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Market segmentation: Venezuelan ADRs

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SEGMENTACIÓN DE MERCADOS: ADRS VENEZOLANOS

RESÚMEN: Los controles cambiarios impuestos en Venezuela en 2003 constituyen un experimento natural que permite a los investigadores observar el efecto que tales controles tuvieron sobre la segmentación del mercado de capitales. Este trabajo presenta evidencia empírica que sugiere que, aún cuando el mercado de capitales venezolano se encontraba altamente segmentado antes de que se impusieran los controles, las acciones de la empresa CANTV estaban, por medio de sus American Depositary Receipts (ADRs o certificados de depósito americanos), parcialmente integrados con los mercados globales. Esa integración se perdió después del establecimiento de los controles cambiarios. La investigación también documenta la espectacular y aparentemente contradictoria alza experimentada por la Bolsa de Valores de Caracas durante la severa crisis económica de 2003. Se argumenta que, tal y como fue el caso en Argentina en 2002, el alza en el precio de las acciones fue causado por la depreciación del Bolívar en el mercado paralelo de monedas, lo cual ocasionó un incremento en el precio local de las acciones que tenían ADRs asociados, los cuales se negociaban en dólares.

PALABRAS CLAVE: mercados emergentes, Bolsa de Valores de Caracas, certificados de depósito americanos, segmentación de mercado.

SEGMENTATION DE MARCHÉS : ADRS VÉNÉZUELIENS

RÉSUMÉ : Les contrôles de change imposés au Venezuela en 2003 constituent une expérience naturelle permettant aux chercheurs d'observer l'effet de ces contrôles sur la segmentation du marché de capitaux. Ce travail présente une évidence empirique qui suggère que, bien que le marché de capitaux Vénézuéliens se soit trouvé très segmenté avant l'imposition de ces contrôles, les actions de l'entreprise CANTV étaient partiellement intégrées dans les marchés globaux, par le biais des American Depositary Receipts (ADRs ou certificats de dépôt américains). Cette intégration a disparu après l'établissement des contrôles de change. La recherche signale également la hausse spectaculaire et apparemment contradictoire expérimentée par la Bourse de Valeurs de Caracas durant la crise économique de 2003. On argumente que, comme pour le cas de l'Argentine en 2002, la hausse du prix des actions a été causée par la dépréciation du Bolívar dans le marché parallèle de la monnaie, entraînant une augmentation du prix local des actions ayant des ADRs associés, ceux-ci étant négociés en dollars.

MOTS-CLEFS: marchés émergents, Bourse de valeurs de Caracas, certificats de dépôt américains, segmentation de marché.

SEGMENTAÇÃO DE MERCADOS: ADRS VENEZUELANOS

RESUMO: Os controles cambiais impostos na Venezuela em 2003 constituem um experimento natural que permite aos pesquisadores observar o efeito que tais controles tiveram sobre a segmentação do mercado de capitais. Este trabalho apresenta evidência empírica que sugere que, ainda quando o mercado de capitais venezuelanos se encontrava altamente segmentado antes de se impusessem os controles, as ações da empresa CANTV estavam, por meio de seus American Depositary Receipts (ADRs ou certificados de depósito americanos), parcialmente integradas com os mercados globais. Essa integração se perdeu depois do estabelecimento dos controles cambiais. A pesquisa também documenta a espetacular e aparentemente contraditória alta experimentada pela Bolsa de Valores de Caracas durante a dura crise econômica de 2003. Argumenta-se que, assim como foi na Argentina em 2002, a alta no preço das ações foi causada pela depreciação do Bolívar no mercado paralelo de moedas, o que ocasionou um aumento no preço local das ações que tinham ADRs associados, os quais se negociavam em dólares.

PALAVRAS-CHAVE: mercados emergentes, Bolsa de Valores de Caracas, Certificados de Depósito Americanos, segmentação de mercado.

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ABSTRACT: The control on foreign exchange imposed by Venezuela in 2003 constitute a natural experiment that allows researchers to observe the effects of exchange controls on stock market segmentation. This paper provides empirical evidence that although the Venezuelan capital market as a whole was highly segmented before the controls were imposed, the shares in the firm CANTV were, through their American Depositary Receipts (ADRs), partially integrated with the global market. Following the imposition of the exchange controls this integration was lost. Research also documents the spectacular and apparently contradictory rise experienced by the Caracas Stock Exchange during the serious economic crisis of 2003. It is argued that, as it happened in Argentina in 2002, the rise in share prices occurred because the depreciation of the Bolívar in the parallel currency market increased the local price of the stocks that had associated ADRs, which were negotiated in dollars.

KEYWORDS: emerging markets, Caracas Stock Exchange, American Depositary Receipts, market segmentation.

Introduction*

In February 2003 the Venezuelan Central Bank established a fixed exchange rate system accompanied by severe controls on capital movements. The system, which was accompanied by price controls on the components of the basic family basket of goods, severely restricted the access of private companies and the general public to foreign exchange. The exchange controls were originally imposed to reduce capital flight, which had led to a significant decrease in international reserves during the year prior to their establishment.

Following the implementation of the controls, the Caracas Stock Exchange (Bolsa de Valores de Caracas, or BVC) registered a sustained growth. According to the BVC Index (IBC), which value is measured in increased by more than 200% in a single year. This behavior differed from that of many other countries experiencing economic crisis, but resembled the Argentinian

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experience in 2002, which was also marked by severe controls on capital movements.

This paper compares the performance of a portfolio of Venezuelan companies listed locally in Bolívars in the BVC that possessed American Depositary Receipts (ADRs) negotiated in dollars in the New York Stock Exchange (NYSE), with a portfolio of shares that did not possess ADRs. Within the former group of companies the most important was CANTV. The present paper demonstrates that, with the exception of the CANTV shares, the influence of global factors on the portfolio of ADRs in the BVC was insignificant before the imposition of exchange controls. This suggests that the Venezuelan market was segmented before the controls were implemented. Following the policy change, the influence of global factors on the ADR shares ceased. This created a natural experiment and an ideal opportunity to observe the distortion and subsequent segmentation generated by controls of this type. Furthermore, the performance of the BVC is compared to the Buenos Aires Stock Exchange's Merval Index, before and after the imposition of the Argentinian "corralito financiero" (deposit freeze) at the end of 2001.

The present paper is structured as follows: the second section sets out the theoretical grounding of the study and develops the hypothesis. The third section presents the data and methodology. The fourth analyses the results, focusing on the performance of the local share portfolios, with and without ADRs, while the fifth compares these results with the Argentinian case of 2001-2002. The conclusions are presented in the sixth section.

Capital Controls, Market Integration and ADRs

In the early and mid-1990s most economists argued that emerging markets should liberalize their capital accounts. It was expected that the liberalization of markets would produce ample benefits and that capital inflows would increase, leading to higher levels of investment and economic growth. Furthermore, the liberalization was expected to facilitate the diversification of risk, leading to reduced volatility in consumption and income. Finally, it was deemed likely to increase market discipline, leading to greater efficiency in identifying sources of capital and increased productivity.

Economists have also argued that other benefits accrue from capital flows, such as the technology transfers that frequently accompany foreign investment or the increased levels of competition in local markets that result from local investment by foreign firms (Eichengreen *et al.*, 1999). However, some countries that lifted capital controls in

the mid-1990s suffered severe crises: Mexico (1994) Asia (1996 – 98), Russia (1998), Argentina (2002), as well as the Global Financial Crisis (2008-09). These crises led to an intensification of debates concerning the pros and cons of capital controls and their effectiveness in restricting capital flows.

Controls have been placed on the inward and outward flows of capital throughout history. The literature advances two principal explanations for the imposition of restrictions on outward flows as in the Venezuelan case examined here (Neely, 1999; Johnston and Tamirisa, 1998, Malone and Ter Horst, 2010, and Gramacy *et al.*, forthcoming). The first explanation refers to the reduction (or cessation) of the velocity of outward flows that occurs when a country faces sudden destabilizing capital flight in times of uncertainty. The second involves attempts to break the relationship between domestic and foreign interest rates. Controls on capital outflows allow for the reduction in local interest rates and for money supply to be increased. They are used to postpone choosing between devaluation and rigid monetary policy. Such controls are generally associated with balance of payments problems, large government deficits and high real domestic interest rates; when introduced they tend to produce distortions that isolate and segment stock markets (Auguste *et al.*, 2002).

Several studies have examined the impact of market segmentation on share prices. One of the most important, by Errunza & Losq (1985) provides evidence of the existence of an additional risk premium in markets that are "mildly" segmented. In such markets company shares traded in local stock markets are barely sensitive - or entirely insensitive - to fluctuations in international stock markets.

American Depositary Receipts (ADRs)

ADRs were developed by JP Morgan in 1927 to enable investors to register and receive dividends from shares that were not traded in the United States market without the need for them to have direct access to the local markets (Károlyi, 1998). An ADR consists of batches of shares that, though traded in the United States, are from non-US firms. These firms are registered with the US authorities by an investment bank. A financial institution serves as depositary for the ADRs; daily operations involving the titles are carried out by this institution (the depositary for most Venezuelan ADRs is the Bank of New York). The shares of firms possessing ADRs are negotiated in local currency in the stock exchanges of the country of origin.

ADRs may be issued at different levels (see <http://www.adr.com/>): Level I: This level is used when firms are not



interested in raising capital investment in the US market, or do not fulfill the requirements to do so. Firms operating at this level negotiate their securities in the Over the Counter (OTC) market. The requirements of the Securities and Exchange Commission (SEC) are minimal for this level. Level II: For this level the SEC demands more rigorous accounting systems than for Level I (detailed financial information, fulfillment of the GAAP accounting standards, annual reports). These ADRs are negotiated in one of the US stock exchanges (NYSE, AMEX and others). Level III: the ADRs are traded in the same places as in Level II. The requirements of the SEC are more stringent: companies have to fulfill the requirements for Level II (completing forms F-6, 20-F and providing annual reports) and, in addition, fill in form F-1 and send their financial information to all publicly registered shareholders. This level offers the advantage of increased visibility in the market and, as a consequence, a greater likelihood of attracting capital. Finally, there is Rule 144A. This level does not require registration with the SEC. ADRs traded under Rule 144A are invested privately by institutional buyers.

Latin American firms have been active participants in the ADRs market. For example, in average 50% of the most

important shares traded on the principal Latin American markets are traded using ADRs in the US market (see González *et al.*, 2011, and Hunter, 2011).

The ADRs market offers a good opportunity to observe the factors determining the price of given assets in two distinct markets. According to the theory of market segmentation forwarded by Errunza & Losq (1985), in a totally integrated market the price of shares (or their associated ADRs) should be established according to factors present in the global market. Equally, basing their arguments on Errunza and Losq (1985), Auguste *et al.* (2002), show that investors with access to global assets would expect returns based on the covariance between local assets and the global market portfolio. Thus, if before the imposition of exchange controls the Venezuelan market was integrated with the rest of the world the ADR price should have been set by external factors. This external influence can be measured using a global market index such as the Morgan Stanley World Capitalization Index (MSCI). The first hypothesis tested in this paper, then, is as follows:

Hypothesis 1: *Before exchange rate controls were established the prices of Venezuelan ADRs were positively related to the World MSCI.*

Since ADRs are globally traded instruments where investors who have access to them are not subject to the same restrictions affecting local investors¹, it might be expected that factors intrinsic to the Venezuelan market had little influence on ADR prices following the establishment of exchange controls. If a portfolio of local shares (without ADRs) is chosen as a proxy of the factors inherent to the local market, it might be expected that little or no correlation would be observed between ADR prices and exchange controls. Thus, the second hypothesis is as follows:

Hypothesis 2: *After the establishment of exchange controls the influence of local factors in determining the price of ADRs was low or non-existent.*

In contrast, capital markets would be expected to become much more segmented following the implementation of exchange controls. Karolyi & Stulz (2002), show that contextual aspects of the local market tend to increase the influence of local factors on asset prices. Therefore, the local market price of shares with ADRs should be determined fundamentally by local factors after the establishment of controls. That is, global factors should have low (or non-existent) influence on the prices of local shares with associated ADRs once exchange controls have been established.

Formally speaking, the third working hypothesis has two parts:

Hypothesis 3a: *Local factors will exert more influence on the prices of shares with associated ADRs during a period of exchange controls compared to the period before controls were established.*

Hypothesis 3b: *The influence of global factors on the prices of shares with associated ADRs will be lower during a period of exchange controls compared to the period before controls were established.*

Having developed the three hypotheses, the following section explains the data base used in the study and the methodology employed to test the hypotheses.

Data and Methodology

The data used in the study was obtained from the *Datastream* data base, which provides information on prices, dividends, the volumes of shares, and – if relevant - ADRs – for Venezuelan firms listed in the BVC. The data analyzed were drawn from the period between 1 January 2002 and 28 February 2004.

¹ In reality, investors in ADRs might be affected if the government of a country does not sell the dollars that the firm issuing ADRs requires to pay dividends to its shareholders.

The performance of the prices, dividends, and volumes of selected shares were analyzed for the period of exchange controls. Additionally, two equally-weighted portfolios were constructed and the evolution of their prices was compared². The first of these portfolios consisted of shares with no associated ADRs and the second of shares possessing ADRs traded in the US market.

Given that CANTV, at the time the leading company in Venezuela's telecommunications sector³, accounted for the highest volume of shares traded in the BVC and of ADRs in the NYSE the study paid particular attention to analyzing the evolution of CANTV shares and their associated ADRs.

Once the portfolios had been constructed attempts were made to determine the influence on them of the global and local markets in order to establish the degree of segmentation of the Venezuelan market before and after the introduction of foreign exchange controls.

An index was constructed for each portfolio consisting of the arithmetic mean of the overall returns of their constituent shares. The index of overall returns included yields resulting from price fluctuations and the reinvestment of dividends accruing from each share. The following firms were included in the portfolio of shares with no associated ADRs⁴: Banco de Venezuela, Banco Provincial, CEMEX, Corp Banca, Corporación INDL DE ENGA, Envases Venezolano, HL Boulton & Co, Terminales de Maracaibo, and VENCRED. The following firms were included in the portfolio of shares possessing ADRs⁵: Banco Venezolano de Crédito, CANTV, CORIMON, La Electricidad de Caracas, Fondo de Valores Inmobiliarios, MANPA, MANTEX, Mercantil Servicios Financieros "B", SIVENSA and VENEPAL "B".

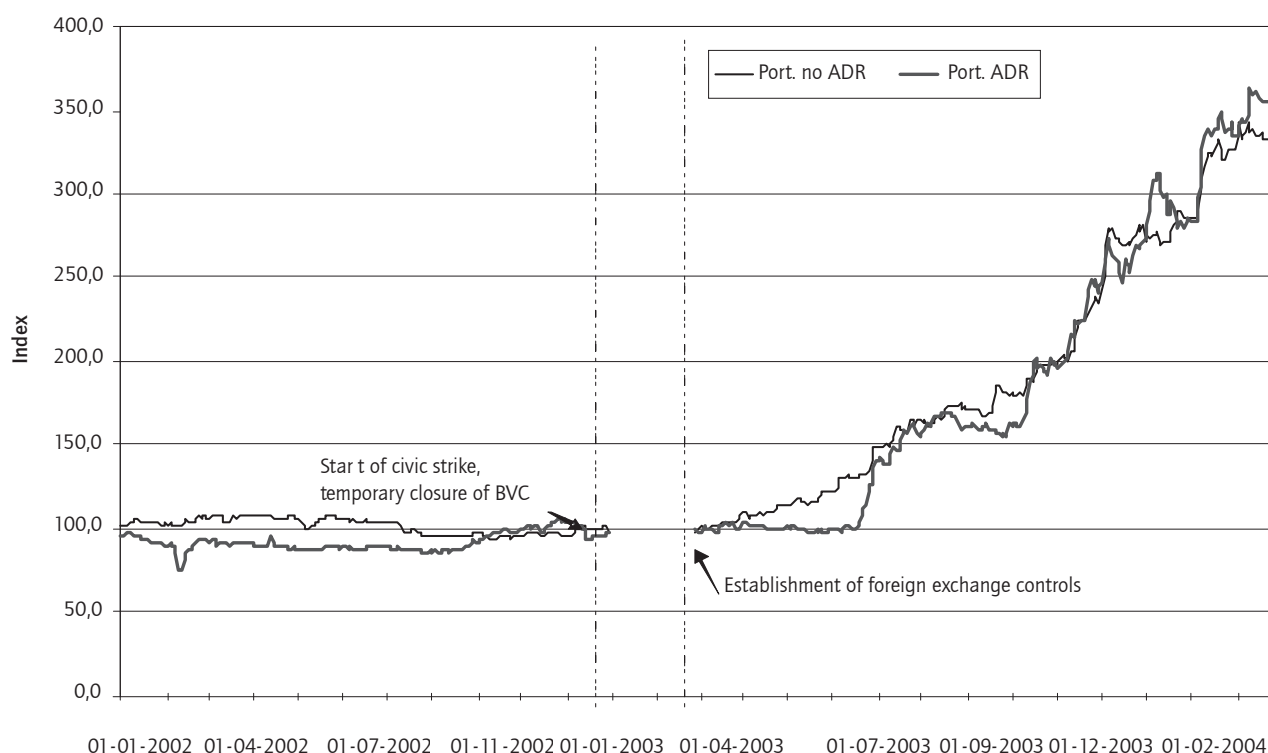
² It was assumed that the performance of a portfolio made up exclusively of CANTV shares – analyzed separately – would be similar to that of a portfolio weighted by market capitalization, because in 2003-4 CANTV represented about 50% of the BVC's stock market capitalization. On this basis two kinds of portfolio were analyzed: a group that was equally-weighted and another that had similar performance to a portfolio weighted by market capitalization and made up exclusively of CANTV shares.

³ CANTV was nationalized by the Venezuelan government in 2007.

⁴ These firms showed the highest levels of stock market activity in the period under review. The other firms listed in the BVC are traded only infrequently and could not therefore be included in the study.

⁵ The ADRs of the following firms were not included because they were seldom or never traded: Cerámica Carabobo, Domínguez & Compañía, and Sudamtex. The ADRs of the following firms were also excluded, in this case because a different ADR from the same company had already been included in the portfolio: Venepal 144A, Sivena A, Sivena B and Sivena 144A.

FIGURE 1. Index of Returns for Stock Portfolios traded on the BVC with and without ADRs in the Period 01/2002 - 02/2004 (February 3rd, 2003 = 100, expressed in local currency)



Source: Datastream and author calculations.

Figure 1 illustrates the performance of the two portfolios, demonstrating similar rising curves that in both cases started in June 2003, about four months after the foreign exchange controls were introduced. The largest difference between the two occurred between February and May 2003 when the ADR portfolio remained stable, showing no growth. This finding could be attributed to the fact that the Bank of New York – the financial institution that converted local shares into ADRs – refused to do so during that period as it did not consider that the foreign exchange control rules established by the Venezuelan government were clear enough. In February 2003 the Venezuelan Central Bank imposed rigid exchange controls that required all importers wishing to acquire ADRs to register with CADIVI, a new body created to administer the country's foreign currency reserves, at the official exchange rate. A parallel, illegal, market immediately emerged, with an exchange rate 50% lower than the official rate. However, from June 2003 onwards trading operations began again when local conversion of ADRs was declared legal. The same month saw a spectacular - almost 50% - rise in the local currency price of shares possessing ADRs (*ADR portfolios*), while shares in Venezuelan firms without ADRs appreciated only slightly during the same month. This suggests that the extraordinary rise in the IBC in June 2003 (see Figure 2) was due to interest of investors in buying shares in the BVC (payable

in Bolívars) in order to convert them into ADRs that could be liquidated in dollars in New York, thus sidestepping the strict foreign exchange controls that prevailed at the time. This led to a spectacular rise in the IBC at a time when the economy was entering into depression (between 2002 and 2003 the Venezuelan economy contracted by more than 20% - the worst figures since records began).

Figure 1 also shows that between August and November 2003 the growth of the ADR portfolio was lower than that of its non-ADR equivalent. This period coincides exactly with the dates during which the Venezuelan authorities first issued bonds payable in Bolívars but denominated in dollars. These bonds acted as an escape valve for Bolívars possessed by persons and firms and that it was not possible to repatriate as a consequence of the foreign exchange controls. It may therefore be inferred that during those periods investors took advantage of a legal route offered by the government to enable them to transfer their capital at a reduced cost, as the implicit exchange rate obtained when the bonds were sold was below that obtained upon sale of the ADRs. In the months following the bond issue both the ADR and the non-ADRs portfolios grew at very similar rates; indeed in some cases the former grew faster than the latter, a result that is consistent with ADRs being used to facilitate capital outflows.

Analysis and results

The context of the Venezuelan Stock Market

During the period under study the BVC experienced a 211% growth between the first trading day (27/01/2003) after the suspension of activities during the national civic strike (December 2002 - February 2003) and February 27th of 2004. Figure 2 shows the performance of the IBC, in Bolivars, between January 2002 and February 2004. During the first three months after the foreign exchange controls were imposed (February to May, 2003), the index showed a slight upward trend which later became more marked, though the increase was punctuated with small falls from which, however, the index quickly recovered. This pattern of performance differed substantially before the strike, during which the BVC was closed. The strike had been called by the opposition to the government of President Hugo Chávez, in pursuit of its demand – allowed for under the terms of the 1999 Constitution – for a referendum to revoke the presidential mandate. The strike, which lasted for almost three months between December 2001 and February 2002, was supported by a significant percentage of the population, including the oil sector and many in the industrial and commercial sectors. During this period the IBC remained stable, hovering around the 7,000 mark, followed by a slight rise in the two months prior to the strike.

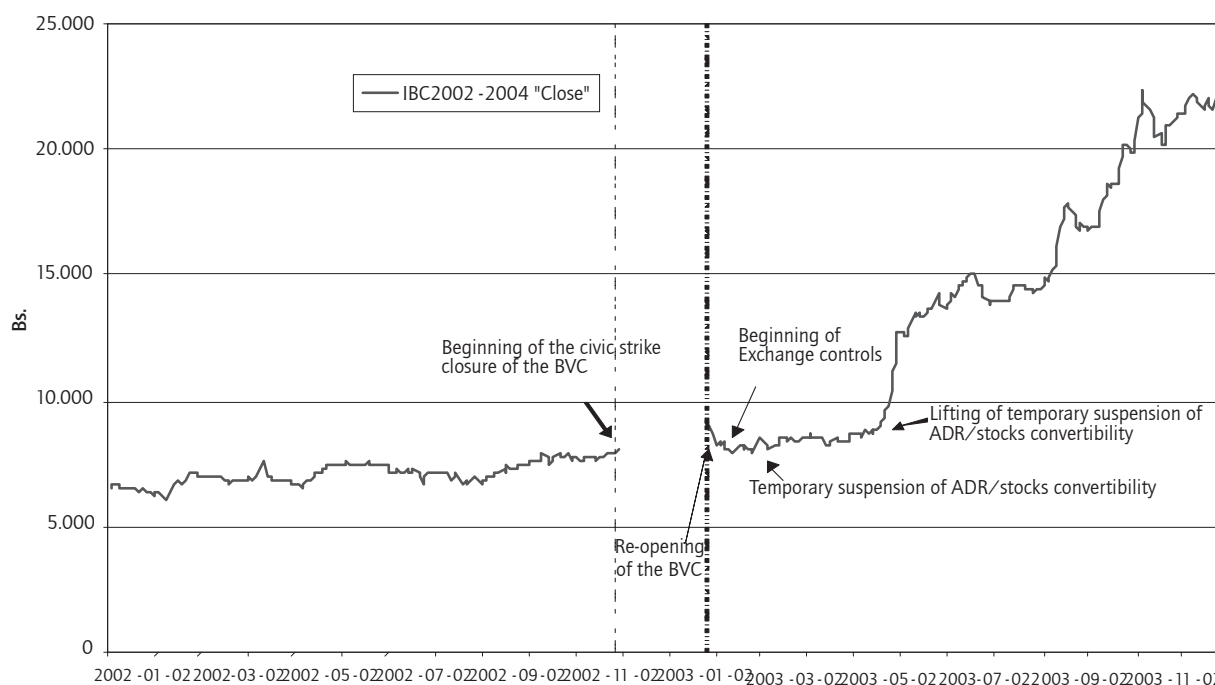
The rise in the IBC during the period under study was driven mainly by the purchase by Venezuelan investors of local shares in firms possessing ADRs that were negotiated in the NYSE and in the US OTC market. As it was mentioned above, this was a legal method of acquiring dollars using the escape valve provided by the ADR instrument and which led to an increase in the prices of local (non-ADR) shares compared to ADRs.

Table 1 presents a list of all the Venezuelan firms that had ADR programs in 2003. However, the ADRs held by CANTV were the only ones negotiated in the NYSE at that time. The shares of other Venezuelan firms with ADR programs, such as those of Electricidad de Caracas or Mercantil Servicios Financieros (type B) were negotiated in the OTC market.

A detailed examination of the evolution of the volumes traded and the prices of the local shares of CANTV, Electricidad de Caracas (EDC) and Mercantil Servicios Financieros (MSF) and their ADR equivalents during the period of foreign exchange controls shows that the price and the volume of shares traded increased significantly compared to the months prior to the introduction of the controls. Table 2 shows the percent variation for each of these firms.

The Bolivar price of CANTV's local shares increased by 261% and traded volume by 443.6% compared to November 2002, before the start of the strike. The increase in the price of the ADRs that were negotiated during the

FIGURE 2. Behavior of the BVC 01/2002 - 02/2004 (Índice Bursátil Caracas, expressed in local currency)



Source: Datastream

same period was 11.46%. These figures clearly show that the increase in local share prices and in the volume traded was much higher than in the market for their respective ADRs. This suggests that only a percentage of the shares purchased locally were used to avoid exchange controls and facilitate the outflow of capital. The remaining purchases were presumably made by investors who were

anxious to channel excess liquidity into local investments that offered higher yields than anything offered at the time by the banks. The local shares of Electricidad de Caracas and Mercantil Servicios Financieros also showed significant increases by over 150% in local prices and above 50% for ADRs. The volume of trading in local shares in both firms increased by more than 500%.

TABLE 1. Venezuelan Stocks listed in the U.S. in the form of ADRs

Company Name	CUSIP	Market	Symbol	ADR: ORD	Industry	EFF. Date
ADRs						
CANTV-NACIONAL TELEFONOS DE	204421101	NYSE	VNT	1:7		11-09-1996
Regla 144A y OTC acciones						
BANCO VENEZOLANO DE CREDITO	59650101	OTC	BVZCY	1:1	Bank	01-08-1996
C.A. LA ELECTRICIDAD DE CARACAS, SACA	12477A106	OTC	ELDAY	1:50	Electricity	30-11-1998
CERAMICA CARABOBO "A" SHARES	15671P407	OTC	CMCJY	1:10	Manufacture and Construction	n.d.
CERAMICA CARABOBO "B" SHARES	15671P506	OTC	CMCKY	1:10	Manufacture and Construction	n.d.
CORIMON C.A. S.A.C.A.	218728509	OTC	CRM	1:250	Chemical	n.d.
DOMINGUEZ Y CIA. COMMON SHARES	25712R106	OTC	DCIAY	1:100	Manufacture and Construction	n.d.
DOMINGUEZ Y CIA. PREFERRED SHARES	25712R205	OTC	DCIPY	1:250	Manufacture and Construction	n.d.
F.V.I FONDO DE VALORES INMOBILIARIOS	302669304	OTC	FVIMY	1:150	Real Estate	15-01-1998
MANTEX COMMON SHARES	564601201	OTC	MTXVY	1:15	Manufacture and Construction	01-05-1992
MANUFACTURAS DE PAPEL, C.A. (MANPA)	564681105	OTC	MUPAY	1:25	Paper	12-06-1996
MERCANTIL SERVICIOS FINANCIEROS C.A.	587339102	OTC	MSVYF	1:4	Bank	08-08-1997
SIVENSA "A" SHARES LEVEL-I	825865405	OTC	SDNZY	n.d.	Manufacture and Construction	n.d.
SIVENSA "B" SHARES 144A	825865504	144A	SDNXY	n.d.	Manufacture and Construction	n.d.
SIVENSA "B" SHARES LEVEL-I	825865603	OTC	SDNVY	1:98	Manufacture and Construction	23-08-1996
SUDAMTEX DE VENEZUELA "B" SHARES LEVEL-I	864598305	OTC	SDXVY	1:200	Textile	01-01-1994
SUDAMTEX DE VENEZUELA 144A "B" SHARES	864598206	144A	SUDXYP	1:200	Textile	25-09-1997
VENEPAL "B" SHARES	92263Y203	OTC	VNPSY	1:10	Paper	01-02-1994
VENEPAL "B" SHARES 144A	92263Y104	144A	VNPLYP	1:10	Paper	01-02-1992
VENPRECAR "B" SHARES 144A	922644109	144A	VNZZY	1:7	Manufacture and Construction	n.d.

Source: www.adr.com n.d.: Unavailable

TABLE 2. Percentage Variation in the Prices and Traded Volumes of Local Stocks and Their Corresponding ADRs (November, 2002 to February, 2004)

Variation in	Cantv	EDC	MSF"B"
Local stock traded on the BVC			
Price (in Bs)	261,05%	186,89%	153,12%
Price (in U.S. dollar at the official exchange rate)	147,57%	96,71%	73,56%
Number of stocks	443,60%	589,97%	614,59%
Volume in Bs. (precio * Nro. acciones negociadas)	1862,68%	1879,41%	1708,74%
Volume in U.S. dollars (official rate)	1245,77%	1257,24%	1140,21%
ADR traded in the U.S.			
ADR price (in U.S. dollars)	50,32%	94,12%	54,19%
Number of ADRs traded	11,46%	566,00%	4811,20%
Volume in U.S. dollars (price * Number of ADR)	67,54%	1192,82%	460,00%

Source: Datastream and own computations

Testing the Integration of the Venezuelan Market with the World Market Before, During and After the Imposition of Foreign Exchange Controls

In theory ADR prices in a fully liberalized and integrated market should be established by factors in the global market. Investors with access to global assets would expect to enjoy returns based on the covariance of individual shares with the global market portfolio (Auguste *et al.*, 2002).

In practice, Karolyi & Stulz (2002) found that factors related to the local market tend to increase the degree of local influence on asset prices, finding that local market portfolios usually offer the best explanation to predicted variations in local share prices. Additionally, they also found that capital flows and correlations between countries increase the influence of global factors on asset prices.

The following regression equation - based on Errunza & Losq (1985) and Auguste *et al.* (2002) - was used to test the hypotheses:

$$R = \alpha + \beta_1 R^g + \beta_2 R^l + \epsilon$$

where α is the ordinate at the origin; R is a return index for local shares with ADR; R^g is a return index for the global market represented by the world index of the MSCI; R^l is a return index for the local market, consisting of a portfolio of local shares without ADRs; and ϵ is the regression error.

Panel A of Table 3 shows the results of the regression of the BVC's daily returns in Bolívars for the portfolio of Venezuelan shares with associated ADRs as a dependent variable. A global market portfolio (MSCI) and a portfolio of local shares without ADRs (non-ADR portfolio) were chosen as independent or explanatory variables. Each regression is presented for the periods before and after the establishment of exchange controls.

These results suggest that local market factors were significant determinants of the prices of local shares with associated ADRs before and after the establishment of foreign exchange controls. Although the local factor (β_2) diminished in importance slightly following the initiation of foreign exchange controls, it remained statistically significant at 1%. The resulting coefficients for the global market factors (β_1) are not statistically significant, demonstrating that global factors were not significant determinants of the prices of local shares. This shows that the Venezuelan market for shares possessing ADRs was segmented during the period under study. These findings led to the rejection of Hypothesis 1, which postulated that

the influence of global factors in the period prior to the implementation of exchange controls was significant.

As it can be seen on Panel A of Table 3, Hypothesis 3a, which suggested an increase in the influence of local factors on the performance of a portfolio of shares with ADRs following the start of the control regime, remains valid since –despite their continuing and real importance– rather than increasing in influence it in fact diminished slightly. No evidence was found to reject Hypothesis 3b, which postulated that global factors would not influence the portfolio of shares with associated ADRs in the period following the establishment of exchange controls. In the case of the portfolio investigated for this study, not only was it the case that global factors did not exert any influence prior to the controls, but, also, the effects were not significant after their implementation.

Panel B of Table 3 shows the regression results, but using dependent variable only information on the daily returns of CANTV's ADRs⁶ negotiated in New York. The results suggest that before the exchange controls were implemented both local and global market factors were important in determining CANTV's ADR prices in New York, with global factors exerting most influence ($\beta_1 = 0.575$ versus $\beta_2 = 0.281$). After the implementation of the controls the global and local coefficients ceased to be significant, indicating that the controls introduced severe distortions into the market.

Consequently it was not possible to reject Hypothesis 1, which concerned the influence of global factors on CANTV's ADRs. Hypothesis 2, which posited a reduction in the influence of local factors on the performance of ADRs in New York following the implementation of the controls, is not rejected either: not only did the coefficient diminish appreciably, it also ceased to be statistically significant after the implementation of the exchange controls.

As the portfolio of Venezuelan ADRs used in this regression consisted exclusively of CANTV ADRs, an additional regression was carried out using a portfolio made up exclusively of local CANTV ADRs⁷ and employing the same shares used in the earlier regressions as independent variables in order to compare the results with the other regressions and to validate the results, which are presented in Panel C of Table 3.

⁶ As was mentioned above only the ADRs of CANTV were considered, as these were the only Venezuelan ADRs traded on the NYSE and because they were the only Venezuelan ADRs that were regularly traded.

⁷ The value of CANTV's local ADR is calculated by multiplying the price of its shares negotiated the BVC by seven and converting the result into dollars using the official exchange rate.

TABLE 3. Tests of Market Segmentation

PANEL A: Regression Model of the Returns of the Portfolio of Local Stocks in Venezuela (traded in the BVC) with Associated ADRs using a Portfolio of the World Stock Market (MSCI) and a Portfolio of Local Stocks without ADRs (Port-No ADR)

Dependent Variable: Port-Adr (in U.S. dollars at the official exchange rate)							
Independent Variables: MSCI, Port-No ADR (in U.S. dollars at the official exchange rate)							
Time period	Global market Index (MSCI)			Local Market index (Portfolio No ADR)			R2
	β_1	t-stat	Sig	β_1	t-stat	Sig	
Before exchange controls	0,0236	0,315	0,753	0,911	23,397	0	0,7
02 Feb 2002 - 28 Nov 2002							
After exchange controls	-0,103	-0,641	0,522	0,713	14,577	0	0,432
28 Jan 2003 - 28 Feb 2004							

PANEL B. Regression Model of the Returns of the Portfolio of Venezuelan Stocks with ADRs (traded in New York) using a Portfolio of the World Stock Market (MSCI) and a Portfolio of Local Stocks without ADRs (Port-No ADR)

Dependent Variable: ADR Cantv (NY)							
Independent Variables: MSCI, Port-No ADR (in U.S. dollars at the official exchange rate)							
Time period	Global market Index (MSCI)			Local Market index (Portfolio No ADR)			R2
	β_1	t-stat	Sig	β_1	t-stat	Sig	
Before exchange controls	0,575	3,421	0,001	0,281	3,217	0,001	0,88
02 Feb 2002 - 28 Nov 2002							
After exchange controls	0,168	1,024	0,307	-0,0187	-0,238	0,812	0,004
28 Jan 2003 - 28 Feb 2004							

PANEL C. Regression Model of the Returns of the Portfolio of Venezuelan Stocks with ADRs in the BVC (local stock of CANTV) with Associated ADRs using a Portfolio of the World Stock Market (MSCI) and a Portfolio of Local Stocks without ADRs (Port-No ADR)

Dependent Variable: ADR Cantv Local (en dólares a la tasa oficial)							
Independent Variables: MSCI, Port-No ADR (in U.S. dollars at the official exchange rate)							
Time period	Global market Index (MSCI)			Local Market index (Portfolio No ADR)			R2
	β_1	t-stat	Sig	β_1	t-stat	Sig	
Before exchange controls	0,484	3,114	0,002	0,784	9,715	0	0,31
02 Feb 2002 - 28 Nov 2002							
After exchange controls	0,241	1,295	0,196	0,128	2,255	0,025	0,022
28 Jan 2003 - 28 Feb 2004							

Source: Own computations

Panel C suggests that before the foreign exchange controls were implemented global and local market factors were important in determining the prices of local CANTV ADRs, with local factors exerting a slightly higher influence than global ($\beta_1 = 0.484$ and $\beta_2 = 0.784$). Following the initiation of foreign exchange controls local factors were no longer so important, as shown by the reduction in the coefficient ($\beta_2 = 0.128$). The global coefficient also diminished in size ($\beta_1 = 0.241$), but the change was not statistically significant.

For this case, as for the analysis of Hypothesis 1, which posited the influence of global factors on the performance of ADRs, the possibility that global factors exerted influence in the period prior to the implementation of the controls is not rejected. Hypothesis 3a (positing an increasing influence of local factors in determining the prices of local shares with associated ADRs during the period of controls

when compared with the previous period) is rejected, because this factor actually decreased significantly between the period prior to and following the policy change. Similarly, it was not possible to reject Hypothesis 3b, which posited that global factors would not influence the performance of these same shares following the imposition of exchange controls.

These results differ in one respect from the analysis of the portfolio of Venezuelan ADRs, in which the influence of global factors before the implementation of the exchange controls was neither significant nor relevant, as in this case. This result might be affected by the increased influence of global factors on CANTV's shares, as they are the only ones which ADRs were traded in the NYSE. The natural experiment constituted by the case of CANTV allows for a series of similarities with the performance of the full portfolio of firms with ADRs. The first of these involves

the non-significance of global factors in the period following the implementation of foreign exchange controls while the second concerns the significance of local factors before and after the policy change, since the coefficient was reduced in both cases (though it was more marked in the case of CANTV's shares than in the portfolio of shares with ADRs).

"Discounted" prices of ADRs during the period of foreign exchange controls

The investor with an ADR has the right to exchange it for the underlying shares at any point. Therefore, in the absence of restrictions on capital flows or exchange controls ADRs and their equivalent shares are perfect substitutes for each other. Generally, an ADR should be worth the same as its equivalent in local shares, once an allowance has been made for differences in exchange rates and transaction costs. This eliminates the possibilities of using the instrument for arbitrage.

In order to evaluate whether the performance of the shares and their corresponding ADRs conforms to normal pricing patterns described in the Law of One Price, the price of a local CANTV share negotiated in the BVC and expressed in dollars at the official rate, was compared to the price of a share negotiated in dollars in the United States. This was done by dividing the price of the ADR by the appropriate number of equivalent shares (one CANTV ADR = seven local shares). Figure 3 shows how the price of the local share and its ADR equivalent, expressed - at the official rate - in dollars, were practically identical before controls began, while following the implementation of the controls the price of the local share was significantly higher than its New York equivalent.

Figure 4 shows the ADR discount (the price of the local share minus the US price) and illustrates the fact that prior to the temporary closure of the BVC in November 2002 as a result of the national civic strike, the average discount was close to zero. This suggests that the few arbitrage possibilities between the BVC and the NYSE maintained close alignment in prices. Following the implementation of foreign exchange controls in February of 2003 the discount came close to 10%, reaching a peak (of 50%) in January of 2004, just before the Bolívar was officially devalued in February of that year from Bs. 1,600 to Bs. 1,920 to one dollar. Following the devaluation, at the end of the month, there was a slight reduction in the gap which brought the discount close to 40%.

The difference between the price of the ADR and the local share price (i.e. the discount) may be interpreted as the

market's prediction concerning the expected future devaluation in the official exchange rate.

Comparative analysis with the Argentinian exchange controls of 2002

Figure 5 shows the reactions of the stock markets in Argentina and Venezuela to the exchange crises examined in this paper. In both cases a substantial growth in the value of the indexes may be observed in the period following the key events in each control process: the "corralito" in Argentina and the exchange control decree in Venezuela (see Auguste *et al.*, 2002, Melvin, 2002, and Kadiyala & Kadiyala, 2003).

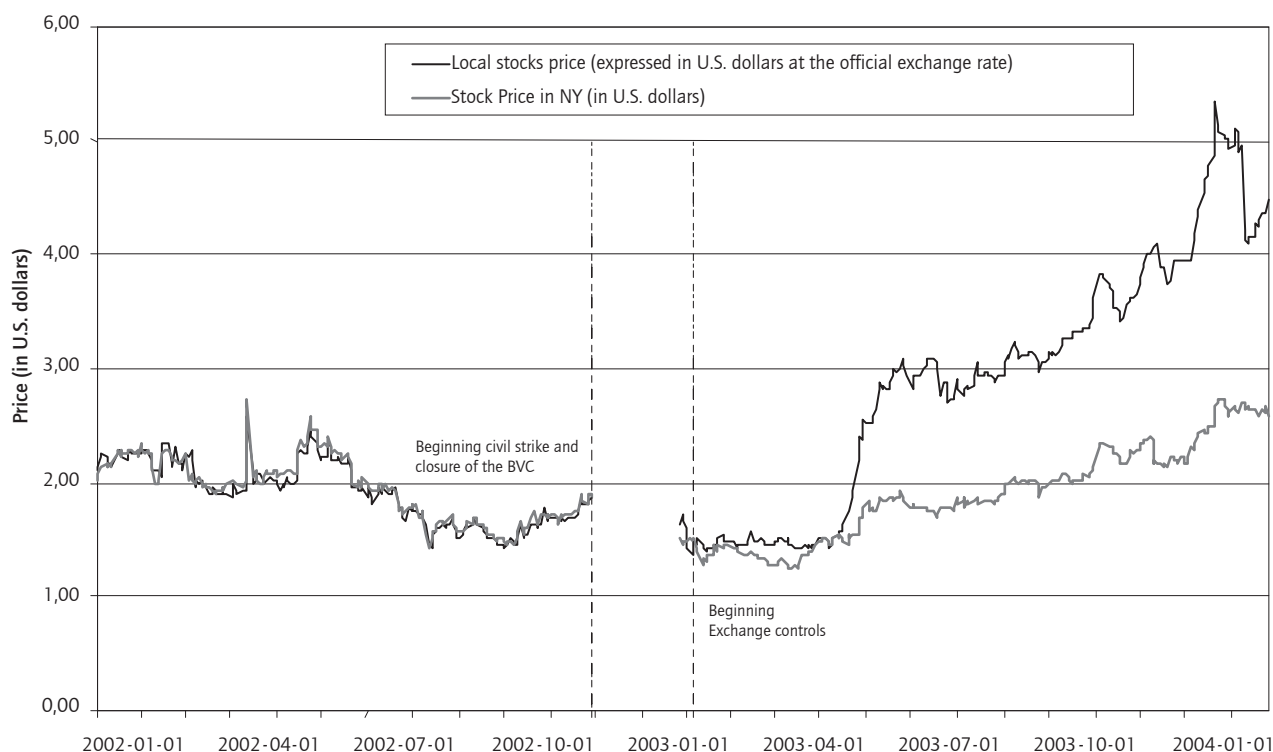
In the Argentinian case growth was, at first, more dramatic as there was a rapid increase following a period of sustained decline in the months prior to the "Corralito." The corralito was the name given to the economic measures taken in Argentina at the end of 2001 in a desperate attempt to stop a massive bank run at that time. The corralito, which was in force for one year, froze bank accounts and did not allow withdrawals from U.S. dollar-denominated accounts. The corralito was also accompanied by a devaluation of the peso and very strict foreign exchange controls, which left the conversion of stocks of Argentinean companies (which traded in the Buenos Aires exchange and in Argentinean Pesos) into ADRs (which traded in the U.S. markets and in U.S. dollars) as one of the few ways available to obtain foreign exchange in Argentina at the time.

It is noteworthy that the first fall in the value of the index occurred 45 days after the "corralito" was imposed. The first fall coincided with the first devaluation of the Argentinian peso against the dollar; the second important fall in the value of the index coincided with the second devaluation, in February of 2002, and the third - and most dramatic - occurred at the end of March with the imposition of the strictest exchange controls to date and the imposition of severe restrictions on the convertibility of local shares into ADRs.

In Venezuela, a brief increase occurred following the implementation of exchange controls, resulting from the period of uncertainty (which lasted until May 2003) concerning the legality of ADR operations. This was followed by a generally rising trend during which the IBC broke all historical records, outstripping the levels attained by the Buenos Aires Merval Index in the same period (235 days).

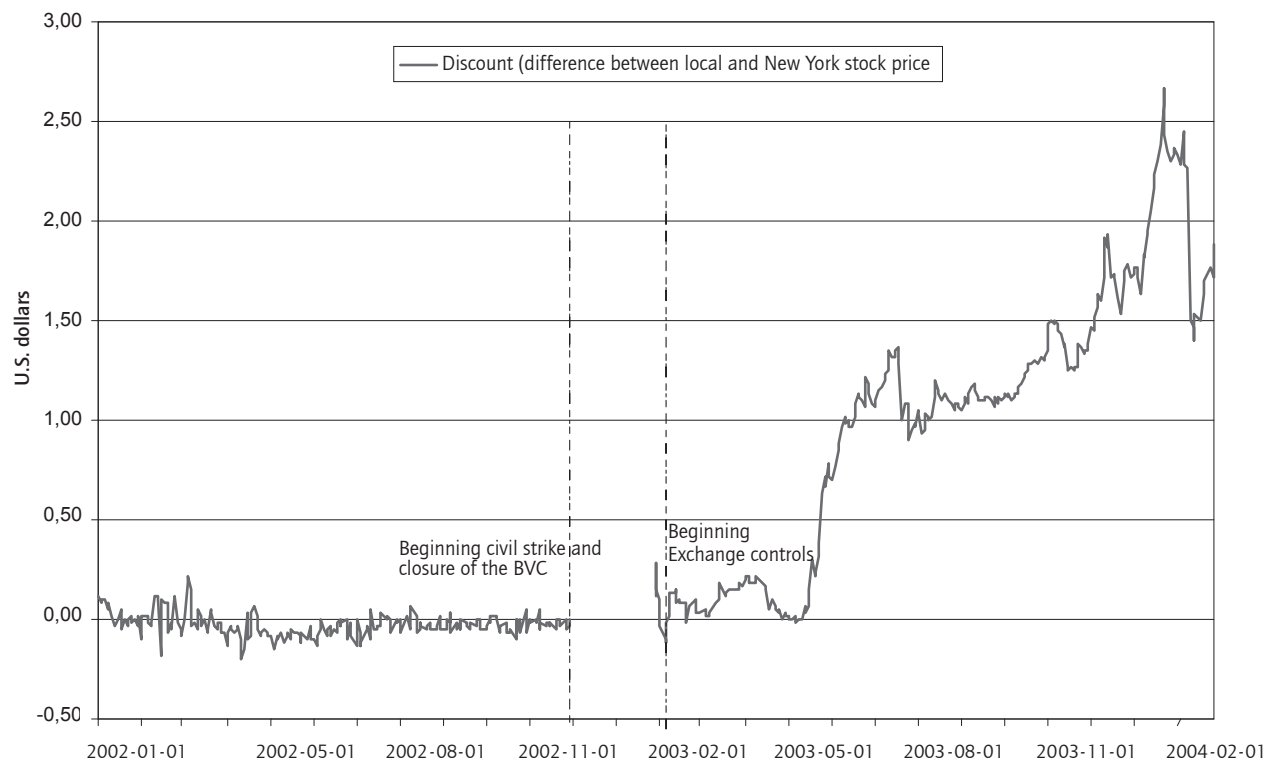
In contrast with the Venezuelan case, the portfolio of Argentinian shares with associated ADRs was much more integrated with the world market in the period before the "corralito" (Auguste *et al.*, 2002). In Venezuela - except in

FIGURE 3. Local and New York Price, expressed in U.S. dollars, of one stock of CANTV during the period 01/2002 – 02/2004.



Source: Datastream and own computations

FIGURE 4. Evolution of the Discount of CANTV Stocks, expressed in U.S. dollars at the official exchange rate, and the ADR Price in New York during the period 01/2002-02/2004



Source: Datastream and own computations

the case of the CANTV ADRs – the influence of global factors was not significant either before or after the implementation of foreign exchange controls. This resembled the Argentinian case in as much as global factors ceased to be significant in the period following the "corralito."

In the wake of the "corralito" in Argentina the importance of local factors increased significantly. This paper has shown that local factors became more important in determining the price of shares with ADRs during the period of foreign exchange controls ($\beta_2 = 1.459$). In the Venezuelan case this element did not increase but declined slightly, though it remained important.

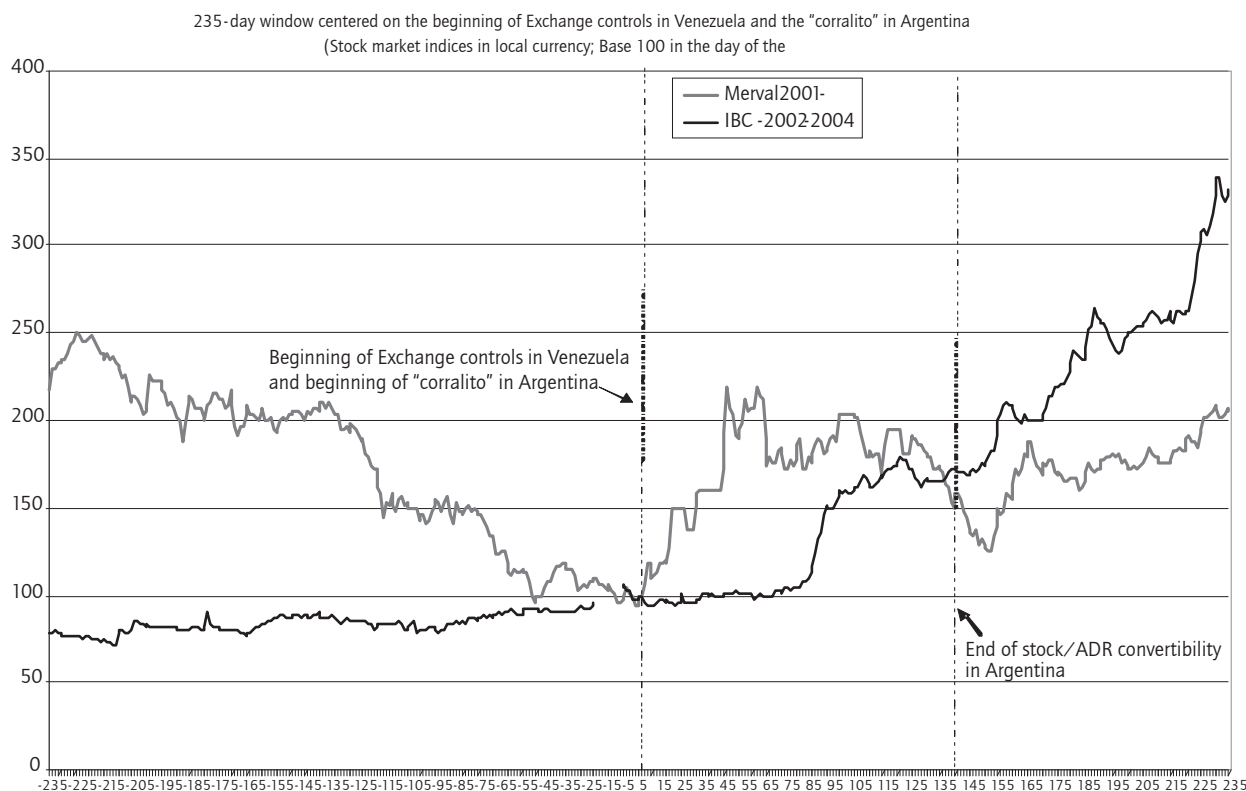
In the Argentinian case before the "corralito" global and local factors affected ADR prices in New York. However, the drastic reduction in the significance of the two factors (β_1 and β_2), and their statistical non-significance (t-stat less than 2) during most periods, indicates that neither local nor global factors are sufficient to explain the performance of the ADRs portfolio following the "corralito." This result coincides with the findings for Venezuela (in particular, concerning the CANTV ADRs), which provide evidence that the imposition of foreign exchange controls

introduced distortions in the markets, isolating and segmenting them.

Conclusions

It was found that in the case of the Venezuelan market global factors had significant effects on CANTV's shares but did not affect the rest of the firms with ADRs. This created a natural experiment where, despite the fact that the evidence shows that the Venezuelan stock market was already segmented before the imposition of foreign exchange controls, there was at least one group of shares – CANTV – that was integrated into the global market. It was therefore possible to isolate the impact of the foreign exchange controls on the ADRs of CANTV, where a decrease in the influence of global factors was observable following the initiation of exchange controls in February 2003. Similarly, there was no evidence that the influence of local factors on the portfolio of shares with associated ADRs increased in the period following the introduction of foreign exchange controls. However, it is important to emphasize that local factors remained statistically significant and that the decrease was relatively minor. In the case of

FIGURE 5. Comparisson of the evolution of the stock markets of Argentina (08/01/2001 – 28/10/2002) and Venezuela (02/01/2002 – 27/01/2004) around the establishment of foreign exchange controls



Source: Datastream

local CANTV shares there was an appreciable decrease in the coefficient associated with local factors. Finally, the influence of global factors on the portfolio of shares with ADRs in the period following the imposition of foreign exchange controls was not statistically significant. This result was true for the portfolio of shares with associated ADRs and the one that consisted only of local CANTV shares.

The recent imposition of foreign exchange controls in Iceland (in early 2009) and in Argentina (starting in November 2011) highlights anew the fact that when faced with balance of payments crises and falling international reserves some governments will opt to impose restrictions on capital outflows. These controls, with their concomitant effects on the assignment of resources will – as in the case examined here – have effects on the prices of assets regardless of whether they are denominated in local or (like ADRs) foreign currencies.

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