Box 3: A Description of the Foreign Exchange Risk of Real Sector Firms in Colombia in 2021

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Introduction

The existence of an exchange rate mismatch can increase the economy's external vulnerability through the investment, growth, liquidity, and capital adequacy of the firms subject to this phenomenon. In Box 1 of the Financial Stability Report for the first half of 2022, an overview of the situation of negative currency mismatches of Colombian companies was presented. This is the second part of the exercise, which estimates the level of risk faced by Colombian firms based on their balance sheets. The results suggest that the majority of the firms evaluated are classified as medium risk (83%) and have accumulated the highest total mismatch value (64%). A small proportion of companies (5.0%) belong to the group with the highest exchange rate risk, whose total mismatch represents 18% of the total amount of negative mismatch. The companies classified in these two groups belong to economic sectors that produce tradable goods and have a supply of products for export (mining and quarrying, manufacturing, trade) as well as to regulated sectors and those with a market share limited to a few companies (electricity and gas supply and communication).

Thus, this paper first presents the data sources and the methodology used to calculate the risk indicators for companies with negative exchange rate mismatches and availability of accounting information. It then describes the results obtained for the sample of companies and ends with a general conclusion.

Methodology for calculating the mismatch

Box 1 of the Financial Stability Report for the first half of 2022 defines the methodology and data sources for the nominal exchange rate mismatch. The exercise in this box is bases on those calculations. Based on the results of the firms' nominal dollar mismatch and their accounting information, three risk indicators have been calculated which take discrete values from 1 to 3. Those indicators are then synthesized into an overall exchange rate mismatch risk score that classifies the firms into three risk levels. The source of information for balance sheets is the Superintendency of Corporate Affairs. The source of information for foreign trade is the National Bureau of Statistics (DANE) and the National Tax and Customs Agency (DIAN) while the source for foreign equity is *Banco de la República*. The data on flows correspond to the total for 2021 and those on the position as of December 31 of that year.

The dollar value of a company's mismatch does not allow us to interpret the true magnitude of the phenomenon. Therefore, we need to express the mismatch as a proportion of the size of the firm to incorporate the ability to classify and compare the results between different companies. Consequently, three indicators are calculated in this analysis, which means that three levels of risk are determined based on the relative size of the mismatch: low (3), medium (2) and high (1) (Table B3.1). The first indicator corresponds to the level of negative mismatch[1] in dollars as a share of the firm's total assets (Mismatch/Total Assets). This reflects a scale measure of the firm's mismatch level.

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1 The foreign exchange mismatch is defined as the difference between foreign currency (f/c) assets and f/c liabilities. If f/c liabilities are greater than f/c assets, the FX mismatch is defined as "negative" due to the sign in the mathematical operation.

The second indicator is the dollar value of the trade balance (*exports - imports*) as a percentage of the company's operating income (*trade balance/operating income*). The company's trade balance shows how many net dollars it can generate from its economic activity and potentially use to cover its foreign currency obligations. The higher the dollarization of income, the greater the hedge the company has against foreign exchange risk. Conversely, a net importer faces greater risks from these events, and the higher the ratio of net dollar outflows to total operating income, the greater these risks will be.

The third indicator corresponds to the share of foreign capital held by the firm in its total equity. This is based on the premise that an enterprise with more foreign capital share may be better protected against the risk of exchange rate depreciation because its foreign parent company may be able to absorb part of the shock on a consolidated basis through international trade in foreign currencies (see Table B3.1).

Table B3.1[a/]

Risk Group	(a) Negative mismatch/Total assets	(b) Trade balance/ Operating income	(c) Share of Foreign Capital
1	x ≥ 60%	x ≤ −50%	x ≤ 20%
2	60% ≥ x ≥ 20%	0% ≥ x ≥ -50%	60% ≥ x ≥ 20%
3	x ≤ 20%	x ≥ 0%	x ≥ 60%

a/ Trade balance = exports - imports
Source: Prepared by authors

Once the three indicators have been calculated and the individual scores (1 to 3) have been determined for each, a simple average of the scores is calculated to obtain the overall indicator and its corresponding risk level. If the calculated average is greater than 2.5, the company is considered low risk or risk group 3; if this value is between 1.5 and 2.5, the company is considered medium risk or risk group 2; finally, if the value is less than or equal to 1.5, the company is considered high risk or risk group 1 (see Table B3.2).

Rating results for negative foreign exchange mismatch risk

Real private sector companies in Colombia

This section presents the implications of the risk indicators calculated on the relevance of the negative exchange rate mismatch of private companies in Colombia. 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. The inclusion of the latter could distort the foreign exchange risk analysis.

It is estimated that in 2021 8,231 Colombian companies had negative exchange rate mismatches[2] of USD 29.804 billion (USD b). Of the total number of companies, balance sheet information is available for 2,631 (32%), and these account for 62% (USD 18.603 b) of the total negative exchange rate mismatch. These percentages are similar to those observed in recent years (see Graph B3.1). The indicators presented here are calculated with the information for this sample of companies and classified according to their level of risk.

The results of the components (see Graph B3.2) indicate that the main risk factors for the companies are the ratio of mismatch to total assets and the firm´s foreign capital share. Although most of the firms are classified in the lowest risk level on the basis of the first indicator, the sum value of their mismatches is significantly lower in relation to the companies with a higher risk level on the basis of this indicator. With respect to the share of foreign capital, on the other hand, most of the companies are classified in the highest risk level and their level of mismatch is slightly higher than that of the other two risk groups (levels 2 and

2 The values vary with respect to the results presented in the first half of the year because of the updating of the information sources.

Table B3.2
Main Results for Fiscal Year

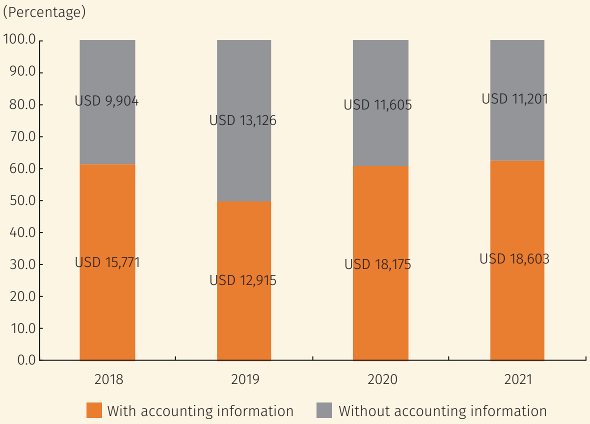
Risk Group	Total indicator
1	y <= 1,5
2	1,5 < y <= 2,5
3	y > 2,5

$$y = \frac{a+b+c}{3}$$

Source: Prepared by authors

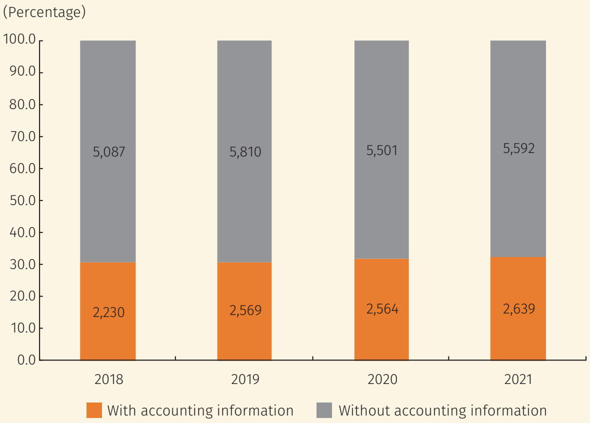
Graph B3.1
Negative Exchange Rate Mismatch: accounting information

A. Negative Exchange Rate Mismatch



Note: Figures in millions.

B. Number of Companies with Negative Exchange Rate Mismatches



Source: Prepared by authors Based on the sources described in the methodology.

3), where a proportionally smaller number of companies are classified. Moreover, the commercial balance indicator shows that 40% of the number of companies and the value of the mismatch are classified in the lowest risk level. This suggests that some companies, although exposed to higher risk in terms of the first two indicators, may be hedged by their low exposure to foreign exchange fluctuations.

The three components are used to construct the overall risk indicator, which averages the resulting ratings. Level 1 is interpreted as the highest risk, while level 3 is the lowest. The results suggest (see Graph B3.2) that, both in terms of the level of mismatch and the number of companies, the main classification obtained for the companies analyzed is the medium level. Companies with high exposure, which could end up having liquidity or capital adequacy problems that could jeopardize their stability in the event of exchange rate depreciations, represent a low percentage both in terms of the number of companies and the amount of mismatches, a ratio that is very similar to the level of risk defined as low.

Since levels 1 and 2 could be at risk in situations of economic volatility, these companies are classified by economic sector for further analysis. The top three sectors, accounting for 61% of the companies and 52% of the mismatch value, are the production of tradable goods and the supply of goods for export (see Graph B3.3). This suggests that these firms have some degree of hedging against depreciation events due to their ability to earn income in dollars. This is particularly evident in mining and quarrying, where a large proportion of output is destined for export and is concentrated in a limited number of companies.

Public sector Colombian companies

In 2021, the negative mismatch of public sector companies, a total sixteen corporations, amounted to USD 21.104 billion, of which 98% is accounted for by three conglomerates belonging to the mining-energy and electricity, gas, and water supply sectors. Those companies are actively involved in the export of goods and therefore have natural hedges. In general, these companies have significant direct investments abroad, especially 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 (see Graph B3.3 in the *Financial Stability Report* for the first half of 2022).

With respect to 2020, the increase in the mismatch is 28% (USD 4.443 b), mostly due to the debt incurred by these companies to finance investments in the electricity sector.

Scaling the mismatch to total assets in 2021, it reaches 23%, 4 pp more than in the previous year (Graph B3.4).

As for the risk indicator, the sixteen public companies analyzed showed a uniform performance and were in the lowest risk group.[3] The same can be said when the information is grouped by business conglomerates. The low level of risk is due to the fact that they do not have foreign trade deficits or have a mismatch relative to assets of less than 20%.

3 The results are not reported in this section, which focuses on the private sector.

Graph B3.2

A. Mismatch/Total Assets

	Number of companies	Mismatch (dollars)
3	1,877	4,456
2	529	8,195
1	233	5,952

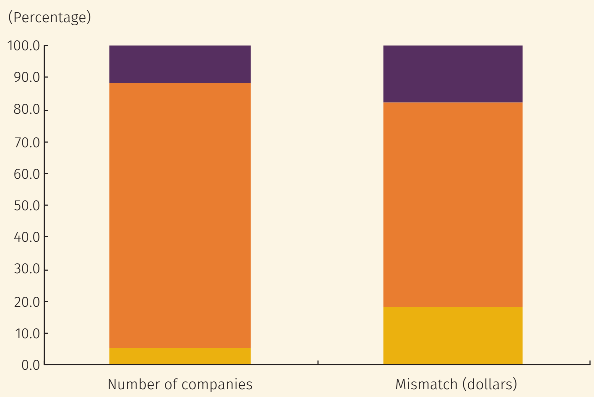
C. Share of Foreign Capital

	Number of companies	Mismatch (dollars)
3	468	6,907
2	91	1,188
1	2,080	10,508

B. Balance of Trade/Operating Income

	Number of companies	Mismatch (dollars)
3	1,054	7,498
2	1,088	8,591
1	497	2,514

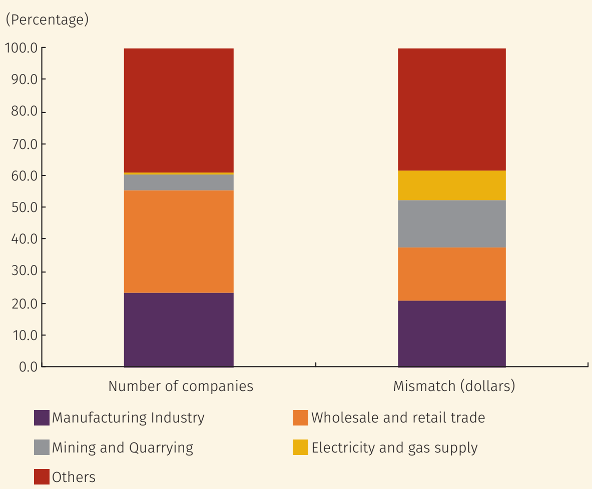
D. Total indicator



	Number of companies	Mismatch (dollars)
3	308	3,339
2	2,194	11,887
1	137	3,378

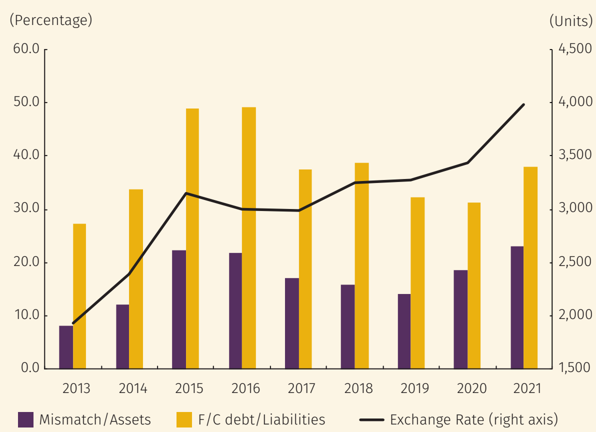
Source: Prepared by authors Based on the sources and calculations described in the methodology.

Graph B3.3
Classification by Economic Sector Companies in Risk Groups 1 and 2



Source: Prepared by authors Based on the sources described in the methodology.

Graph B3.4



Source: Prepared by authors Based on the sources described in the methodology.

Conclusion:

The results indicate that the majority of the evaluated firms are classified as medium risk and accumulate the highest total mismatch value. A small portion falls into the group with the highest foreign exchange risk, with a total mismatch that represents 18% of the total amount of negative mismatch. These companies (both groups) belong to economic sectors that produce tradable goods and have a supply of export products (mining and quarrying, manufacturing, trade) as well as to regulated sectors with a market share concentrated in a limited number of companies (electricity and gas supply, and communications). Given the current exchange rate situation, some companies may have suffered a deterioration in these indicators as their vulnerability has increased. Finally, the companies that account for the public sector mismatch are in the lowest risk group, as they have natural hedges, high participation in their respective markets, and low levels of mismatch relative to assets.