

A STOCK MARKET BOOM DURING A FINANCIAL CRISIS? ADRs and capital outflows in Argentina

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Abstract: Beginning in late 2001, Argentina experienced a tumultuous economic and social crisis including the end of the decade-long peso peg to the dollar, drastic foreign exchange and capital controls, violent anti-government demonstrations, social unrest, and the largest debt default in history. Yet the Argentine stock market experienced a boom during the early period of the crisis. This is in contrast to the experience of other countries undergoing financial crises, where the domestic stock market experiences sharp declines in value. This paper explains the surprising Argentine experience as a result of investors using the stock market to shift funds out of Argentina and into the United States. This was accomplished via purchases in Argentina of shares of firms listed in the United States and traded as American Depositary Receipts (ADRs). These Argentine shares were converted into ADRs and sold in the U.S. to shift out of pesos in Argentina into dollars in the United States. While ADRs and underlying share prices typically trade in a very narrow range, during the time when ADR conversions were permitted in Argentina, a large premium on share prices in Argentina relative to ADR prices existed. This premium reflected the capital loss expected on peso investments in Argentina and the value of capital control avoidance. On March 25, 2002, the conversion of Argentine shares into ADRs was prohibited and the premium of Argentine share prices over ADR prices once again returned to fluctuate about zero.

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I. INTRODUCTION

From late 2001 to early 2002, the Argentine economy experienced a crisis of massive proportions. Ultimately, it led to the end of the peso peg against the dollar, drastic foreign exchange and capital controls, a nationwide bank closure, and the largest debt default in history. Yet in the face of economic disarray and social unrest, the Argentine stock market experienced a boom. Between the end of November, 2001, prior to the first announcement of restrictions on financial transactions, until March 25, 2002, when extensive capital controls were imposed, the Argentine stock market experienced a dramatic rise of more than 217 percent as measured by the Merval index.

The Argentine experience stands in sharp contrast to other recent financial crises. If one examines the stock market performance of other countries in the immediate months involving crises, one finds the following *fall* in stock market indexes: Mexico (December 1994-February 1995), 53.5%; Korea (July 1997-November 1997) 47.0%; Malaysia (July 1997-January 1998) 52.0%; and Thailand (July 1997-December 1998) 33.8%. Such pronounced drops in stock market values are the typical result expected during crises. Yet the Argentine market more than doubled in the early months of the crisis of 2001-2002. How can such a surprising event occur?

This paper analyzes the rise in Argentine stock prices as a result of investors using the stock market to shift funds out of Argentina (and pesos) into the United States (and dollars). By purchasing shares of Argentine stocks at home that are listed in the United States, investors were able to convert peso-denominated home-market shares into dollar-

denominated American Depositary Receipts (ADRs) in the United States. This conversion of the underlying home-market shares into the derivative ADRs accomplished the shift of wealth out of Argentina and into dollars in the United States. The value of capital controls avoidance results in investors' willingness to pay a premium over the ADR price to purchase Argentine shares at home. Empirical evidence on the premium is presented and it is seen that on the peak day following the announcement that the fixed exchange rate would be broken, investors were paying a premium of more than 40 percent above the value of shares in New York to buy shares in some Argentine firms with ADRs. Over the period from December 3, 2001 until March 25, 2002, when ADR conversions were prohibited, the home price premium in excess of the peso value of ADRs averaged up to 20 percent for the sample of firms studied. Following the prohibition of ADR conversions, this premium quickly dissipated and the home-market price converged toward the ADR price.

The rest of the paper is organized as follows: the next section gives a brief overview of events related to the crisis. Section III provides a discussion of the role of Argentine stocks that are listed in the United States and how investors could use the U.S.-listed shares to evade Argentine capital controls and shift wealth out of Argentina and pesos into the United States and dollars. Section IV presents a simple rational stock market valuation model that indicates how the premium paid for Argentine shares in excess of the price of the U.S.-listed derivative shares serves as a measure of the value of capital controls avoidance. Empirical evidence is also presented on the magnitude of this premium. The final section presents a summary and conclusions.

II. THE CRISIS IN ARGENTINA: A BRIEF CHRONOLOGY AND REVIEW

Our task is not to explain the root causes of the Argentine crisis but, rather, a particularly striking feature associated with the crisis. For this reason, we do not discuss likely causal events contributing to the breakdown of the one-to-one parity between the peso and the dollar and the dramatic events of late 2001 and early 2002.¹ It is important, however, to understand the timing of events as the crisis unfolds. A brief chronology of major events is outlined below:

December 1&2, 2001

The government imposes restrictions on bank deposit withdrawals. Only \$250 per week may be withdrawn in cash, only \$1,000 may be taken abroad in cash, and firms must have official permission to make foreign payments above that amount. These restrictions were announced on the weekend prior to the IMF announcement that a \$1.3 billion tranche would not be disbursed to Argentina.

December 6, 2001

The government appropriates private pension funds by converting \$3.5 billion in private pension fund assets into treasury bonds.

December 19, 2001

Following proposed major cuts in government spending by Economy Minister Cavallo, protests demanding a change in economic policy degenerate into rioting and looting and result in 28 deaths.

December 20, 2001

Economy Minister Cavallo and other cabinet members resign as thousands fill the streets of Buenos Aires to protest government policies. These resignations are then followed by the resignation of the President, Fernando de la Rúa.

December 21, 2001

The central bank announces the closure of all foreign exchange houses until the following Monday (December 24). But, in fact, Argentine financial markets were closed, including the stock exchange, until December 28.

December 23, 2001

New President Adolfo Rodríguez Saa announces that payments would be suspended on the public debt—creating the largest debt default in history. In addition, a plan to issue a “third currency” that will float in value against the peso and U.S. dollar is announced.

December 30, 2001

New protests lead to the resignation of President Saa.

¹ An early review of the events leading to the crisis is presented in Quispe-Agnoli and Kay (2002).

January 4, 2002

New President Duhalde announces that “a devaluation is a foregone conclusion” signaling the end of the one-to-one peso peg.

January 6, 2002

The forthcoming devaluation is announced and financial markets are closed for an emergency holiday on Monday, January 7. In fact, the markets, including the stock market, were not reopened until January 17.

February 1, 2002

A supreme court ruling declares that the government’s financial controls are unconstitutional. In response, the central bank declares two days of bank holidays, and the government announces a 6-month ban on legal challenges to its economic plan.

February 11, 2002

The central bank allows the peso to freely float against the dollar while opening exchange houses and relaxing some restrictions on bank deposit withdrawals.

March 5, 2002

An export tax is announced along with a plan to allow frozen term deposits in banks to be converted into peso-denominated bonds maturing in 10 years.

March 25, 2002

Foreign exchange controls are tightened with limits on dollar purchases of \$1,000 for individuals and \$10,000 for firms, reduced hours of operation for exchange houses, a requirement of daily cash deposits for large retailers, and a restriction on conversion of Argentine stocks into ADRs. Banks and exchange houses will only be allowed to buy dollars if they transact at the official government-set exchange rates.

At the time this study was written, the crisis events were still unfolding. However, since the particular phenomenon addressed in this study has now passed, the continuing events have no bearing on the stock market behavior considered here.

An especially newsworthy aspect of the crisis was the break from the decade-long one-to-one peg with the dollar. Figure 1 depicts the time path of the peso/dollar exchange rate over the period from January 2001 through April 2002. The peso was fixed at $\text{ARS } 1 = \text{USD } 1$ from April 1991 until January 11, 2002. On that day, the peso depreciated to $\text{ARS } 1.4025 = \text{USD } 1$. From January 11 onward, the peso steadily depreciated with a sharp upward spike on March 25, 2002, following the implementation of stricter capital controls. In section IV below, it will be shown that the value of capital controls avoidance rose substantially in anticipation of the end of the fixed exchange rate

and the associated market closings. This is consistent with an increased demand to move wealth out of Argentina and to the United States through equity market conversions.

Of particular interest in this study is the behavior of the Argentine stock market during the crisis period. Figure 2 illustrates the time path of the Merval stock market index value from the beginning of 2001 until late April 2002. It is seen that the Argentine stock market was steadily falling over 2001 from its high on January 23, 2001 to its low at the end of November, 2001. Over this period, the index fell by more than 60 percent. Then following the weekend of December 1 and 2, 2001 when the government announced the first wave of financial market restrictions, the stock market started to rise. The Merval index more than doubled in value from the end of November, 2001 until the end of March, 2002. Our focus is on this period of stock market boom in the midst of the financial and social crisis in Argentina. The flat spots in the index illustrate market closings that occurred from December 21-December 27, 2001 and January 7 to January 16, 2002.

III. THE ROLE OF U.S.-LISTED SECURITIES IN THE STOCK MARKET BOOM

With the first wave of restrictions on withdrawals from Argentine bank deposits and limitations on international capital outflows, the stock market started to rise. Why would demand for Argentine stocks rise to fuel the rapid rise in stock prices observed during the December 2001-March 2002 period? One reason is the simple desire to reduce peso currency holdings. Since dollar exchanges were strictly limited, there was an increased demand for Argentine shares as a means of diversifying out of currency. However, as will be shown in the model presented in section IV, the prices of Argentine shares should have been expected to fall due to the economic and social crisis, but the expected loss from holding local currency was perceived to be greater. An analysis of the share prices in Argentina and in the U.S. suggests that the primary motive for the big movements in the Argentine stock market was the purchase of Argentine shares of firms that are listed on U.S. securities markets. One could buy shares of the underlying firm in Argentina using pesos and then have a bank or broker convert the Argentine shares into that firm's depositary receipts traded in the United States in dollars. One could then sell the U.S.-traded shares for dollars and deposit the dollars in the United States. To understand better this avenue of moving wealth out of Argentina, we should first consider a brief overview of the depositary receipt market.

III.A. American Depositary Receipts

American Depositary Receipts or ADRs are the most popular form of foreign firm listings on U.S. stock exchanges.² ADRs are U.S.-dollar-denominated negotiable instruments issued by a depositary bank that represent ownership of non-U.S. securities. ADRs enable U.S. investors to acquire and trade non-U.S. securities denominated in U.S. dollars without concern for the differing settlement times and procedures and other problems typically associated with overseas markets.

Any firm listing on a U.S. exchange such as the New York Stock Exchange or the NASDAQ must fully comply with U.S. Securities and Exchange Commission rules for listing and disclosure. Once an ADR program is established and shares begin to trade in the United States, there is a tight range for pricing the ADR and the underlying home-market shares. If the price in one market varies too much from the other market, then arbitrage will bring prices back in line. Price does not have to be identical in each market (when quoted in a common currency) as there are transaction costs of 5 cents per share associated with converting foreign shares into ADRs or ADRs into foreign shares, brokers fees of about 10 basis points on either side of a trade, and a bid-ask spread. Also, since settlement in equity markets typically takes place at $t+3$ (3 days after the transaction), there is also foreign exchange risk unless the stock trade is matched with a forward exchange contract. Beyond outright arbitrage between ADRs and the home market shares, firms look at the price in each market to decide where to buy or to sell. This latent demand and supply shifts buying activity into the market that is priced relatively low and selling activity into the market priced relatively high. The bottom line

² An article containing a useful “primer” on ADRs is Foerster and Karolyi (1999).

is that in normal times, the home-currency price of an ADR is very close to the price of the same firm in the home country.³

There are 25 Argentine firms listed as ADRs in the United States. Of these, 11 are private placements available only to qualified institutional buyers. Three are listed on the NASDAQ and 11 are listed on the New York Stock Exchange (NYSE). The NYSE-listed firms include the “bellwether” Argentine ADRs: Telecom Argentina, Banco Frances, and Perez Companc.

To examine the relationship between ADRs and the underlying Argentine shares, data were taken from Datastream on the daily closing price of the Argentine firms listed on the New York Stock Exchange (NYSE). The firms, their industries, NYSE trading symbols, and their associated values of NYSE trading in 2001 are listed in order of trading activity (in thousands of dollars): Telecom Argentina, telecom and data networking, TEO (\$1,516,362); BBVA Banco Frances, banking, BFR (\$717,402); Perez Companc, gas and electric utility, PC (\$568,410); Quilmes Industrial, beverages, LQU (\$139,000); Telefonica de Argentina, telecom and data networking, TAR (\$108,194); Nortel Inversora, telecom and data networking, NTL (\$106,782); IRSA-Inversiones y Representaciones, real estate, IRS (\$88,409); Siderca, steel, SDT (\$48,998); Transportadora de Gas del Sur, oil and gas service, TGS (\$29,904); YPF Sociedad Anonima, oil and gas service, YPF (\$26, 443); and MetroGas, oil and gas service, MGS (\$3,375).

³ A small sample of papers related to ADRs and the underlying home-market shares includes Eun and Sabherwal (forthcoming), Karolyi (1999), Kim, Szakmary, and Mathur (2000), and Miller and Morey (1996). A study that includes an analysis of the impact of an exchange rate change on ADR and home-market pricing is Grammig, Melvin, and Schlag (2002).

Figure 3 displays the daily deviation of the price of shares in Argentina from the peso value of the ADR price in the U.S. for the three most heavily-traded firms. The deviation between the closing home market prices and the ADR prices was computed by converting ADR prices into pesos using the daily peso/dollar exchange rate taken from Datastream and dividing by the multiple of Argentine shares the ADR represents. Each firm in Figure 3 illustrates a similar phenomenon. Before December, 2001 the share prices in Argentina and the ADR prices moved closely together. Figure 3 shows that prior to December 2001, the deviation between the Argentine and ADR price fluctuated around zero. Then in December 2001, the deviation started to widen. The home peso price of shares grew substantially at the same time that the ADR price was stagnant. Figure 4 shows the share prices in New York for the ADRs of the three most heavily traded firms, Banco Frances (BFR), Perez Companc(PC), and Telecom Argentina (TEO). Note that all three ADRs were sinking in value throughout the 2001-2002 period. While Perez Companc had a brief run up in share price in early December 2001, the other two firms steadily fell throughout the crisis period. If the ADR reflects the fundamental value of the firm, then the deviation between the price in Argentina and the price in New York reflects the value of capital controls avoidance to investors desiring to move wealth out of Argentina.

IV. THE VALUE OF CAPITAL CONTROLS AVOIDANCE

The informal evidence presented in Figures 3 and 4 above is consistent with a premium paid for Argentine shares above the ADR price that reflects the value of capital controls avoidance in Argentina. In order to formalize the argument, assume a simple rational valuation model of stock prices where the price of a stock P_t reflects the present discounted value of dividend cash flows as:

$$(1) \quad P_t = E_t \sum_{j=1}^{\infty} \left\{ \left[\prod_{i=1}^j (1 + r_{t+i} + rp_{t+i}^D) \right]^{-1} D_{t+j} \right\}$$

where E is the expectation operator, r is the risk-free rate of interest, rp^D is the risk premium used to discount future dividends, and D represents dividends. As Figure 4 illustrates, ADR prices of Argentine firms were generally falling throughout the period of 2001 and 2002, including the financial crisis period.⁴ Prior to the crisis period, share prices were also falling in Argentina, as Figure 2 illustrates. Once the crisis arrives, ADR prices generally continue to fall while share prices in Argentina start to deviate and rise above ADR prices. In terms of the rational valuation model, equation (1) may be thought of as representing stock market valuation for Argentine firms in both the ADR and domestic market in normal times. However, it may not be appropriate in the domestic Argentine market crisis case where additional cash flows may be realized through capital controls avoidance. An augmented version of equation (1) is needed for the crisis period to reflect the expected cash flows associated with the conversion of the Argentine shares

⁴ In addition to the visual evidence presented in Figure 4, this is also supported by the decline in the Bank of New York ADR index for Argentina.

into ADRs and subsequent sale for dollars in the United States. A valuation model for the Argentine crisis period is given by:

$$(2) \quad P_t = E_t \sum_{j=1}^{\infty} \left\{ \left[\prod_{i=1}^j (1 + r_{t+i} + rp_{t+i}^D) \right]^{-1} D_{t+j} + \left[\prod_{i=1}^j (1 + r_{t+i} + rp_{t+i}^C) \right]^{-1} C_{t+j} \right\}$$

where rp^C is the risk premium used for discounting cash flows associated with capital controls avoidance. C represents those cash flows, which may be thought of as the positive returns expected from U.S. investment opportunities relative to the losses anticipated from investments in Argentina.

In times of financial crisis, we normally would expect future dividends to fall due to financial repression of domestic firms as well as a rise in the risk premium used to discount those dividends. The effect would be to lower share prices. This is what we generally observe in countries experiencing financial crises and this is what we observe in the New York prices of Argentine firms. So one may think of equation (1) as representing a model of stock price valuation for the shares traded in New York even during the crisis period. The second term in equation (2) explains how share prices can rise in Argentina while falling in New York. The cash flows associated with capital control avoidance are discounted and priced into Argentine trading but not New York trading. So one can think of equation (2) as a model of home-market stock price valuation for Argentine shares that are listed in the United States.

The difference between equations (2) and (1) represents the premium paid to avoid capital controls. In the data, the price in Argentina will exceed the price in New York by an amount that reflects this premium. Since the first term in equation (2), representing the fundamental value of the firm, should fall as a result of the crisis, we

posit that the price increase in Argentina over the ADR serves as an empirical measure of the value of capital control avoidance via international cross-listing conversions. This premium should reflect the expected capital loss associated with peso investments in Argentina.

Table 1 presents data on the value of capital control avoidance as implied by the deviation of the home market price from the peso value of the ADR price for the Argentine firms listed on the NYSE. Quilmes Industrial, Nortel Invesora, and YPF are do not appear in the table since there are no home-market share price data available on Datastream for these firms. Quilmes' shares in Argentina are owned by Quinsa of Luxembourg and Heineken of the Netherlands, so there is no float in Argentina. Nortel Invesora is a holding company organized to hold a controlling interest in the common stock of Telecom Argentina and the ADRs are issued against preferred shares held by the holding consortium. YPF is a wholly-owned subsidiary of Repsol YPF of Spain.

The daily closing ADR price on the NYSE is divided by the multiple of underlying Argentine shares the ADR represents, and then multiplied by the daily peso/dollar exchange rate.⁵ This adjusted ADR value is then subtracted from the daily closing price in Argentina. All data are from Datastream. To find the days of peak value of capital controls avoidance, days where the stock market was closed in Argentina are omitted. Otherwise, the Argentine closing price would reflect stale data from the last day the market was open and the results would be meaningless. For each firm, the two trading days with the largest deviation of the Argentine price from the ADR price are identified by the largest deviation as a percentage of the Argentine share price. The table lists these

⁵ The ADRs represent the following number of shares traded in Argentina: Banco Frances, 3; IRSA Inversiones Y Representaciones, 10; Metrogas, 10; Perez Companc, 10; Siderca, 10; Telecom Argentina, 5; Telefonica de Argentina, 10; and Transportadora de Gas Del Sur, 5.

percentage deviations along with the peso values of the deviations on these two days. In addition, the table presents the mean percentage deviation and the mean peso value of the deviation for the crisis period of December 3, 2001 to March 25, 2002, the latter date being the day when ADR conversions were prohibited.

Table 1 indicates that the maximum percentage deviation ranges from 26.2 percent for IRSA to 45.2 percent for Banco Frances. The maximum peso value of the deviation ranges from AGS 0.20 for MetroGas to AGS 1.81 for Banco Frances. The average value of the percentage deviation over the crisis period ranges from 8.3 percent for MetroGas to 20.0 percent for Perez Companac. The average peso value of the deviation ranges from AGS 0.07 for MetroGas to AGS 0.62 for Siderca. These are substantial deviations from the “law of one price,” which is generally seen to hold for ADRs and the underlying home-market shares. Since the deviations fluctuated in a narrow range about zero prior to the imposition of the first wave of controls on capital outflows, it is likely that these substantial deviations reflect the expected loss associated with peso investments in Argentina and, therefore, the value of capital controls avoidance.

It is interesting to note that the days of peak premium over the ADR price are found to be most frequently Thursday, January 3 and Friday, January 4, 2002. This is coincident with new President Duhalde’s ascension to office and his announcement that the peg with the dollar would be broken. Perhaps more importantly for the timing of the value of capital controls avoidance is that the Argentine financial markets were closed on Monday, January 7 and they remained closed for 9 business days. The high value of capital controls avoidance as registered by the premium paid for Argentine shares above

ADR values on Thursday and Friday, January 3 and 4, is consistent with some investors anticipating the market closure and inability to trade any financial assets in Argentina for an extended time while the peso is devalued. The fact that December 20, 2001 was the day of second highest home-market share premiums for 3 firms indicates a similar phenomenon, as Argentine financial markets were also closed from December 21 through December 27, although no peso devaluation occurred. Given the 40 percent devaluation on January 11 and the later continuing depreciation of the peso, those who moved from pesos into dollars before the trading halt announced on Sunday January 6, would have found the equity market premium they paid worthwhile in an ex post sense.

V. SUMMARY

The winter of 2001/2002 saw the emergence of a financial crisis in Argentina that culminated in an unprecedented debt default and severe restrictions on financial transactions by Argentine residents and firms. In the midst of the economic and social crisis, the Argentine stock market experienced a dramatic rise in share prices with the Merval index rising by more than 217 percent between early December, 2001 and late March, 2002. Such a stock market boom is striking in a country undergoing dramatic economic, political, and social strife.

Why did the Argentine stock market boom occur in the crisis period? The answer lies in the desire to diversify away from peso currency and also evade the capital controls imposed over the weekend of December 1 and 2, 2001. The government decree declared that no more than \$1,000 may be taken abroad by an individual and firms must have official permission to make foreign payments in excess of that amount. More specifically, the rise in Argentine share prices was, at least partially, fueled by the ability of investors to buy shares of Argentine firms that are also listed in the United States. One could buy shares in Argentina with pesos and then have a bank or broker convert the Argentine shares into the derivative American Depositary Receipts (ADRs) traded in the United States and then sell the ADRs for dollars to be deposited in a U.S. bank. This ability to convert Argentine shares into ADRs was an important factor in the run-up in Argentine share prices. Once the government prohibited banks and brokers from converting domestic shares into ADRs, the large premiums of domestic prices over ADRs collapsed.

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Table 1: The Value of Capital Controls Avoidance

The table is based upon the share price in Argentina minus the ADR share price adjusted for the exchange rate and multiple of Argentine shares the ADR represents. This deviation is used as a measure of the value of capital controls avoidance. *Peak Value* is determined by the days when the biggest percentage deviations existed relative to the price in Argentina. Only days when the Argentine stock market was open are considered. Otherwise the closing price would reflect stale data from the last active day. Both the percentage deviation and the peso value of the deviation between the share price in Argentina and the ADR price are given for the top 2 days for each firm. *Average Value* is the mean value of the deviation over the crisis period from December 3, 2001 until ADR conversions were prohibited on March 25, 2002. Both the average percentage deviation and the average peso value of the deviation are listed.

<u>Firm</u>	<u>Peak Value</u>			<u>Average Value</u>	
	<u>Date</u>	<u>Percent</u>	<u>Pesos</u>	<u>Percent</u>	<u>Pesos</u>
Banco Frances	1/21	45.2%	1.81	19.5%	0.51
	1/3	38.6%	1.47		
IRSA	1/3	26.2%	0.21	13.4%	0.12
	1/4	24.0%	0.19		
MetroGas	2/14	33.9%	0.20	8.3%	0.07
	12/20	25.3%	0.17		
Perez Companc	1/4	43.6%	0.85	20.0%	0.41
	12/20	40.0%	0.79		
Siderca	1/3	40.3%	1.08	18.8%	0.62
	1/4	39.3%	1.10		
Telecom Argentina	1/4	35.0%	0.71	17.3%	0.38
	1/3	33.4%	0.67		
Telefonica de Argentina	1/30	28.0%	0.78	8.7%	0.21
	2/13	26.4%	0.71		
Transportadora de Gas	1/4	36.8%	0.57	18.0%	0.26
	12/20	36.5%	0.50		

Figure 1: Peso/Dollar Exchange Rate

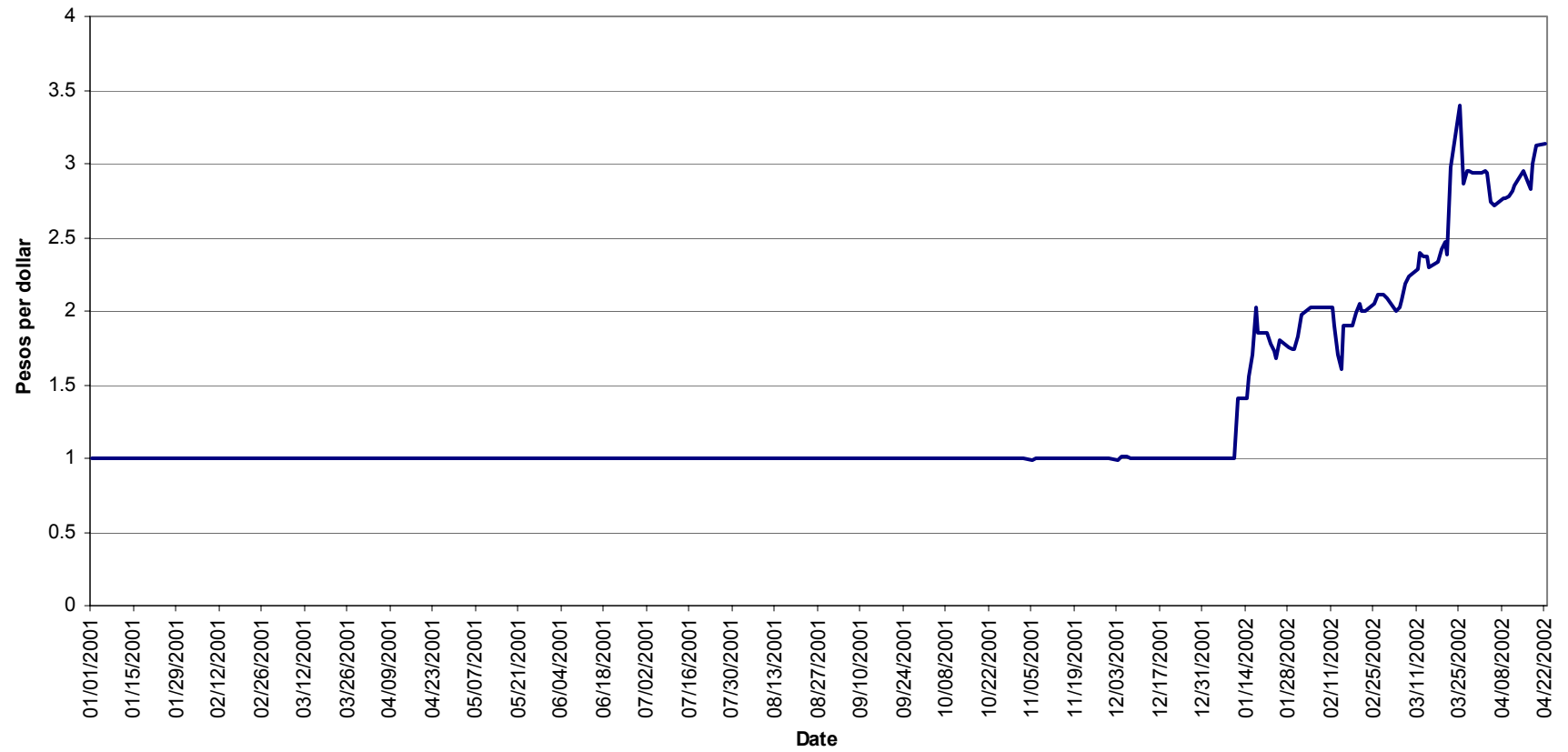
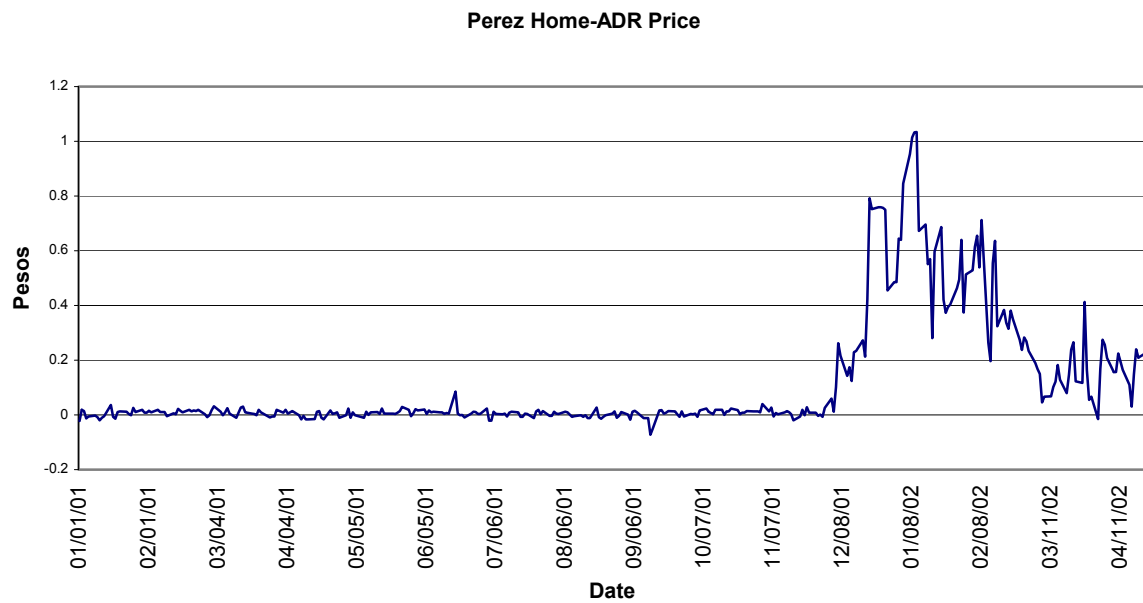
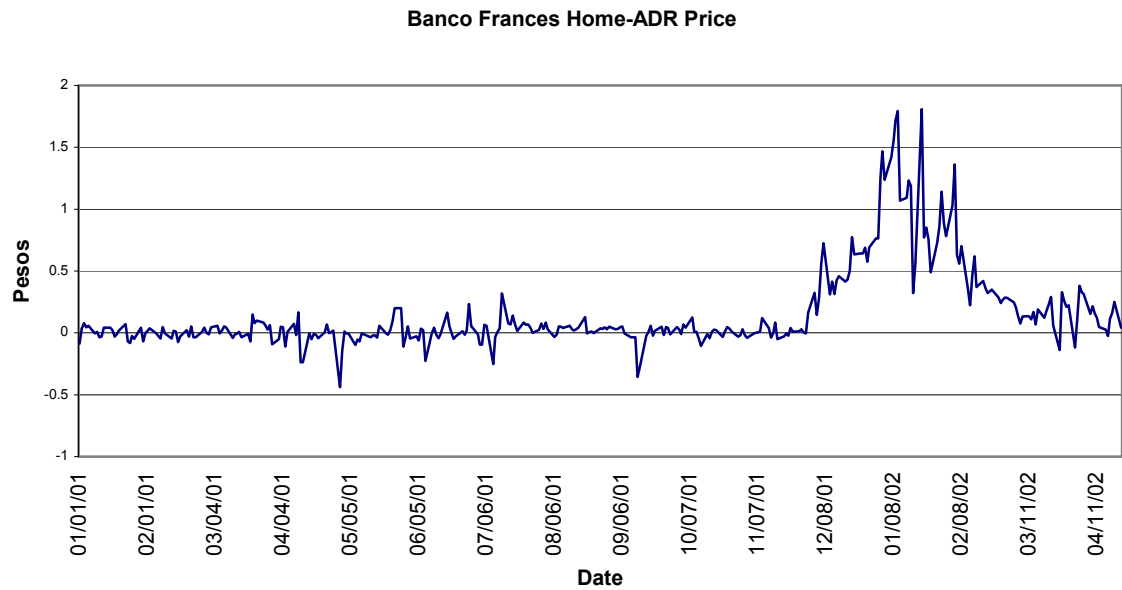


Figure 2: Merval Stock Market Index



Figure 3: Deviation between Argentine Share Price and ADR Price (in pesos) of 3 Top Traded Firms



Telecom Argentina Home-ADR Price

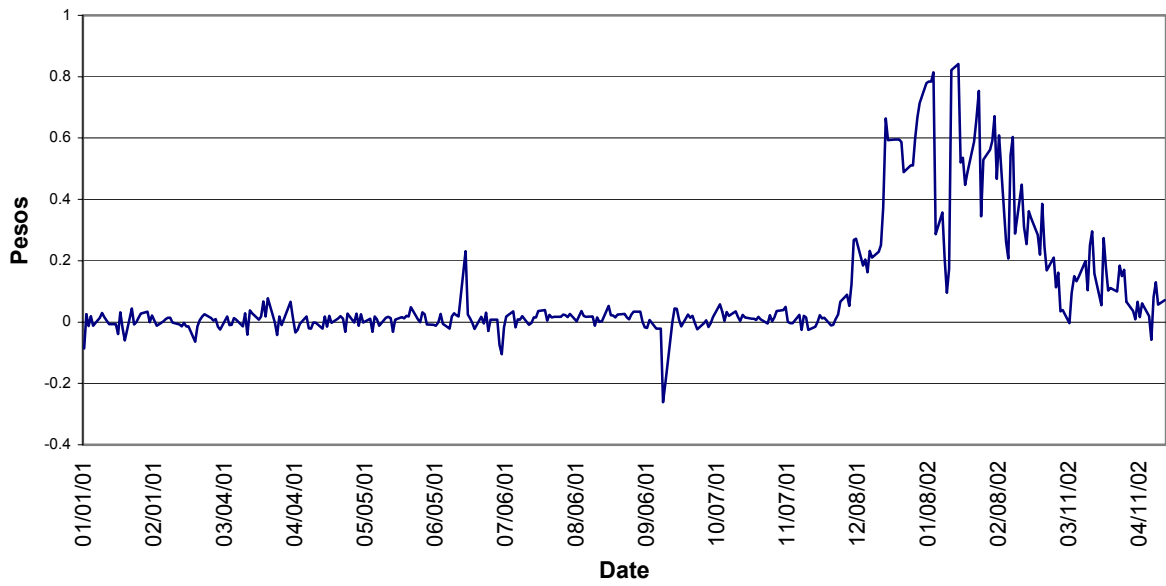


Figure 4: ADR Price in New York of Banco Frances (BFR), Perez Companc (PC), and Telecom Argentina (TEO)

