

Stock Market Response to Currency Devaluations: The Case of Multinationals in Venezuela

Abstract

Devaluations may have an impact on multinational stock prices depending on the size of the particular country and whether they are anticipated or not. In an efficient market, predictable devaluations on very small countries should not have impacts on stocks of large multinational companies. We analyze six the abnormal returns to six devaluations occurring in Venezuela within the context of stiff exchange controls. Our event study covers a period of five years, and uses daily stock prices for up to 152 multinationals operating in Venezuela. We find evidence of significant negative impacts on stock prices on various devaluations that reach up to -1.75% per day. We interpret these results as evidence of market myopia, as they are driven by retained earnings being converted into dollars at highly overvalued official exchange rates, in spite of subsidiaries not having access to dollars at these prices for years prior to the devaluations.

JEL classification: G14, G15

Keywords: devaluation, market efficiency, market myopia, multinationals, abnormal returns, macroeconomic factors

1. Introduction

Investors are much less familiar with the macroeconomic dynamics and the intricacies of exchange rate regimes of foreign countries, than they are with domestic markets. That is what diversification is all about, right? Multinational companies (MNC) diversify across a wide array of countries, making the job of investment analysts much easier. They concentrate in understanding and forecasting large markets, assuming that variations coming from small countries within the MNC portfolio will tend to cancel each other, or in any case will be too little to worry. And yet, there are times when not paying attention to the small brings inversely proportional consequences.

The impacts of devaluations on MNC might be divided into stocks and flows (Ang and Ghallab, 1976). There is a balance sheet effect, as the net value of assets of the subsidiary in foreign currency (property, plant, equipment, cash and other investments, net of liabilities denominated in domestic currency) will be lower after a devaluation. The income statement effect is derived from a decrease in the expected value of the future earnings of the subsidiary. In contrast to the income effect, which comes from recurring impacts on financial statements and take time to understand and estimate, balance sheet impacts are one-time events and are relatively straightforward to calculate.

How does the stock price of a multinational company (MNC) should react when one of its subsidiaries suffers exchange losses because of a currency devaluation in its base country? The answer to this question should be very simple. For countries that follow a fixed or managed floating exchange rate system, currency prices remain constant or in a very narrow band until the central bank announces a devaluation. Models of international asset pricing (Stulz, 1981; Adler and Dumas, 1984) predict that such devaluations will have significant impacts on asset prices, and to the extent that real cash flows of the firms are affected by the devaluations, the security prices will also change. If the country where the subsidiary is located has a significant size within the scope of operations of the MNC, and the devaluation was entirely unexpected, its stock price should react negatively. Glen (2002), studying 24 emerging markets using monthly stock returns, reports significant negative returns in the months before, not after, the devaluation. Patro, Wald, and Wu (2014). using data from stock markets in 27 countries around 85 announcements of devaluations, find that devaluations were anticipated by the local stock markets, with significant negative abnormal returns occurring even one year prior to the announcement of devaluations. The exchange rate system, relative size of the market, and predictability seem to be the keys to appraising the impacts of devaluation on MNC stock prices.

Venezuela is a rather small country, representing an average of 0.42% of the world gross domestic product (GDP) over the previous decade.¹ Since 2003, it has been working under a stiff exchange control regime. Multiple official rates coexist with a black parallel market at highly significant premiums. MNC should introduce requests to a Commission for the Administration of Foreign Currency (CADIVI, for its Spanish acronym), in order to receive authorization to purchase dollars in the Venezuelan Central Bank (VCB) at the official rates. Between 2005 and 2009, the VCB maintained the official exchange rate fixed at 2.15 Venezuelan bolivars (VEB) per US\$, in spite of inflation running at a compounded annual growth rate of 18.6%.

¹ Calculations by the authors base don World Developmen Indicators for the period 2004-2014.

A massive appreciation ensued, inflating the profits of MNC in foreign currency, as calculated at the official rates. The problem is that profits are recorded at the official rates, regardless of whether the company has access to dollars at those prices to repatriate dividends. Indeed, CADIVI authorizations for 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 dollars per barrel (December) in six months. Even though prices recovered and averaged more than 100 dollars per barrel in 2011, 2012, and 2013, authorizations and liquidations for dividend repatriations remained close to zero, at least until last quarter of 2011 when this information was last available. The process led to a massive overestimation of the retained earnings of multinational companies operating in Venezuela, distorting the relative size and importance of the Venezuelan subsidiary within MNC.

Between early 2010 and 2015 six official devaluations of the official exchange rates occurred. In spite of these, black market premiums went from a factor of 1.2 (2006) to a factor of 100 (2015). Reuters reported on February 10th, 2015 that 40 major U.S. companies had a substantial exposure to Venezuela and could collectively be forced to take billions of dollars of write downs.² By then multiple official exchange rates coexisted with a black parallel market. Only taking the ten largest S&P500 companies with operations and Venezuela and switching the calculation of retained earnings in foreign currency from the lowest official exchange rate to the highest would have resulted in estimated losses close to USD 5.8 billions (McLaughlin, 2015).

We developed an event study in order to analyze the impacts of these Venezuelan devaluations on the stock prices of MNC operating in Venezuela. We begin with a sample of 63 MNC whose stocks trade in U.S. markets, have enough data available for the whole period, and were registered in CADIVI. We find evidence that in the most important devaluation events, where the official exchange rate was devaluated 65.38% and 79.35%, there were negative and statistically significant cumulative abnormal returns (CAR). The economic impact as measured by the size of the coefficient were sizable, going as high as -1.75% over the event window.

But our balance-sheet argument is not restricted to those MNC registered in CADIVI. Other MNC not registered at CADIVI and therefore not eligible to purchase dollars at the official rates for dividend repatriation, also saw the value of their cumulative retained earnings by registering them at official, massively overvalued, exchange rates. In order to account for MNC regardless of their registration in CADIVI, we searched the ORBIS database for companies trading at the New York Stock Exchange (NYSE), NASDAQ Capital Market, or NASDAQ National Market, that declared having a foreign subsidiary in Venezuela. We ran our event study for the resulting 137 seven firms, and found statistically significant negative CAR on the events of the same devaluations reported above, going as high as -1.67% within the event window. Our results are robust to using different event windows and are not present in peer-groups of MNC without operations in Venezuela that mirrors both of our samples in terms of industry composition.

It is hard to explain how the stock price of large, fully globalized MNC can suffer losses of the magnitude reported here in response to devaluations from a relatively small country such as Venezuela. Moreover, the fact MNC have lost access to official dollars to repatriate dividends two and six years prior to the two devaluations where we found

² Need to introduce Reuters quote.

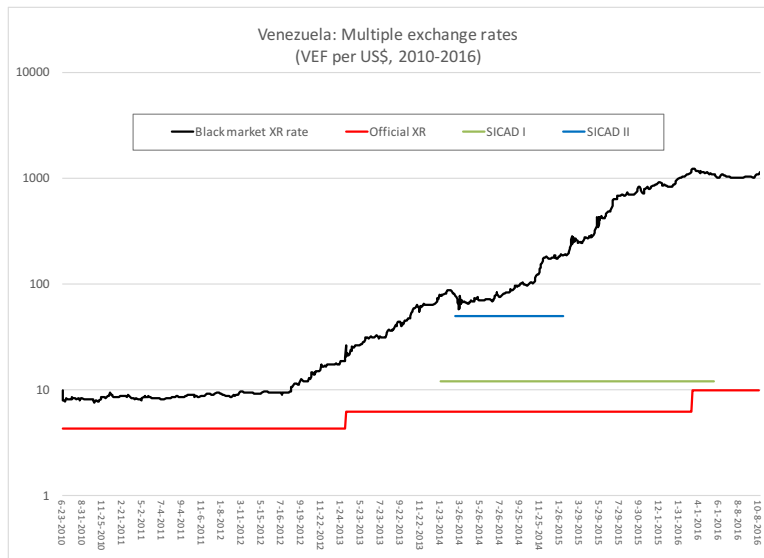
significant negative CAR, should have led analysts to build into the price of these stocks the possibility that those retained earnings might never be converted at those rates. The question we present in this paper is important both from the investors' viewpoint of investment timing and from the viewpoint of MNCs' managers relative to their abilities to legally overstate the figures in the financial statements, their earnings, and importance of the subsidiary relative size.

The rest of the paper is organized as follows. Section 2 presents a brief description of the Venezuelan exchange rate system. Section 3 describes the data in our sample of MNC. Section 4 proposes an empirical framework to estimate the reaction of MNC's parents stock price to devaluation events affecting their subsidiaries in Venezuela. Section 5 reports the results for the cumulative abnormal returns of the MNC's parents stock for both of our samples. It also contains a robustness check we have developed by running the same event study on a sample composed by peers of MNC with subsidiaries in Venezuela. Conclusions are in Section 6.

2. The Venezuelan exchange rate system

The exchange rate control that still prevails in Venezuela was implemented amidst intense political turmoil in February 2003. The system was designed to have a single fixed official exchange rate, that would coexist with an (illegal) parallel market rate. Companies shall register at the Commission for the Administration of Foreign Currency (CADIVI), and request access to official dollars for importing, foreign debt service or repatriating dividends. Black market premium started at 45% and never went below 19% (May 2006). From then onwards, both rates consistently diverged. Their trajectory (red and black) is depicted in Figure 1 (2010-2016). By early 2014 the dollar in the parallel black market was trading at a factor of 10 times the official rates, hiking up to 100 by the end of 2015. Beside the changes in the lowest official rate (depicted in red in Figure 1), some intermediate official rates were introduced (green and blue). In total, six devaluations were implemented between 2010 and 2015³

Figure 1.

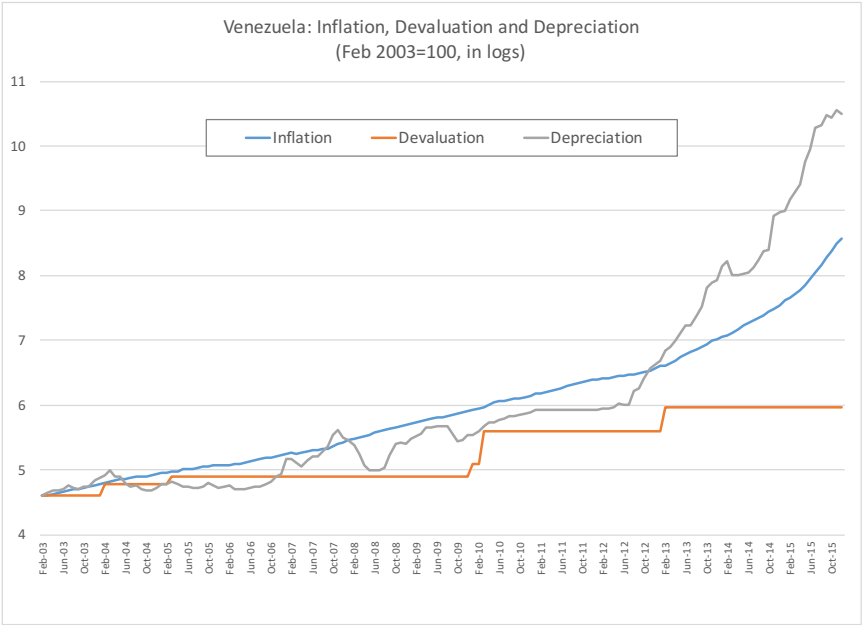


³ These six events are described in detail in the next section

The official exchange rate significantly lagged inflation. Figure 2 represents the evolution of inflation, devaluation,⁴ and depreciation, from the moment the exchange control was instated until the end of 2015. Note that we have been forced to use a logarithmic scale in order to depict the accelerated evolution of these rates. To put it another way, between February 2003 and December 2015 cumulative inflation was 5,171%, equivalent to a compounded annual growth rate (CAGR) of 39.2%. Over that same period, the official exchange rate was devaluated 294% (CAGR 12%), and the black parallel market depreciated 35,932% (CAGR 63%). The large differences between these three resulted in humongous distortions, one of them being that as profits tend to grow with inflation (unless price controls are imposed, more on that later), and the official exchange rate lags inflation in the magnitudes reported here, the value of profits in foreign exchange as calculated at the official, massively overvalued rate, will grow exponentially.

In order to illustrate this effect, let us think about a hypothetical MNC that produced yearly profits of 100 Venezuelan bolivares (VEF) in 2002. That year no exchange control existed, so the company could have exchanged those profits for 84 US dollars at the prevailing rate and repatriate them home. Now imagine that the profits of that company parsimoniously grow with inflation every year. By 2015, those 100 VEF in profits would have grown to 5,271 VEF. At the average official exchange rate prevailing in 2015, that would have been equivalent to 915.7 US dollars, more than ten times the figure of 2002. At the parallel market rate, however, the 2015 profits would have been equivalent to 10.6 US dollars, one eighth of the original 2002 figure.

Figure 2.



⁴ Given that in some periods more than one official exchange rate exists, we have taken devaluations as announcements affecting the lowest official exchange rate.

Our simple example above only illustrated the large distortions on the MNC profits for 2015. From a financial standpoint, distortions accumulated every year between 2003 and 2015. In order to assess the real value in foreign exchange of those retained earnings, we need to find out if MNC had access to dollars at the official exchange rates in order to repatriate dividends home.

Obtaining access to dollars at the official rate in Venezuela entails two different authorizations. First, the MNC shall introduce in CADIVI a request stating all the details of the operation, and proving that the specific use of proceeds does comply with the previsions to receive dollars at 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), orders the Central Bank to sell dollars to the MNC at the stated rate.

Figures 3 and 4 depict the total amount of AAD coming from CADIVI from 2004 to 2011, and the total amount of ALD from 2007 to 2012.⁵ Since some MMC register investments as loans to the subsidiary (private external debt) while others used the more traditional foreign direct investment approach (foreign investment), we have incorporated here the total amount of AAD and AAL for both categories. Total authorization to acquire dollars at the official rates (for both purposes) peaked in 2007 (US\$4,670 million), and then fell 40% in 2008 (US\$2,787 million), and another 71% in 2009 (US\$801 million). Since then, they have been hovering around zero. When it comes to ALD, we only have figure from the third quarter of 2007 onwards. We know that total ALDs fell by 75% between the second half of 2007 (US\$2,080 billion), and the second half of 2008 (US\$502 million). Total ALD for both purposes fell by another 75% between 2008 (US\$2,250 million) and 2009 (US\$573 million). From then onwards it has remained very close to zero. In the years where AAD and ALD for these purposes boomed, the black market premium remain below 30%. By the time the slowed down, in 2007 and 2008, it was around 100%. By 2009 it was 185%. Nowadays, the price of the dollar in the black parallel market is 100 times that of the lowest official rate.

Figure 3

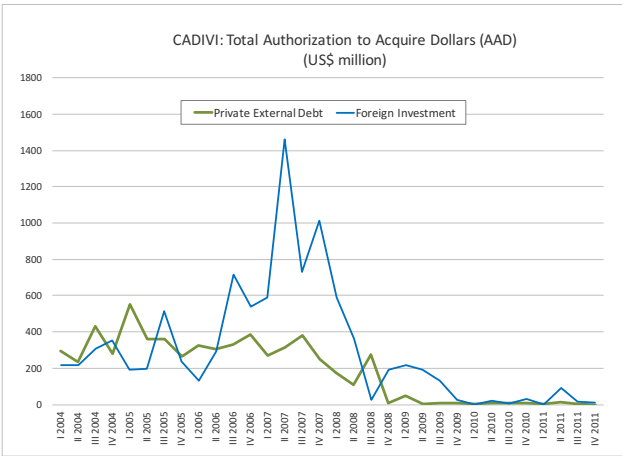
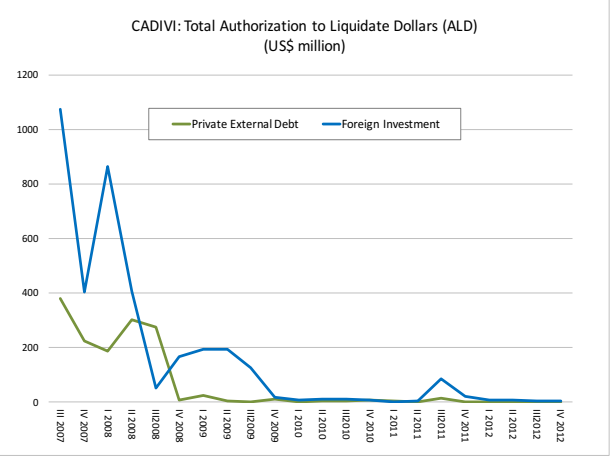


Figure 4



⁵ These are the last oficial statistics published by CADIVI.

3. Data

We identified 109 subsidiaries of MNC operating in Venezuela registered in CADIVI. We then 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 was from April 3, 2009 through Feb 20, 2015. The sample was reduced to 63 parent companies trading in the New York Stock Exchange (NYSE), NASDAQ Capital Market, or NASDAQ National Market, with available stock price data for all this time span. We have also collected from the CRSP database daily returns for the Standard and Poor's 500 index (S&P500), which we use as market index proxy. Appendix I shows the list of 63 parent companies in our final sample, with their corresponding industries. The most relevant sectors are oil and gas (9 companies), pharmaceutical companies (9); manufacturing (6), technology (6), personal care (5), automotive (4), food (3), and beverages (3). The remaining 18 companies are scattered between many sectors.

Given that Venezuelan devaluations might affect MNC regardless of whether they are registered in CADIVI or not, we have performed a more comprehensive search to include within our analysis all MNC who have a foreign subsidiary in Venezuela. According to the ORBIS database, 152 MNC active on the New York Stock Exchange (NYSE), NASDAQ Capital Market, or NASDAQ National Market, declared having at least a 25.0% stake of a foreign subsidiary in Venezuela. Out of those, only 137 have stock price data for the period of analysis. Appendix II contains the full list of this second, more comprehensive sample.

Data on our six events comes from the Venezuelan Central Bank. Table 1 shows the dates on which these six devaluations were announced, and a brief description of the particular 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 VEB 2.6 and 4.3/US\$, substitute previous fixed exchange rate VEB 2.15/US\$
2	30-Dec-10	The dual exchange rate system is unified into a single exchange rate at VEB 4.3/US\$.
3	08-Feb-13	Devaluation of the exchange rate from VEB 4.3/US\$ to VEB 6.3/US\$
4	23-Jan-14	New currency tier SICAD is added to the fixed rate of Event 3, which remains unchanged. SICAD rate starts at VEN 11.30/US\$.
5	10-Mar-14	SICAD II is a currency system complementing SICAD (now SICAD I), conforming a three-way exchange rate system: (i) the fixed rate of VEB 6.3/US\$, (ii) the SICAD rate between VEB 11.3 and 12.0/US\$, (iii) new SICAD II rate starting at VEB 51.86/US\$
6	10-Feb-15	Replacement of the SICAD II with the SIMADI System. The SICAD I and fixed 6.3 rate remain unchanged. The SIMADI exchange rate starts at VEB 199.47/USD.

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

The first three events are relatively straightforward devaluations of a fixed exchange official rate. The first devalued the official rate that have prevailed for four years and ten months (2.15 VEF per US\$). An official, dual exchange rate system was established, with the new fixed exchange rates representing a devaluation of the domestic currency by 17% (2.60) and 50% (4.30). The dual system lasted only twelve months, and was followed by a reunification of the

official exchange rate by means of eliminating the intermediate rate (2.60). The unique official rate (4.30) represented a devaluation of the domestic currency of 40% for those that had access to the 2.60 VEF per US\$ exchange rate.

From then onwards the system got more complicated. In every case, a new official rate was added to the pre-existing system. In all three, the government insisted that at least one of the official rates will be determined by some form of market, but that never happened and rates either remained fixed and lagged inflation by long periods (SICAD I and SICAD II), or were somewhat flexible, but determined unilaterally by the Central Bank. One might be tempted to think that these three latter events did not represent a devaluation for companies having access to the lowest prevailing exchange rate (6.30). But the true is that in practice none of the MNC in both, our smaller CADIVI-registered sample or our wider MNC sample, was ever granted access to dollars in order to repatriate dividends (or pay for foreign debt) at VEB 6.3 per US\$. The specific devaluation for the three latter event is hard to pin down, as it depends on the tier the particular company was located by CADIVI. In any case, moving from 6.30 to the rate at which SICAD I started (11.30, fourth event) represented a devaluation of 43%. From SICAD I to the rate at which SICAD II started (51.86, fifth event) there was an additional devaluation of 78%. From SICAD II to the rate at which SIMADI kicked off (199.47, sixth event) an additional 74% devaluation was scored. In total, from our first to the sixth event, the Venezuelan bolivar devaluated an 99%. By then, all retained earnings pending for conversion into dollars had melted (regardless of the MNC having AAD to repatriate those dividends or not) and companies started to recognized loses and deconsolidate Venezuela from their financial statements.

4. Empirical Framework

We follow Mackinlay (1997) classic event study methodology, and Ang and Ghallab (1976) in the research design. Devaluations might have affected the value of the subsidiaries in our sample, but we measure their impact on the MNC 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 MNC stock return. For robustness, and to gauge the speed at which markets interpret and incorporate the impacts of devaluation on stock prices, we have incorporated all event windows surrounding the devaluations from [-1,+1] to [-10,+10] (see Kanas, 2005). However, from the event three onwards, devaluations represented complex arrangements involving multiple official rates depending on the nature of the operation and the company. As such, their impact is not straightforward and it might have taken the markets a few days to assess and price.

We estimate a market model to measure the expected return of the MNC 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, R_{mt} is the daily market stock return. As the market proxy we use the Standard and Poor's 500 index.⁶ For each stock in our sample we estimated the market model on a window of

⁶ We also use as a market proxy, the market index, weighted and unweighted, from the CRSP database. Results are available from the authors upon request.

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 250 days to estimate the market model for each stock return. That means, we inform our expectations of how the MNC should have behaved in the absence of a devaluation with the stock price behavior in an estimation window going from 280 days to 30 prior to the event [-280,-30]. We then estimate the abnormal return (AR) as:

$$\widehat{AR}_{it} = R_{it} - \widehat{\alpha}_i - \widehat{\beta}_i R_{mt} \quad [2]$$

where \widehat{AR}_{it} is the estimate for the abnormal return, $\widehat{\alpha}_i$ and $\widehat{\beta}_i$ are the estimates of coefficients α and β in equation [1]. The abnormal return will be the one result 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 (CAR). In order to do this, we sum of the abnormal returns by business day of the event window. The CAR together with its standard deviation are the results that will 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. This test will indicate if the difference between the expected market returns and real MNC's returns the days of the window event is significant. (Mackinlay, 1997)

5. Results

Our null hypothesis is that Venezuelan devaluations should not significantly impact the stock price of the MNC's parents. First, devaluations decreed in such a small country shall be immaterial to the stock price of large globalized multinational. Second, the evolution of black market premiums and the fact that CADIVI AAD and ALD have come to a halt two or even six years prior to these events (depending on the specific devaluation analyzed), should have given market analysts enough cues on the unlikelihood of those retained earnings be converted back into dollars at official exchange rates.

5.1 CADIVI-registered 63 MNC sample

Table 3 presents the results for the Cumulative Abnormal Return (CAR) of the stock prices of the 63 MNC registered in CADIVI that are listed in Appendix I. The results are presented for the six devaluation events described in Table 2. Each column presents the results for a different event window, with t=0 being the day of the devaluation announcement. The event window in Table 3 goes from [-1,+1] to [-10,+10] days prior and after the event. We have filled with light grey those cells that display significant CAR.

Table 3. Cumulative Abnormal Return (CAR) for sample of 63 MNC around the six events studied

Event	Event window									
	[-1,+1]	[-2,+2]	[-3,+3]	[-4,+4]	[-5,+5]	[-6,+6]	[-7,+7]	[-8,+8]	[-9,+9]	[-10,+10]
1	-0.00287	0.00220	0.00158	0.00461	0.00691	0.00468	-0.00071	-0.00134	0.00260	0.00057
2	0.00427**	0.00087	-0.00379	-0.00636*	-0.00968*	-0.0124**	-0.0142**	-0.0146**	-0.00978	-0.01060
3	-0.00476	0.00154	0.00423	0.00531	0.00535	0.00778	0.00764	0.00792	0.00888	0.00904
4	-0.00633*	-0.00561	-0.00742*	-0.0114*	-0.0125**	-0.0175**	-0.0138*	-0.01030	-0.00754	-0.00902
5	-0.00392	-0.00473	-0.00542	-0.00148	-0.00738	-0.00887	-0.01000	-0.0166**	-0.0123*	-0.00840
6	-0.00257	-0.00434	-0.00334	-0.00192	0.00375	0.00732	0.00396	0.00718	0.00557	0.01300

Note: All studies conducted with estimation window [-280,-30]
 * p<0.10, ** p<0.05, *** p<0.01

We find that in the case of events 2 and 4, most of the intermediate windows (going from 3 days prior and after, to eight days prior and after) show average statistical significant negative cumulative abnormal returns. The size of the coefficients is noteworthy. In the case of event 2, CAR reactions range from -0.6% to -1.46%. In the case of event 4, significant negative CAR range from -0.6% to -1.75%. Events 2 and 4 comprised significant devaluations. In event four, companies electable to purchase foreign currency at CADIVI at 2.60 VEF per US\$ moved to 4.30 VEF per US\$, a 40% devaluation of the domestic currency. In event 4, the applicable rate moved from 6.30 VEF per US\$ to 11.30, a devaluation of 44.2%. These are estimates based on moving from the existing rate to the new rate, but as the system became of multiple exchange rates that might mean devaluations for some companies and not for others. In any case, both the statistical significance and the size of the negative coefficients its remarkable.

Out of these, we also found a significant, negative CAR for event 5 on windows between eight and nine days prior to the event. Once again, the size of the coefficient is economically meaningful, implying cumulative negative abnormal returns in response to devaluations of -1.66% and -1.23% for the windows [-8,+8] and [-9,+9] respectively. The delayed response is related on the one hand to the complexity of the devaluation announcement (a three-was exchange rate system), and on the other to the fact that probably for that same reason CADIVI took some days to publish the specific provisions regulating the new exchange rate arrangement.

In spite of the massive devaluation implemented on event six (74%), we found no abnormal CAR for our 63 company sample. Probably by then, five events later where devaluations have taken the value of domestic currency by 96%, the implausibility if realizing accumulated earnings at highly subsidized official exchange rate have vanished, companies decided to take the losses, and market analysts were not surprised anymore.

5.2 ORBIS sample of 137 multinationals with subsidiaries in Venezuela

The overstatement of retained earnings by means of translating them into dollars at highly subsidized and hardly attainable official exchange rates was not a corner of CADIVI-registered companies. All MNC with subsidiaries in Venezuela reported inflated earnings at official rates, regardless of their being electable or not to receive dollar at these rates. Our search at the ORBIS database reported 137 companies that are actively trading at United States stock markets declared having subsidiaries in Venezuela. Table 4 presents the results for the Cumulative Abnormal Return (CAR) of the stock prices of these 137 MNC. Once again, results are presented for the six devaluation events described in Table 2, columns report CAR on event windows going from [-1,+1] to [-10,+10] days prior and after the event, and significant cells have been filled in light grey.

Table 4. Cumulative Abnormal Return (CAR) for sample of 137 MNC around the six events studied

Event	Event window									
	[-1,+1]	[-2,+2]	[-3,+3]	[-4,+4]	[-5,+5]	[-6,+6]	[-7,+7]	[-8,+8]	[-9,+9]	[-10,+10]
1	-0.00398	-0.00076	-0.00305	-0.00160	0.00110	-0.00130	0.00101	0.00142	0.00620	0.00592
2	-0.00173	0.00774***	-0.0142***	-0.0135***	-0.0167***	-0.0150***	-0.0134***	-0.00948**	-0.00617	-0.00510
3	0.00432***	-0.00430*	-0.00215	0.00136	0.00041	0.00510	-0.00046	-0.00755	-0.00856	-0.0120**
4	0.00859***	0.00953***	-0.00803**	-0.00799*	-0.0105*	-0.00618	-0.00875	-0.00758	-0.00763	-0.00791
5	-0.00347	-0.00245	-0.00477*	-0.00244	-0.00409	-0.00249	-0.00333	-0.00073	0.00528	0.00348
6	-0.00094	0.00310	0.0163***	0.0169***	0.0258***	0.0282***	0.0307***	0.0280***	0.0253***	0.0328***

Note: All studies conducted with estimation window [-280,-30]
 * p<0.10, ** p<0.05, *** p<0.01

Our expanded sample confirms the results we have reported previously, with respect to events 2 and 4. In event 2, statistically significant negative CAR come up in all estimation windows going from two and eight days prior and after the announcement of devaluation. The size is again meaningful from an economic standpoint, going from -0.8% [-2,+2] all the way up to -1.67% [-5,+5]. In the case of event 4, statistically significant negative CAR are reported for the first five windows, going from -0.8% [-4,+4] to -1.05% [-5,+5].

Table 4 also has some other significant results that are worth mentioning. Event 3 also displays significant negative CAR ranging from -0.4% [-2,+2] to -1.20% [-10,+10]. Interestingly, the event 6 has significant positive CAR through all the spectrum of event windows. The size here it also remarkable, as they go from 1.63% [-3,+3] all the way up to 3.28% [-10,+10]. Event 6 (the creation of SIMADI) was effectively accompanied by massive official communication stating that the rate will be of free access, and the price of foreign exchange would be determined by the interaction of supply of demand. As mentioned before, probably by that time most of the value of net assets has been wiped out

by devaluations, and the announcement was seen as a first opportunity to repatriate whatever was left from the Venezuelan wreckage without needing any governmental authorization in a free exchange market.⁷

These results, both in the CADIVI-registered 63 MNC sample and the ORBIS 137 MNC sample, are inconsistent with our hypothesis that MNC's parent stocks should not react abnormally to the devaluation events in Venezuela. First, the reported impacts are disproportionate when put in contrast of the size the Venezuelan market represent within the global portfolio of these corporations. Second, given the large black market premiums and the fact that CADIVI shut down AAD and ALD for dividend repatriation by 2009, analysts could have guessed those assets on the subsidiaries would not be converted at official rates. Moreover, our 137 MNC sample also contains companies that were and were not registered in CADIVI, and therefore did not have any possibility of accessing dollars at official rates, and yet the negative CARs are as prevalent there as they were in the smaller sample.

5.3 Peer-group robustness check

The event study methodology provides for a counterfactual on what would have happened to the stock price in the absence of the events under scrutiny. In doing so, it is intended to provide a benchmark against which the actual performance of the stock over the event window can be contrasted, thereby pinning down the “*abnormal returns*”. In doing so, the methodology relies on the volatility of the stock over the estimation period, and its correlation to the market, in our case proxied by the S&P500 index. It is not.

The event study methodology has already built in a counterfactual, but does not account for industry factors. More precisely, the composition of the companies in both of our samples might not necessarily reflect that of the market index. That observation seems to be particularly relevant in the case of Venezuela, because our sample of multinational companies is strongly biased towards pharmaceuticals, oil and gas, and food and beverages companies, in a way that surely does not resemble the weights of these sectors in the market index. That is to say, if concomitant to a Venezuelan devaluation there is a specific event impacting the pharmaceutical industry worldwide, it might show up as abnormal return (because pharmaceuticals are not as relevant within the market index as they are in Venezuela), when in fact it is not.

In order to address this possibility, we have built peer-group of companies that are intended to replicate the composition of our portfolio of MNC, but did not have a Venezuelan subsidiary. We have identified peer companies to each of the companies within our sample first by pairing by the North America Industry Classification System (NAICS), and then by similar market capitalization. Appendix III and IV contain the list of companies that conform our peer-group of MNC without subsidiaries in Venezuela, and their corresponding NAICS code.

Tables 5 and 6 contain our event study for both peer-groups of MNC without subsidiaries in Venezuela. In the case of Table 5 we have no consistent pattern that resembles the results we obtained within our list of MNC with Venezuelan subsidiaries. If anything, there seems to be something around event 2 that is affecting both group of

⁷ In spite of the fanfare, the free exchange rate market did not materialize, and the SIMADI rate was capriciously determined and administered at the sole discretion of the government, and continues to be nowadays.

companies (with and without subsidiaries in Venezuela), but the significance, size, and prevalence of the coefficients is far from that reported in Table 3. Something similar occurs with our larger sample of 137 companies. The signs of the coefficients are irregular, and alternate between positive and negatives, significant and non-significant. Here again, there might be an indication of an event impacting both groups of companies (with and without Venezuelan subsidiaries) around the date of the second devaluation we have analyzed.

Table 5. Cumulative Abnormal Return (CAR) for peer-group of 63 MNC

Event	Event window									
	[-1,+1]	[-2,+2]	[-3,+3]	[-4,+4]	[-5,+5]	[-6,+6]	[-7,+7]	[-8,+8]	[-9,+9]	[-10,+10]
1	-0.0106***	-0.00870*	-0.00505	-0.00278	-0.00440	-0.00762	-0.00323	0.00012	0.00181	-0.00538
2	-0.00348	-0.00524	-0.0189**	-0.0102*	-0.00812	-0.01500	-0.00323	0.00023	0.00256	0.00742
3	-0.00204	-0.00001	-0.00336	-0.00116	0.00339	0.00944	0.00493	-0.00198	-0.00232	0.00012
4	0.00226	0.00045	0.00583	0.00514	0.00652	0.01040	0.00624	0.01100	0.00641	0.01240
5	-0.00115	-0.00394	-0.00684	0.00326	0.00959	0.00319	-0.00135	-0.00528	-0.00740	-0.00931
6	-0.0102*	-0.01250	-0.0178**	-0.0185*	-0.0198*	-0.0225*	-0.0258**	-0.0236*	-0.02120	-0.00988

Note: All studies conducted with estimation window [-280,-30]
* p<0.10, ** p<0.05, *** p<0.01

Table 6. Cumulative Abnormal Return (CAR) for peer-group of 137 MNC

Event	Event window									
	[-1,+1]	[-2,+2]	[-3,+3]	[-4,+4]	[-5,+5]	[-6,+6]	[-7,+7]	[-8,+8]	[-9,+9]	[-10,+10]
1	0.00509	0.00726	0.00879	0.00566	0.0101*	0.00579	0.00719	0.01130	0.0197**	0.0238***
2	0.00106	-0.00212	-0.00939***	-0.00956***	-0.00943**	-0.00903*	-0.00550	-0.00556	-0.00593	-0.00611
3	-0.00137	0.00518*	0.00608*	0.00470	0.00542	0.00924*	-0.00143	-0.0107*	-0.00918	-0.0132*
4	0.00152	-0.00180	0.00002	0.00044	0.00221	0.00613	-0.00035	-0.00027	-0.00376	-0.00474
5	-0.00405*	-0.00421	-0.00325	0.00336	0.00276	0.00012	-0.00037	-0.00067	-0.00350	-0.00577
6	-0.00527***	-0.00555*	-0.00064	0.00233	0.0115*	0.00995	0.00490	0.00483	0.00354	0.00972

Note: All studies conducted with estimation window [-280,-30]
* p<0.10, ** p<0.05, *** p<0.01

6. Conclusions

In this paper we study the reaction of the stock price of multinational parents to currency devaluations in the country of one of its subsidiaries. We use the special case of Venezuela between 2010 and 2015, where six major devaluations occurred in a five-year span with strict exchange controls. We use a sample of 63 MNC registered in the Commission for the Administrations of Foreign Currency (CADIVI), and a sample of 137 companies trading in US stock markets that declared having subsidiaries in Venezuela (regardless of whether they are registered or not at CADIVI).

Venezuela is a special case because from 2010 and 2015 the government kept devaluating the official exchange rate, taking it from VEB 2.15 per US\$ up to VEB 199.47 to US\$, a massive 99% devaluation that melted the dollar value of net assets in the balance sheets of MNC. Interestingly, throughout that period, most companies operating in Venezuela did not have access to any of the official rates for dividend repatriation.

Our hypothesis is that the stock price of multinational parents should not react significantly to the Venezuelan official evaluation effect. First, because Venezuela is a very small economy comprising an average of 0.4% of the world gross domestic product. Second, because all MNC in our sample either were not eligible to receive US\$ at preferential rates, or have seen that access denied for at least two years prior to the beginning of the sequence of devaluations we analyzed. The evidence we report on our series of event studies do show that the stock price of parent MNC did experience an abnormal, negative reaction in response to announcements of devaluations in Venezuela. The size of the coefficient is meaningful from an economic standpoint, going as high as -1.75% stock price decline over the event window. Our findings are robust to performing the event study using different size of event windows, and are not found in a sample of peer-group companies we have assembled.

Our results show that in spite that early devaluations (beginning from devaluation in event 2) did have an average negative impact on the stock prices of MNC across different event windows, and notwithstanding the fact that access to dollars at official rate did not resume after 2008, stock prices kept on experiencing negative abnormal returns in response to devaluations for a long time. Once the currency has been devalued by cumulative 96% (by event 5) many companies decided to recognized their losses and even deconsolidated their Venezuelan operations from their balance sheets.

Our paper is not one about window dressing. We do not deal here with the validity of MNC reporting financial statements at artificially overvalued official exchange rates, in spite of not having access to that. Given that the parallel market rate has remained illegal, probably they did not have any other option. We do provide arguments suggesting significant market myopia when it comes to valuing the stock of multinationals with Venezuelan subsidiaries. Regardless of the exchange rate MNC chose to present their financial statements, market analysts should have been aware of the fact that the net assets of the Venezuelan subsidiaries did not have any probability of materializing at the prevailing official exchange rates.

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Appendix I. Sample of 63 MNC with Venezuelan subsidiaries registered in CADIVI

No.	Parent Companies	Industry	No.	Parent Companies	Industry
1	3M CO	Manufacturing	33	KIMBERLY CLARK CORP	Personal Care
2	ABBOTT LABORATORIES	Pharmaceuticals	34	LILLY ELI & CO	Pharmaceuticals
3	ASTRAZENECA PLC	Pharmaceuticals	35	MARRIOTT INTERNATIONAL INC NEW	Hospitality
4	AVON PRODUCTS INC	Beauty Products	36	MARSH & MCLENNAN COS INC	Insurance
5	B P PLC	Oil and Gas	37	MATTEL INC	Toys
6	BAKER HUGHES INC	Oil and Gas	38	MCDONALDS CORP	Restaurants
7	BANCO BILBAO VIZCAYA ARGENTARIA	Financial	39	MERCK & CO INC NEW	Pharmaceuticals
8	BENCHMARK ELECTRONICS INC	Manufacturing	40	MICROSOFT CORP	Technology
9	BRITISH AMERICAN TOBACCO PLC	Tobacco	41	MONSANTO CO NEW	Chemicals
10	CHEVRON CORP NEW	Oil and Gas	42	NOVARTIS A G	Pharmaceuticals
11	CITIGROUP INC	Financial	43	NOVO NORDISK A S	Pharmaceuticals
12	COCA COLA FEMSA S A B DE C V	Beverages	44	ORACLE CORP	Technology
13	COLGATE PALMOLIVE CO	Personal Care	45	PEPSICO INC	Beverages
14	COPA HOLDINGS SA	Airlines	46	PETROBRAS ENERGIA S A	Oil and Gas
15	DIAGEO PLC	Beverages	47	PFIZER INC	Pharmaceuticals
16	DIRECTV	Telecommunications	48	PHILIP MORRIS INTERNATIONAL INC	Tobacco
17	DUPONT FABROS TECHNOLOGY INC	Chemicals	49	PRAXAIR INC	Oil and Gas
18	ENERSIS S A	Power	50	PROCTER & GAMBLE CO	Personal Care
19	ERICSSON	Telecommunications	51	REVLON INC	Personal Care
20	FORD MOTOR CO DEL	Automotive	52	S A P SE	Technology
21	FRESH DEL MONTE PRODUCE INC	Food	53	SANOFI	Pharmaceuticals
22	GENERAL ELECTRIC CO	Manufacturing	54	SCHLUMBERGER LTD	Oil and Gas
23	GENERAL MILLS INC	Food	55	SONY CORP	Technology
24	GLAXOSMITHKLINE PLC	Manufacturing	56	STATOIL A S A	Oil and Gas
25	GOODYEAR TIRE & RUBBER CO	Automotive	57	TOTAL S A	Oil and Gas
26	HALLIBURTON COMPANY	Oil and Gas	58	TOYOTA MOTOR CORP	Automotive
27	HERBALIFE LTD	Health	59	UNILEVER PLC	Manufacturing
28	HONDA MOTOR LTD	Automotive	60	UNITED CONTINENTAL HOLDINGS INC	Airlines
29	HONEYWELL INTERNATIONAL INC	Manufacturing	61	WENDYS CO	Restaurants
30	INTERNATIONAL BUSINESS MACHS COR	Technology	62	WEST PHARMACEUTICAL SERVICES INC	Pharmaceuticals
31	JOHNSON & JOHNSON	Personal Care	63	XEROX CORP	Technology
32	KELLOGG CO	Food			

Source: Center for Research in Security Prices (CRSP)

Appendix II. Sample of 137 MNC with Venezuelan subsidiaries according to ORBIS

No.	Parent Companies
1	MICROSOFT CORP
2	MANPOWER INC WIS
3	MIDDLEBY CORP
4	ALLERGAN INC
5	CISCO SYSTEMS INC
6	TETRA TECHNOLOGIES INC
7	PROGRESS SOFTWARE CORP
8	OWENS ILL INC
9	PRAXAIR INC
10	SEACOR HOLDINGS INC
11	WATSON PHARMACEUTICALS INC
12	JABIL CIRCUIT INC
13	EASTMAN CHEMICAL CO
14	ALBEMARLE CORP
15	FLEXTRONICS INTERNATIONAL LTD
16	LINCOLN ELECTRIC HOLDINGS INC
17	GREIF INC
18	GREIF INC
19	P R G SCHULTZ INTERNATIONAL INC
20	INGERSOLL RAND PLC
21	POLYCOM INC
22	TUPPERWARE BRANDS CORP
23	NATIONAL OILWELL VARCO INC
24	NU SKIN ENTERPRISES INC
25	TESCO CORP
26	ENERGY TRANSFER PARTNERS L P
27	SILGAN HOLDINGS INC
28	CHICAGO BRIDGE & IRON CO N V
29	GENERAL CABLE CORP DEL NEW
30	INTERNATIONAL BUSINESS MACHS COR
31	JONES LANG LASALLE INC
32	ARVINMERITOR INC
33	AUTODESK INC
34	CORN PRODUCTS INTERNATIONAL INC
35	GRACE W R & CO DEL NEW
36	MARRIOTT INTERNATIONAL INC NEW
37	SEALED AIR CORP NEW
38	LEVEL 3 COMMUNICATIONS INC
39	KORN FERRY INTERNATIONAL
40	INTERACTIVE INTELLIGENCE INC
41	ENERGIZER HOLDINGS INC
42	MONSANTO CO NEW
43	FLUOR CORP NEW
44	F M C TECHNOLOGIES INC
45	KRAFT FOODS INC
46	ACCENTURE PLC IRELAND
47	JOY GLOBAL INC
48	BUNGE LTD
49	I T T CORP
50	HERBALIFE LTD
51	NOBLE CORP BAAR
52	HUNTSMAN CORP
53	INNERWORKINGS INC
54	TYCO ELECTRONICS LTD NEW
55	MERCADOLIBRE INC
56	DANA HOLDING CORP
57	PHILIP MORRIS INTERNATIONAL INC
58	VISA INC
59	COLFAX CORP
60	INTERVAL LEISURE GROUP INC
61	MEAD JOHNSON NUTRITION CO
62	HONEYWELL INTERNATIONAL INC
63	PEPSICO INC
64	CONOCOPHILLIPS
65	SCHLUMBERGER LTD
66	TIMKEN COMPANY
67	E M C CORP MA
68	GOODYEAR TIRE & RUBBER CO
69	GENERAL MILLS INC

No.	Parent Companies
70	KIMBERLY CLARK CORP
71	PROCTER & GAMBLE CO
72	CATERPILLAR INC
73	BRINKS CO
74	COLGATE PALMOLIVE CO
75	F M C CORP
76	BROWN SHOE CO INC NEW
77	BRISTOL MYERS SQUIBB CO
78	CRANE CO
79	ABBOTT LABORATORIES
80	DOW CHEMICAL CO
81	PFIZER INC
82	EMERSON ELECTRIC CO
83	JOHNSON & JOHNSON
84	3M CO
85	MERCK & CO INC NEW
86	C M S ENERGY CORP
87	COCA COLA CO
88	HALLIBURTON COMPANY
89	HARSCO CORP
90	HARRIS CORP
91	C A INC
92	STEAK N SHAKE CO
93	KELLOGG CO
94	AVNET INC
95	BAXTER INTERNATIONAL INC
96	XEROX CORP
97	DU PONT E I DE NEMOURS & CO
98	FLOWSERVE CORP
99	HELMERICH & PAYNE INC
100	WEATHERFORD INTL LTD NEW
101	OCCIDENTAL PETROLEUM CORP
102	SHERWIN WILLIAMS CO
103	HARBINGER GROUP INC
104	DONNELLEY R R & SONS CO
105	BECTON DICKINSON & CO
106	COMPUTER SCIENCES CORP
107	AVON PRODUCTS INC
108	EATON CORP
109	DIEBOLD INC
110	PARKER HANNIFIN CORP
111	NEWMARKET CORP
112	STANLEY WORKS
113	AVERY DENNISON CORP
114	TYCO INTERNATIONAL LTD SWTZLND
115	MARSH & MCLENNAN COS INC
116	CLOROX CO
117	CABOT CORP
118	TIDEWATER INC
119	GENERAL DYNAMICS CORP
120	LILLY ELI & CO
121	INTERPUBLIC GROUP COS INC
122	NORDSON CORP
123	KIRBY CORP
124	CHUBB CORP
125	MEDTRONIC INC
126	NEWELL RUBBERMAID INC
127	AON CORP
128	GENERAL ELECTRIC CO
129	WEST PHARMACEUTICAL SERVICES INC
130	QUAKER CHEMICAL CORP
131	R P M INTERNATIONAL INC
132	TEAM INC
133	A T & T INC
134	AMERICAN INTERNATIONAL GROUP INC
135	CITIGROUP INC
136	ECOLAB INC
137	SONOCO PRODUCTS CO

Source: ORBIS

Appendix III. Sample of 63 MNC peer-group without Venezuelan subsidiaries

No.	Parent Companies	NAICS	No.	Parent Companies	NAICS
1	BRUNSWICK CORP	333618	33	STERIS CORP	339113
2	CELGENE CORP	541710	34	UNITED GUARDIAN INC	325611
3	EXXON MOBIL CORP	324110	35	COTT CORP QUEBEC	312111
4	INTERMEDIATE PARFUMS INC	325620	36	ACTIVISION BLIZZARD INC	334611
5	CONOCOPHILLIPS	324110	37	INCYTE CORP	325412
6	UNIVERSAL CORPORATION	424590	38	AMERIS BANCORP	551111
7	SOUTHERN CO	221111	39	AGRIUM INC	325311
8	C C A INDUSTRIES INC	325620	40	DARDEN RESTAURANTS INC	722110
9	NEXTERA ENERGY INC	221122	41	ERIE INDEMNITY CO	524210
10	BIGLARI HOLDINGS INC	722110	42	WATERS CORP	334516
11	ALASKA AIRGROUP INC	481111	43	CITRIX SYSTEMS INC	334611
12	ALLIANCE ONE INTERNATIONAL INC	424590	44	NICE SYSTEMS LTD	541921
13	HORMEL FOODS CORP	311611	45	MONSTER WORLDWIDE INC	541810
14	WELLS FARGO & CO NEW	522110	46	BOSTON PROPERTIES INC	531120
15	SMUCKER J M CO	311421	47	SHIRE PLC	325412
16	PIER 1 IMPORTS INC DE	337122	48	AMERICAN NATIONAL BANKSHARES INC	523999
17	CONCURRENT COMPUTER CORP NEW	541512	49	REYNOLDS AMERICAN INC	312221
18	MCCORMICK & CO INC	311919	50	MONSTER BEVERAGE CORP	312111
19	SOUTHWEST AIRLINES CO	481111	51	MCCORMICK & CO INC	311919
20	BANK OF AMERICA CORP	522110	52	JETBLUE AIRWAYS CORP	481111
21	BROWN & BROWN INC	524210	53	ACADIA PHARMACEUTICALS	325412
22	SPARTAN MOTORS INC	336120	54	SALESFORCE COM INC	541611
23	STRYKER CORP	339112	55	MOSAIC COMPANY NEW	325312
24	HARMAN INTL INDS INC NEW	334310	56	OSHKOSH CORP	336111
25	VECTOR GROUP LTD	312221	57	CHIPOTLE MEXICAN GRILL INC	722110
26	HOLOGIC INC	334517	58	ACHILLION PHARMACEUTICALS INC	325412
27	REGENERON PHARMACEUTICALS INC	325412	59	ALLEGiant TRAVEL CO	481111
28	PANERA BREAD CO	722110	60	JAZZ PHARMACEUTICALS PLC	325412
29	VERTEX PHARMACEUTICALS INC	325412	61	TERADATA CORP DE	334111
30	PERRIGO CO PLC	325412	62	KANDI TECHNOLOGIES GROUP INC	336112
31	GILEAD SCIENCES INC	325414	63	DR PEPPER SNAPPLE GROUP INC	312111
32	JACK IN THE BOX INC	722213			

Appendix IV. Sample of 137 MNC peer-group without Venezuelan subsidiaries