Fool's Gold: On the Impact of Venezuelan Devaluations in Multinational Stock Prices

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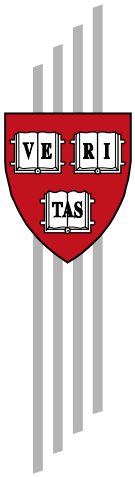

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Abstract

This paper documents negative cumulative abnormal returns (CARs) to five exchange rate devaluations in Venezuela within the context of stiff exchange controls and large black-market premiums, using daily stock prices for 110 multinationals with Venezuelan subsidiaries. The results suggest evidence of statistically and economically significant negative CARs of up to 2.07% over the ten-day event window. We find consistent results using synthetic controls to causally infer the effect of each devaluation on the stock prices of global firms active in the country at the time of the event. Our results are at odds with the predicaments of the efficient market hypothesis stating that predictable devaluations should not impact stock prices of large multinational companies on the day of the event, and even less so when they happen in small countries. We interpret these results as suggestive indication of market inefficiencies in the process of asset pricing.

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JEL classification: F31, G12, G14, G15.
Keywords: devaluations, stock prices, market efficiency, event study, synthetic controls.

Introduction

Under the efficient market hypothesis (EMH), investors and financial analysts are expected to price any present or foreseeable event that affects a company's value. Yet, there are instances where loss aversion can lead investors to behave in myopic ways. While many macroeconomic events might be considered unforeseeable shocks, there are others of a more predictable nature that we can reasonably expect to be priced into the valuation of companies. In this paper, we study the stock performance of 110 Multinational Corporations (MNCs) with subsidiaries in Venezuela, in response to several arguably foreseeable episodes of currency devaluation occurred within the context of an exchange control. We find significant and relevant negative cumulative abnormal returns (CARs) on the stock prices of these MNCs on various devaluations. Given the existence of a parallel exchange rate market running at large premiums over the official fixed rate, and the fact that most of the affected MNCs were not even eligible to purchase dollars at the official rates, we contend that these abnormal returns provide suggestive evidence of market inefficiency.

We start by putting together an event study covering a sample of 110 companies trading at the NYSE and NASDAQ markets, with active subsidiaries in Venezuela between 2010 and 2014. We find that stock prices of this group of MNCs were on average negatively impacted by three Venezuelan devaluations spreading over a

period of twenty-five months, in a magnitude that is both statistically and economically. We find maximum significant negative CARs ranging between 1.36% to 1.74%, depending on the event. Our results remain strong when using different specifications, including different size of estimation and event windows.

To assure our results are not driven by unobservable factors, we perform an analysis based on the synthetic control methodology (Abadie and Gardeazabal, 2003; Abadie et al., 2010), were we create a synthetic firm –i.e., a counterfactual— for each firm active in Venezuela and compare their stock value over time following each devaluation. Using synthetic controls, we find significant negative CARs on MNCs stock prices in three Venezuelan devaluations, going up to a maximum of 0.83% and 1.24% over the five-day and ten-day event window.

We consider our results to be important for three reasons. First, they are economically highly significant. Based on year-end market capitalization, the maximum negative CARs on stock prices reported on the three events mentioned above are equivalent to an average loss per MNCs that goes from USD 689.1 million (2011) to USD 750.8 million (2014). The cumulative loss of the composite of MNCs operating in Venezuela on each end of that range goes from USD 37.293 billion (2011) to USD 41.295 billion (2014). This is particularly noteworthy in light of the trifling size of the Venezuelan economy, accounting only for 0.3% of the

world's GDP on average over the period studied.[1] Second, our results are suggestive of market inefficiencies, as they are driven by financial statements naively converted at the massively overvalued official exchange rates, despite subsidiaries not having access to dollars at these prices.[2] Most likely, the loss recorded among those firms on the days following the devaluation had de-facto materialized well in advance of these events, as signaled by the continuous upward trend in the black parallel market exchange rate. Third, we find it noteworthy that markets seem to have been consistently "surprised" by a series of devaluations, all of them arguably foreseeable. In fact, the stock prices of MNCs operating in Venezuela exhibited negative and significant CARs in three devaluations spanning over a period longer than three years. That feature is even more extraordinary when considering the fact that – throughout the period – the impact of the Venezuelan devaluations on MNCs was widely reported in the media as pungently affecting American and European companies' earnings and stock prices.[3]

[1] World Economic Outlook of the International Monetary Fund (IMF).
[2] The list of companies eligible to buy dollars at the official fixed exchange rate was public information, as reported in the website of the commission in charge of administering the exchange control (CADIVI, by its initials in Spanish).
[3] *Market Watch*, January 11, 2010: "Venezuela Currency Devaluation Weighs on Avon, Telefonica," *Fierce Telecom*, January 11, 2010: "Telefonica's Stock Drops Amidst Venezuela's Currency Devaluation," *The Sydney Morning Herald*, January 12, 2010: "Venezuela Devaluations: U.S. Companies Face Earnings Hit," *Business News*, February 11, 2013: "Venezuela Devaluation Hits U.S., European Companies," CNBC, February 14, 2013: "Why Venezuela's Devaluation is Biting: Reports Colgate-Palmolive, Halliburton, Avon, and Merck as Taking a Big Hit on Earnings," *The New York Times*, July 8, 2014: "Profits Vanish in Venezuela After Currency Devaluation," *Business News*, February 2, 2015: "U.S. Companies Face Billions in Venezuela Currency Losses, Reuters Analysis Shows," and *CNN Money*, February 11, 2015: "Venezuela is Causing Havoc on U.S. Companies."

Within this context, our contribution to the literature is twofold. First, we present novel results that show that negative CARs following devaluations in the context of a country under stiff exchange controls. These results are in stark contrast with previous studies that have found negative CARs before – not after – devaluations (e.g., Glen 2002; Chue and Cook 2008; Patro, Wald, and Wu 2014) or studies that show positive CARs following devaluations in the currency of the country where they operate driven by exporting firms (He and NG 1998; Gao 2000; Wilson, Saunders and Caprio 2000; Becker, Gelos and Richards 2000; Herrero, Gyntelberg, and Tesei 2008; and Muller and Verschoor 2008). Second, to the extent of our knowledge, our paper is the first to implement the synthetic controls methodology on asset pricing, and more particularly to assess the impacts of devaluations on multinational's stock prices.

The paper is organized as follows. In section 1 we explain the Venezuelan exchange rate system and explore its intricacies. Section 2 describes the data in our sample of MNCs, selection criteria, and provides dates and nature of the events studied. Section 3 uses the event-study methodology to estimate the MNCs' stock price reaction to devaluations affecting their subsidiaries in Venezuela. Section 4 implements the synthetic control methodology to causally infer the existence of cumulative abnormal returns to MNCs stock prices following devaluation events. Our conclusions, the implications of our results, and further research topics are in Section 5.

1. The Venezuelan exchange rate system

In February 2003, the Venezuelan government implemented an exchange control administered by the Central Bank. Although the initial idea was to protect international reserves in the wake of falling oil prices and political turmoil, the control persisted throughout the lengthy oil bonanza registered between 2004 and 2013, and remains in place nowadays. Initially, the system was designed to have a single official fixed-exchange rate that would coexist with a parallel (semi-legal) market rate. Companies had to register at the Commission for the Administration of Foreign Currency (CADIVI)[4] and request access to official dollars for imports of goods and services, payments of foreign debt, or dividend repatriation.

Over the first two years of the exchange control, the official fixed rate was devaluated once a year. From March 2005 to January 2010 the rate was fixed at 2.15 VEB per USD, despite inflation running at a compounded annual growth rate (CAGR) of 18.6%. In 2010 the parallel market was rendered illegal. The fact that devaluation significantly lagged inflation for five years, caused a massive appreciation of the official exchange rate and inflated the profits of MNCs in foreign currency calculated at those rates. The problem is that profits were recorded at the official rates, regardless to whether the company had access to dollars at those prices to repatriate dividends. Indeed, official authorizations issued by CADIVI to

[4] Comisión de Administración de Divisas.

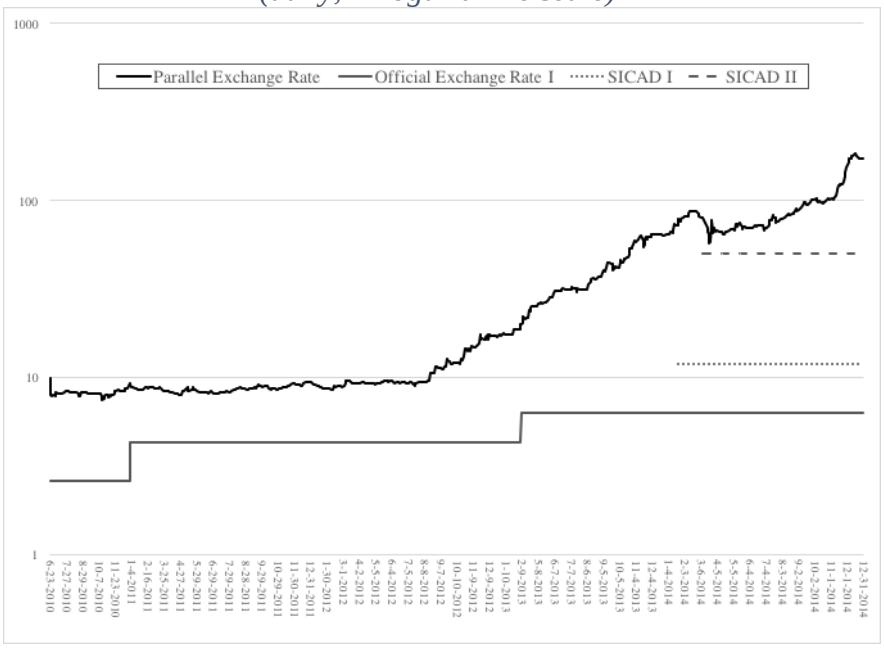
purchase dollars for foreign debt service or dividend repatriation came to a halt in 2008, in the middle of the financial crisis that brought the price of the Venezuelan oil basket from 117.6 (June) to 31.6 USD per barrel (December) of that year. While prices recovered, averaging more than 100 USD per barrel in 2011, 2012, and 2013; authorizations and liquidations for dividend repatriations remained close to zero, at least until the last quarter of 2011, when this information was last publicly available. The process led to a massive overestimation of the assets of MNCs operating in Venezuela, distorting the relative size and importance of their Venezuelan subsidiary.

Between 2010 and 2014 there were five devaluations of the official exchange rate. Reuters reported on February 10th, 2015 that 40 major United States-based companies had substantial exposure to Venezuela and could collectively take billions of dollars in write downs.[5] By then, multiple official exchange rates coexisted with a parallel market, with the ratio between the exchange rate in the latter and the lowest official fixed rate running at a factor of 35.3. Using the ten largest S&P500 companies with operations in Venezuela and switching the calculation of retained earnings in foreign currency from the lowest official fixed-exchange rate to the highest would have resulted in estimated losses close to USD 5.8 billion (McLaughlin, 2015).

[5] *Business News*, February 2, 2015.

Figure 1 illustrates the trajectory of the different official and parallel exchange market rates over 2010-2014 in logarithmic scale. Notice that the parallel exchange market premium over the lowest official fixed-exchange rate went from a factor of 1.9 (January 2010) to a factor of 29.3 (December 2014). In 2014, two additional intermediate official rates were introduced (dotted lines). In total, five devaluations occurred from 2010-2014. We describe these events in the next section.

Figure 1. Venezuela: Multiple exchange rate system
(daily, in logarithmic scale)



Source: Venezuelan Central Bank, Dollar Today.

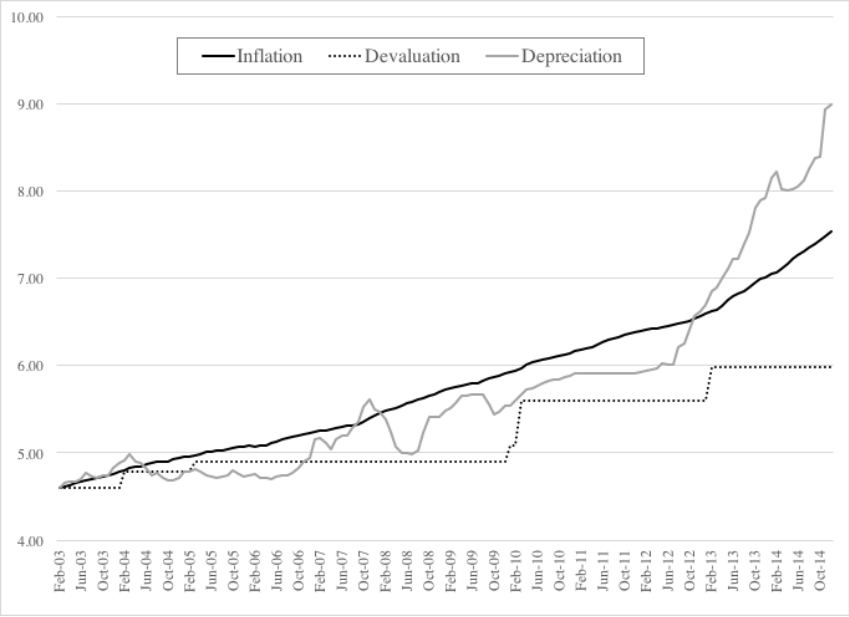
It is important to stress – as evidenced in Figure 1 – that devaluations did not affect the trend of the parallel exchange rate. The parallel market would only react to changes in the fundamentals, including an increased supply of dollars at the official

fixed-exchange rates, changes in the legal restrictions on parallel exchange trading, or changes in expected inflation.

The official exchange rate significantly lagged inflation. Figure 2 represents the evolution of inflation, devaluation, and depreciation from the beginning of the exchange control until the end of 2014.[6] Note that we use a logarithmic scale to depict the accelerated evolution of these rates. To put it another way, from February 2003 to December 2014, the cumulative inflation was 1,776%, equivalent to a CAGR of 28.1%. Over that same period, the official fixed-exchange rate increased 294% (CAGR 12.3%), and the parallel exchange market rate 7,899% (CAGR 44.8%). The large differences between these three resulted in enormous distortions. When profits and a large portion of assets tends to grow with inflation and the official fixed-exchange rate lags inflation in the magnitudes reported here, the value of profits and assets in foreign currency as calculated at the official fixed – massively overvalued rate – grows exponentially.

[6] Given that in some periods there was more than one official fixed-exchange rate, in Figure 2 we take devaluations as announcements affecting the lowest official exchange rate.

Figure 2. Venezuela: Inflation, devaluation and depreciation (February 2003=100, in logs)



Source: Venezuelan Central Bank, Dollar Today.

To illustrate this effect, consider a hypothetical MNC that produced yearly profits of 100 VEB in 2002. That year, no exchange control existed. Thus, the company could have exchanged those profits for 84 USD at the prevailing rate and repatriate them home. Imagine now that the profits of that company parsimoniously grow with inflation every year. By 2014, those 100 VEB in profits would have become 1,876 VEB. At the average official exchange rate prevailing in 2014, that would have been equivalent to 297.8 USD or 3.5 times the figure of 2002. At the parallel market rate, however, the 2014 profits would have been equivalent to 19.2 USD, one fifth of the original 2002 figure.

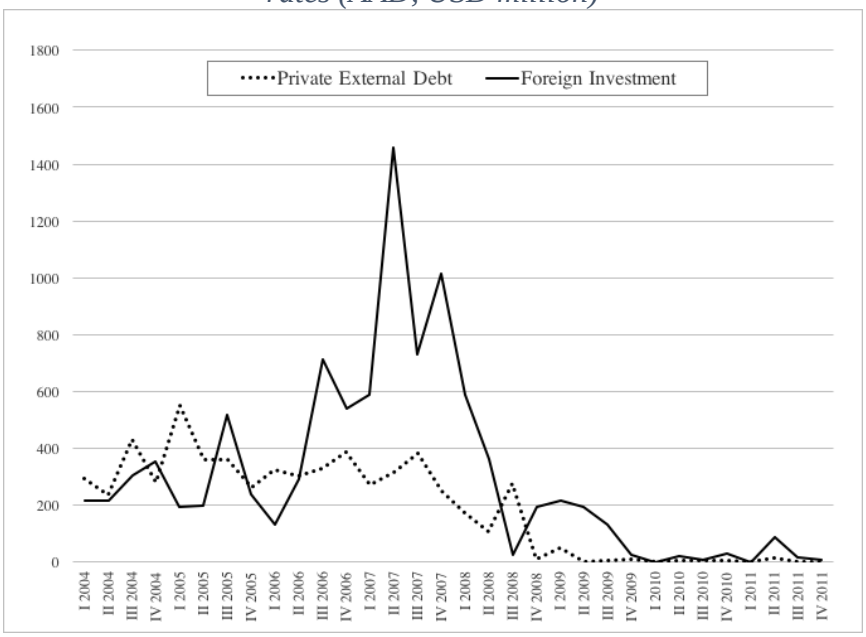
Our example above only illustrates the large distortions regarding the MNCs profits for 2014. From a financial standpoint, distortions accumulated every year from 2003 to 2014. To assess the real value in foreign exchange of those retained earnings, we need to determine whether the MNCs had access to dollars at the official fixed-exchange rates to repatriate dividends home. Obtaining access to dollars at the official rate in Venezuela entails registering with CADIVI and obtaining two different types of authorizations. First, each MNC shall introduce a request stating the details of the operation, and attesting that their specific use of dollars complies with the provisions to have access to the official rate. This first step ends with an Authorization to Acquire Dollars (AAD). Once the operation is completed, and the MNC has provided all the associated documentation, CADIVI issues an Authorization to Liquidate Dollars (ALD) and orders the Central Bank to sell the corresponding amount of dollars to the MNC at the stated rate.

Figure 3 and Figure 4 depict the total amount of AADs issued by CADIVI from 2004 to 2011, and the total amount of ALDs from 2007-2012.[7] Since some MNCs registered investments as loans to the subsidiary (private external debt) – while others used the more traditional foreign direct investment approach (foreign investment) – we have incorporated the total amount of AADs and AALs for both categories. Total authorization to acquire dollars at the official fixed rates (for both

[7] These are the last official statistics published by CADIVI.

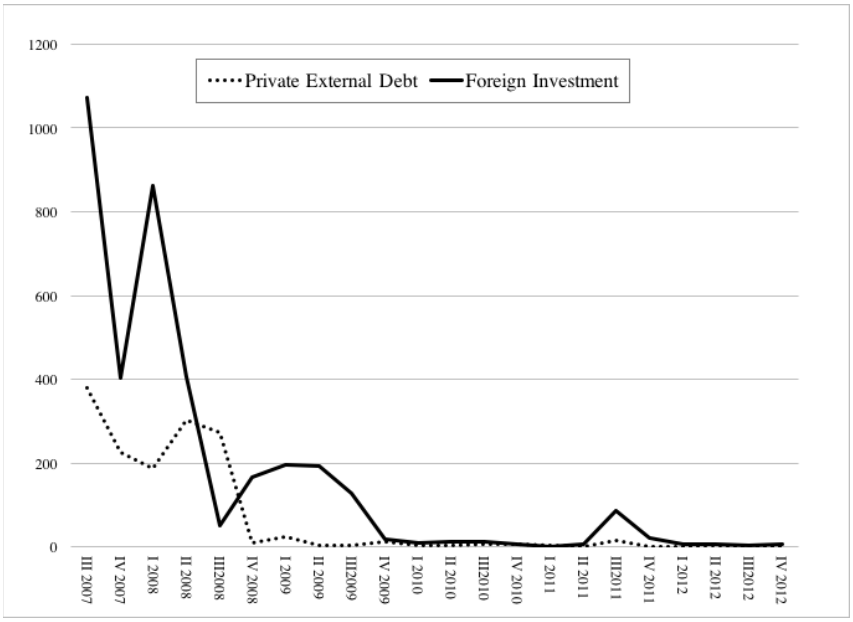
purposes) peaked in 2007 (USD 4,670 million) and then fell 40% in 2008 (USD 2,787 million) and another 71% in 2009 (USD 801 million). Since then, they have been hovering around zero. When it comes to ALDs, we only have figures from the third quarter of 2007 onward. We know that total ALDs fell by 75% between the second half of 2007 (USD 2,080 billion) and the second half of 2008 (USD 502 million). Total ALDs for both purposes fell by another 75% between 2008 (USD 2,250 million) and 2009 (USD 573 million). Since then, they have also remained close to zero. In the years where AADs and ALDs for these purposes boomed, the parallel exchange market premium was below 30%. By the time they slowed down – 2007 and 2008 – it was around 100%. By 2009, it was 185%. By the end of our study (December 2014) the parallel market rate was equivalent to 27.5 and 3.5 times the lowest and highest official fixed-exchange rates, respectively.

Figure 3. CADIVI: Total authorizations to acquire dollars at the official fixed rates (AAD, USD million)



Source: Commission for the Administration of Foreign Currency (Spanish acronym: CADIVI).

Figure 4. CADIVI: Total authorization to liquidate dollars at the official fixed rate (ALD, USD million)



Source: Commission for the Administration of Foreign Currency (Spanish acronym: CADIVI).

2. Data

We use the ORBIS database to collect data for all MNCs listed on the New York Stock Exchange (NYSE), NASDAQ Capital Market, or NASDAQ National Market, that have a subsidiary in Venezuela owned in at least 25% by the MNCs. We also use the Center for Research in Security Prices (CRSP) database to collect daily stock returns for the parent companies of these subsidiaries. The data collected is from April 3, 2009 to February 20, 2015. Our sample consists of 110 MNCs with subsidiaries in Venezuela and data available from 2009-2015. Out of these 110, 29 were registered in CADIVI and could potentially access USD at official fixed-exchange rates, as documented in CADIVI's website. The rest of the MNCs in the sample (81) were not even registered in CADIVI and therefore did not have any possibly of purchasing dollars at the official rates.

We have also collected daily returns for the Standard and Poor's 500 Index (S&P500) from the CRSP database, which we use as a market index proxy. In Appendix 1, we provide the list of 110 parent companies in our final sample with their corresponding three-digit NAICS industry code, their market capitalization at year-end for each of the years of the study, and whether they were registered in CADIVI or not. Table 1 presents the dates on which these five devaluations where announced and a brief description of the changes introduced in the exchange rate control.

Table 1. Exchange rate devaluation events

Event	Date	Description
1	08-Jan-10	A dual exchange rate system is established. New official fixed rates of 2.6 and 4.3 VEB per USD substitute for the previous fixed exchange rate VEB 2.15 per USD.
2	30-Dec-10	The dual exchange rate system is unified into a single exchange rate at 4.3 VEB per USD.
3	08-Feb-13	Devaluation of the exchange rate from 4.3 to 6.3 VEB per USD.
4	23-Jan-14	New currency tier SICAD is added to the fixed rate created in Event 3, which remains unchanged. SICAD rate starts at 11.30 VEB per USD.
5	10-Mar-14	SICAD II rate is introduced, complementing SICAD (now SICAD I), conforming a three-way exchange rate system: 1) the fixed rate of 6.3 VEB per USD, 2) SICAD I rate between 11.3 and 12.0 VEB per USD, and 3) new SICAD II rate starting at 51.86 VEB per USD

Source: Venezuelan Central Bank (BCV), www.bcv.org.ve .

The first three events are relatively straightforward devaluations of the official fixed-exchange rate. The first debased the official rate that had prevailed for four years and ten months (2.15 VEB per USD), substituting it for a dual exchange rate system. The new fixed exchange rates represented a devaluation of the domestic currency by 17.3% (2.60) and 50.0% (4.30).[8] The dual system lasted only 12 months, and was followed by a reunification of the official fixed-exchange rate at 4.30 VEB per USD. The unification represented a devaluation of the domestic currency by 39.5% for those firms that had access to the 2.60 VEB per USD rate. In 2013, a third straight devaluation occurred, where the official fixed-exchange rate devalued 31.7%, with the rate going from 4.30 to 6.30 VEF per USD.

[8] Devaluations are calculated using the inverse of the exchange rate, i.e. the dollar price of one unit of domestic currency.

From then onwards the system got more complicated. In every case a new official fixed rate was added to the pre-existing ones while, at the same time, the government insisted that at least some form of market would determine one of the rates. That promise never materialized, and rates either remained fixed or were somewhat flexible, but determined unilaterally and arbitrarily by the Central Bank, unrelated to the rising inflation rates. One might be tempted to think that these two latter events did not represent devaluations for companies with access to the lowest prevailing exchange rate (6.30). However, the truth is that in practice none of the MNCs in our sample had access to dollars to repatriate dividends (or service foreign debt) at 6.3 VEB per USD. The specific devaluation for our last two events is hard to pin down, as it depends upon the tier in which the company was located within CADIVI. In any case, moving from 6.30 to the rate at which SICAD I started (11.30, Event 4) represented a devaluation of 44.2%. From SICAD I to the rate at which SICAD II started (51.86, Event 5) there was an additional devaluation of 78.2%. In total, cumulative devaluations to the official fixed-exchange caused the Venezuelan bolivar to lose 95.9% of its value over the period studied.

Of particular interest within our study are the rates at which the MNCs reported the financial statements of their subsidiaries in Venezuela. Before Event 1, all the companies in Venezuela translating financial statements needed to use the 2.15 VEB per USD rate. After Event 1, they had to move to either the 2.6 or 4.3 VEB per USD exchange rate, depending on their industry classification, but the firms

had some discretion as to which exchange rate to use. We do not have access to data concerning specific exchange rates used. After Event 2, MNCs had to use the 4.3 VEB per USD. With Event 3, all the firms switched to the 6.3 VEB per USD rate. Event 4 introduced a new rate (SICAD I). Firms with no access to CADIVI and the 6.3 rate needed to use 11.3 VEB per USD in their financial statements. With the introduction of the SICAD II rate in Event 5, firms with no access to SICAD I rate were forced to use the much higher SICAD II exchange rate. Firms not registered in CADIVI did not have access to either SICAD I or SICAD II rates.

3. Event Studies

We follow MacKinlay (1997) classic event study methodology and Ang and Ghallab (1976) in the research design. Devaluations could have affected the value of the subsidiaries in our sample, but we measure their impact on the MNCs parent company using daily frequency stock prices adjusted by dividends.

In the design of the event study, we first define an event over which we measure the impact of the devaluation on the MNCs stock return. For robustness, and to gauge the speed at which markets interpret and incorporate the impact of devaluation on stock prices, we have incorporated all event windows surrounding the devaluations from [-1, +1] to [-10, +10] (Kanas, 2005).

The reasons for using such a long event window are two-fold. On the one hand, these devaluations – in particular from Event 3 onwards – represented complex arrangements involving multiple official fixed rates depending on the nature of the operation and the company. As such, it might have taken markets a few days to assess its impacts on stock prices. On the other hand, such a long window allows to study if there is mean reversion on the returns to MNC stock prices.

We estimate a market model to measure the expected return of the MNCs stocks during the event window. Following MacKinlay (1997), we estimate Equation (1) using least squares:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (1)$$

where, R_{it} is the daily stock return of the MNC parent and R_{mt} is the daily market stock return. We use the Standard and Poor's 500 Index as a proxy for market. For each stock in our sample, we estimate the market model on a window of time previous to the event. There is no fixed estimation period in the literature. Cox and Peterson (1994) use 100 days, while Carow and Kane (2002) use 200 days. MacKinlay (1997) suggests the use of 250 days for the estimation window. For our base case model, we use a window of 150 days to estimate the market model for each stock return. We form our expectations as to how the MNCs stock should have behaved in the absence of a devaluation based on the stock price behavior in an

estimation window from 180 days to 30 days prior to the event [-180, -30].[9] We then estimate the abnormal return (AR) as:

$$\widehat{AR}_{it} = R_{it} - \hat{\alpha}_i - \hat{\beta}_i R_{mt} \quad (2)$$

where $\widehat{AR}_{it}$ is the estimate for the abnormal return and $\hat{\alpha}_i$ and $\hat{\beta}_i$ are the estimates of coefficients α_i and β_i in Equation (1). The abnormal return will be the one that is outside the normal statistical range of the market model. Under the null hypothesis, the abnormal return is normally distributed with zero conditional mean, and calculated cumulatively around the different estimation windows. To do this, we sum the abnormal returns by business days over the event window. The CARs obtained and their standard deviations will ultimately determine whether the sample has evidence of significant deviation from what we would expect from those stocks given the market behavior and the stocks' relationship to the market over the estimation window.

Our null hypothesis is that Venezuelan devaluations should not significantly impact the stock price of the MNC parents. First, devaluations decreed in such a small country should be immaterial to the stock price of large globalized multinational corporations. In addition, the evolution of parallel exchange market premiums and the fact that AADs and ALDs have come to a halt for two to five years prior to

[9] Our results are robust to using different estimation window sizes. In particular, we have tried 220 days [-250, -30], 190 days [-220, -30], 150 days [-180, -30], and 120 days [-150, -30] and found no significant difference in the size or significance of coefficients. The results are available from the authors upon request.

these events (depending upon the specific devaluation analyzed) should have given market analysts enough cues regarding the implausibility of those retained earnings to be converted back into dollars at the official fixed-exchange rates. More importantly, subsidiary firms in Venezuela used to translate their balance sheets to dollars at the official fixed-exchange rate, even though most firms did not have access to those rates. Even if the company had legal grounds to use the official fixed-exchange rate and some discretion around the possibility of creating provisions in advance of a possible loss, market analysts should have easily recognized that financial statements at official fixed-rates were unrealistic. That statement is particularly true for companies that were not registered in CADIVI (the registration is public information) and therefore were not even eligible to acquire dollars at the official exchange rates. First, we present the results for the full sample of 110 MNCs. We then break the sample into companies registered and not registered in CADIVI, and report the results for each of these sub-groups.

Table 2 presents the results for the CARs of the stock prices of the 110 MNCs in our sample. The rows correspond to the five devaluation events described in Table 1. Each column reports the results for a different event window, with t=0 as the day of the devaluation announcement. Each cell contains the coefficient, standard deviation, and associated p-value.

We find significant negative abnormal returns for Events 2, 4, and 5. The numbers are both statistically and economically significant. Maximum negative impact recorded in each of these three events range from 1.32% (Event 5, window [-8, +8]) – to 1.74% (Event 2, window [-5, +5]). The long event window allows to evaluate if markets initially overreacted to devaluation announcements and then reverted back to their mean stock price. Ten days after these devaluations stock prices have not reverted back to their expected values, displaying negative CARs that range from 1.04% (Event 5) to 1.21% (Event 2). It is worth stressing the strength of these results, as the long window (twenty days around the devaluation event) also increases the possibility of confounding the impacts of Venezuelan devaluations with those of other material events occurring at the same time worldwide.

Although it is hard to assess which among the multiple exchange rates applies to each MNCs in our sample, it is noteworthy that we have recorded significant negative CARs in the three events where the devaluations were possibly the largest. In Event 1, companies could have potentially passed from 2.15 to 2.60 VEB per USD (a devaluation equivalent to 17.3%). In Event 3, firms unequivocally went from 4.30 to 6.30 VEB per USD (31.7%). The three remaining devaluations – the ones where we have recorded significant negative CARs – are larger than these: 39.5% for Event 2 (from 2.60 to 4.30 VEB per USD), 44.2% for Event 4 (from 6.30 to 11.30 VEB per USD), and 78.2% in Event 5 (from 11.30 to 51.86 VEB per USD).

We also find striking that the negative effects of devaluations did not wane in time, but continued to show up three years after the first negative "surprise." If Venezuelan had been initially neglected by the analysts – i.e. due to the country's meager size – the successive negative impact of devaluations on MNC stock prices should have alerted them. To the contrary, it seems that markets persisted in overlooking the large parallel exchange market premiums and the fact that these companies either never had access to dollars at the official fixed rates, or have some positive right in theory that had not materialized for years prior to these events.

Table 2. CARs of stock price of MNCs with Venezuelan subsidiaries

Table presents Cumulative Abnormal Returns (CARs) of stock prices for 110 MNCs in our sample with subsidiaries in Venezuela. The first column provides the devaluation event as described in Table 1. Columns 2-11 report CARs for ten event windows, from one [-1, +1] to ten [-10, +10] days day prior to and after the event. The last column presents the number of observations. For each event/window cell, standard errors, and p-values are displayed.

Complete Sample											
	[-1;+1]	[-2;+2]	[-3;+3]	[-4;+4]	[-5;+5]	[-6;+6]	[-7;+7]	[-8;+8]	[-9;+9]	[-10;+10]	N
Event 1	-0.0029	-0.0007	-0.0054	-0.0054	-0.0042	-0.0077	-0.0061	-0.0076	-0.0028	-0.0032	110
	0.0030	0.0038	0.0041	0.0052	0.0055	0.0057	0.0060	0.0062	0.0062	0.0065	
	0.3411	0.8549	0.1940	0.2999	0.4501	0.1756	0.3077	0.2225	0.6507	0.6245	
Event 2	-0.0017	-0.0067***	-0.0136***	-0.0150***	-0.0174***	-0.0153***	-0.0135***	-0.0122***	-0.0113**	-0.0121**	110
	0.0011	0.0014	0.0023	0.0027	0.0038	0.0042	0.0044	0.0044	0.0048	0.0052	
	0.1325	0.0000	0.0000	0.0000	0.0000	0.0004	0.0026	0.0060	0.0200	0.0211	
Event 3	-0.0026	-0.0010	0.0004	0.0063*	0.0055	0.0088*	0.0060	-0.0001	-0.0007	-0.0006	110
	0.0016	0.0027	0.0032	0.0038	0.0041	0.0050	0.0052	0.0056	0.0062	0.0063	
	0.1049	0.7189	0.9067	0.0982	0.1772	0.0806	0.2529	0.9874	0.9066	0.9259	
Event 4	-0.0088***	-0.0094***	-0.0091***	-0.0097**	-0.0133**	-0.0101	-0.0127*	-0.0116	-0.0133*	-0.0146*	110
	0.0026	0.0030	0.0033	0.0048	0.0059	0.0065	0.0067	0.0073	0.0079	0.0086	
	0.0009	0.0025	0.0066	0.0473	0.0264	0.1227	0.0615	0.1154	0.0923	0.0927	
Event 5	-0.0063**	-0.0066**	-0.0104***	-0.0103***	-0.0136***	-0.0126**	-0.0131**	-0.0132**	-0.0082	-0.0104*	110
	0.0025	0.0025	0.0029	0.0031	0.0042	0.0050	0.0053	0.0059	0.0062	0.0061	
	0.0142	0.0106	0.0005	0.0014	0.0016	0.0132	0.0148	0.0271	0.1856	0.0897	

***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

As previously mentioned, only 29 of our 110 sample of MNCs with subsidiaries in Venezuela had registered with CADIVI. This could have substantiated some expectation that retained earnings and their corresponding assets might eventually convert to dollars at official fixed rates. Table 3 presents the CARs on stock prices resulting for our event study for 29 MNCs in our sample registered at CADIVI.[10]

The results in Table 3 differ from those in Table 2. When we consider only those firms with normative access to the official fixed-exchange rate, we find no consistent abnormal returns for any of these events. There are two reasons why that does not necessarily mean that markets were efficient in pricing these stocks. First, when restricting the sample to MNCs registered in CADIVI, we are left with only 29 firms. Across devaluations 2, 4 and 5, the CARs reported are consistently negative and similar in size to those in Table 2, but they are not large enough to achieve statistical significance in such a small sample. Second, lack of statistical significance might also well be a case of getting the right results for the wrong reasons. Devaluations did not have an impact on the asset prices of these companies as they had piled up authorizations to acquire dollars at past official fixed rates (AADs) that were not altered by the new devaluations. Retained earnings were registered in dollar values on the subsidiaries' balance sheets at the official rates prevailing when these earnings were recorded. From an accounting standpoint,

[10] These companies are listed and identified in the Appendix I.

devaluations could impact the rate of recorded future earnings, but did not affect the way they had registered retained earnings. In other words, the financial statements of CADIVI registered firms were not translated at a unique official fixed rate. These firms used multiple official fixed rates, because in most cases they received AADs for dividend repatriation at different official exchanges rates in time. The market possibly did not adjust the probability they were assigning to these AADs being honored with successive devaluations. Years passed without MNCs being able to convert these AADs into ALDs, and ultimately into effective dollars. In the meantime, the parallel market premium continued to rise. However, one might argue that registration in CADIVI provided some reasonable grounds to expect the conversion of these assets at the official exchange rate prevailing on the year profits were recorded.

Table 3. CARs of stock price of MNCs with Venezuelan subsidiaries registered in CADIVI

This table presents the Cumulative Abnormal Returns (CARs) of stock prices of the 29 MNCs in our sample with subsidiaries in Venezuela registered at CADIVI. The first column reports the devaluation event as described in Table 1. Exchange rate devaluation events. Columns 2-11 report CARs for ten event windows, from one [-1, +1] to ten [-10, +10] days day prior to and after the event. The last column presents the number of observations. For each event/window cell, standard errors, and p-values are displayed.

CADIVI											
	[-1;+1]	[-2;+2]	[-3;+3]	[-4;+4]	[-5;+5]	[-6;+6]	[-7;+7]	[-8;+8]	[-9;+9]	[-10;+10]	N
Event 1	-0.0005	0.0073	0.0052	0.0077	0.0082	0.0072	0.0032	0.0015	0.0005	-0.0023	29
	0.0046	0.0053	0.0061	0.0068	0.0083	0.0079	0.0078	0.0083	0.0083	0.0090	
	0.9167	0.1820	0.3998	0.2668	0.3282	0.3735	0.6877	0.8546	0.9539	0.8025	
Event 2	0.0007	-0.0045**	-0.0069	-0.0081	-0.0082	-0.0101	-0.0116	-0.0123	-0.0070	-0.0120	29
	0.0021	0.0021	0.0042	0.0051	0.0066	0.0080	0.0086	0.0087	0.0109	0.0111	
	0.7366	0.0444	0.1116	0.1238	0.2209	0.2182	0.1887	0.1704	0.5262	0.2875	
Event 3	-0.0015	0.0026	0.0046	0.0117	0.0104	0.0122	0.0110	0.0118	0.0115	0.0130	29
	0.0020	0.0075	0.0082	0.0098	0.0089	0.0099	0.0096	0.0110	0.0117	0.0123	
	0.4599	0.7289	0.5784	0.2416	0.2485	0.2305	0.2632	0.2907	0.3333	0.3000	
Event 4	-0.0088	-0.0091	-0.0127*	-0.0163*	-0.0186*	-0.0198*	-0.0137	-0.0113	-0.0090	-0.0128	29
	0.0064	0.0060	0.0067	0.0091	0.0096	0.0106	0.0095	0.0112	0.0108	0.0106	
	0.1767	0.1388	0.0707	0.0855	0.0622	0.0710	0.1625	0.3209	0.4143	0.2347	
Event 5	-0.0029	-0.0039	-0.0050	-0.0029	-0.0079	-0.0075	-0.0053	-0.0099	-0.0070	-0.0065	29
	0.0026	0.0040	0.0053	0.0052	0.0086	0.0100	0.0099	0.0125	0.0130	0.0119	
	0.2701	0.3365	0.3513	0.5768	0.3696	0.4606	0.5981	0.4358	0.5973	0.5882	

***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

The case of MNCs whose Venezuelan subsidiaries *were not* registered in CADIVI is different. Based on the previous table, one would expect that most of the significant, negative CARs reported in Table 2 were driven by the 81 MNCs not eligible to buy dollars at the official fixed-exchange rates. Table 4 presents the results for the CARs of the stock prices of these companies.

We confirm that companies not registered in CADIVI drove most of the results reported in response to devaluations 2, 4, and 5. In Event 2, CARs are negative and significant across the full range of event windows. There are no signs of mean reversion, and the maximum size of -2.07% [-5, +5] is large and economically significant. In Event 4, the most significant impacts seem to be concentrated on the first three event windows, but the magnitudes are more sizable on the [-9, +9] window (1.50%, significant at the 10% level) and the [-10, +10] window (1.53%). Given that the size of these coefficients is slightly higher than those registered in Table 2, the loss of statistical significant on the latter seems to be more a consequence of the increased variance due to due lower number of observations.

Finally, negative and significant CARs are registered across all but one of the event windows in Event 5, with the negative impact by [-10, +10] statistically significant and practically relevant (1.18%), and the maximum cumulative negative impact of 1.60% registered at event window [-7, +7].

Table 4. CARs of stock price of MNCs with Venezuelan subsidiaries NOT registered in CADIVI

This table presents the Cumulative Abnormal Returns (CARs) of stock prices of the 81 MNCs in our sample with subsidiaries in Venezuela not registered at CADIVI, and therefore having no access to dollars at the official fixed-exchange rate. The first column reports the devaluation event as described in Table 1. Exchange rate devaluation events. Columns 2-11 report CARs for ten event windows, from one [-1, +1] to ten [-10, +10] days day prior to and after the event. The last column presents the number of observations. For each event/window cell, standard errors, and p-values are displayed.

Non-CADIVI											
	[-1;+1]	[-2;+2]	[-3;+3]	[-4;+4]	[-5;+5]	[-6;+6]	[-7;+7]	[-8;+8]	[-9;+9]	[-10;+10]	N
Event 1	-0.0038	-0.0036	-0.0092	-0.0101	-0.0086	-0.0131	-0.0094	-0.0108	-0.0040	-0.0035	81
	0.0038	0.0048	0.0051	0.0065	0.0068	0.0071	0.0076	0.0078	0.0079	0.0083	
	0.3235	0.4597	0.0752	0.1264	0.2096	0.0690	0.2175	0.1708	0.6149	0.6705	
Event 2	-0.0026*	-0.0074***	-0.0160***	-0.0175***	-0.0207***	-0.0172***	-0.0141***	-0.0122**	-0.0129**	-0.0121**	81
	0.0013	0.0017	0.0027	0.0032	0.0046	0.0050	0.0051	0.0051	0.0053	0.0058	
	0.0563	0.0001	0.0000	0.0000	0.0000	0.0009	0.0070	0.0183	0.0165	0.0409	
Event 3	-0.0030	-0.0023	-0.0011	0.0043	0.0037	0.0076	0.0042	-0.0044	-0.0051	-0.0055	81
	0.0021	0.0025	0.0032	0.0038	0.0045	0.0058	0.0062	0.0065	0.0072	0.0072	
	0.1466	0.3729	0.7190	0.2508	0.4106	0.1942	0.5009	0.5074	0.4820	0.4531	
Event 4	-0.0088***	-0.0095***	-0.0078**	-0.0073	-0.0114	-0.0066	-0.0123	-0.0117	-0.0150*	-0.0153	81
	0.0027	0.0035	0.0038	0.0057	0.0073	0.0080	0.0085	0.0091	0.0089	0.0111	
	0.0016	0.0089	0.0414	0.2028	0.1209	0.4079	0.1501	0.2030	0.0949	0.1735	
Event 5	-0.0074**	-0.0076**	-0.0123***	-0.0129***	-0.0156***	-0.0144**	-0.0160**	-0.0144**	-0.0086	-0.0118*	81
	0.0033	0.0032	0.0034	0.0038	0.0048	0.0058	0.0063	0.0067	0.0070	0.0071	
	0.0259	0.0184	0.0006	0.0011	0.0016	0.0147	0.0130	0.0341	0.2196	0.0988	

***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively

For these 81 MNCs markets seem to have reacted belatedly to an accounting change, when in fact the likelihood of those retained earnings being converted into dollars at the official rates was actually zero. Instead of gradually adjusting the stock price as the parallel market rate evolved and dissociated from the official exchange rate, markets seem to have waited for accounting changes resulting from devaluations to realize that the equity values of these MNCs were much lower.

Based on these results, from now onwards, we focus our analysis on the 81 firms not registered in CADIVI. Our next step is to assess whether Venezuelan devaluations had differential impacts on the stock prices of MNCs of different sizes. We divide our sample of MNCs into three groups of similar size (27 each) by average market capitalization over the period studied: MNCs with less than USD 4.0 billion fall into our "small group"; companies ranging from USD 4.0 to 11.2 billion are considered "medium"; and companies above USD 11.2 billion conform our "large" bucket.

Small MNCs in our sample have an average market capitalization of USD 2.3 billion, significantly lower than the USD 6.4 billion registered by medium companies, which in turn have a market capitalization significantly lower than the USD 46.0 billion registered by large MNCs. The results of our event study on the MNCs of each group not registered in CADIVI are reported in Table 5.

Table 5. CARs of stock price of MNCs with Venezuelan subsidiaries NOT registered in CADIVI

These three tables (5a, 5b, and 5c) present Cumulative Abnormal Returns (CARs) of stock prices for the 81 MNCs in our sample with subsidiaries in Venezuela not registered at CADIVI, divided by different groups of identical size (27). The first column of each table reports the devaluation event as described in Table 1. Exchange rate devaluation events. Columns 2-11 report CARs for ten event windows, from one [-1, +1] to ten [-10, +10] days day prior to and after the event. The last column presents the number of observations. For each event/window cell, standard errors, and p-values are displayed.

Table 5a) Small companies

	[-1;+1]	[-2;+2]	[-3;+3]	[-4;+4]	[-5;+5]	[-6;+6]	[-7;+7]	[-8;+8]	[-9;+9]	[-10;+10]	N
Event 1	-0.0064	-0.0084	-0.0145	-0.0072	-0.0072	-0.0145	-0.0090	-0.0104	0.0029	-0.0006	27
	0.0067	0.0098	0.0097	0.0117	0.0124	0.0146	0.0153	0.0159	0.0165	0.0167	
	0.3463	0.3983	0.1458	0.5455	0.5656	0.3283	0.5622	0.5186	0.8621	0.9704	
Event 2	-0.0058**	-0.0090**	-0.0181***	-0.0222***	-0.0283**	-0.0182	-0.0094	-0.0077	-0.0057	-0.0026	27
	0.0028	0.0040	0.0058	0.0064	0.0102	0.0120	0.0116	0.0113	0.0115	0.0127	
	0.0462	0.0327	0.0044	0.0019	0.0102	0.1407	0.4237	0.5022	0.6265	0.8370	
Event 3	0.0018	0.0054	0.0059	0.0084	0.0073	0.0132	0.0036	-0.0082	-0.0056	-0.0077	27
	0.0026	0.0044	0.0057	0.0079	0.0097	0.0126	0.0128	0.0138	0.0157	0.0155	
	0.4995	0.2374	0.3041	0.3017	0.4578	0.3048	0.7790	0.5578	0.7254	0.6263	
Event 4	-0.0078	-0.0145**	-0.0150**	-0.0193**	-0.0197**	-0.0144	-0.0249*	-0.0200	-0.0297**	-0.0250	27
	0.0050	0.0067	0.0073	0.0080	0.0087	0.0114	0.0130	0.0125	0.0139	0.0159	
	0.1337	0.0407	0.0492	0.0233	0.0326	0.2184	0.0665	0.1212	0.0429	0.1272	
Event 5	-0.0092	-0.0074	-0.0136	-0.0100	-0.0130	-0.0178	-0.0163	-0.0137	-0.0054	-0.0138	27
	0.0089	0.0085	0.0084	0.0095	0.0119	0.0150	0.0163	0.0170	0.0173	0.0176	
	0.3115	0.3882	0.1176	0.3025	0.2851	0.2475	0.3255	0.4252	0.7581	0.4402	

***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Table 5b) Medium companies

	[-1;+1]	[-2;+2]	[-3;+3]	[-4;+4]	[-5;+5]	[-6;+6]	[-7;+7]	[-8;+8]	[-9;+9]	[-10;+10]	N
Event 1	-0.0105	-0.0091	-0.0115	-0.0223	-0.0197	-0.0270	-0.0232	-0.0249	-0.0183	-0.0176	27
	0.0071	0.0086	0.0099	0.0141	0.0144	0.0134	0.0150	0.0155	0.0149	0.0162	
	0.1541	0.2997	0.2556	0.1262	0.1838	0.0545	0.1341	0.1191	0.2303	0.2867	
Event 2	-0.0035	-0.0099***	-0.0204***	-0.0181***	-0.0207***	-0.0157**	-0.0119	-0.0116	-0.0128	-0.0125	27
	0.0023	0.0025	0.0044	0.0052	0.0069	0.0067	0.0075	0.0074	0.0078	0.0083	
	0.1348	0.0005	0.0001	0.0017	0.0061	0.0271	0.1253	0.1312	0.1130	0.1436	
Event 3	-0.0074	-0.0096	-0.0047	0.0066	0.0067	0.0155	0.0163	0.0081	0.0061	0.0070	27
	0.0050	0.0053	0.0064	0.0070	0.0078	0.0097	0.0112	0.0116	0.0130	0.0126	
	0.1505	0.0820	0.4744	0.3548	0.3966	0.1231	0.1553	0.4902	0.6446	0.5858	
Event 4	-0.0097**	-0.0086	-0.0076	-0.0077	-0.0138	-0.0066	-0.0136	-0.0140	-0.0155	-0.0204	27
	0.0043	0.0055	0.0056	0.0132	0.0185	0.0194	0.0198	0.0226	0.0249	0.0276	
	0.0340	0.1287	0.1846	0.5668	0.4628	0.7346	0.4977	0.5407	0.5376	0.4668	
Event 5	-0.0120***	-0.0097***	-0.0156***	-0.0191***	-0.0255***	-0.0176**	-0.0216**	-0.0187*	-0.0115	-0.0097	27
	0.0032	0.0034	0.0049	0.0047	0.0065	0.0078	0.0085	0.0095	0.0105	0.0105	
	0.0010	0.0083	0.0039	0.0004	0.0005	0.0319	0.0175	0.0604	0.2810	0.3606	

Table 5c) Large companies

	[-1;+1]	[-2;+2]	[-3;+3]	[-4;+4]	[-5;+5]	[-6;+6]	[-7;+7]	[-8;+8]	[-9;+9]	[-10;+10]	N
Event 1	0.0056	0.0068	-0.0015	-0.0008	0.0011	0.0023	0.0039	0.0028	0.0033	0.0076	27
	0.0056	0.0060	0.0066	0.0069	0.0076	0.0075	0.0076	0.0077	0.0087	0.0090	
	0.3268	0.2679	0.8229	0.9138	0.8879	0.7629	0.6133	0.7172	0.7024	0.4031	
Event 2	0.0016	-0.0034	-0.0095**	-0.0121**	-0.0132**	-0.0176***	-0.0211***	-0.0173**	-0.0202**	-0.0210**	27
	0.0016	0.0021	0.0037	0.0050	0.0064	0.0062	0.0068	0.0072	0.0076	0.0086	
	0.3314	0.1301	0.0164	0.0221	0.0496	0.0085	0.0049	0.0229	0.0135	0.0218	
Event 3	-0.0035	-0.0026	-0.0047	-0.0019	-0.0029	-0.0059	-0.0074	-0.0130	-0.0159*	-0.0156*	27
	0.0024	0.0026	0.0041	0.0039	0.0055	0.0069	0.0074	0.0077	0.0078	0.0085	
	0.1551	0.3274	0.2627	0.6263	0.6068	0.4038	0.3256	0.1035	0.0519	0.0759	
Event 4	-0.0090	-0.0054	-0.0007	0.0052	-0.0007	0.0011	0.0016	-0.0011	0.0005	-0.0003	27
	0.0048	0.0062	0.0065	0.0068	0.0078	0.0087	0.0094	0.0097	0.0093	0.0105	
	0.0741	0.3968	0.9127	0.4531	0.9265	0.8970	0.8663	0.9098	0.9594	0.9746	
Event 5	-0.0011	-0.0056*	-0.0078**	-0.0096**	-0.0084*	-0.0078*	-0.0100*	-0.0106*	-0.0090	-0.0117*	27
	0.0026	0.0029	0.0035	0.0043	0.0046	0.0043	0.0050	0.0055	0.0063	0.0065	
	0.6728	0.0620	0.0364	0.0339	0.0797	0.0806	0.0539	0.0616	0.1662	0.0827	

***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively

Our results indicate that large MNCs not registered in CADIVI suffered the most statistically significant and practically relevant impacts following three Venezuelan devaluations. It is noteworthy that in these events the maximum negative CARs were recorded at the end of the spectrum of event windows, ranging from 1.17% (Event 5) to 2.10% (Event 2). For MNCs in our small and medium buckets, the coefficients are mostly negative and sizable, but lack statistical significance, potentially as a consequence of the small sample size. However, in spite of the small sample size, the results reported for large companies are remarkable, and provide suggestive evidence indicating that negative CARs recorded are not driven by the markets neglecting a number of small firms whose operations were overrepresented in Venezuela.

Another interesting aspect is to evaluate if firms with exporting subsidiaries were less affected by these devaluations. For exporters, devaluation would typically have a positive income effect, as it reduces the relative cost of products manufactured by the Venezuelan subsidiary of the MNC, while increasing the relative price of exports in the domestic market.[11] By focusing on exporters we can test whether the balance sheet impacts (one-time loss in the value of assets denominated in VEB, net of domestic liabilities) are strong enough to yield negative and significant CARs.

[11] He and NG (1998), Gao (2000), Wilson, Saunders and Caprio (2000), Becker, Gelos and Richards (2000), Herrero, Gyntelberg, and Tesei (2008) and Muller and Verschoor (2008) have reported positive abnormal returns on MNCs in response to devaluations in the currency of the country where they operate.

Our sample does not contain information on whether the MNCs under consideration exported products and services from Venezuela. Yet, we classify those as exporters if the industry code they are active in registered positive exports from Venezuela to the United States.[12] Table 6 reports the results from our event study for the restricted sample of MNCs active in exporting sectors.[13]

The results show negative CARs in events 2, 4 and 5 throughout the full length of the event window, albeit statistically weak. For events 2 and 5 the negative impacts are statistically and economically significant for most of the range of event windows, and only lose significance towards the end of spectrum [-10, +10]. In any case, it seems like the negative CARs are not fully offset by better exporting conditions for those firms following a devaluation, and therefore we can infer that the results reported in Table 4 are indeed driven by balance-sheet effects.

[12] We rely on data from https://usatrade.census.gov

[13] The sample size changes, because for each devaluation-year we check if exports of that NAICS code were positive and adjust the definition of firms in exporting industries accordingly.

Table 6. CARs of stock price of MNCs with Venezuelan subsidiaries in exporting sectors

This table provides Cumulative Abnormal Returns (CARS) of stock prices for the MNCs in our sample with subsidiaries in Venezuela, that belong to industries that reported positive exports to the United States the year of the devaluation event. The first column of each table reports the devaluation event as described in Table 1. Columns 2-11 report CARs for ten event windows, from one [-1, +1] to ten [-10, +10] days day prior to and after the event. The last column presents the number of observations. For each event/window cell, standard errors, and p-values are displayed.

Firms in Exporting Industries - Non-CADIVI											
	[-1;+1]	[-2;+2]	[-3;+3]	[-4;+4]	[-5;+5]	[-6;+6]	[-7;+7]	[-8;+8]	[-9;+9]	[-10;+10]	N
Event 1	0.0000	0.0034	-0.0015	-0.0025	-0.0011	-0.0072	-0.0028	-0.0044	0.0007	0.0010	54
	0.0046	0.0059	0.0063	0.0077	0.0078	0.0085	0.0088	0.0092	0.0094	0.0096	
	0.9934	0.5734	0.8143	0.7442	0.8870	0.4011	0.7492	0.6388	0.9443	0.9150	
Event 2	-0.0013	-0.0062***	-0.0147***	-0.0184***	-0.0229***	-0.0190***	-0.0134**	-0.0132**	-0.0114*	-0.0105	54
	0.0014	0.0018	0.0032	0.0037	0.0056	0.0061	0.0064	0.0063	0.0065	0.0068	
	0.3525	0.0013	0.0000	0.0000	0.0001	0.0028	0.0397	0.0404	0.0855	0.1299	
Event 3	-0.0021	-0.0019	-0.0005	0.0046	0.0038	0.0042	-0.0017	-0.0107	-0.0119	-0.0142	53
	0.0026	0.0033	0.0043	0.0051	0.0056	0.0076	0.0075	0.0083	0.0090	0.0090	
	0.4250	0.5780	0.8991	0.3755	0.5051	0.5809	0.8193	0.2024	0.1913	0.1218	
Event 4	-0.0095***	-0.0097**	-0.0085*	-0.0043	-0.0068	0.0012	-0.0047	-0.0042	-0.0040	-0.0030	53
	0.0033	0.0043	0.0046	0.0049	0.0061	0.0069	0.0080	0.0081	0.0081	0.0090	
	0.0055	0.0281	0.0728	0.3829	0.2675	0.8677	0.5594	0.6115	0.6193	0.7368	
Event 5	-0.0074**	-0.0090***	-0.0119***	-0.0129***	-0.0129**	-0.0139**	-0.0146*	-0.0140*	-0.0065	-0.0117	53
	0.0033	0.0030	0.0038	0.0041	0.0054	0.0064	0.0073	0.0078	0.0080	0.0082	
	0.0311	0.0045	0.0025	0.0029	0.0196	0.0345	0.0502	0.0812	0.4217	0.1585	

***, **, and * denote significance at the 1%, 5%, and 10% levels, respective

4. Estimating CARs using synthetic controls

One concern that remains from the previous section is that, in the absence of a measured counterfactual, it is not straightforward to claim that our results are driven by the devaluation events. This is because, even if we control for the aggregate market returns (proxied the S&P500 indexed), other confounding factors at the industry level, for example, could be affecting those firms active in Venezuela, thereby biasing our estimates. In order to deal with this possibility, we implement the synthetic controls methodology in the context of our exercise.

This methodology allows to causally infer the effect of the devaluations on the stock price of MNCs active in Venezuela in each event by creating a synthetic counterfactual based on other firms with similar characteristics, though not active in Venezuela. The synthetic firms allow us to form our expectations of what would have happened to stock prices in the absence of each one of the five devaluations events.

Since first used by Abadie and Gardeazabal (2003) to gauge the impacts of terrorism on the economy of the Basque country in Spain, synthetic controls have been applied to estimate causal impacts in a wide range of topics. Among the most recent and quoted in the literature are the estimation of impacts of tobacco control programs in California (Abadie, Diamond and Heinmuller, 2010), those of financial liberalization (Billmeier and Nannicini, 2013) and natural disasters (Cavallo,

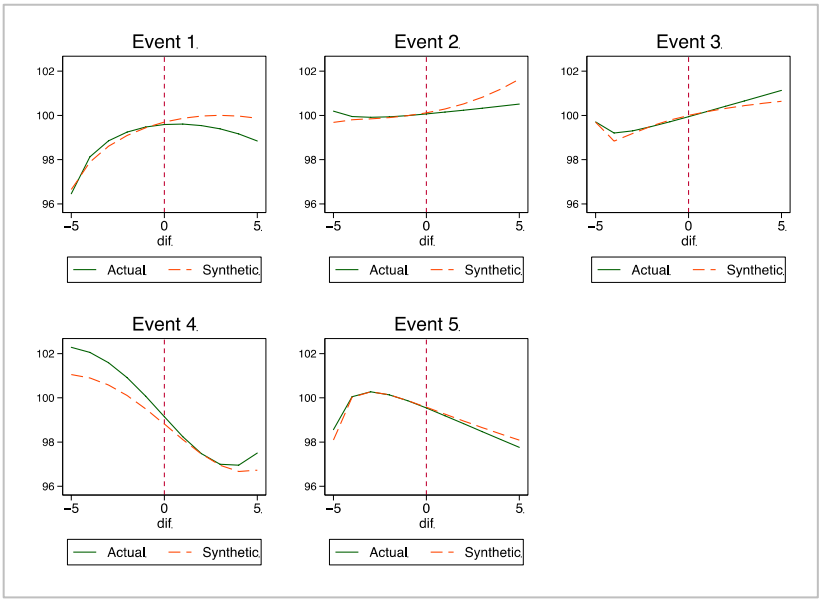
Galiani, Noy and Pantano, 2013) on economic growth, and the effects of changes in handgun laws on suicide rates in Missouri and Conneticut (Crifasi, Speed, Vernick and Webster, 2015). To the extent of our knowledge, this is the first time that synthetic controls are used in the context of research on asset pricing, and in particular, on studying CARs in response to currency devaluations.

To implement the synthetic controls, we collect daily stock returns for MNCs listed on the New York Stock Exchange (NYSE), NASDAQ Capital Market, or NASDAQ National Market from the Center for Research in Security Prices (CRSP), that have no subsidiaries in Venezuela at the time of the events ("control firms"). As a result, we get a sample of 2,851 unique publically listed firms that we use as the base to construct our synthetic firms.

Based on daily stock returns we reconstruct a nominal stock value for each firm normalized to 100 on the day of the devaluation for each event. For each firm active in Venezuela ("treated firm") and devaluation, we construct a synthetic firm which corresponds to a weighted sum of the stock value using the synthetic control methodology, taking as the main input the market capitalization for 100 days prior to devaluation day. The synthetic firm for each "treated" firm is based on a subset of the "control" firms that are active in the same 3-digit NAICS industry code as the "treated" firm. Across all devaluation events, each synthetic firm is based on an average of 88.95 firms, with the range going from 4 to 275 depending on the treated

MNCs and devaluation day. Figure 5 plots, for each event, the average stock values for actual vs. synthetic firms 5 days before and after the devaluation date, using a fractional-polynomial plot.

Figure 5. Synthetic Controls and Devaluation Events



Note: The figure plots a polynomial fit of the average stock value actual vs. synthetic firms 5 days before and after each devaluation (value is normalized to 100 in day 0).

In the figure, we notice two important things. First, the trends before day 0 are quite similar across both groups; and second, that they often diverge after day 0. That is what we would expect seeing using this methodology. We refrain, however, from concluding any results from the graphs as we are simply averaging across each type of firm (actual vs. synthetic) instead of looking at the proper comparison, which would be each firm with its synthetic control, and evaluating the impact by estimating the standard error of all those differences.

Such comparison can be performed analytically by employing a difference-in-difference (DID) regression to estimate the impacts of the five Venezuelan devaluations on the average stock value of the treated firms for ten days following each event. By choosing a DID –instead of a first-difference model—we are being conservative as graphically we do see small differences in the baseline level for some events. For these regressions – consistently with the event study reported above – we limit our sample to data coming from 10 days prior to and after the event. The equation for each event takes the following form:

$$stock_{i,t} = \beta\ treated_i X after_t + treated_i + after_t + \eta_I + \varepsilon_{i,t} \qquad (3)$$

where *after* is defined as a dummy for the days following the devaluation (inclusive of day "zero"), *treated* is a dummy that equals 1 if the firm MNCs with Venezuela subsidiary, and 0 if the firm is a synthetic one. η_I represents fixed effects for each actual firm and its corresponding synthetic firm, to guarantee that we are comparing every treated firm with its synthetic counterpart. In this context, β estimates the average difference in the stock value between firms active in Venezuela and synthetic firms (not active in Venezuela) during the 10 days following the devaluation. The stock values are normalized to 100 in the day of the devaluation. Table 7 reports our results for the complete set of firms in our sample with Venezuelan subsidiaries (Panel a), for those registered in CADIVI (Panel b), and for those not eligible to acquire dollars at the official exchange rate (Panel c).

Table 7. Difference-in-difference estimation using the Synthetic Controls methodology

These tables provide the coefficients for the difference-in-difference estimation described in specification (3). Column 1 contains the list of the variables, and columns 2-6 represent the five devaluation events. For each variable/event window cell, corresponding regression coefficient and standard errors are displayed. The coefficient of interest (β) is reported on the top row and represents the change in stock price in percentage points as compared to a synthetic firm.

Panel a) Complete Sample of MNC (110)					
	Event 1	Event 2	Event 3	Event 4	Event 5
Treated*After	-0.9611**	-1.2429***	0.0032	-0.8308*	-0.5059
	(0.418)	(0.312)	(0.354)	(0.460)	(0.471)
Treated	0.0710	0.3817***	0.3283	1.4074***	0.1906
	(0.382)	(0.135)	(0.232)	(0.399)	(0.289)
After	0.9492***	2.4340***	0.8811***	-3.9845***	-0.2660
	(0.210)	(0.155)	(0.155)	(0.166)	(0.256)
N	4536	4578	4704	4746	4746
R2	0.26	0.29	0.17	0.41	0.14

Panel b) Complete Sample of MNC registered in CADIVI (29)					
	Event 1	Event 2	Event 3	Event 4	Event 5
Treated*After	0.7833	-1.6837**	-0.1057	-0.2321	-0.1211
	(0.622)	(0.768)	(0.782)	(0.862)	(0.725)
Treated	-0.2871	0.4420*	1.3915***	1.3486*	0.0873
	(0.575)	(0.237)	(0.326)	(0.659)	(0.301)
After	0.2773	2.7145***	1.6011***	-4.4936***	-0.4645
	(0.488)	(0.491)	(0.381)	(0.189)	(0.339)
N	1218	1218	1218	1218	1218
R2	0.31	0.26	0.29	0.52	0.13

Panel c) Complete Sample of MNC not registered in CADIVI (81)					
	Event 1	Event 2	Event 3	Event 4	Event 5
Treated*After	-1.6015***	-1.0832***	0.0412	-1.0376*	-0.6387
	(0.507)	(0.323)	(0.395)	(0.544)	(0.584)
Treated	0.2025	0.3958**	-0.0431	1.4277***	0.2263
	(0.392)	(0.163)	(0.281)	(0.488)	(0.375)
After	1.1958***	2.3323***	0.6295***	-3.8038***	-0.1971
	(0.231)	(0.175)	(0.153)	(0.211)	(0.325)
N	3318	3360	3486	3528	3528
R2	0.24	0.30	0.13	0.38	0.14

***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively

The results derived from the synthetic control methodology confirm those of our event study estimation for devaluations 2 and 4. In Event 2, the coefficient of interest for the specification comprising the whole sample of MNCs (Table 7, Panel a) indicates that the stock prices of firms with subsidiaries in Venezuela experienced significant, negative returns that are on average 1.2429 percentage points (pp) lower than the corresponding synthetic firm over the event window. As can be seen, the results for Event 2 are significant and negative for both firms registered (Table 7, Panel b, 1.6837) and not registered in CADIVI (Table 7, Panel c, 1.0832 pp), pointing to the fact that our lack of significance of the same results using the event studies could have been driven by the small sample size, as noted above. But yet again, across the board, our results indicate that firms registered in CADIVI did not suffer from devaluations as their counterparts not registered.

In the case of Event 4, the coefficient of interest for the whole sample of MNCs with subsidiaries in Venezuela is statistically significant and negative, indicating that within a ten-day window around the devaluation the stock prices of firms with subsidiaries in Venezuela experienced returns that are on average 0.8038 pp lower than those of the corresponding synthetic firm. In this case, the results are driven by MNCs not registered in CADIVI (Table 7, Panel c, 1.0376 pp).

The results differ from those of the event study reported above in two important ways. On the one hand, the former identifies one devaluation that does not show up

in the latter (Event 1) as having a statically significant, negative impact on the stock prices of MNCs with subsidiaries in Venezuela, that is strongly driven by MNCs not registered in CADIVI. This could be explained by parallels incidents impacting our market proxy in the event study – the S&P500 index – to a higher degree than the synthetic firms based on a sample of companies of similar market size and industry not present in Venezuela.

On the other hand, in the event study devaluation 5 appeared to have a significant, negative impact on the stock prices of MNCs with subsidiaries in Venezuela, also strongly driven by MNCs not registered in CADIVI. That could in turn be explained by world industry trends affecting firms present and not present in Venezuela to a larger degree than their impact in the market index.

All in all, however, it is comforting that using the synthetic control methodologies, without many impositions in the formation of the synthetic firms beyond their industry classification and market capitalization value, we find results consistent with the ones obtained through the event study methodology.

5. Conclusions

This paper studies changes in stock prices following arguably foreseeable exchange rate devaluations in Venezuela during the past decade, and find statistically and economically significant negative returns of up to about 2 percent over a window of twenty days [-10, +10] surrounding the event. The results are surprising for several reasons. First, because Venezuela is a small economy, representing on average less than 0.3% of the world gross domestic product over the period studied. Second, because most firms in our sample were, in fact, not registered in CADIVI – the governmental agency managing access to foreign currency at the official fixed exchange rate – during the period of the study and therefore were not eligible to buy foreign currency at those rates. Third, even if official devaluations occurred, nothing actually changed in the fundamentals of the parallel exchange market premium, which remained at a steady rise throughout the period studied. Fourth, we find remarkable that we are not documenting here a one-time negative surprise. More than three years after the first devaluation which had a significant negative impact on MNC stock prices, market analysts continued to be "surprised" by Venezuelan devaluations. Finally, we find that the most significant and negative abnormal returns were recorded among large companies not registered in CADIVI, averaging market capitalization of USD 46.0 billion. That indicates that our results are not driven by markets neglecting a number of small firms whose operations were overrepresented in Venezuela.

All in all, our findings contrast with previous studies showing that devaluations are either anticipated by markets – with abnormal returns registered before, not after, the event – or, alternatively, could have a positive impact on sub-samples of exporters. To the extent of our knowledge, our paper is the first one to report significant, negative abnormal returns to the stock prices of MNCs in response to devaluations. Methodologically, our paper also contributes to the literature by being the first study to apply synthetic control methods in the context of asset pricing.

Our preferred interpretation of these results is market analysts' myopia, which failed to incorporate the foreseeable devaluations into the companies' valuation ex-ante. That myopia can also apply other countries with running macroeconomic disequilibria and multiple exchange rates, such as Venezuela during the period of the study, whose particularities are neglected by market analysts.

Moreover, the evidence suggests that while analysts where not neglecting specific companies – as our result are particularly prevalent among large companies, usually subject to considerable analyst coverage – they were consistently neglecting the country as a whole. Our results at the country-level present a parallel with those reported by a strand of the asset-pricing literature dealing with neglected-firm-effect: The existence of price anomalies in securities that are neglected by market analysts (Arbel and Strebel, 1982; Arbel, Carvell, and Strebell, 1983; James and Edmister, 1982; Barry and Brown, 1984, 1985 and 1986; and Bhardwaj and Brooks,

1982). Whether our findings conform a wider syndrome – a sort of neglected-country effect – can potentially be fertile ground for future research.

Since the parallel exchange rate is neither official nor legal, MNCs translate the financial statements of their Venezuelan subsidiaries using the official exchange rate. By doing so, MNCs comply with current applicable regulations.[14] However, our results suggest that MNCs with operations in countries with exchange control and multiple exchange rates should be compelled to include a disclosure note in their financial statements. In that note, firms should estimate the impact on their assets and profits of translating their subsidiaries' financial statements at all different exchange rates that may exist. In addition, MNCs must explain which exchange rate or combination of rates is more likely to apply given its legal status. With a disclosure note along these lines, we will not only promote more transparent assessment of equity values and stock prices, but will also prevent insiders from taking advantage of the kind of market anomalies we have documented in the paper.

[14] The SEC (Security and Exchange Commission), the FASB (Financial Accounting Standard Board), the US GAAP (US General Accepted Accounting Principles), and the IAS (International Accounting Standard) requirements

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Appendix I. Sample of 110 Multinational Companies with Venezuelan subsidiaries

#	Ticker	Company Name	NAICS	Market Cap 2011	Market Cap 2012	Market Cap 2013	Market Cap 2014	Cadivi	Exportable
1	ABT	ABBOTT LABORATORIES	325	74,060.04	103,533.74	59,265.30	67,790.70	1	1
2	ACN	ACCENTURE PLC IRELAND	541	23,324.08	39,103.72	55,541.66	63,520.78	0	0
3	ADSK	AUTODESK INC	511	9,250.43	8,693.57	11,562.00	12,287.25	0	0
4	AGN	ALLERGAN INC	325	6,472.21	10,987.08	22,371.08	68,229.38	0	1
5	ALB	ALBEMARLE CORP	325	5,107.83	5,544.82	4,705.40	4,705.40	0	1
6	AVP	AVON PRODUCTS INC	325	12,471.98	6,205.85	7,469.51	4,081.42	1	1
7	AVT	AVNET INC	423	3,640.77	4,476.33	4,604.92	6,132.49	0	0
8	AXE	ANIXTER INTERNATIONAL INC	423	2,027.34	2,063.18	2,915.94	2,895.61	0	0
9	BAX	BAXTER INTERNATIONAL INC	339	29,497.65	36,621.53	37,744.62	39,721.58	0	1
10	BCO	BRINKS CO	561	1,247.14	1,362.86	1,647.87	1,185.68	0	0
11	BDX	BECTON DICKINSON & CO	339	17,202.01	15,677.03	19,425.12	21,832.85	0	1
12	BG	BUNGE LTD	311	9,493.15	10,625.22	12,110.65	13,199.71	0	1
13	BGC	GENERAL CABLE CORP DEL NEW	331	1,828.60	1,513.53	1,463.42	725.20	0	1
14	BMY	BRISTOL MYERS SQUIBB CO	325	45,325.43	53,795.95	87,513.76	97,917.58	0	1
15	C	CITIGROUP INC	522	137,407.30	116,010.52	158,049.70	163,925.60	1	0
16	CA	C A INC	511	12,333.08	11,480.16	13,871.85	14,439.88	0	0
17	CAT	CATERPILLAR INC	333	59,832.14	58,697.91	57,920.64	55,412.16	0	1
18	CB	CHUBB CORP	524	21,127.02	27,116.70	35,224.32	38,110.01	0	0
19	CBI	CHICAGO BRIDGE & IRON CO N V	237	3,263.67	4,486.37	8,938.16	4,546.09	0	0
20	CBT	CABOT CORP	325	2,128.01	2,314.69	2,727.56	3,278.75	0	1
21	CFX	COLFAX CORP	333	798.91	3,792.01	6,490.23	6,378.50	0	1
22	CKH	SEACOR HOLDINGS INC	483	2,147.35	1,747.47	1,854.27	1,371.18	0	0
23	CL	COLGATE PALMOLIVE CO	325	60,332.86	49,393.24	60,332.86	63,059.65	1	1
24	CLX	CLOROX CO	325	8,754.69	9,424.71	10,946.47	11,752.88	0	1
25	CMS	C M S ENERGY CORP	221	4,549.11	6,465.67	7,150.02	9,596.18	0	0
26	COP	CONOCOPHILLIPS	324	100,054.20	70,393.75	86,553.23	85,006.84	0	1
27	CR	CRANE CO	332	2,400.40	2,634.48	3,462.36	3,462.36	0	1
28	CSCO	CISCO SYSTEMS INC	334	131,756.30	85,442.22	136,761.60	129,245.50	0	1
29	DAN	DANA HOLDING CORP	336	2,430.31	2,311.82	2,882.26	3,682.85	0	1
30	DBD	DIEBOLD INC	334	2,105.03	1,935.14	2,107.30	2,238.75	0	1
31	DD	DU PONT E I DE NEMOURS & CO	325	45,535.15	41,941.15	60,168.91	66,985.73	0	1
32	DOW	DOW CHEMICAL CO	325	39,626.84	38,770.44	53,851.25	53,754.15	0	1
33	ECL	ECOLAB INC	325	11,704.25	21,060.11	31,416.47	31,368.17	0	1
34	EEI	ECOLOGY & ENVIRONMENT INC	813	30.27	31.71	27.75	27.43	0	0
35	EMN	EASTMAN CHEMICAL CO	325	5,948.51	10,436.63	12,304.10	11,276.40	0	1
36	EMR	EMERSON ELECTRIC CO	335	39,621.85	35,107.92	46,230.18	43,675.54	0	1
37	ETN	EATON CORP	336	17,084.13	18,309.23	36,118.94	32,253.82	0	1
38	ETP	ENERGY TRANSFER PARTNERS L P	221	9,928.69	12,902.50	18,901.62	22,934.28	0	0
39	F	FORD MOTOR CO DEL	336	57,116.28	48,473.59	59,654.66	59,654.66	1	1
40	FLEX	FLEXTRONICS INTERNATIONAL LTD	334	5,677.29	4,433.39	5,566.24	7,254.87	0	1
41	FLR	FLUOR CORP NEW	237	11,846.76	9,780.77	13,115.58	9,471.65	0	0
42	FLS	FLOWSERVE CORP	333	6,656.21	7,337.69	10,994.31	8,155.33	0	1
43	FMC	F M C CORP	333	5,711.00	8,056.47	10,027.55	7,603.11	0	1
44	GD	GENERAL DYNAMICS CORP	336	26,804.71	24,457.14	45,605.86	45,605.86	0	1
45	GE	GENERAL ELECTRIC CO	333	195,542.40	220,107.43	253,766.20	253,766.20	1	1
46	GIS	GENERAL MILLS INC	311	23,632.45	24,778.99	30,350.48	33,754.06	1	1
47	GRA	GRACE W R & CO DEL NEW	339	2,567.26	5,063.32	7,041.90	7,041.90	0	1
48	GT	GOODYEAR TIRE & RUBBER CO	326	2,878.52	3,382.94	5,888.50	7,844.25	1	1
49	HAL	HALLIBURTON COMPANY	213	37,136.31	32,191.86	33,330.61	33,330.61	1	0
50	HLF	HERBALIFE LTD	424	4,050.21	3,557.57	7,949.52	3,460.86	1	0
51	HON	HONEYWELL INTERNATIONAL INC	336	41,473.98	49,720.63	71,695.55	78,218.41	1	1
52	HP	HELMERICH & PAYNE INC	211	4,281.22	5,032.03	7,342.38	10,592.17	0	1
53	HRS	HARRIS CORP	334	5,346.59	4,761.60	5,396.99	8,067.33	0	1
54	HSC	HARSCO CORP	332	2,279.95	1,893.74	1,526.49	1,526.49	0	1
55	HUN	HUNTSMAN CORP	325	3,734.15	3,808.63	5,939.40	5,556.36	0	1

Source: ORBIS and Center for Research in Security Prices (CRSP)

Appendix I. Sample of 110 Multinational Companies with Venezuelan subsidiaries (cont.)

#	Ticker	Company Name	NAICS	Market Cap 2011	Market Cap 2012	Market Cap 2013	Market Cap 2014	Cadivi	Expertable
56	IBM	INTERNATIONAL BUSINESS MACHS COR	334	182,328.90	216,438.57	203,673.70	158,781.10	1	1
57	IILG	INTERVAL LEISURE GROUP INC	561	921.27	#N/A	1,772.83	1,192.79	0	0
58	INWK	INNERWORKINGS INC	323	299.21	688.18	399.37	419.76	0	1
59	IPG	INTERPUBLIC GROUP COS INC	541	5,190.37	4,753.90	7,367.48	8,686.62	0	0
60	IR	INGERSOLL RAND PLC	333	15,257.66	14,436.05	17,746.13	16,828.26	0	1
61	JBL	JABIL CIRCUIT INC	334	2,229.00	4,680.87	4,624.64	4,312.32	0	1
62	JLL	JONES LANG LASALLE INC	531	3,579.03	3,697.34	4,549.88	6,720.15	0	0
63	KEX	KIRBY CORP	483	2,357.73	3,459.90	4,606.94	4,606.94	0	0
64	KFY	KORN FERRY INTERNATIONAL	541	745.74	773.79	805.67	1,444.75	0	0
65	KMB	KIMBERLY CLARK CORP	322	25,707.28	33,036.24	39,866.01	43,033.47	1	1
66	KO	COCA COLA CO	312	182,421.80	162,587.10	182,421.80	184,928.40	1	1
67	LECO	LINCOLN ELECTRIC HOLDINGS INC	332	2,749.22	4,037.75	5,779.26	5,319.73	0	1
68	LLY	LILLY ELI & CO	325	40,406.14	57,233.52	57,459.13	76,815.52	1	1
69	MAN	MANPOWER INC WIS	561	5,119.15	3,329.69	6,782.42	5,394.95	0	0
70	MDT	MEDTRONIC INC	339	48,125.93	39,750.56	47,324.46	58,867.93	0	1
71	MELI	MERCADOLIBRE INC	519	2,941.14	3,468.05	4,759.25	5,637.21	0	0
72	MMC	MARSH & MCLENNAN COS INC	524	14,857.94	18,765.01	26,538.79	30,961.07	1	0
73	MMM	3M CO	339	61,692.34	63,796.46	93,300.17	105,299.40	1	1
74	MON	MONSANTO CO NEW	424	28,454.71	46,425.28	52,186.07	60,669.25	1	1
75	MRK	MERCK & CO INC NEW	325	111,034.90	124,460.54	146,242.50	161,901.10	1	1
76	MSFT	MICROSOFT CORP	511	201,655.90	256,982.50	288,489.00	344,459.20	1	0
77	NDSN	NORDSON CORP	333	2,649.34	3,784.05	4,629.90	4,830.04	0	1
78	NEU	NEWMARKET CORP	339	1,763.10	3,518.17	4,430.96	5,056.65	0	1
79	NOV	NATIONAL OILWELL VARCO INC	333	34,046.81	29,178.99	34,046.81	28,215.50	0	1
80	NUS	NU SKIN ENTERPRISES INC	424	1,879.95	2,174.59	8,221.66	2,590.72	0	0
81	NWL	NEWELL RUBBERMAID INC	326	5,277.65	6,404.85	10,326.20	10,326.20	0	1
82	OI	OWENS ILL INC	327	5,026.07	3,499.55	5,903.50	4,450.92	0	1
83	ORCL	ORACLE CORP	511	113,280.90	131,691.05	159,126.00	187,362.40	1	0
84	OXY	OCCIDENTAL PETROLEUM CORP	211	79,714.66	62,068.19	76,656.30	62,507.26	0	1
85	PEP	PEPSICO INC	312	103,537.70	105,851.19	127,196.80	141,519.10	1	1
86	PFE	PFIZER INC	325	140,254.30	184,648.19	198,515.20	196,265.50	1	1
87	PG	PROCTER & GAMBLE CO	325	172,736.70	167,831.49	211,012.10	212,661.40	1	1
88	PH	PARKER HANNIFIN CORP	332	8,931.04	11,612.81	14,238.57	18,725.76	0	1
89	PM	PHILIP MORRIS INTERNATIONAL INC	312	106,196.50	139,725.05	126,550.10	126,550.10	1	1
90	PRGS	PROGRESS SOFTWARE CORP	511	1,667.20	1,285.19	1,367.51	1,294.30	0	0
91	PRGX	P R G X GLOBAL INC	541	151.32	204.17	196.33	155.88	0	0
92	PX	PRAXAIR INC	325	29,250.07	32,520.49	38,276.07	37,750.23	1	1
93	RPM	R P M INTERNATIONAL INC	325	2,568.12	3,466.95	4,389.97	5,738.96	0	1
94	RRD	DONNELLEY R R & SONS CO	323	3,604.06	1,620.90	3,685.90	3,357.64	0	1
95	SEE	SEALED AIR CORP NEW	322	4,063.87	3,405.94	6,679.64	8,959.42	0	1
96	SHW	SHERWIN WILLIAMS CO	444	9,039.54	15,859.93	18,594.61	25,251.23	0	0
97	SJM	SMUCKER J M CO	311	7,274.81	8,920.05	10,024.65	10,024.65	0	1
98	SLB	SCHLUMBERGER LTD	213	113,925.70	92,017.58	117,803.50	109,905.10	1	0
99	SLGN	SILGAN HOLDINGS INC	332	2,749.74	2,874.73	3,045.21	3,387.70	0	1
100	SON	SONOCO PRODUCTS CO	322	3,464.72	2,995.03	4,253.44	4,425.07	0	1
101	T	A T & T INC	517	173,635.80	191,472.79	185,222.90	174,231.30	0	0
102	TDW	TIDEWATER INC	488	3,078.74	2,494.58	897.39	897.39	0	0
103	TEL	TYCO ELECTRONICS LTD NEW	334	13,078.26	14,549.80	21,412.93	22,628.22	0	1
104	TESO	TESCO CORP	333	593.00	441.31	773.56	508.21	0	1
105	TKR	TIMKEN COMPANY	332	4,634.41	4,584.36	5,376.85	3,785.15	0	1
106	TTI	TETRA TECHNOLOGIES INC	325	904.27	592.64	974.52	531.73	0	1
107	TUP	TUPPERWARE BRANDS CORP	325	3,010.28	3,544.27	4,789.22	3,173.36	0	1
108	V	VISA INC	522	36,882.49	70,822.85	98,338.05	105,572.70	0	0
109	WST	WEST PHARMACEUTICAL SERVICES INC	325	1,371.89	1,868.21	3,426.13	3,783.78	1	1
110	XRX	XEROX CORP	334	14,982.66	8,678.77	14,982.66	15,821.96	1	1

Source: ORBIS and Center for Research in Security Prices (CRSP)