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THE ANATOMY OF TERMS OF TRADE BOOMS IN LAC

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THE ANATOMY OF TERMS OF TRADE BOOMS IN LAC[1]

The evolution of terms of trade has been an important driver of economic activity in the region. The literature has studied the impact of terms of trade in different macroeconomic variables. In this paper we take a look at how terms of trade cycles have been reflected in exports, imports and as result, the current account. We also look at how FDI inflows has responded to terms of trade cycles. In the aftermath of the end of the commodity super-cycle, the region's economic performance going forward will be partly dependent on the evolution of investment. On a second section, we quantify the headwind that that tariff barriers to capital goods imports have on investment.

A. Introduction

1. The strong decline in some commodity prices in 2014 has brought to the surface the interconnection of terms of trade and macroeconomic performance across the globe. Recent literature, for instance, has highlighted the connection between terms of trade cycles and actual and potential GDP. Celasun et al (2015) for instance, finds that for commodity exporters the impact on potential GDP is about half of the impact on actual GDP and that, a key mechanism behind this result is the response of investment to terms of trade cycles.

2. Recent studies for LAC highlight the role of policies in shaping the impact of terms of trade cycles. Adler and Sosa (2014) find that differences in policies in the run-up to sharp terms of trade drops are a key determinant of economic performance. They find that limited exchange rate flexibility, external positions and loose fiscal policy for example tend to amplify the drag of terms of trade busts on domestic output. On average, the authors find that the current account balance improved when terms of trade strengthened in the run up of a bust. In this chapter, we look at the latest data and indirectly revisit this finding.

3. In LAC there is a strong correlation between trade and financial flows. Part due to foreign investment into the commodity sector, FDI inflows into LAC tripled between 2003 and 2013 at the same time total trade doubled. Motivated by this fact, in this note we also look at connection of FDI and trend by studying the comovement of cyclical variation of FDI inflows, exports, imports and terms of trade.

4. The main goal of this paper is to revisit the latest data to provide stylized facts and statistical results which could subsequently be used to shed light on key mechanism behind the observed macroeconomic performance. Of particular interest is what has been the evolution

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of export volumes in response to terms of trade cycles in particular if countries have enjoyed a "double" dividend of not only higher relative price of its exports but also of larger volumes of exports regardless of potential Dutch-disease-type of headwind arising from currency appreciation. Similarly, this note attempts to quantify the cyclical response of imports to terms of trade cycles. Terms of trade booms, for instance, could be reflected as increase in national income (see Adler and Magud 2013) which would tend to increase imports; also, in some countries the expansion of the commodity sector in response to favorable global prices was accompanied by surges of investment-related imports. In Colombia for instance, the simultaneous worsening of the current account balance with improving terms of trade (oil prices in particular) has been anecdotally linked to oil-sector related imports. Albeit this note won't tackle individual industries or type of imports, it hopes to provide some statistical background to the general issue of comovement of imports, exports and terms of trade.

5. This chapter relates to the exiting literature of S-Curve dynamics of trade and terms of trade. Backus, Kehoe and Kydland (1992) is a seminal paper describing on what theoretical conditions one could explain the negative correlation between trade balance and terms of trade observed in some advanced countries. They show the central role of the intertemporal decision of investment in generating the result when their model economy is faced with productivity shocks. In the present chapter we take a purely statistical approach at looking at the data without taking a position on the type of model or shocks behind the results. As mentioned in the concluding remarks, this chapter aims to provide input to more structural analysis as in Backus, Kehoe and Kydland (1992) suitable to provide models tailored to particular characteristics of LAC economies.

B. Data and Cycle Measurement

6. The data used in this analysis covers countries in Latin America and the Caribbean (LAC). The main source is the World Economic Outlook (WEO) database, and is subject to its data availability. 32 LAC countries are covered in the sample (25 for FDI data which is of more limited availability). The main variables used in the study are annual exports and imports *volumes*, goods terms of trade, current account balance and FDI inflows. The main time period of interest are the 1990s and 2000-2013; however whenever available data for 1970-2021 was used to estimate the cyclical position of each series (see below).

7. Statistical filters were used to measures cyclical properties of each variable. In the literature there are different definitions and methodologies used to gauge terms of trade booms/busts. For instance, Adler, Magud (2013), require that a boom includes a particular (15 percent) increase from start to peak (among other conditions). Adler and Sosa (2013) instead used a definition so that a terms of trade bust involves a drop of 3 percent of GDP of GDP-weighted terms of trade. In contrast, in this paper we follow a rather off-the-shelf definition by measuring the cyclical component of series by removing the Hodrick-Prescott (HP) trend. The end-of sample bias of such filter is among its weakness but one that would be ameliorated by the fact that the main

focus on this paper is the period ending in 2013 while the sample used ends until 2021[2]. The removal of a stochastic trend as embedded in the HP filter calculation could help adjust (or control for) in a *reduced form* low frequency/secular changes in terms of trade including the growing importance of China and its implication for global commodity markets. This technique is somewhat related to the use of regime-switching identification such as in Adler, Magud, Werner (2016) but yet remains a reduced form option which does not help identify a particular underlying driver of such stochastic trend.

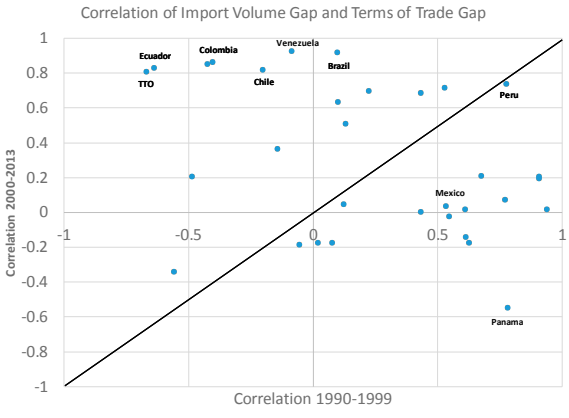
C. Results

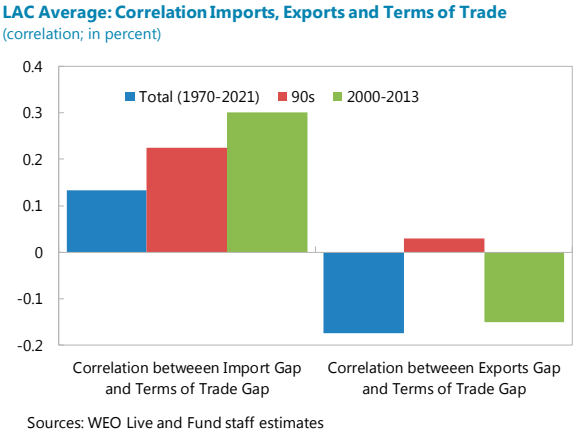
8. In the following results, the main focus is on how the gap between each series and its trend, correlate to the corresponding gap in terms of trade. For instance, this notes aimed to identify if moments when terms of trade are particularly strong or above trend (weak or below trend) have coincided when imports volumes are strong or above trend (weak or below trend). Similarly, between exports volumes, imports volumes, the current account or FDI inflows. Except for the current account, the correlation is computed against the percent gap between a series and its HP-trend; yet for the current account this note focus on the level (nominal) difference vis-à-vis the trend, as to avoid the algebraic problem of dealing with a denominator that can switch signs (positive or negative).

9. Region averages might be masking experience of largest countries. Something important to remark is that in the region averages below, this note uses simple averages so that each country's size (e.g. GDP, total trade, etc.) will not increase such country's weight on the results. While this strategy should help disentangle how pervasive where some phenomena observed in isolated countries, it could also contrast with other results in the literature in which large countries drive the regional average by their sheer size.

Correlation of Imports and Exports with Terms of Trade

10. We find that the cyclical position of import volumes has had a positive but mild correlation with terms of trade; slightly more so in the last decade. The correlation between the





Sources: WEO Live and Fund staff estimates

[2] Part of the analysis were redone using the Baxter-King filter which rendered very similar results.

import volume gap and the terms of trade gap was on average about 0.12 percent, but it was double that magnitude during 2000-2013. Behind this average there is significant variation across LAC members. In the chart below, countries like Chile, Colombia, Ecuador, Venezuela switched from having a negative correlation between import volume gap had positive correlation larger than 0.8 during the last decade; while in Mexico the correlation was near zero and for Panama was negative.

11. The cyclical position of exports has on average correlated negatively with terms of trade. The correlation (about 0.12) is however only mildly negative and will seem consistent with the traditional Dutch-disease phenomena in which exports tend to suffer the headwinds of the currency appreciation that often accompanies term of trade improvements. It stands out that such negative correlation is driven by the last decade, as in the 1990s the correlation was near-zero (marginally positive).

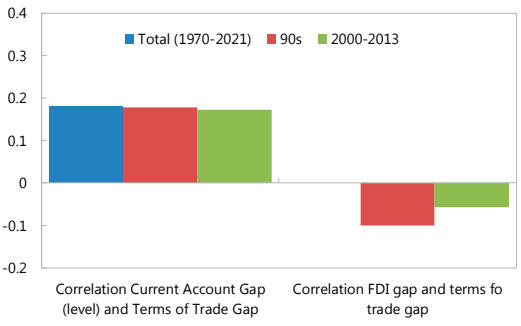
Current Account, FDI and Terms of Trade

12. Despite the positive response of imports and negative of exports, the current account tends to cyclically improve when terms of trade do so too. In short, in the previous section this notes showed that when terms of trade have been above trend, there is also the tendency for import volumes and export volumes to be above trend and below trend, respectively. Data suggest that the current account cyclical position has improved at times the terms of trade do so; in a way, suggesting that the price effect of the terms of trade boom was not offset by the reaction of imports and exports volumes moving against it.

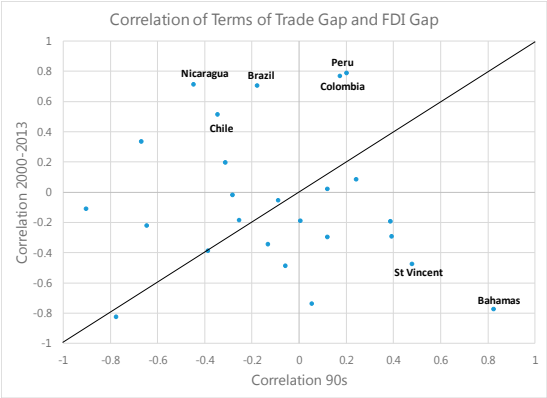
13. An important caveat to note is that the above positive correlation between the current account balance and terms of trade is not present in some of the largest economies. For instance, for Brazil, Colombia, and Uruguay the correlation between the cyclical position of the current account balance and terms of trade range between -0.22 (Peru) and -0.84 (Brazil). Hence, the analysis in this chapter would also be consistent with other findings of a negative correlation of GDP-weighted measures; yet it also shows there is a group of countries in which the current account improved when terms of trade improved.

14. Despite evidence of strong FDI inflows in some commodity exporters, FDI inflows on average have tended to move in opposite direction as the cycle of terms of trade. As a caveat, compared to the previous estimates, for FDI the sample is somewhat more limited. A scatter plot

LAC Average: Correlation CA balance, FDI and Terms of Trade
(correlation; in percent)



Sources: WEO Live and Fund staff estimates



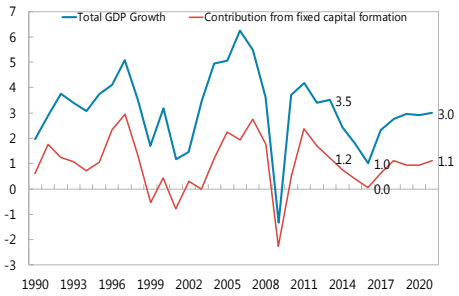
shows this average result masks significant variation across countries; in particular, it hides the fact that for some large countries in the sample (Brazil, Colombia, Chile, Peru) the last decade has been one in which FDI inflows have tended to be above trend.

15. This chapter has presented a simple statistical analysis that on average suggest that on LAC countries terms of trade booms have coincided with strong import volumes and relatively weak export volumes. This type of analysis can be extended in many directions, some of which could help identify potential mechanisms behind the observed behavior. For instance, it stands to reason that the reaction to goods terms of trade could depend on the nature and concentration of exports (see chapter on Composition of Trade in LAC). The existence of trade barriers (or trade agreements) could naturally shape the responds of exports and imports (see chapter The Impact of Trade Agreements in LAC using Synthetic Control Method for a related study). Exchange rate flexibility and overall business competitiveness could affect the reaction of FDI to terms of trade shocks.

D. A Detour to Take a Deeper Look at Investment

16. Investment remains an important growth driver in LAC. Besides its the connection with the recent evolution of the sheer size and financing of the current account deficit in some countries (through imports and FDI), investment has also driven about one half of the growth slowdown since 2013. Further, the expected strengthening of investment will drive about half of the additional growth between 2017 and 2021.

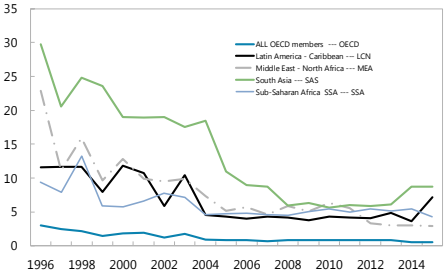
LAC: Growth contribution from Investment
(in percentage points of GDP growth; simple average)



Sources: WEO and Fund staff estimates

17. Despite an overall reduction in tariffs over the last decades, capital goods tariffs remain sizeable in some countries in the region. The weighted average of tariffs on capital goods reached 7.2 percent for LAC in 2015, which places the region above OECD members, and the middle-east and north Africa. It is likely that tariffs barriers could amplify the drag from relatively weak competitiveness such as the ones identified in the World Bank's doing business survey.

Capital goods tariffs
(trade weighted; in percent)



Sources: WITS and Fund staff estimates

18. In this section, we focus on the private component of investment and aim to quantify the quantitative importance of existing tariff barriers for capital goods on the outlook for investment. Based on the high correlation between capital goods imports and some measures of private investment, trade barriers could be playing an important role.

Correlation between Capital Goods Imports and Investment

(correlation of YoY growth rates; 2007Q1-2016Q1 in percent)

Brazil	0.83
Chile 1/	0.98
Colombia 1/	0.82
Dominican Republic	0.37
Ecuador	0.83
Mexico	0.88
Peru	0.81

1/ Investment in machinery and investment

19. This section relates to recent cross-country studies on private sector investment determinants. For instance, Beidas-Strom, Magud, and Sosa (2015) decompose private sector investment at the firm level among emerging markets and identify lower commodity prices and expected profitability as key drivers of the investment slowdown in LAC since 2011. Interestingly they also discuss that in some countries there seems to be other individual factors keeping investment subdued. In the paragraphs below, we revisit some of this forces by regressing private sector investment on terms of trade, expected GDP growth, tariffs and other factors.

20. Through regression analysis, we explore key determinants of private sector investment across LAC since 1990. In contrast with the study by Beidas-Strom, Magud, and Sosa (2015) we use national accounts private sector investment as reported WEO, across LAC countries and include as potential determinants terms of trade, inflation, 5-year ahead GDP growth forecast, capital goods tariffs, intermediate goods tariffs and country fixed effects. To try to ease the problem of simultaneity and better capture the information available at the time of investment decision, one period lags are used for terms of trade, inflation, and tariffs.

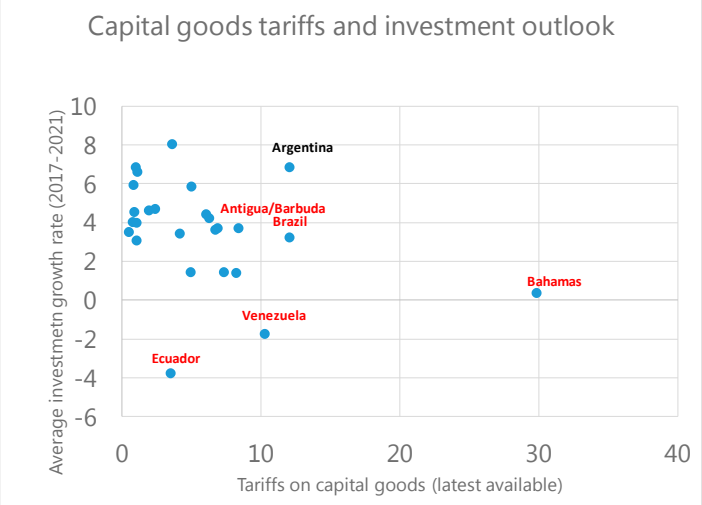
Private investment regression

dependent variable: growth rate of private investment
sample: LAC countries, 1990-2015

	Coefficient	t-value	P
Terms of Trade	-0.00108	-3.44	0.001
Inflation	0.04059	0.93	0.355
Capital goods tariffs	-2.24467	-1.76	0.080
Intermediate goods tariffs	2.08641	1.44	0.150
Consumer goods tariffs	-0.17968	-0.25	0.803
Growth expectation (5y ahead)	0.00107	0.16	0.871

Source: Author's calculation bases on data from WEO and WITS.

21. Regression results suggests tariffs on capital goods might be a quantitatively relevant headwind for investment. Only two variables were identified as statistically significant: terms of trade and capital goods tariffs. At the same time, the negative sign on terms of trade is somewhat puzzling and further work could explore alternative specifications such as using market expectations for terms of trade instead of actual realized values. On the other hand, the coefficient for capital goods tariffs implies that reducing by half the tariffs on capital goods from its last value in the sample (5.5 percent) would lead to private investment growth to increase by about 6 percentage points.



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