIAN, MHCP, calculations by Banco de la República.

Graph B1.3
Negative Currency Mismatch for Public Sector Companies



Source: Banco de la República, DANE, DIAN, MHCP, calculations by Banco de la República.

assets¹ (USD 397 m) that are partially offset by lower long-term debt (USD 117 m) and the higher net forward position² (USD 105 m).

The foreign currency debt that is part of the negative mismatch these companies have can be classified into three groups based on the type of lender. Fifty-five percent of this debt corresponds to what has been contracted between companies with a direct investment link.³ In terms of risk, this debt implies a lower level of vulnerability since there is greater flexibility in the financial conditions. Secondly, there is the debt with foreign financial institutions (non-resident banks of the Colombian economy) that totals 38%. Last of all, 7.0% of this balance has Colombian banks as counterparties.

When the negative mismatch is distributed by economic sector, transportation, storage, and communications with 22% of the total are in first place (Table B1.1). This sector includes port and airport operating companies as well as mobile telecommunications companies. The manufacturing industry sector is in second place with 15%. The main companies in this group are producers of construction materials and food and beverages. Third is the trade, hotels, and restaurants sector with 11% of the total value of the negative mismatch. In this sector, large supermarkets and retailers of imported products stand out. The mining and quarrying sector is in fourth place with 10%, and the main companies are engaged in the extraction of coal, gold, oil, and natural gas. Companies operating in the listed sectors accounted for 58% of the total value of the negative exchange rate mismatch in 2021.

Companies in the transportation, storage, and communications sector have very little export and import activity, so this activity is mostly non-tradable, and this makes the risk associated with their mismatch level higher since they do not have possible natural hedges. In spite of the above, these companies have a high degree of power and a high market share in their respective markets. This allows them to pass on the higher costs associated with a depreciation of the peso to their consumers. Furthermore, due to their link to international trade, transportation companies have a high percentage of their revenue denominated in dollars. Companies in the other three sectors have a high participation in export and import markets, either directly (manufacturing industry and commerce) or through trading companies (mining and quarrying).

3.2 Public sector Colombian companies

In 2021, the negative mismatch of public sector companies, which total sixteen corporations, amounted to USD 21.1 b, 98% of which is concentrated in three conglomerates belonging to the mining-energy and electricity, gas, and water supply sectors. The companies that account for the mismatch are actively involved in the export of goods, and therefore have natural hedges. These companies generally have significant direct investments abroad, particularly in Central and South America, and have a high market share in their respective markets. This allows them to pass on the higher costs associated with a depreciation of the peso to their consumers.

With respect to 2020, the increase in the mismatch was 28% (USD 4.44 b), most of which was due to the indebtedness incurred by these companies to finance investments in the electricity sector.

1 Loan assets, bonds and deposits.

2 Purchase minus sale.

3 The lender is the parent company or subsidiary of the debtor company.

Regarding the description of foreign currency debt, the maturity for which it is mainly contracted is greater than one year (99%). Of these instruments, 63% correspond to bonds issued in international markets, 27% to foreign commercial banks, and the remaining 10% correspond to obligations with bilateral and multilateral banks. In terms of foreign exchange earnings, net exports of public sector companies account for about half of the amount of their negative foreign exchange mismatch.

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