

THE IMPACT OF CAPITAL CONTROLS ON FIRM VALUE

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Abstract

This research studies the impacts of controls on capital outflows in stock returns, by analysing: the reaction of investors to the announcement of the imposition of the restrictions.

The purpose of this dissertation was to investigate:

- If the implementation of controls on capital outflows has a negative effect on firms' stock prices?
- If the imposition of controls on capital outflows has a different impact across industries? And how it affects differently firms' in export oriented-sectors and the remaining sectors?

The existence of potential differences in the impacts on stock prices: of the imposition of restrictions and a tightening of the capital controls already in place, was also examined.

This dissertation intends to contribute for the knowledge of controls on capital outflows, through an analysis of the impact of their implementation in: Cyprus, Greece, Brazil and Argentina.

Nonetheless, based on the results obtained it is not possible to draw a conclusion on the impacts of the imposition of restrictions to funds mobility in stock returns.

The findings are not only inconsistent with the main hypothesis formulated, but also do not support the initial study expectation: that firms operating in sectors with a high export volume exporting would face smaller losses, in stock prices, than the remaining companies. Furthermore, it appears that the impacts of the imposition of controls on capital outflows differ among different industry groups; which also contradicts the results of previous research, on inflow controls, and leads to the rejection of the hypotheses established.

Keywords: Abnormal returns, Capital controls, Event studies, Short term wealth effects.

JEL Classification: G14, G15

Sumário

Este estudo debruça-se sobre o impacto dos controlos de capitais nos retornos das acções, analisando a reacção dos investidores ao anúncio da imposição destas restrições.

O objectivo desta dissertação foi investigar:

- Se a implementação de controlos à saída de capital possui um efeito negativo sob o preço das acções das empresas?
- Se o efeito da imposição destas medidas difere entre indústrias? E a forma como varia entre empresas em sectores com uma maior orientação exportadora e as que operam nos restantes sectores de actividade.

Também foi analisada a existência de possíveis diferenças, em termos do efeito sob a quotação de mercado das empresas, entre uma imposição de controlos de capitais e um reforço dessas mesmas limitações.

Esta dissertação pretende contribuir para o conhecimento acerca dos controlos à saída de capital, através da análise do impacto da sua implementação: no Chipre, Grécia, Brasil e Argentina.

Contudo, os resultados obtidos não permitem estabelecer conclusões relativas ao impacto da sua imposição, sob os retornos das acções.

Os resultados não só são inconsistentes com a principal hipótese estudada, como também contradizem a expectativa detida inicialmente: de que empresas em sectores com uma maior orientação exportadora registariam perdas menores, na quotação das suas acções, do que as empresas a operar nos restantes sectores de actividade.

Além disso, aparentemente os impactos da imposição de controlos à saída de capital diferem entre indústrias; o que também contradiz os resultados de estudos anteriores, relativos a restrições à entrada de fundos, e leva à rejeição das hipóteses estabelecidas.

Keywords: Retornos anormais, Controlos de capitais, Estudo de eventos, *Short term wealth effects*.

JEL Classification: G14, G15

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Abbreviations Index

ADRs – American Depositary Receipts.

AR – Abnormal Return.

ATHEX - Athens Stock Exchange.

BOT – Bank of Thailand.

CAR - Cumulative Abnormal Returns.

ELA - Emergency Liquidity Assistance.

EMEs - Emerging Market Economies.

ESO - Employee Stock Option.

EU – European Union.

FDI – Foreign Direct Investment.

IMF – International Monetary Fund.

MOF - Ministry of Finance (Thailand) .

OLS – Ordinary Least Squares.

SEC - Securities and Exchange Commission (Thailand).

SET – Stock Exchange of Thailand.

U.S. – United States.

USA – United States of America.

Commonly Used Notations

R_{it} – Stock returns of firm i for period t .

α_i - Intercept term.

β_i - Regression coefficient for the market return.

R_{mt} - Market return for period t .

ε_{it} – Error term or regression residual.

N - Number of enterprises under analysis.

AR_{it} - Abnormal return (AR) of firm i for period t .

$E(R_{it})$ - Expected return of firm i for period t .

$\hat{\alpha}_i$ and $\hat{\beta}_i$ - Estimated regressions coefficients of the market model.

$\sigma_{\varepsilon_i}^2$ – Disturbance variance.

L – Length of the estimation period.

$\overline{R_m}$ – Average stock index performance during the estimation period.

$\sigma^2(AR_{it})$ - Conditional variance of AR_{it} .

AAR_t – Average abnormal return (ARR) for period t .

$\text{Var}(AAR_t)$ – Variance of the average abnormal return for period t .

$CAR_i(t1, t2)$ - Cumulative AR of firm i for the period between $t1$ and $t2$.

$\sigma_t^2(t1, t2)$ - Variance of $CAR_i(t1, t2)$.

$CAAR(t1, t2)$ - Cumulative AAR for the period between $t1$ and $t2$.

$\text{Var}(CAAR(t1, t2))$ – Variance of the cumulative abnormal return for the period between $t1$ and $t2$.

1. Introduction

The use of restrictions on funds mobility is controversial, due to their potential adverse repercussions: on investors' wealth, FDI (Foreign Direct Investment), portfolio capital levels and company's funding costs.

However, the rising volatility of capital flows, which is reflected in large influxes of funds that ultimately are reversed, stimulates economies to continue to implement capital controls.

This popularity of capital controls has turned them into an interesting object of study. Moreover, the examination of the microeconomic impacts of the imposition of controls on capital inflows has been a central part of the research conducted by Vithessonthi and Tongurai (2008, 2009, 2010, 2013a, 2013b). They found that the imposition of controls on capital inflows can have a significant detrimental effect on the firm's stock valuation and that it similarly impacts all the industries.

Having said that, not a single study has tested if controls on capital outflows also have a detrimental effect on stock prices. A deeper knowledge of this relationship can help authority's to properly design restrictions on funds mobility, and minimize their possible negative impacts on market participants.

Then, a research analyzing the short run implications, on enterprise performance, of the imposition of outflow controls is of the most importance to shed more light into this issue.

This dissertation is organized in sections. Firstly, there are going to be discussed the reasons that stimulate policymakers to implement capital controls, then in the next section it will be conducted an analysis of the effectiveness of these measures. By its turn, section 4 consists of a cost-benefit analysis of the implementation of capital controls; while section 5 states the hypotheses that are tested with the methodology described in chapter 6.

The empirical results are discussed in section 7, afterwards the limitations of the study are examined in section 8; and finally, in the last section conclusions are drawn.

The appendixes provide more detailed information on the controls on capital outflows measures analyzed in this dissertation.

1.1. Academic Relevance

This first section of the study will be focused on the analysis of the reasons why it is important to further develop the research on the impacts of the imposition of controls on capital outflows:

- The growing popularity of capital controls.

Controls on funds movements can be a useful tool for policymakers to cope with the adverse effects of capital mobility. Thus, it is not surprising that the popularity of capital controls rises during economic downturns.

Even though, restrictions on capital movements have been mainly implemented by emerging markets; the last international recession has led developed economies, as Iceland and Cyprus, to employ controls.

In the future, it is likely that there will be more situations where developed countries will implement controls on funds mobility, due to the reversal of capital flows. Similarly, it is likely that controls on outflows will remain popular in EMEs (Emerging Market Economies), since it is expected for these markets to continue to suffer with capital flight. Moreover, these economies have underdeveloped financial systems, which makes them more vulnerable to volatile funds; and likely to impose restrictions.

Then, it is important to fill the research gap on the impacts of controls on capital outflows, to determine if in reality they are a viable policy instrument to manage severe financial crises.

- Recent financial crises have rekindled the discussion on the: benefits of freedom in capital movements and, the use and the impacts of controls on funds mobility.

Several economists and international institutions started to admit the use of controls, when the first best policies are not effective in reducing the country vulnerability to a reversal of funds flows or in specific situations to stem financial instability. This shift in public opinion was mainly due to the following factors:

- The absence of evidence on the advantages of freedom in funds mobility: "...if financial integration has a positive effect on growth, there is as yet no clear and robust empirical proof that the effect is quantitatively significant."-Eswar Prasad, Ken Rogoff, Shang-Jin Wei and Ahyan Kose (2005).

- The much more pronounced effects of recessions on markets that had recently removed restrictions on funds mobility.

Countries that had a closed financial system were not significantly affected by the international shocks, which has raised questions as to whether restrictions on funds movements are capable to minimize the economy exposure to global financial conditions.

- There is no evidence that supports that restrictions on funds mobility can have more negative effects than other capital management instruments.

However, it is important to develop further research on the microeconomic impacts of capital controls, to verify if the shift in the opinion of these institutions is not precipitated.

- The research gap on the microeconomic impacts of the imposition of controls on capital outflows.

There is a reduced amount of studies on the impacts of controls on capital outflows, even though they are used more often than restrictions to funds entry that were the subject of an extensive research.

On the other hand, the research on the micro level impacts of restrictions on funds movements is still scarce. Despite the fact that studies of this type have obtained more success in identifying the impacts of the implementation of restrictions on funds mobility.

Taking everything into account, research is disproportionately focused on the macroeconomic impacts of restrictions on funds entry; thus, there is yet a research gap regarding the effects of controls on capital outflows, at the firm value.

The lack of research contributes to perpetuate misconceptions about restrictions on capital movements and can lead to inefficient policies. For instance, Thailand was forced to remove its restrictions shortly after implementation, due to the massive negative response of investors promoted by prejudice against this policy instrument.

It is particularly important to examine the impacts of capital controls on the stock market; since:

- Monetary authorities have to evaluate the effects of controls on the largest components of capital flows, which are portfolio and foreign direct investments, when they consider their adoption.

What's more, portfolio flows are becoming increasingly important, as since the beginning of the century these capital movements quintupled in EMEs (IMF, 2014).

- Portfolio investment has the highest volatility, in other words, it has the fastest reaction to changing market conditions. Moreover, the vulnerability of portfolio flows to contagion was accentuated by the increasing financial integration. Thus, it is likely to be the form of investment most affected by the imposition of capital controls.

All things considered, there is a need to study the effect of restrictions on funds departure in firms' stock prices, especially after the recent recession that aggravated the vulnerability of portfolio flows to the evolution of international markets interest rates.

2. An overview of capital controls

2.1. The concept

According to Neely (1999) “a capital control is any policy designed to limit or redirect capital account transactions”.

These capital flow management measures, can: serve multiple goals (Neely,1999), assume various forms, possess varying degrees of restrictiveness (Terra and Soihet, 2006) and act upon inflows, outflows or both (Vithessonthi & Tongurai, 2013a).

2.2. Reasons for the imposition of controls on capital outflows

Restrictions on capital outflows are adopted to: control a substantial departure of funds (Vithessonthi & Tongurai, 2013b) and, provide the space for market reforms (Zainal-Abidin, 2000) and monetary policy autonomy (Neely,1999).

Some other major purposes of controls on capital outflows, are summarized in table 1:

Table 1: Goals of the imposition of controls on capital outflows

Control goal	Description	Examples
Correct a balance of payments deficit	<p>A deficit in the balance of payments reflects an outflow of funds from the economy and a depreciated currency, which affects negatively the firms' stock returns (Vithessonthi & Tongurai, 2013b) and leads to a growth in foreign debt (Marjit, Das, & Bardhan, 2007), but can be corrected through the implementation of restrictions on capital departure (Neely,1999).</p> <p>The implementation of these restrictions promotes: a decrease of the exposure of the domestic currency to speculative attacks; which leads to a decline in the demand for international assets and avoids its depreciation (Neely,1999).</p>	<p>The restrictions on funds departure adopted by the USA between 1963-74, were implemented with this purpose (Neely,1999).</p>
Safeguard local financial companies	<p>Another argument that is commonly adopted to support the imposition of restrictions, is related to the incapacity of small domestic financial markets to be competitive against foreign markets (Neely,1999). Then, to develop the domestic market it has to be temporarily sheltered from external shocks, through the imposition of restrictions on funds mobility (Neely,1999).</p>	
Create Revenue	<p>Restrictions on funds departure allow to maintain, at the same time, high price levels (Neely,1999) and low costs of costs of funding; since capital is maintained in the economy (Aizenman & Pasricha, 2013).</p> <p>The restrictions on residents' capacity to acquire external assets leads to a rise in the country's revenues not only by: promoting a growth in the inflation level</p>	

	but also by facilitating the taxation process (Aizenman & Pasricha, 2013).	
Conserve savings domestically and Credit allocation	The funds that exit the economy, can no longer be used by authorities to reward favored sectors or to increase revenue (Neely,1999). Thus, emerging markets often resource to restrictions to control the volume of investments abroad (Neely,1999).	

Source: Author's analysis.

Above all, controls are adopted to manage the harmful impacts of the volatility on capital flows (Terra and Soihet, 2006), not only in terms of the country vulnerability to external shocks but also in terms of: balance of payments imbalances (Terra and Soihet, 2006) and the currency value (Neely,1999).

Now, it is important to assess how effective capital controls have been in the attainment of these goals that motivate their implementation.

3. The effectiveness of controls on capital outflows

Evaluating restrictions on funds mobility is a complex task, since the effectiveness of these policy instruments is dependent on their contribute to meet the several goals that underlie their imposition (Neely,1999), which are usually associated with the:

- Volume of capital flows.

Research on the impact of controls in the volume of capital departure has produced contradictory findings (Sanya et al., 2014), although IMF findings indicate that controls only help stabilize capital flows when the country has a sound economy and institutional quality. It also found that the imposition of these controls on outflows can lead to a reduction on the entry of capital in the country (Sanya et al., 2014).

- Exchange rate volatility.

Evidence from Iceland and Malaysia demonstrates that restrictions on funds departure can stabilize the currency value, by promoting its appreciation (Sanya et al., 2014); however alternative research, presented in table 2, has generated mixed results (Vithessonthi & Tongurai, 2013b).

- Monetary policy autonomy.

Restrictions on funds departure contribute for a greater monetary policy independence (Athukorala, 2008); providing the necessary breathing space for the implementation of reforms on struggling sectors (Sanya et al., 2014).

Research was not able to obtain data to support the effectiveness of controls on outflows (Sanya et al., 2014). It has achieved mixed results, as those presented in table 2, perhaps because the effectiveness of the controls is dependent on several factors:

- The Country Specific factors

The results of research on the impacts of capital controls should not be generalized, as their effects frequently differ according to the market considered. Hence, it is not surprising that the effectiveness of restrictions on capital flows is dependent on country specific factors (Magud & Reinhart, 2006).

It is larger in markets with: good institutional quality; which involves a stable government and strong regulations that reduce the room to escape restrictions and boost investor’s confidence; and solid macroeconomic conditions that reflect the government competence (Sanya et al., 2014).

All things considered, the effectiveness of capital controls is influenced by: the country macroeconomic conditions and the functioning of its institutions (Sanya et al., 2014).

- Design of the market reforms’ process.

Restrictions on funds mobility have to be complemented with: market reforms and supervision mechanisms (Eichengreen, 2000) that promote the financial stability (Terra and Soihet, 2006). In fact, the effectiveness of restrictions on funds mobility is greatly influenced by how the reform process is designed (Athukorala, 2008), since it can impact: the obtainment of financing (Neely,1999) and the allocation of resources (Athukorala, 2008).

- Adjustments of the capital controls to the market conditions.

Market participants rapidly adjust their actions (Gallego & Hernández, 2003) to take advantage of the loopholes (K. Forbes, 2007) in the controls (Gallego & Hernández, 2003).

Thus, monetary authority’s must continuously develop and adjust the regulatory framework to: investor’s behavior (K. Forbes, 2007) and to the changing market conditions (Eichengreen & Rose, 2014).

Table 2: The effectiveness of controls on capital outflows

Country	Index	Reduce the volume of net capital inflows	Alter the composition of flows	Reduce real exchange rate pressures	Make Monetary Policy Independent	Country Average
Malaysia	CCE	0,20	0,00	0,00	0,80	0,25
	WCCE	0,02	0,00	0,00	0,62	0,16
Spain	CCE	0,50	0,00	0,50	0,50	0,38
	WCCE	0,05	0,00	0,20	0,20	0,11
Thailand	CCE	0,50	0,00	0,00	0,00	0,13
	WCCE	0,05	0,00	-0,50	-0,50	-0,24

Source: Magud, Reinhart, Rogoff, & Magud (2007).

Despite the mixed results of research on the effectiveness of capital controls (Edwards, 2005) (N. E. Magud et al., 2007), they are still a popular policy instrument. Thus, it is important to analyze the potential positive effects of capital controls to understand why policymakers continue to impose these restrictions.

4. Cost-Benefit analysis of controls on capital outflows

When evaluating the advantages and disadvantages of restrictions on funds mobility it is important to take into consideration the potential positive and negative effects of alternative measures (Ghosh & Qureshi, 2016).

4.1. The advantages of controls on capital outflows

Restrictions on funds departure promote: on one hand, a reduction in the volume of outflows (Sanya et al., 2014), in the country's debt (Aizenman & Pasricha, 2013) and in the interest rates (Sanya et al., 2014); and on the other hand, a rise in: domestic consumption, investment (Athukorala, 2008), market liquidity (Vithessonthi & Tongurai, 2009), current account and foreign reserves levels (Athukorala, 2008).

They can also contribute for a sustainable economic growth (Marjit et al., 2007); through the improvement of: the macro level policies, regulations and the resources allocation (Swaan, 1999).

Controls on outflows also share benefits with the other type of restrictions on funds mobility (Athukorala, 2008). What's more, they: contribute for a greater monetary policy independence (Sanya et al., 2014), providing the room to undertake the reforms (Athukorala, 2008) on struggling banks and companies (Zainal-Abidin, 2000); and help stabilize capital flows (Athukorala, 2008) and the exchange rate (Sanya et al., 2014). A reduction on the exchange rate movements will turn: stock prices less volatile (Vithessonthi & Tongurai, 2013b) and the predictions for their future market returns more accurate (Desai et al, 2005), which has a positive impact on firms' equity prices and performance (Vithessonthi & Tongurai, 2013b).

Despite these positive impacts of controls on capital outflows, they receive far less support than restrictions on the entry of funds (Neely,1999). Moreover, some author's advocate that restrictions on the entry of capital are more effective in insulating the domestic economy; since if the entry of hot money is restricted, then the risk of a sudden departure of funds will also register a reduction (Magud & Reinhart, 2006).

To correctly evaluate controls on capital outflows it is also necessary to take into account their potential costs.

4.2. The disadvantages of controls on capital outflows

Historical records demonstrate that controls on outflows are more strict and persistent; and tend to be connected with: recessions, dictatorships and attempts to sustain ineffective macro-level policies (Ghosh & Qureshi, 2016).

Restrictions on funds mobility cause a negative growth (Terra & Soihet, 2006), since they:

- Discourage Foreign Investment.

Generally, restrictions on funds mobility hurt the country's image as investment destination (Zainal-Abidin, 2000).

Moreover, restrictions on funds mobility can sustain a fragile financial system (K. Forbes, 2007), which leads to delay in the: development and implementation of market reforms (Terra and Soihet, 2006) and regulations that would have promoted the economic activity and attracted FDI (Swaan, 1999).

The imposition of restrictions also hurts the external country image, as usually there are involved several administrative costs to transfer funds (Zainal-Abidin, 2000) that provide a signal to the market regarding investment-unfriendly policies in the economy (Labán & Larraín, 1997) These costs inflicted by restrictions, deteriorate the returns to investors (Vithessonthi & Tongurai, 2013a) and influence the investment behavior of multinational affiliates (Desai et al, 2005). As a result, there will be a considerable reduction on the volume of FDI of multinational corporations; which will also possess an inferior dimension, in economies with restrictions on funds mobility (K. Forbes, 2007).

Having said that, some researchers argue that restrictions only lead to a reduction on foreign investment when the country has not solid macroeconomic conditions (Sanya et al., 2014); while others assert that the arguments for the harmful impact of restrictions on FDI are not valid (Zainal-Abidin, 2000). Since short term policies do not affect FDI (Athukorala, 2008), which is: a form of long run investment (Zainal-Abidin, 2000) and the less volatile component of capital flows. What's more, EMES FDI stocks have remained constant; despite the innumerable external shocks (IMF, 2014).

- Deteriorate the Market efficiency.

Generally, controls on capital outflows involve limitations to firms' dividend remittances, which enterprises try to avoid by: increasing the regularity of the repatriation of cash and, manipulating accounting profits and the funds country of origin (Desai et al, 2005). That type

of attitude will hurt enterprises performance, since market participants act differently than if their profit repatriation behavior was not constrained when they become mainly focused on methods to evade the limitations imposed (Desai et al, 2005).

Thus, the attempts to evade the restrictions (Gallego & Hernández, 2003), lead to: distortions in investment decisions (K. J. Forbes, 2007a), a misallocation of resources (Aizenman & Pasricha, 2013), economic imbalances (Aizenman & Pasricha, 2013), and to a decrease in the market discipline, development, and efficiency (K. Forbes, 2007).

It is also going to lead to a reduction in the: market confidence (Athukorala, 2008), investor's returns (K. Forbes, 2007) and equity market investments volume (Vithessonthi & Tongurai, 2009).

- Negatively impact the cost of capital.

The imposition of restrictions will raise enterprises' financial constraints (K. Forbes, 2007), and promote a decrease in their investments and expansion prospects (Vithessonthi & Tongurai, 2013a); due to their negative effect on:

- Debt Financing,

The imposition of controls on funds outflows can cause a decrease in capital inflows (Terra and Soihet, 2006).

Then, credit obtainment will become harder (Neely,1999) following the imposition of restrictions on funds mobility; as firms will be more dependent on banks to obtain capital (Athukorala, 2008).

- Equity Financing.

The implementation of restrictions on capital mobility is going to impact the stock's market price; since the expected future returns of financial instruments are affected by a modification in the monetary policy (Vithessonthi & Tongurai, 2009). Nonetheless, the investors' response to the adoption of these policy tools is dependent on the perceived net balance between the costs and positive impacts associated with the restrictions on funds mobility (Vithessonthi & Tongurai, 2013a).

Studies substantiate the market participants disbelief regarding the benefits of restrictions on inflows in enterprises' performance (Vithessonthi & Tongurai, 2013a), as they demonstrate that these controls cause an increase in the risk premium charged by market participants (Vithessonthi & Tongurai, 2009). Research also indicates that restrictions influence stock prices

by turning firms more vulnerable to exchange rate movements (Vithessonthi & Tongurai, 2013b).

The deterioration of the market efficiency will also contribute for a decline in portfolio investment by leading to an equity mispricing, which negatively affects the: company's cost of capital and their volume of investment; and thus the economy's growth (K. Forbes, 2007).

Likewise, restrictions on funds departure can stimulate an increase in the market risk premium (Neely, 1999). Since these restrictions usually: limit investors' ability to diversify portfolios (Vithessonthi & Tongurai, 2009) and the remittances of investment proceeds (Terra and Soihet, 2006) and, lead to a rise in the costs to transfer funds (Desai et al, 2005); which negatively affects the market participants' confidence (Desai et al, 2005) and the investment returns (Vithessonthi & Tongurai, 2010).

Thus, the implementation of capital controls will turn markets participants increasingly risk adverse (Collins, Huefner, Koepke, & Mohammed, 2014) and the market less liquid (Vithessonthi & Tongurai, 2013a); which leads to a growth on the vulnerability of equity prices to external shocks (IMF, 2014). Moreover, research found that controls on capital outflows challenge monetary authorities assumption: that these policy tools contribute for the protection of the economy against external shocks (Sanya et al., 2014).

All things considered, restrictions on funds mobility raise the cost of capital; since they lead to a decline in stock prices and in the foreign capital available (Alfaro, Kanczuk, & Chari, 2014), and make it harder to obtain credit (K. J. Forbes, 2007a). Moreover, research found that the opening of the capital account leads to an investment boom, namely in stock exchanges, in emerging economies (Henry, 2000).

Nonetheless, alternative studies suggest that there is also a direct relation among the opening of the capital account and: economic downturns, capital flows volatility and the departure of funds.

5. Hypotheses development

Restrictions on funds departure can be imposed to control a substantial departure of funds that causes: the currency depreciation and a decline of market participants returns (Vithessonthi & Tongurai, 2010), in other words, capital outflows are directly related to stock prices falls. Thus, if it is believed that controls on outflows are able to manage effectively capital flows, it is likely that investors will react positively to the announcement of the imposition of these policy tools. A stock price rise after the implementation of restrictions on outflows, can also be stimulated by the fact that the advantages of having an open economy are only related with the positive effects of the entry of foreign funds on the country (Block & Forbes, 2004), which is not directly affected by these controls.

Nonetheless these measures are often not welcomed by investors, as the stock market reaction to the controls imposed in Thailand, on 2006, demonstrates (Ghosh & Qureshi, 2016). The event has evidenced the market participants aversion to these policy tools, independently if restrictions act on the entry or departure of funds (Ghosh & Qureshi, 2016).

This market reaction is not surprising as restrictions on funds departure: limit market participants ability to spread risks and employ funds efficiently (K. Forbes, 2007), and thus affect the investment returns (K. Forbes, 2007).

Taking into consideration the findings of similar research on the impacts and effectiveness of capital controls, it is reasonable to expect that the implementation of restrictions on outflows will cause a rise in risk premium demanded by investors.

Thus, this research is going to test the following hypothesis:

Hypothesis 1: The implementation of controls on capital outflows will have a negative effect on stock prices.

Furthermore, research suggests that companies in all industries, not only in the financial sector, are deeply affected by the imposition of restrictions on funds mobility.

Then, the following hypothesis will test if there is no industrial effect on abnormal returns (ARs) around the imposition of controls on capital outflows; as found in previous research.

Hypothesis 1.1: The effect of the imposition of controls on capital outflows, in stock returns, is similar across industries.

5.1. The moderating variables of the impacts of capital controls

Research has demonstrated that the impacts of restrictions on funds mobility differ among companies (Desai et al, 2005). Moreover, it is moderated by their: access to international capital markets (Gallego & Hernández, 2003) and specific features, as dimension and previous performance (Vithessonthi & Tongurai, 2013a).

Hence, it is reasonable to expect that the impact of controls on capital outflows on firm value to differ considerably among:

- Companies in export-oriented sectors and firms´ in the remaining sectors.

Restrictions on funds mobility are likely to trigger larger losses in the market value of exporting companies (Labán & Larraín, 1997), due to the appreciation in the exchange rate following the imposition of controls on outflows (Zainal-Abidin, 2000). Moreover, it leads to a decline in the competitiveness of these firms against foreign companies (Zainal-Abidin, 2000) and increases the investment risk as sales may drop (Vithessonthi & Tongurai, 2009). Investors will require a larger risk premium to invest in exporting companies (Vithessonthi & Tongurai, 2009); hence export-oriented sectors will be the most harmed by the imposition of controls (Vithessonthi & Tongurai, 2013b). As a result, the removal of capital controls leads to a disproportional rise in trade, among industries, as sectors highly depend of foreign funds were the most affected by the restrictions (Manova, 2008).

On the other hand, it is likely that firms that have stronger international links will benefit the most from the imposition of restrictions on funds movements (IMF, 2014). What´s more, research indicates that enterprises with a substantial volume of exports are more sheltered from the negative effects of the imposition of restrictions on capital inflows (Alfaro et al., 2014) and can circumvent the limitations more easily (Desai et al, 2005).

However, these firm´s stock price is more vulnerable to external shocks (IMF, 2014) and research found that controls on capital outflows may increase the economy exposure to external shocks (Sanya et al., 2014).

Even though, research has provided mixed results of the impact of controls on capital inflows in stock returns, among companies and sectors of activity (Vithessonthi & Tongurai, 2013a) (Vithessonthi & Tongurai, 2013b); the following hypothesis will be examined:

Hypothesis 1.2: There is an inverse relationship among the detrimental impact of controls on capital outflows in a firm stock prices and their export volume.

6. Data and Methodology Procedures

The hypotheses will be tested through a methodical approach that will be now described.

6.1. Event studies: Introduction

The studies that address the impacts of restrictions to funds mobility upon firm value, described in table 3, always resource to the event study methodology.

This methodology is the preferential method to examine the impacts of new news in the price of a security (Binder, 1998), usually in the form of equity securities (Campbell et al., 1997), because it allows to measure the effect of an announcement on the market value of a company (Kothari & Warner, 2007).

The basic idea of event studies is that firms' market value rapidly adjusts to news, thus a specific news stimulates investors to review their beliefs, leading to a change in the company's stock prices (Serra, 2002). Since returns adjust to announcements, the effect of an event in the economy can be assessed through the short horizon security returns (Campbell et al., 1997).

Moreover, event studies will measure the: deviations of stock prices from normality, the unexpected investment performance in the period surrounding the announcement (Brown & Warner, 1980). In other words, this methodology analyzes if: the actual return of the stocks diverges significantly from the estimated return, if there is an abnormal return that will be assigned to the event (Kothari & Warner, 2007).

The main goals of this type of research are to:

- Assess the market efficiency (Brown & Warner, 1980), as it delivers the most consistent evidence, especially if daily prices are used, to determine if a market is efficient (FAMA, 1991). In these markets, security prices will rapidly adjust to the impact of an event (Campbell, Lo, & Mackinlay, 1997); as it is reflected in the incorporation of all the information accessible into the company's stock price (FAMA, n.d.).
- Assess the effect on the wealth of stock investors, in an efficient market, of an announcement (Binder, 1998); related to corporate decisions (FAMA, 1991), as mergers (Campbell et al., 1997), or an event that affects all the companies, as a regulatory change (Kothari & Warner, 2007)

The abnormal performance will allow to determine the magnitude of the unexpected variation in returns, stimulated by the announcement (Kothari & Warner, 2007).

Table 3: Research on the impacts of capital controls

Study	Event	Results
Kraay (1998)	Removal of capital controls.	The removal of capital controls does not have a significant impact on: growth, investment or inflation.
Alfaro et al. (2014)	Imposition of controls on capital inflows in Brazil.	It demonstrates that the imposition of restrictions leads to: a considerable drop in stock markets, or in other words, a rise in company's cost of capital; that mainly affects small enterprises and firms that are more dependent on foreign funds. On the other hand, companies with large exports, that have sales of more than 100 million dollars, are more sheltered from the negative impacts of the imposition of restrictions on capital flows. The findings also suggest that the imposition of controls on capital movements has a more negative impact in stock prices than restrictions on debt flows, indicating that investors have a different perception of these policy instruments.
Henry (2000)	Opening of the capital account.	This research indicates that the opening of the capital account leads to an investment boom, namely in stock exchanges, in emerging economies.
Vithessonthi & Tongurai (2010)	Announcement of the imposition of restrictions on funds mobility.	It found that the imposition of restrictions on funds mobility has a negative impact on firm's stock prices. However, the company past performance has a positive effect on its stock prices, in the period surrounding the imposition of the restrictions. The results obtained in this research do not support the hypothesis that the company size and financial leverage have a significant impact on its stock prices, in the period surrounding the implementation of these policy tools.
Vithessonthi & Tongurai (2013, b)	Announcement of the implementation of	This research suggests that the currency becomes more volatile, which impacts negatively the company's equity prices; in the time around the announcement of the imposition of controls on capital inflows. Thus, it

	controls on capital inflows.	contradicts the expectations that the imposition of controls would help stabilize the value of the currency and have a positive effect on company's performance. It also indicates that the impact of controls on capital inflows differs among companies and sectors of activity.
Vithessonthi & Tongurai (2013, a)	Announcement of the imposition of the unremunerated reserve requirement.	The research findings suggest that the imposition of the unremunerated reserve requirement, which is a type of control on capital inflows, will lead to a decrease in stock prices. Moreover, they demonstrate that company-specific features: as size, profitability or financial risk; can affect stock prices in the period surrounding that event. Nonetheless, there is no industrial effect, in other words, all companies are similarly impacted by the implementation of the restrictions.
Vithessonthi & Tongurai (2009)	Announcement of the imposition of capital controls in Thailand, on 2006.	This study indicates that the implementation of restrictions on capital mobility can have a negative impact in the short-term stock returns, therefore the removal of these policy tools will lead to an increase in equity prices. The findings also point out that prior enterprise performance moderates that detrimental effect on stock prices; however, the company size and financial risk do not affect returns in the period surrounding the imposition of controls.
Vithessonthi & Tongurai (2008)	Announcement of the implementation of the URR in Thailand, on 2006.	The research demonstrates that the imposition of restrictions on funds mobility can lead to a decline in stock prices. Furthermore, it suggests that enterprises with a better prior performance will register substantially smaller stock prices, in the period surrounding the implementation of the restrictions, than companies with a worse prior performance. Although, the former will benefit the most from the relaxation of these policy tools.

Source: Author's analysis.

6.2. Data

Research focused on particular micro level impacts of the imposition of restrictions and/or cases of a single country adoption (K. J. Forbes, 2007b), has obtained more robust findings (Vithessonthi & Tongurai, 2009). Since cross country studies assume that restrictions on funds mobility have the same impacts, independently of the economy and timeframe considered (K. J. Forbes, 2007b).

Thus, this research only explores the impacts of the implementation of capital controls in the stock market, by independently analyzing stock returns data of firms listed in the stock exchanges of: Cyprus, Greece, Thailand and Argentina. These markets are interesting objects of study of the imposition of capital controls, due to the following reasons:

- Cyprus has the third smallest economy in the European Union.

It makes it an interesting object of study, because research has demonstrated that small open economies are more affected by the imposition of capital controls as these markets need a permanent flow of foreign capital to keep growing.

- Greece is one of the most recent cases of the imposition of controls on capital outflows.

The study of its controls will not only provide the most up to date of the investors' assessment of restrictions but will also be the first study to analyze the impacts of these tools in the Greek market.

- The Merval experienced a clear increasing trend after the announcement of the imposition of capital controls.

Usually during economic downturns stock prices drop considerably, however at the beginning of Argentina's economic downturn, between 2001 and 2002, its stock exchanged experienced a boom.

Even though, research indicates that it was a result of the use of the equity market to take capital out of the country, to the USA, it will be interesting to analyze the relation between the announcement of the implementation of controls and this evolution of stock prices.

- Thailand has high FDI and Exports levels.

Theory suggests that economies that have strong investments relations with foreign counterparts suffer the most with the imposition of capital controls. This study can test if theory holds, by examining the evolution of stock prices after the imposition of these policy tools.

The extensive research on the impacts, in stock prices, of the imposition of controls on capital inflows in Thailand also turns it into an interesting object of study.

This study will allow to verify if investors in Thailand react differently to the implementation of controls on inflows and outflows, since these different types of restrictions were imposed shortly after each other.

- Cyprus and Greece are unique cases of the imposition of capital controls.

These countries were the first to implement restrictions on funds mobility in a monetary union and in the euro area.

Restrictions on funds mobility are incompatible with one of the main goals of forming a currency union: the free capital flows across countries. Free capital movements are considered one of the fundamental freedoms of the European Union and can only be restricted in exceptional situations: “in case of serious difficulties in economic and monetary policy”, as established in the EU internal market law.

Furthermore, the imposition of restrictions on capital mobility in a member of a currency union poses unique challenges; as there is little space to act.

Although controls usually have a double mission of controlling: the exchange rate and the capital movements, in these cases the restrictions could only be intended to safeguard the financial liquidity.

These controls were also a result of a financial assistance program, which will allow to test if investors react differently to controls that are supported by international entities and that have reforms attached.

- Greece and Thailand have been battling capital flight for a long time.

Even though, in Greece the outflow of funds was mainly from deposits, as in Cyprus and Argentina, in the former the problem was more severe and lasted for several years; while in the latter capital flight was concentrated in a short period of time.

Likewise, Thailand has been a net creditor of funds for a long period of time, in other words, the number of Thai assets held abroad exceeds the foreign capital in this market. It will be interesting to assess if in these situations, where controls are imposed to manage more persistent capital flows problems, investors have a more favorable reaction to the implementation of such policy tools.

- Argentina and Thailand had already imposed restrictions on capital flows in the past.

Investors might react differently to the imposition of restrictions on funds mobility in countries that had imposed these tools in the past, as their behavior might be affected by the impacts that such controls had in the market.

The analysis of these cases will also allow to determine whether investors react more negatively to restrictions that directly affect their capacity to invest abroad.

- The Gap in institutional quality among Cyprus and Argentina.

Cyprus and Argentina are at opposite ends of the spectrum in terms of the quality of their institutions: the former has a good rank, while the latter is one of the countries with more corruption. Thus, the analysis of the implementation of capital controls in these markets will allow to test the theory that the impacts of these tools differ according to the levels of institutional quality of the country, which is reflected in transparency levels.

The analysis of data of economies from different continents, will allow to assess if the effects of the implementation of capital controls differ according to the region considered.

This study will also allow to test if the market reacts differently according to the type of measured implemented, as the controls analyzed are diverse and have varying degrees of restrictiveness. The diversity of the measures studied, is reflected in table 4.

Table 4: Capital controls measures imposed in selected countries

Country	Date of the announcement	Description of the measure
Argentina	1-12-2001	<ul style="list-style-type: none"> - Weekly cash withdrawal limit of 250 dollars, - 1000-dollar limitation on capital outflows. To conduct international payments over that amount firms needed an obligatory permission. - Limits on: the acquisition and international transfers of foreign currency, and on the distribution of dividends.
	25-03-2002	<ul style="list-style-type: none"> - 1000\$ and 10000\$ cap on the acquisition of dollars for citizens and companies, respectively; - Reduced opening hours at exchange houses, whose dollar purchases had to be conducted at the official exchange rate, - Big retailers were required to make daily deposits, - Limitations to convert Argentine stocks on ADRs.
Thailand	31-12-2005	<ul style="list-style-type: none"> - Obligatory approval from BOT of overseas direct investment larger than \$10 million, - Non-residents also needed permission from Bank of Thailand, MOF and SEC to sell or issue in the local market. However, ESO plans investments in foreign stocks, greater than 100000\$ per year, were not subject to obligatory approval procedures, - Financial institutions were required to report all the capital transfers from non-residents.
Cyprus	27-03-2013	<ul style="list-style-type: none"> - 300 euros' daily cap on withdrawals, - Cap of 1000 euros on the amount that residents were allowed to take abroad, - Restriction on bank cards payments of 5000 euros, - 5000 euros' quarterly restriction (per household) on payments related to the education of study abroad children, - 5000 euros' cap on the transfers that firms' could conduct without a special permission, - Firms had to provide documents to support all transfers.

Greece	18-06-2015	<p>- Daily cash withdrawal limit of 60 dollars, however, in an attempt to protect tourism, foreign tourists were exempt from this restriction. Nonetheless, it was created a committee to authorize withdrawals and transfers, for urgent and critical payments, over that amount;</p> <p>- Prohibition of International transfers or payments.</p>
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Source: Author's analysis.

The imposition of controls on outflows in: Cyprus, Greece and Argentina was stimulated by the collapse of their banking systems; thus, it is important to analyze these cases in detail to: understand better the similarities and differences among them, and the results obtained in the study.

To that end, Annex 1 provides a Chronology of the Events Surrounding the implementation of capital controls in these countries.

6.2.1. Data for returns

The estimation of the abnormal returns will be based on daily returns, as the capacity to statistically recognize the impact of announcements is maximized by using a smaller interval of observations (Campbell et al., 1997).

Moreover, research indicates that the use of daily returns allows to accurately measure the time that the security price takes to react to the announcement (FAMA, 1991), while larger sampling intervals have a significantly smaller power (Morse, 1984).

It is possible to use shorter sampling intervals, intraday returns, however the advantages of using this type of data are uncertain and might not compensate the additional complexity in the analysis (Barclay & Litzenberger, 1987).

Data for daily stock prices and index returns of the 4 events was extracted from Datastream, furthermore for each market analyzed the following indexes were used:

- Argentina: Merval, where data was collected from 18 firms;
- Cyprus: Cyprus General, where returns were extracted from 15 enterprises;
- Greece: Athex Composite, where the stock prices of 48 firms were used;
- Thailand: Stock Exchange of Thailand (SET), where data was collected from 304 firms.

Then, the final sample is constituted by 385 firms.

Since only the sample from Thailand has enough data to conduct an industry and sector level analysis of the impacts of controls, the returns were segregated according to the SET official industry group and sector classification structure; which can be consulted in annex 2.

In this analysis, the study has considered as export-oriented sectors those that had contributed the most for Thailand exports in the period between 2004 and 2006; which includes both estimation and event window. Then, the sectors represented on table 5 were considered in the analysis of the impacts of capital controls in export-oriented sectors.

Table 5: Export-oriented sectors in Thailand

	2004	2005	2006
Automotive	37,44%	36,34%	36,13%
Industrial Materials and Machinery			
Electronic Components			
Packaging	10,43%	11,1%	11,69%
Transportation and Logistics	7,24%	8,61%	8,86%
Food and Beverage	6,68%	6,56%	6,34%
Fashion	6,68%	6,11%	5,32%
Total exports	68,47%	68,72%	68,34%

Source: Author's analysis.

This data regarding the sectors export-orientation was collected from the World Integrated Trade Solution (WITS).

6.3. Measurement of abnormal returns

Abnormal returns (ARs) correspond to the difference among the actual stock performance of an enterprise (R_{it}) and its normal or expected returns $E(R_{it})$, for the same date, if the announcement did not occur (Campbell et al., 1997):

$$AR_{it} = R_{it} - E(R_{it}) \quad (1)$$

Thus, to compute the ARs it is necessary to select a model to determine the expected security prices (Kothari & Warner, 2007).

The different models available vary in terms of bias and accuracy of the normal returns (Kothari & Warner, 2007) and can be divided into two types:

- Statistic models, as the market model or the constant expected returns model, which make statistic assumptions regarding the behavior of security prices (Campbell et al., 1997).

The constant-mean-return model considers that an asset average performance is constant, independently of the period of time considered.

On the other hand, in the market model there is an implicit assumption that the revaluation of the company market value is stimulated by the announcement; as it considers a stable linear relationship among the index performance and the asset returns (Campbell et al., 1997).

The advantage of this model over the former is the use of the market performance when estimating normal returns; which eliminates the component of the stock performance relative to the fluctuations of the index returns (Campbell et al., 1997). Thus, it will increase the capacity to identify and analyze the impacts of the announcement (Campbell et al., 1997).

- Economic models, as the Capital Asset Pricing Model (CAPM) and exact versions of the Arbitrage Pricing Theory (APT), that incorporate assumptions about market participants (Campbell et al., 1997).

Even though, in theory the use of these more refined multifactor models would provide a more accurate measurement of the expected stock prices; generally the benefits, in

practical terms, of incorporating more variables into the model are insignificant (Campbell et al., 1997).

It appears that there is no valid justification to employ such models instead of the market model; especially when taking into consideration that they are more complex, difficult to employ and only introduce insignificant gains (Brown & Weinstein, 1985).

As a result, statistic models are far more popular than multifactor models (Kothari & Warner, 2007).

Taking everything into account, this research will estimate the expected stock prices through the market model :

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (2)$$

Where,

R_{it} – measures the enterprise i market performance on date t,

α_i and β_i - represent firm specific features (McWilliams & Siegel, 1997),

R_{mt} - measures the market performance on the date t,

ε_{it} – represents a disturbance term, the component of enterprise i return in day t assignable to info specifically related with the company (Binder, 1998).

Thus, the daily market return has to be determined before computing the expected stock prices:

$$R_{mt} = LN \left(\frac{r_{i_{mt}}}{r_{i_{mt-1}}} \right) \quad (3)$$

Where,

LN – Natural logarithm,

R_{mt} - measures the market performance on the date t,

$r_{i_{mt}}$ – measures the total return at the index level of country i on date t.

By its turn, the daily stock returns were obtained with the resource to this formula:

$$R_{it} = LN \left(\frac{r_{i_{it}}}{r_{i_{it-1}}} \right) \quad (4)$$

Where,

R_{it} – measures the enterprise i market performance on date t ,

$r_{i_{it}}$ – measures the total return at the index level of enterprise i on date t ,

LN – Natural logarithm.

The firm specific features will be estimated through the OLS in a regression of R_{it} on R_{mt} , as it is a reliable method to compute the parameter estimates of the market model (McWilliams & Siegel, 1997) that will be based on the security returns in the estimation period (Campbell et al., 1997).

Afterwards, it is possible to determine and examine the abnormal performance (Campbell et al., 1997), which can also be defined as:

$$AR_{it} = R_{it} - (\hat{\alpha}_i + \hat{\beta}_i R_{mt}) \quad (5)$$

Where,

$\hat{\alpha}_i$ and $\hat{\beta}_i$ - Estimated regressions coefficients of the market model.

It is important to determine if the event does not affect the company's market performance by testing the hypothesis that the ARs have a zero conditional mean and variance (Campbell et al., 1997), which can be computed through the following method:

$$\sigma^2(AR_{it}) = \sigma_{\varepsilon_i}^2 + \left[1 + \frac{1}{L} + \frac{(R_{mt} - \overline{R_m})^2}{L(Var(R_m))} \right] \quad (6)$$

Where,

$\sigma_{\varepsilon_i}^2$ – disturbance variance (MacKinlay, 1997),

L – length of the estimation period (MacKinlay, 1997),

$\overline{R_m}$ – average stock index performance during the estimation period (Brown & Warner, 1985).

The null hypothesis will be rejected if the value of the test is superior to the test level, which usually is 0,05 or 0,01; otherwise, the ARs will have the following distribution (MacKinlay, 1997):

$$AR_{it} \sim N(0, \sigma^2 (AR_{it})) \quad (7)$$

To evaluate the effect of the announcement on firms' value, the ARs have to be aggregated through the event window and among stocks (Campbell et al., 1997). Then, the next step is to compute the average abnormal returns in t (AAR_t):

$$AAR_t = \frac{1}{N} \sum_{i=1}^N AR_{it} \quad (8)$$

Where,

N- represents the amount of enterprises under analysis (Binder, 1998).

When the estimation window has a considerable dimension (MacKinlay, 1997), the VAR can be computed with the following method:

$$Var(AAR_t) = \frac{1}{N^2} \sum_{i=1}^N \sigma_{\varepsilon_t}^2 \quad (9)$$

After estimating the VAR, it is time to aggregate the mean ARs across the event window, with a procedure equivalent to the one employed in the aggregation of the cumulative abnormal returns (CAR) of individual firms (MacKinlay, 1997).

The cumulative abnormal return (CAR) aggregate the abnormal returns of a specific stock across time (Campbell et al., 1997), through the following procedure:

$$CAR_t = \sum_{i=1}^N AR_{it} \quad (10)$$

If the null hypotheses is observed, the distribution of the CAR will be as follows:

$$CAR_i (t_1, t_2) \sim N (0, \sigma_i^2 (t_1, t_2)) \quad (11)$$

When the estimation window has a considerable dimension, the variance of the cumulative abnormal returns can be defined as (MacKinlay, 1997):

$$\sigma^2(t_1, t_2) = (t_2 - t_1 + 1) \sigma_{\varepsilon_i}^2 \quad (12)$$

Then, the cumulative average abnormal returns (CAAR) will be determined through the following method:

$$CAAR (t_1, t_2) = \sum_{t=t_1}^{t_2} AAR_t \quad (13)$$

Their variance can be defined as:

$$Var (CAAR (t_1, t_2)) = \sum_{t=t_1}^{t_2} Var (AAR_t) \quad (14)$$

In this process, it is assumed that the ARS and CARs are independent, in other words, are not correlated among the different stocks (Campbell et al., 1997).

Before making inferences from research data, it is necessary to evaluate the capacity of the procedures employed in the study to identify the existence of abnormal returns (Campbell et al., 1997).

Even though there are several nonparametric testes, as the sign and the rank test, that could be employed to evaluate the power of inferences (Campbell et al., 1997); this research only used parametric tests:

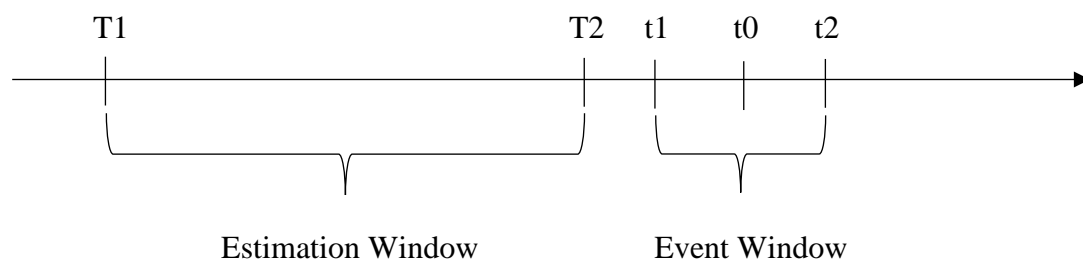
$$\theta_1 = \frac{AAR_t}{(Var(AAR_t))^{1/2}} \sim N (0, 1) \quad (15)$$

$$\theta_2 = \frac{CAAR(t_1, t_2)}{(Var(CAAR(t_1, t_2)))^{1/2}} \sim N (0, 1) \quad (16)$$

6.4. Size of the Event and Estimation Window

As in prior research (Vithessonthi & Tongurai, 2009), the event dates correspond to the day of the government public announcement of the adoption of restrictions on funds outflows (day 0); which, as figure 1 shows, can be represented by $t = 0$.

Figure 1: Timeline for event study



The company's stock prices will be analyzed in the 20 days prior to the announcement to the 20 days that follow it, so that any eventual information leakage is covered by the event window. Tests were also carried with the following windows:

- From day -30 through day 30 relative to the event date,
- From day -10 through day 5 relative to the event date,
- From day -10 through day 10 relative to the event date, as it is visible in table 6 it is the most common length of an event window in the research of capital controls.

Nonetheless, the event window that provided the most significant results was from day -20, relative to the event date, to day 20.

On the other hand, the expected stock prices are determined with daily data from the 250 trading days prior to the event period.

All things considered, this study has a 40-day event window and an estimation period of 250 days

Table 6: Event Study Methodology applied in the study of capital controls

Study	Estimation window	Event window	Variables analyzed	Period of analysis	Model	Sample
Kraay (1998)	Three year's window.		- AR, - Financial openness, - Growth, - Domestic investment', - Inflation.	1985-1997		117 countries.
Alfaro et al. (2014)	From day -280, relative to the event date, to day -30.	2 Days.	- AR, - Real investment, - Firm size, - Export status.	2008 to 2009	Single Factor market model.	Daily data from companies trading in Bovespa, during the period of analysis.
Vithessonthi & Tongurai (2010)	240-day estimation period (since day -250 through day -11).	Period of 16 days (from day -10 through day 5).	- AR, - Firm size, - Financial leverage, -Prior firm performance.	2006–2007		Daily data from a set of 32 technology companies that traded in the SET between 2006 and 2007.

Vithessonthi & Tongurai (2013, b)			- AR, -Exchange Rate Volatility.	2006–2007	Augmented market model.	Daily returns of 270 firms from Thailand Stock Exchange.
Vithessonthi & Tongurai (2013, a)	From day -250, relative to the event date, to day -11.	16-day event window (-10, +5).	- AR, -Firm size and profitability, - Financial risk, - Industrial effect.	2006–2007	Market model.	Daily returns of 289 publicly listed firms in the SET.
Vithessonthi & Tongurai (2009)	Period of 240 days (from day -250 through day -11).	16 days (since day -10 to day +5).	- AR, - Firm size, - Financial leverage, -Prior firm performance.	2006-2007	Market model.	Daily data of 60 industrial firms trading in the SET.

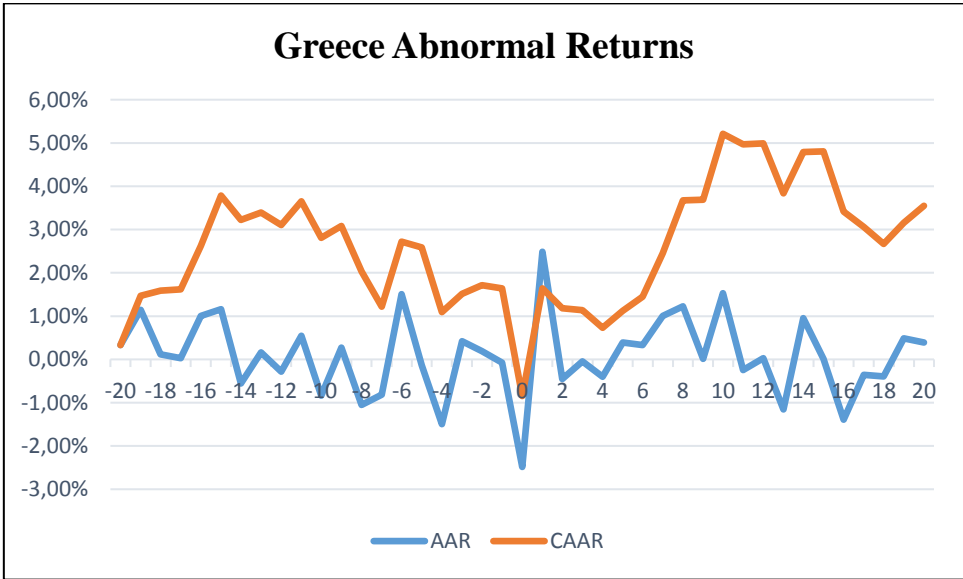
Source: Author’s analysis.

7. Empirical Results

Figures 2 and 3 provide evidence of the decline in firm’s stock prices in the Greek and in the Cypriot stock exchange, respectively, following the announcement of the imposition of capital controls. This negative reaction of investors to the implementation of controls indicates that they consider restrictions to be harmful to firms’, since stock returns mirror the expectations regarding enterprises performance.

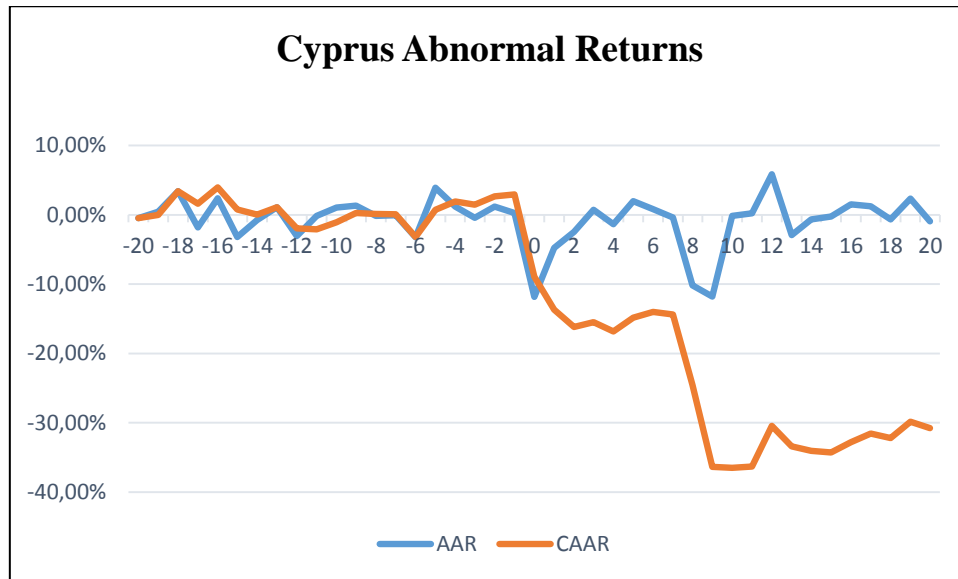
Even though, both countries results obtained pointed in this direction, the magnitude of this effect differed across samples as controls appear to have been more harmful for companies trading in the Cypriot stock exchange.

Figure 2: AARs and CAARs at the announcement of capital controls in Greece



Source: Author’s analysis.

Figure 3: AARs and CAARs at the announcement of capital controls in Cyprus



Source: Author’s analysis.

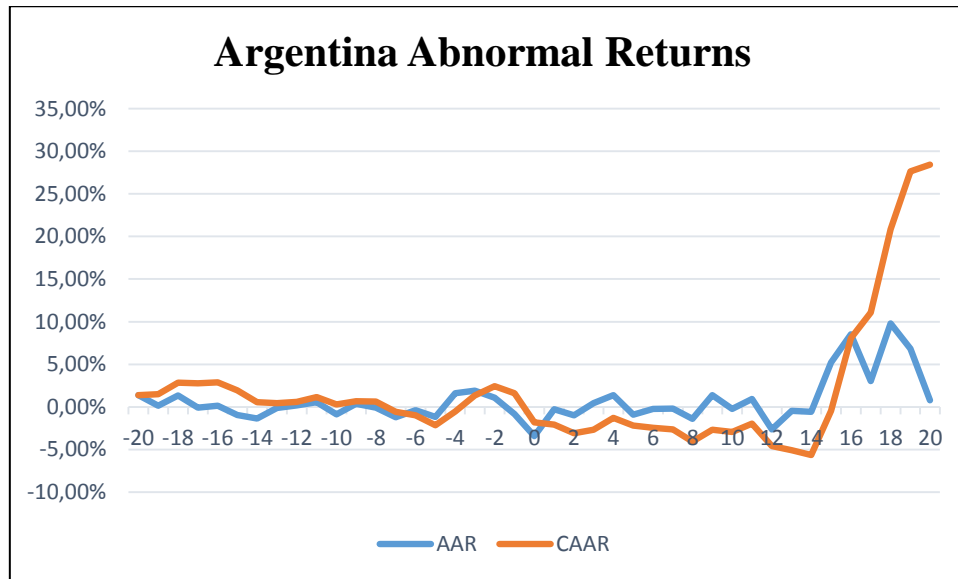
As it is possible to observe in figure 4, there is a negative abnormal return on the event day and on the first two days following the announcement of the imposition of capital controls in Argentina; nonetheless these results are statically insignificant.

The abnormal return obtained in day 12 is negative and statistically significant , which supports the hypotheses that controls on capital outflows have a harmful effect on stock returns.

Having said that, the others statistically significant abnormal returns verified after the imposition of controls in Argentina are positive.

Moreover, previous research suggests that this phenomenon occurred because the corralito allowed to trade, without limitations, with money from frozen bank deposits. If the stocks acquired were also listed in the United States it was possible to: convert them on ADRs, sell them in this country and deposit the earning on banks in the USA.

Figure 4: AARs and CAARs at the imposition of capital controls in Argentina



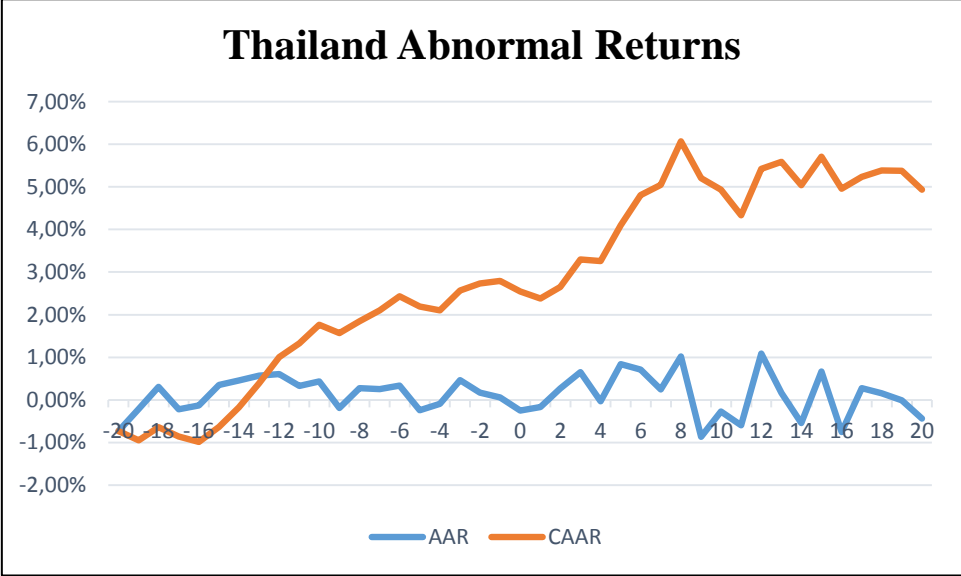
Source: Author’s analysis.

Likewise, in Thailand the abnormal returns on the event date and on the day following it are negative and statically insignificant.

The positive AR, visible in figure 5, verified on the third day following the statement could signal the market belief in the positive effects on firm performance of controls on capital outflows, however it does not have statistical significance.

The remaining days of the event period have also provided mixed results of the impacts of capital controls in Thailand, as there were several positive and negative statistically significant abnormal returns. These results provided contradictory data of the impacts of the imposition of controls on capital outflows.

Figure 5: AARs and CAARs at the imposition of capital controls in Thailand



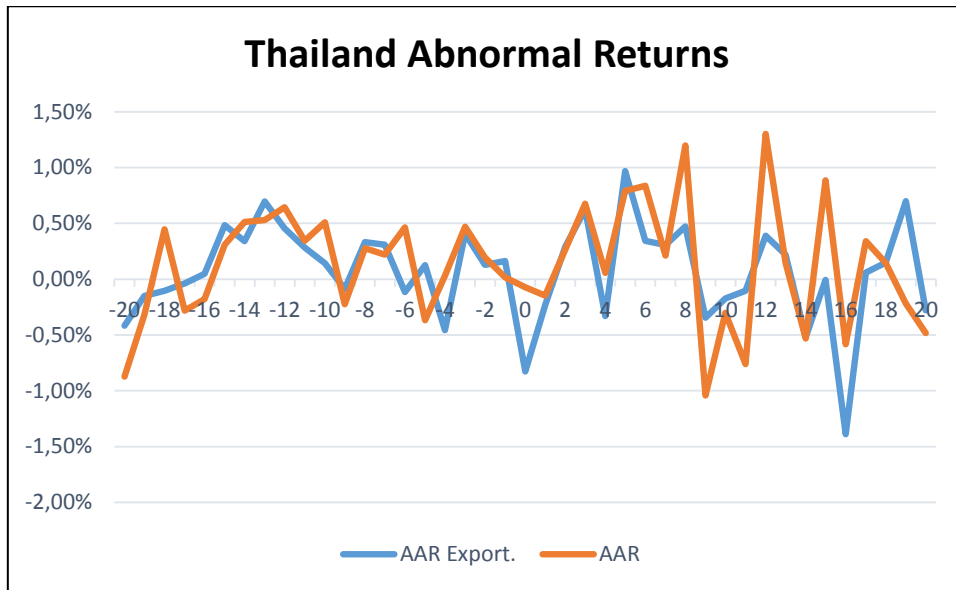
Source: Author’s analysis.

The effects of the imposition of controls on capital outflows in Thailand were also analysed according to firms’ industry and their exports volume. Both these factors, the firm sector export orientation and industry group, appear to impact AR’s in the period around the imposition of controls on capital outflows.

Firstly, the AAR and CAAR values, in figures 6 and 7 respectively, indicate that the imposition of controls on capital outflows has a stronger impact on companies in non-export oriented sectors. However, on the contrary to the expected, the results obtained in the event date indicate that firms operating in export-oriented sectors can be more negatively impacted by the implementation of the controls.

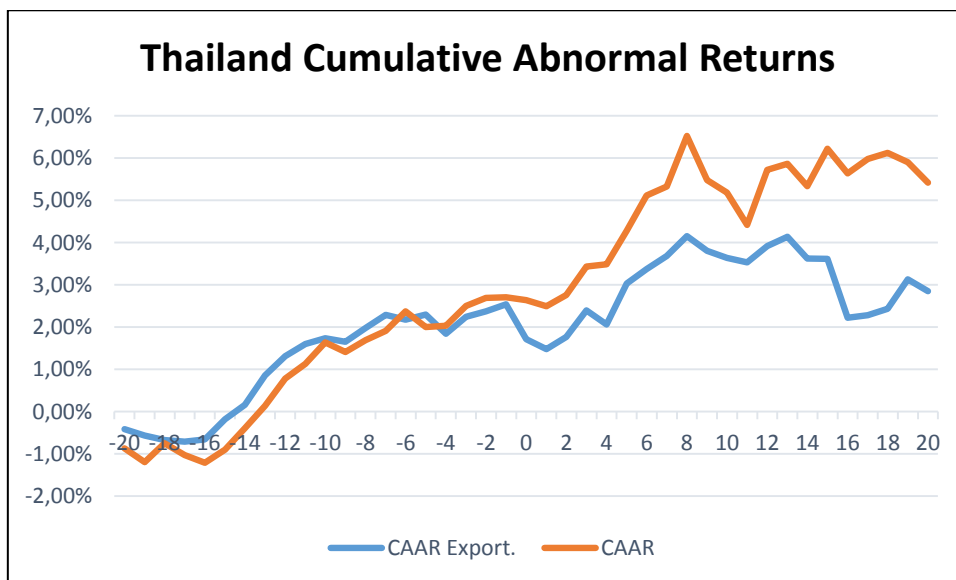
Furthermore, cumulative abnormal returns indicate that companies that operate in sectors with a high exports volume are more prone to have negative stock returns in the period after the implementation of controls on capital outflows.

Figure 6: AARs for firms in export-oriented sectors and in the remaining sectors



Source: Author's analysis.

Figure 7: CAARs for firms in export-oriented sectors and in the remaining sectors



Source: Author's analysis.

It is possible to verify, by the analysis of the CARs values in table 7, that the impact of the imposition of controls in returns was similar for most of the sectors analysed.

However, the magnitude of this effect differed greatly across the several industry groups, in other words, the differences in ARs among the firm’s industries are statistically significant for the event window.

Table 7: CAARs, across industry groups, at the imposition of capital controls in Thailand

Industry	Number of Observations	CAAR	T-Stat
Agro & Food Industry	914	6,34%	2,0800¹
Consumer Products	590	10,90%	2,4982¹
Financials	1714	1,84%	0,7727
Industrials	2312	2,34%	1,1653
Property & Construction	2443	6,04%	2,7010²
Resources	773	-0,60%	-0,1918
Services	2319	6,29%	2,6572²
Technology	949	5,44%	1,6837

¹ Indicates significance at the 5% level. ² indicates significance at the 1% level.

Significance at the 5% and 1% level is printed in "**bold**".

Source: Author’s analysis.

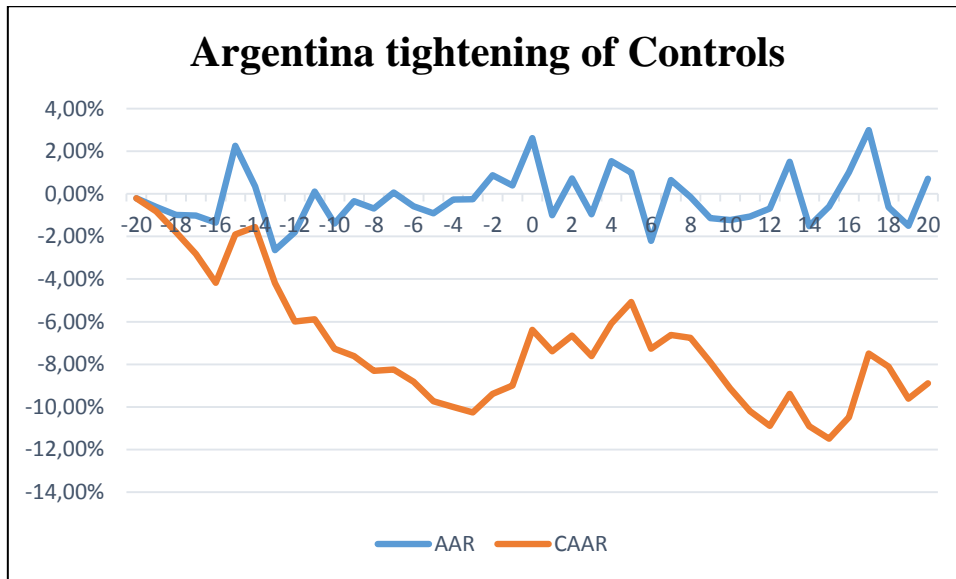
In Argentina, not only the imposition of capital controls was analyzed but also the announcement of a tightening of these policy instruments.

Governments tighten restrictions to remove loopholes in the measures implemented, which allow the capital outflow.

Even though, the AAR and CAAR values, from figure 8, indicate that stock prices have dropped in the days around the event; these results are not significant.

The results also suggest that the market reacts more strongly to the event of “closing” the capital account than to the implementation of additional controls.

Figure 8: AARs and CAARs at the tightening of capital controls in Argentina



Source: Author's analysis.

The values analysed in this section are more detailed in annexes 3,4,5, 6 and 7.

8. Thesis Limitation

This research does not take into account the impact of firm specific news or other economic events, in the period of analysis, on company's market performance.

For instance, in the period surrounding the imposition of capital controls in Greece there were strong fears of default and of the country leaving the Eurozone; while Thailand also implemented restrictions on inflows.

These events could have also contributed for the declining stock markets; thus, the quality of the findings is compromised.

Having said that, it is hard to isolate the impacts of the controls from the remaining issues, as these policy instruments are usually employed by economies experiencing a severe financial crisis. At the firm level, previous research suggests that the magnitude of the effect of the implementation of capital controls outweighs the impact of unforeseen firm-specific news, turned public during the period of analysis, on their stock prices (Vithessonthi & Tongurai, 2013a).

The significance of the findings is also affected by an eventual misspecification of the market model used in the estimation of stock returns, as it might lead to estimation errors. Moreover, this model is based on a value weighted approach that can lead to significantly higher abnormal returns for large companies (Vithessonthi & Tongurai, 2013a).

The CARs can also be biased, due to the procedure used in their estimation (Campbell et al., 1997).

The procedures used in this research assume that the aggregated returns are independent and normally distributed, otherwise results are asymptotic and it can introduce a bias. Nonetheless, this usually is not an issue in this type of research, as the test statistics tend to rapidly become asymptotically distributed.

Other limitation is the potential unsuitability of the event study approach to this research, as it is usually used to analyse the impact of a firm specific information on its performance. However, since previous research already resourced to this methodology to analyse the impact of macroeconomic announcements on equity returns, it is assumed that it has the capacity to test the hypotheses under study (Vithessonthi & Tongurai, 2013a).

8.1. Nonsynchronous trading

Nonsynchronous trading is a common problem in research that uses daily stock returns, as this information is usually obtained from its final price and the index does not close at the same exact hour in each session (Campbell et al., 1997).

However, by saying that the daily price is used there is an incorrect assumption, that exactly 24 hours go by between the last price traded of a stock in each day (Campbell et al., 1997). It will affect the variance and covariance of each stock, causing a bias in the beta of the market model Scholes and Williams (1977).

The beta is also affected by thin trading, thus it could be estimated a beta adjusted to firms absences of trading during the estimation window (Jain, 1986). However, companies that have a high trading frequency will be subject to minimal and residual adjustments. Furthermore, Jain (1986) analyzed these adjusted betas and found that the changes introduced are small, usually the adjustments for lower trading frequency are not relevant.

To solve this problem, companies that presented infrequent trading, during the period analyzed; were removed from the sample. As in similar prior research (Vithessonthi & Tongurai, 2013a) (Vithessonthi & Tongurai, 2013b), it is considered infrequent trading: more than 80 missing daily returns in the estimation window, or missing returns in more than half of the days of the event period that precede the event.

9. Conclusion

This thesis has argued that enterprises are likely to present negative abnormal returns in the period surrounding the monetary authority's statement, regarding the implementation of restrictions on funds departure. Nonetheless, the research findings are mixed.

Moreover, the negative and statistically significant abnormal returns registered in Cyprus and Greece support the hypothesis that was initially formulated, as table 8 demonstrates. These results are consistent with the findings of studies on inflow controls; providing further evidence on the harmful effects of the implementation of restrictions on funds mobility.

By contrast, the stock market performance in Thailand and Argentina, during the period surrounding the implementation of outflow controls, do not provide evidence to support hypothesis 1.

On one hand, the positive ARs experienced by Argentina, after the event, not only lead to the rejection of the hypothesis initially established, as reflected in the table below, but are also inconsistent with previous research. On the other hand, the results from Thailand provide contradictory data on the impacts of the imposition of controls on capital outflows; as several positive ARs were followed by negative and statistically significant abnormal returns. This high volatility in stock prices, during the period following the event, does not allow to draw a conclusion on the impacts of the imposition of restrictions in the SET.

The hypotheses established in this study also suggested that a smaller export volume of firms' sectors of activity would lead to larger negative abnormal returns. That is, the export-orientation of firms' sector of activity should moderate the negative repercussions of controls upon stocks returns, by impacting these positively.

However, the research findings are inconsistent with that hypothesis, as table 8 demonstrates; since the abnormal returns registered indicate that controls can affect more negatively firms operating in export-oriented sectors.

This research also indicates that the implementation of controls not only affects differently the countries analysed but also the stock returns of the firms' within the same country; depending of their industry.

Then, the industry and sector level results lead to the rejection of hypotheses 1.1 and 1.2, respectively, and contradict the results of previous research on the effects of inflow controls in equity prices.

Finally, the analysis of the tightening of the controls in Argentina also indicates that the imposition of additional restrictions does not have a significant impact on the stock market.

Until this moment, there were no studies addressing the microeconomic effects of the imposition of controls on capital outflows. Thus, the outcomes from this research can have significant implications for the discussion relative to the desirability of these capital management tools.

Table 8: Summary of results of the study

Event	Country	Hypothesis 1	Hypothesis 1.1	Hypothesis 1.2
Imposition of capital controls	Thailand	Not conclusive	X	X
	Argentina	X		
	Cyprus	✓		
	Greece	✓		

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Appendixes

Annex 1 - Chronology of the Events surrounding the implementation of capital controls

- Argentina:

January 2001: The Argentinian index (Merval) started to rapidly fall, as a result the stock's value dropped by more than half in the short period of time until the capital controls announcement. Simultaneously, the exchange rate value was incredibly volatile.

November, 2001: On the weekend before the announcement of the implementation of capital controls, it became public that the international monetary fund (IMF) was not going to provide a 1.3 billion dollars' tranche to the country.

December 3, 2001: The Corralito was imposed as a temporary mechanism to control the substantial departure of funds; since in the previous three months' Argentinian banks faced a capital exodus of more than \$15 billion.

December 4, 2001 - Beginning of 2002: The Merval experienced a boom during the severe financial crisis.

From the imposition of the controls until the beginning of 2002 Argentina stock exchange experienced a rise close to 70%.

By that time, Argentina defaulted on its debt and unpegged the U.S. dollar; which meant the conversion of the deposits in dollars to the Argentine peso and led to a devaluation higher than 60% of the deposits held by residents.

March 25, 2002: There was a tightening of the restrictions on capital mobility.

December, 2002: The corralito was abandoned.

- Cyprus:

2011: It began to experience large and persistent capital outflows.

2012- Early 2013: Cyprus obtained 11 billion euros through the Emergency liquidity assistance (ELA) protocols of the European Union (EU), which allowed to maintain its banking system afloat.

March 20, 2013: It was announced that the ELA credit inflow could stop, as a result of the poor use of this source of funding from other European central banks.

The announcement instigated a bank run, as a result of the need of depositors to move their money to safer locations. These outflows reduced substantially the liquidity of Cyprus banking institutions and put at risk the solvency and stability of its financial market, thus the country had no option but to seal an EU-IMF bailout deal.

The agreement heavily penalized accounts with more than 100000 euros, thus people ran once more to banks when this news became public. Then, banks were forced to close for a couple of weeks to stop the outflow of money.

March 27, 2013: Monetary authorities implemented restrictions on capital mobility to protect the liquidity of the market and the country financial stability, which was at risk due to Cyprus outsized banks and the outflow of funds.

Simultaneously, banking institutions reopened for business.

2014: The Cypriot controls were relaxed.

In the meantime, Cyprus conducted deep fiscal and structural reforms, namely to the banking system, which contributed: for its fiscal sustainability and for the improvement of banks' solvency and liquidity.

2015: Cyprus opened-up its capital account.

Nonetheless, its restrictions on funds mobility not only provided space for the implementation of reforms but also accelerated growth, and thus demonstrated that these policy instruments can contribute to preventing economic downturns.

- Greece:

2010-2015: During this period of time, Greece experienced large capital outflows. However, the 65 billion euros that it received from the ELA protocol delayed the collapse of the Greek banking systems.

June 26, 2015: Announcement of a referendum on the bailout offer.

June 28, 2015: Capital controls were introduced, as a last resort solution, to limit capital departure.

Simultaneously, banks were closed, for a period of three weeks, as depositors took more than 1 billion euros from their accounts on the previous day.

July 5, 2015: Referendum day that dictated the rejection of a settlement with international institutions.

July 6, 2015: Reopening of banking intuitions.

August 3, 2015: After a five-week closure, the Athex saw a 35% plunge; caused mainly by the decline in the market value of banking institutions.

September 25, 2015: Announcement of the relaxation of the restrictions on funds mobility.

Even though, both Cyprus and Greece imposed restriction on funds outflows following the collapse of their banking systems; in the first situation, international entities supported the implementation of the controls.

Annex 2 - SET Industry Group and Sector Classification Structure

Industry Group	Sector
Agro & Food Industry	Agribusiness
	Food & Beverage
Consumer Products	Fashion
	Home & Office Products
	Personal Products and Pharmaceuticals
Financials	Banking
	Financing & Securities
	Insurance
Industrials	Automotive
	Industrial Materials and Machinery
	Packaging
	Paper & Printing Materials
	Petrochemicals & Chemicals
	Steel
Property & Construction	Construction Materials
	Construction Services
	Property Development
	Property Fund & REITs
Resources	Energy & Utilities
	Mining
Services	Commerce
	Health Care Services
	Media & Publishing

	Professional Services
	Tourism & Leisure
	Transportation & Logistics
Technology	Electronic Components
	Information & Communication Technology

Annex 3 - AARs and CAARs of the imposition of capital controls in selected countries

Day	Cyprus				Greece			
	AAR	T-test	CAAR	T-test	AAR	T-test	CAAR	T-test
-20	-0,46%	-0,2478	-0,46%	-0,2478	0,33%	0,4211	0,33%	0,4211
-19	0,46%	0,2818	0,00%	-0,0017	1,14%	1,8243	1,47%	1,4711
-18	3,40%	1,5534	3,40%	1,0321	0,11%	0,3027	1,59%	1,4837
-17	-1,81%	-2,6439²	1,59%	0,4714	0,03%	0,0901	1,62%	1,4396
-16	2,37%	0,9663	3,96%	0,9505	1,00%	2,3666¹	2,62%	2,1836¹
-15	-3,21%	-1,0954	0,75%	0,1473	1,16%	2,2763¹	3,78%	2,9005²
-14	-0,73%	-0,8525	0,02%	0,0029	-0,56%	-1,4153	3,23%	2,3672¹
-13	1,09%	1,263	1,11%	0,2118	0,16%	0,4641	3,39%	2,4078¹
-12	-3,04%	-0,9405	-1,93%	-0,3141	-0,28%	-0,6019	3,11%	2,0934¹
-11	-0,16%	-0,2326	-2,10%	-0,3386	0,54%	1,3596	3,65%	2,3747¹
-10	1,04%	1,1555	-1,06%	-0,1696	-0,84%	-1,2814	2,81%	1,6831
-9	1,34%	2,4856¹	0,28%	0,0443	0,27%	0,4692	3,08%	1,7441
-8	-0,16%	-0,2292	0,12%	0,0182	-1,05%	-1,6524	2,03%	1,0809
-7	-0,05%	-0,0611	0,06%	0,0099	-0,81%	-1,283	1,22%	0,6133
-6	-3,26%	-1,468	-3,19%	-0,473	1,51%	2,9353²	2,72%	1,3299
-5	3,90%	1,258	0,70%	0,0946	-0,13%	-0,2578	2,59%	1,225
-4	1,21%	0,9727	1,91%	0,2534	-1,49%	-2,52581	1,10%	0,4993
-3	-0,44%	-0,5219	1,47%	0,1938	0,42%	0,9427	1,52%	0,6776
-2	1,19%	0,6903	2,66%	0,3422	0,19%	0,4369	1,71%	0,7496
-1	0,26%	0,216	2,92%	0,3712	-0,07%	-0,1708	1,64%	0,7053
0	-11,84%	-5,0098²	-8,92%	-1,0858	-2,48%	-1,9997¹	-0,85%	-0,3213
1	-4,79%	-2,0310¹	-13,70%	-1,6038	2,49%	1,4742	1,64%	0,5243
2	-2,48%	-1,4662	-16,18%	-1,8578	-0,46%	-0,3775	1,18%	0,3532
3	0,71%	0,2407	-15,47%	-1,6835	-0,05%	-0,0612	1,13%	0,3288
4	-1,35%	-0,6938	-16,82%	-1,7905	-0,40%	-0,6284	0,73%	0,2085
5	1,98%	1,4126	-14,84%	-1,5624	0,39%	0,7477	1,12%	0,3165
6	0,83%	1,0628	-14,01%	-1,4697	0,33%	0,684	1,45%	0,4054
7	-0,38%	-0,5825	-14,38%	-1,5058	1,00%	2,5277¹	2,45%	0,6807
8	-10,17%	-1,1966	-24,56%	-1,9203	1,22%	2,3243¹	3,68%	1,0098
9	-11,80%	-1,2848	-36,35%	-2,3092¹	0,01%	0,0181	3,69%	1,0012
10	-0,16%	-0,1474	-36,52%	-2,3138¹	1,53%	2,2687¹	5,21%	1,3926
11	0,22%	0,3117	-36,30%	-2,2979¹	-0,25%	-0,4739	4,97%	1,314
12	5,84%	1,1023	-30,46%	-1,8279	0,03%	0,0956	4,99%	1,3175
13	-2,92%	-1,2632	-33,38%	-1,9842¹	-1,16%	-2,1885¹	3,84%	1,003
14	-0,66%	-0,7406	-34,04%	-2,0205¹	0,95%	1,7984	4,79%	1,24
15	-0,24%	-0,2767	-34,28%	-2,0321¹	0,02%	0,018	4,81%	1,2115
16	1,49%	1,2456	-32,78%	-1,9386	-1,39%	-1,1459	3,42%	0,823
17	1,23%	1,2303	-31,55%	-1,8624	-0,35%	-0,8633	3,06%	0,7342
18	-0,64%	-0,6671	-32,19%	-1,8971	-0,39%	-0,7429	2,67%	0,6348
19	2,35%	1,172	-29,84%	-1,7465	0,49%	0,8166	3,16%	0,7437
20	-0,95%	-1,4404	-30,79%	-1,8005	0,39%	0,8034	3,55%	0,8307

¹ Indicates significance at the 5% level. ² indicates significance at the 1% level.

Significance at the 5% and 1% level is printed in "bold".

Day	Argentina				Thailand			
	AAR	T-test	CAAR	T-test	AAR	T-test	CAAR	T-test
-20	1,37%	1,5376	1,37%	1,5376	-0,73%	-4,8615²	-0,73%	-4,8615²
-19	0,13%	0,0968	1,51%	0,9129	-0,22%	-1,4826	-0,95%	-4,5191²
-18	1,33%	1,345	2,83%	1,4736	0,31%	1,928	-0,64%	-2,4245²
-17	-0,07%	-0,1273	2,76%	1,3822	-0,22%	-1,7142	-0,86%	-2,9326²
-16	0,13%	0,1119	2,89%	1,2576	-0,13%	-1,2609	-0,99%	-3,1833²
-15	-0,96%	-1,4805	1,93%	0,8087	0,35%	2,5129²	-0,63%	-1,8578
-14	-1,36%	-1,4253	0,57%	0,2214	0,46%	2,7857²	-0,18%	-0,4683
-13	-0,14%	-0,2479	0,43%	0,1619	0,57%	3,3995²	0,39%	0,9477
-12	0,18%	0,23	0,60%	0,2198	0,61%	2,9247²	1,00%	2,1626²
-11	0,56%	0,6523	1,17%	0,4054	0,33%	1,9042	1,33%	2,6881²
-10	-0,87%	-0,5863	0,30%	0,0928	0,44%	3,083	1,76%	3,4332²
-9	0,38%	0,3711	0,68%	0,2001	-0,19%	-1,3279	1,57%	2,9454²
-8	-0,07%	-0,1245	0,61%	0,1777	0,27%	2,6211²	1,85%	3,3951²
-7	-1,20%	-1,3736	-0,59%	-0,1667	0,25%	2,3539¹	2,10%	3,7875²
-6	-0,39%	-0,4272	-0,99%	-0,2689	0,33%	2,4282¹	2,43%	4,2600²
-5	-1,17%	-1,9385	-2,16%	-0,5809	-0,24%	-1,8947	2,19%	3,7487²
-4	1,61%	2,9740²	-0,55%	-0,1465	-0,09%	-0,7495	2,10%	3,5211²
-3	1,91%	2,4618¹	1,36%	0,3547	0,47%	3,5529²	2,57%	4,2009²
-2	1,08%	1,0431	2,44%	0,6136	0,17%	1,5183	2,74%	4,4045²
-1	-0,84%	-0,6125	1,60%	0,3807	0,06%	0,413	2,80%	4,3828²
0	-3,43%	-1,9199	-1,83%	-0,4017	-0,25%	-1,8248	2,55%	3,9057²
1	-0,26%	-0,2735	-2,10%	-0,4494	-0,17%	-1,0871	2,38%	3,5552²
2	-1,01%	-0,7485	-3,10%	-0,6391	0,27%	1,8073	2,65%	3,8608²
3	0,43%	0,2471	-2,67%	-0,5185	0,65%	4,0084²	3,30%	4,6785²
4	1,39%	0,7796	-1,28%	-0,2352	-0,04%	-0,2043	3,26%	4,4931²
5	-0,93%	-0,9383	-2,21%	-0,3987	0,84%	5,1592²	4,10%	5,5117²
6	-0,25%	-0,5119	-2,46%	-0,4423	0,71%	4,4227²	4,81%	6,3200²
7	-0,20%	-0,1539	-2,66%	-0,4655	0,24%	1,4488	5,05%	6,4837²
8	-1,40%	-1,3233	-4,05%	-0,6983	1,02%	7,0406²	6,07%	7,6597²
9	1,37%	1,4964	-2,68%	-0,4563	-0,86%	-4,6541²	5,20%	6,3958²
10	-0,25%	-0,3382	-2,93%	-0,4944	-0,27%	-1,7683	4,93%	5,9554²
11	0,95%	1,5698	-1,98%	-0,3329	-0,60%	-2,7263²	4,34%	5,0607²
12	-2,62%	-2,1611¹	-4,60%	-0,7582	1,09%	5,9351²	5,42%	6,1887²
13	-0,47%	-0,2657	-5,08%	-0,8022	0,16%	0,8628	5,58%	6,2313²
14	-0,58%	-0,2716	-5,65%	-0,8469	-0,54%	-3,8935²	5,04%	5,5586²
15	5,20%	2,0445¹	-0,45%	-0,0631	0,67%	4,3163²	5,71%	6,2040²
16	8,50%	3,0155²	8,05%	1,048	-0,75%	-4,9445²	4,96%	5,3150²
17	3,03%	1,7293	11,07%	1,406	0,28%	2,2955¹	5,23%	5,5645²
18	9,78%	2,6095²	20,85%	2,3906¹	0,15%	0,9599	5,39%	5,6467²
19	6,81%	2,4978¹	27,66%	3,0269²	-0,01%	-0,0706	5,38%	5,5748²
20	0,78%	0,3018	28,44%	2,9940²	-0,44%	-4,26032	4,94%	5,0918²

¹ Indicates significance at the 5% level. ² indicates significance at the 1% level.

Significance at the 5% and 1% level is printed in "bold".

Annex 4 - AARs and CAARs for firms in export-oriented sectors and in the remaining sectors

Day	Export-Oriented Sectors (Thailand)				Remaining Sectors (Thailand)			
	AAR	T-test	CAAR	T-test	AAR	T-test	CAAR	T-test
-20	-0,42%	-1,7705	-0,42%	-1,7705	-0,87%	-6,4665²	-0,87%	-6,4665²
-19	-0,15%	-0,5937	-0,57%	-1,6429	-0,32%	-2,5280¹	-1,19%	-6,4444²
-18	-0,10%	-0,4222	-0,67%	-1,5838	0,45%	2,9856²	-0,75%	-3,1445²
-17	-0,04%	-0,1547	-0,71%	-1,4515	-0,28%	-2,6687²	-1,03%	-3,9565²
-16	0,05%	0,2257	-0,66%	-1,2478	-0,18%	-2,4895¹	-1,21%	-4,4753²
-15	0,48%	2,0771¹	-0,18%	-0,3056	0,31%	2,4055¹	-0,90%	-3,0135²
-14	0,34%	1,069	0,16%	0,2483	0,51%	3,2976²	-0,39%	-1,1557
-13	0,69%	1,9906¹	0,86%	1,1485	0,53%	4,8268²	0,14%	0,3965
-12	0,45%	1,2942	1,31%	1,5894	0,64%	4,5188²	0,78%	2,0544¹
-11	0,28%	1,4288	1,60%	1,8796	0,34%	2,6275²	1,13%	2,7958²
-10	0,14%	0,7441	1,74%	1,9969¹	0,51%	4,4826²	1,64%	3,9065²
-9	-0,09%	-0,3381	1,65%	1,8207	-0,22%	-1,8933	1,41%	3,2461²
-8	0,33%	1,6926	1,98%	2,1359¹	0,28%	3,3856²	1,69%	3,8153²
-7	0,31%	1,6838	2,29%	2,4209¹	0,22%	2,1980¹	1,91%	4,2037²
-6	-0,12%	-0,5341	2,17%	2,2401¹	0,46%	3,4159²	2,37%	5,0066²
-5	0,12%	0,3963	2,30%	2,2537¹	-0,37%	-5,1726²	2,00%	4,1799²
-4	-0,46%	-1,8361	1,84%	1,754	0,03%	0,2672	2,03%	4,1313²
-3	0,41%	2,3038¹	2,25%	2,1115¹	0,47%	5,4848²	2,50%	5,0082²
-2	0,13%	0,6471	2,37%	2,1939¹	0,19%	2,0484¹	2,69%	5,3014²
-1	0,16%	1,0506	2,54%	2,3209¹	0,01%	0,1101	2,71%	5,1527²
0	-0,83%	-3,2511²	1,71%	1,5236	-0,07%	-0,5974	2,64%	4,8912²
1	-0,23%	-1,2165	1,48%	1,2966	-0,15%	-0,9857	2,49%	4,4549²
2	0,29%	0,8902	1,77%	1,4925	0,27%	2,5443¹	2,76%	4,8457²
3	0,63%	1,7162	2,39%	1,931	0,68%	6,1624²	3,43%	5,9239²
4	-0,33%	-0,9771	2,06%	1,604	0,06%	0,4348	3,49%	5,8732²
5	0,97%	3,3375²	3,03%	2,2998¹	0,79%	7,1142²	4,28%	7,0805²
6	0,34%	1,0317	3,37%	2,4825¹	0,84%	7,8617²	5,11%	8,3348²
7	0,31%	0,878	3,68%	2,6228²	0,21%	2,0431¹	5,32%	8,5581²
8	0,47%	2,5696¹	4,15%	2,9334²	1,20%	8,6157²	6,52%	10,2324²
9	-0,34%	-1,5049	3,81%	2,6554²	-1,04%	-5,8827²	5,48%	8,2835²
10	-0,17%	-0,9483	3,63%	2,5153¹	-0,30%	-2,4655¹	5,18%	7,6970²
11	-0,10%	-0,3668	3,53%	2,3982¹	-0,76%	-3,8239²	4,42%	6,2967²
12	0,39%	1,8739	3,92%	2,6362²	1,30%	7,2960²	5,72%	7,8991²
13	0,22%	1,001	4,14%	2,7541²	0,15%	1,128	5,87%	7,9735²
14	-0,52%	-2,0810¹	3,62%	2,3747¹	-0,53%	-5,3511²	5,33%	7,1855²
15	-0,01%	-0,0216	3,61%	2,3365¹	0,88%	8,7453²	6,22%	8,2995²
16	-1,39%	-5,0702²	2,22%	1,4164	-0,58%	-5,9949²	5,64%	7,4579²
17	0,06%	0,3097	2,28%	1,4437	0,34%	4,0890²	5,97%	7,8596²
18	0,15%	0,516	2,43%	1,5122	0,15%	1,7589	6,12%	8,0042²
19	0,70%	2,0398¹	3,13%	1,904	-0,22%	-2,5281¹	5,90%	7,6662²
20	-0,28%	-1,1276	2,85%	1,714	-0,48%	-7,0095²	5,42%	7,0098²

¹ Indicates significance at the 5% level. ² indicates significance at the 1% level.
Significance at the 5% and 1% level is printed in "bold".

Annex 5 - AARs and CAARs for firms, in export-oriented sectors, trading in the SET

Day	Automotive Sector				Industrial Materials and Machinery Sector			
	AAR	T-test	CAAR	T-test	AAR	T-test	CAAR	T-test
-20	-0,90%	-1,2614	-0,90%	-1,2614	0,49%	6,33456	0,49%	6,3346
-19	-1,03%	-1,2216	-1,93%	-1,7475	-0,51%	-0,9085	-0,01%	-0,0266
-18	-0,87%	-1,8196	-2,79%	-2,3256	-0,60%	-2,1074	-0,61%	-0,9738
-17	0,28%	0,4657	-2,51%	-1,8693	-1,18%	-10,701	-1,79%	-2,8014
-16	0,85%	1,4869	-1,66%	-1,1367	0,39%	0,6377	-1,40%	-1,5859
-15	1,59%	3,1609	-0,07%	-0,0435	-0,39%	-0,5288	-1,79%	-1,5598
-14	0,03%	0,0472	-0,04%	-0,0242	-0,75%	-0,9501	-2,54%	-1,8234
-13	-0,24%	-0,4558	-0,28%	-0,1604	-0,32%	-1,5882	-2,85%	-2,0311
-12	0,11%	0,2177	-0,17%	-0,0947	1,58%	2,87325	-1,28%	-0,8475
-11	-0,12%	-0,2167	-0,29%	-0,1549	1,17%	1,3472	-0,11%	-0,0626
-10	0,96%	4,7135	0,67%	0,3527	0,68%	0,9746	0,57%	0,3056
-9	0,53%	0,7869	1,20%	0,5948	-1,21%	-1,6371	-0,64%	-0,3181
-8	0,26%	0,6866	1,45%	0,7111	0,01%	0,03171	-0,63%	-0,3106
-7	1,43%	2,734	2,89%	1,3679	0,39%	0,85495	-0,24%	-0,1147
-6	0,29%	0,5804	3,18%	1,464	-0,51%	-1,0168	-0,75%	-0,3471
-5	1,13%	1,1991	4,31%	1,8207	0,08%	0,4033	-0,66%	-0,3064
-4	-1,63%	-1,6955	2,68%	1,049	1,03%	1,5672	0,37%	0,1623
-3	0,56%	1,4961	3,23%	1,2534	-0,92%	-1,0469	-0,55%	-0,2287
-2	1,10%	1,7756	4,34%	1,6342	-1,20%	-4,322	-1,76%	-0,7218
-1	-0,21%	-0,4798	4,13%	1,5363	-0,18%	-0,4245	-1,94%	-0,7837
0	-0,62%	-1,4837	3,51%	1,2892	0,05%	0,04598	-1,89%	-0,7011
1	-1,09%	-1,7969	2,41%	0,8664	1,52%	1,81161	-0,36%	-0,1291
2	0,47%	1,0395	2,89%	1,0224	-1,18%	-2,0302	-1,55%	-0,5371
3	0,02%	0,076	2,91%	1,0249	-1,67%	-1,5232	-3,22%	-1,0448
4	0,10%	0,1434	3,01%	1,0299	-0,58%	-0,775	-3,80%	-1,1976
5	2,74%	3,266	5,74%	1,8919	-0,05%	-0,1314	-3,85%	-1,2048
6	-0,06%	-0,1165	5,69%	1,8494	0,79%	2,08654	-3,06%	-0,9522
7	-0,21%	-0,287	5,48%	1,7322	0,63%	1,11697	-2,43%	-0,7462
8	1,33%	2,1411	6,80%	2,1112	-0,42%	-1,1936	-2,86%	-0,8709
9	-1,09%	-2,1826	5,71%	1,7511	0,09%	0,44427	-2,77%	-0,8414
10	0,05%	0,1114	5,76%	1,7503	0,46%	1,22002	-2,31%	-0,6964
11	-0,36%	-0,4122	5,40%	1,5874	0,03%	0,17282	-2,28%	-0,6868
12	0,32%	0,5146	5,72%	1,6542	-0,13%	-0,3953	-2,41%	-0,723
13	0,41%	0,8539	6,13%	1,7554	-0,64%	-1,2152	-3,05%	-0,9047
14	-0,12%	-0,1484	6,01%	1,6731	-0,22%	-0,4866	-3,27%	-0,9614
15	0,70%	2,9114	6,70%	1,8632	0,57%	2,27099	-2,71%	-0,7928
16	-1,42%	-2,811	5,28%	1,4541	-1,06%	-5,6054	-3,76%	-1,1009
17	-0,32%	-0,7423	4,96%	1,3555	-0,28%	-1,3928	-4,04%	-1,1805
18	0,83%	2,4803	5,79%	1,575	0,06%	0,72234	-3,99%	-1,164
19	1,77%	1,2853	7,55%	1,9254	0,62%	2,37722	-3,37%	-0,9802
20	-1,09%	-1,3826	6,46%	1,6143	-0,16%	-0,6347	-3,53%	-1,0246

Day	Electronic Components Sector				Packaging Sector			
	AAR	T-test	CAAR	T-test	AAR	T-test	CAAR	T-test
-20	-0,07%	-0,1752	-0,07%	-0,1752	-1,29%	-1,5953	-1,29%	-1,5953
-19	0,37%	0,676	0,30%	0,43	0,81%	1,43133	-0,48%	-0,4913
-18	0,61%	0,9366	0,90%	0,9552	-0,64%	-1,1758	-1,12%	-0,9985
-17	-0,31%	-1,1232	0,60%	0,6061	0,54%	0,88949	-0,58%	-0,4553
-16	0,08%	0,2305	0,68%	0,6484	-0,62%	-1,1692	-1,20%	-0,8673
-15	0,76%	0,7094	1,44%	0,9605	0,64%	1,90052	-0,56%	-0,3919
-14	0,39%	0,7255	1,83%	1,1501	0,28%	0,28887	-0,28%	-0,1593
-13	2,32%	1,7311	4,15%	1,9942	0,83%	2,41869	0,55%	0,3118
-12	1,97%	0,9813	6,12%	2,1161	0,14%	0,25468	0,69%	0,3748
-11	1,03%	2,829	7,15%	2,4518	0,16%	0,45319	0,86%	0,4535
-10	0,02%	0,0219	7,17%	2,3661	-0,31%	-0,9751	0,54%	0,2825
-9	-0,27%	-0,3614	6,90%	2,2144	-1,06%	-1,5638	-0,52%	-0,2571
-8	0,75%	1,9394	7,65%	2,4376	0,68%	2,03232	0,16%	0,0785
-7	0,01%	0,0202	7,66%	2,4195	0,36%	0,93601	0,52%	0,2503
-6	0,04%	0,061	7,71%	2,3754	-0,22%	-0,6417	0,30%	0,1414
-5	0,31%	0,5438	8,02%	2,4338	-0,57%	-1,7465	-0,27%	-0,1265
-4	-0,28%	-0,9879	7,74%	2,3394	-0,23%	-0,8352	-0,50%	-0,2304
-3	0,07%	0,3387	7,81%	2,3561	0,35%	1,85384	-0,14%	-0,0663
-2	-0,27%	-1,7865	7,54%	2,2722	0,46%	1,0309	0,32%	0,143
-1	0,05%	0,1127	7,59%	2,2663	0,32%	0,59277	0,64%	0,2788
0	-0,87%	-1,1984	6,71%	1,9592	-1,13%	-4,3416	-0,49%	-0,2149
1	-0,38%	-1,0736	6,34%	1,84	-0,30%	-0,5486	-0,79%	-0,3358
2	1,19%	0,6932	7,53%	1,9559	0,12%	0,2223	-0,68%	-0,2788
3	1,65%	1,0931	9,18%	2,22	1,03%	1,5367	0,36%	0,1425
4	-0,82%	-1,6173	8,36%	2,0069	-1,35%	-4,2889	-0,99%	-0,3911
5	-0,22%	-0,2869	8,14%	1,92	1,31%	1,43452	0,32%	0,1175
6	2,80%	2,6256	10,94%	2,5027	0,90%	1,77019	1,21%	0,4424
7	-0,62%	-0,7834	10,32%	2,3229	0,41%	0,80003	1,63%	0,583
8	0,19%	0,3901	10,51%	2,3517	1,01%	2,53339	2,64%	0,9367
9	-1,78%	-1,4347	8,72%	1,8813	-0,40%	-0,8241	2,24%	0,783
10	0,53%	2,7431	9,26%	1,9944	-0,43%	-0,5699	1,81%	0,6118
11	-0,51%	-0,5266	8,74%	1,8431	-0,39%	-0,4921	1,42%	0,4636
12	1,11%	2,2927	9,85%	2,0663	1,31%	2,38776	2,73%	0,8785
13	-0,59%	-1,387	9,26%	1,9344	0,66%	0,80661	3,39%	1,0538
14	-0,26%	-0,6773	9,00%	1,8739	-0,83%	-1,3173	2,56%	0,7803
15	-0,08%	-0,1123	8,92%	1,8364	0,72%	1,3169	3,28%	0,9876
16	-1,94%	-1,8045	6,98%	1,4039	-0,72%	-1,292	2,56%	0,7612
17	-0,78%	-1,3116	6,20%	1,2378	0,54%	1,38719	3,10%	0,9155
18	-1,51%	-0,8149	4,69%	0,8789	-0,31%	-0,8142	2,80%	0,8204
19	1,38%	1,0732	6,07%	1,1059	0,06%	0,13981	2,86%	0,8313
20	0,20%	0,386	6,28%	1,1375	-0,82%	-1,1726	2,03%	0,5801

Day	Transportation and Logistics Sector				Food and Beverage Sector			
	AAR	T-test	CAAR	T-test	AAR	T-test	CAAR	T-test
-20	0,68%	1,7167	0,68%	1,7167	-0,41%	-1,1891	-0,41%	-1,1891
-19	-1,36%	-2,1289	-0,68%	-0,9045	0,07%	0,36307	-0,34%	-0,8461
-18	-0,28%	-0,4868	-0,96%	-1,0143	0,07%	0,12079	-0,26%	-0,3682
-17	1,62%	2,5524	0,66%	0,579	-1,20%	-2,5653	-1,46%	-1,7096
-16	-0,83%	-1,4174	-0,17%	-0,1327	0,28%	0,71842	-1,18%	-1,2532
-15	0,82%	1,5793	0,65%	0,4693	-0,38%	-1,0572	-1,56%	-1,5459
-14	-1,37%	-3,194	-0,72%	-0,4963	1,61%	1,92414	0,06%	0,042
-13	-0,08%	-0,2311	-0,80%	-0,5374	1,31%	1,2936	1,37%	0,8248
-12	-0,03%	-0,0545	-0,83%	-0,5205	0,60%	1,20343	1,97%	1,1372
-11	0,34%	0,5801	-0,49%	-0,2863	-0,14%	-0,5948	1,82%	1,0444
-10	-0,17%	-0,6087	-0,66%	-0,3804	0,31%	0,69615	2,14%	1,1848
-9	-0,97%	-1,3894	-1,63%	-0,8723	0,60%	1,29727	2,73%	1,4689
-8	-0,15%	-0,4529	-1,77%	-0,9366	-0,03%	-0,0484	2,71%	1,3916
-7	0,12%	0,207	-1,65%	-0,8354	0,02%	0,06477	2,73%	1,3833
-6	-0,20%	-0,3818	-1,86%	-0,9062	-0,79%	-1,7403	1,94%	0,959
-5	-1,29%	-2,7808	-3,15%	-1,4971	-0,14%	-0,3343	1,80%	0,8723
-4	0,00%	-0,0089	-3,15%	-1,4844	-0,57%	-1,4603	1,23%	0,5851
-3	0,77%	1,341	-2,38%	-1,083	0,55%	1,10985	1,78%	0,8229
-2	-0,37%	-0,6677	-2,76%	-1,2139	-0,02%	-0,0549	1,76%	0,8026
-1	-0,28%	-0,8387	-3,03%	-1,3228	0,60%	2,63613	2,35%	1,0697
0	-1,24%	-2,0562	-4,27%	-1,8023	-0,71%	-0,9625	1,64%	0,7068
1	0,50%	0,9813	-3,78%	-1,5563	-0,42%	-1,6719	1,22%	0,5218
2	-1,07%	-1,8306	-4,84%	-1,9403	0,89%	1,32569	2,11%	0,869
3	-1,01%	-1,2475	-5,85%	-2,2305	1,16%	1,3554	3,27%	1,2695
4	-0,23%	-0,6663	-6,08%	-2,2988	0,11%	0,10866	3,39%	1,2173
5	0,15%	0,6979	-5,93%	-2,2332	0,70%	1,42532	4,08%	1,4457
6	0,16%	0,1498	-5,77%	-2,0147	-0,82%	-0,9542	3,27%	1,1071
7	0,17%	0,404	-5,60%	-1,9336	1,45%	1,36636	4,72%	1,504
8	0,15%	0,4107	-5,44%	-1,8656	-0,02%	-0,0645	4,70%	1,4929
9	-0,56%	-1,6958	-6,00%	-2,0449	0,77%	2,07868	5,47%	1,7264
10	-0,08%	-0,2469	-6,09%	-2,0596	-0,44%	-1,7457	5,03%	1,5816
11	-0,36%	-0,7245	-6,45%	-2,152	0,34%	0,71818	5,37%	1,6704
12	-0,34%	-0,7073	-6,79%	-2,2375	0,04%	0,1072	5,40%	1,6726
13	0,31%	0,5219	-6,49%	-2,0968	0,46%	1,19779	5,86%	1,8025
14	-1,64%	-2,6049	-8,12%	-2,5734	-0,17%	-0,4437	5,69%	1,7361
15	-1,69%	-1,2291	-9,82%	-2,8502	-0,08%	-0,226	5,61%	1,7017
16	-3,43%	-3,6295	-13,25%	-3,7094	-0,88%	-3,0675	4,73%	1,4282
17	1,29%	1,986	-11,96%	-3,2947	0,00%	0,00948	4,73%	1,421
18	1,11%	2,0247	-10,85%	-2,9558	0,34%	1,15286	5,07%	1,5173
19	0,61%	1,3829	-10,24%	-2,7686	0,16%	0,66775	5,23%	1,562
20	-0,30%	-0,5577	-10,54%	-2,8201	0,18%	0,4278	5,41%	1,6027

Day	Fashion Sector			
	AAR	T-test	CAAR	T-test
-20	-0,49%	-1,6312	-0,49%	-1,6312
-19	0,16%	0,8987	-0,33%	-0,9611
-18	0,16%	0,3307	-0,17%	-0,2887
-17	-1,17%	-2,8308	-1,35%	-1,8567
-16	-0,02%	-0,0683	-1,37%	-1,6947
-15	0,89%	0,8477	-0,48%	-0,3658
-14	1,54%	2,1988	1,05%	0,7047
-13	0,94%	1,1305	2,00%	1,1665
-12	0,39%	0,8856	2,39%	1,3488
-11	0,04%	0,1701	2,42%	1,3595
-10	0,05%	0,1304	2,48%	1,3554
-9	0,40%	1,0076	2,87%	1,5369
-8	0,31%	0,5486	3,18%	1,6296
-7	-0,14%	-0,481	3,03%	1,5378
-6	-0,53%	-1,4129	2,51%	1,2495
-5	-0,22%	-0,7071	2,28%	1,1245
-4	-0,25%	-0,678	2,03%	0,9842
-3	0,35%	0,8228	2,38%	1,1302
-2	0,03%	0,085	2,41%	1,1298
-1	0,93%	3,3388	3,35%	1,5543
0	-0,26%	-0,4269	3,08%	1,379
1	-0,69%	-2,3617	2,39%	1,0595
2	0,62%	1,1014	3,01%	1,2932
3	0,91%	1,3133	3,92%	1,6145
4	0,06%	0,0692	3,97%	1,5482
5	0,69%	1,6988	4,66%	1,7945
6	-0,62%	-0,9445	4,05%	1,5095
7	1,33%	1,5707	5,37%	1,9118
8	0,06%	0,2523	5,44%	1,9267
9	0,60%	1,7098	6,03%	2,1222
10	-0,28%	-1,1786	5,76%	2,0185
11	0,05%	0,1147	5,81%	2,0123
12	0,21%	0,7243	6,02%	2,0751
13	0,83%	1,616	6,85%	2,3253
14	-0,23%	-0,6969	6,62%	2,2312
15	-0,12%	-0,4236	6,50%	2,1808
16	-0,90%	-3,2047	5,60%	1,8712
17	-0,01%	-0,0184	5,59%	1,8606
18	0,33%	1,2719	5,92%	1,9621
19	0,25%	1,151	6,17%	2,039
20	0,17%	0,456	6,34%	2,08

Annex 6 - AARs and CAARs for firms trading in the SET, according with their industry group

Day	Financial Industry				Industrial Industry			
	AAR	T-test	CAAR	T-test	AAR	T-test	CAAR	T-test
-20	-0,10%	-0,2027	-0,10%	-0,2027	-0,83%	-2,4996	-0,83%	-2,4996
-19	-0,43%	-0,7953	-0,53%	-0,7146	-0,06%	-0,2128	-0,89%	-2,024
-18	0,74%	1,5901	0,21%	0,2336	-0,35%	-1,37	-1,23%	-2,4377
-17	-0,27%	-0,7047	-0,06%	-0,0653	-0,24%	-0,8252	-1,48%	-2,5215
-16	-0,25%	-1,0616	-0,31%	-0,3143	0,17%	0,76259	-1,31%	-2,0857
-15	0,65%	2,1428	0,34%	0,3242	0,20%	0,57713	-1,11%	-1,5463
-14	0,78%	2,2132	1,12%	1,0251	0,04%	0,12411	-1,07%	-1,3842
-13	0,22%	0,8598	1,34%	1,1919	0,14%	0,54696	-0,93%	-1,1463
-12	0,12%	0,2422	1,46%	1,1888	1,14%	2,40841	0,21%	0,2191
-11	-0,09%	-0,339	1,36%	1,0843	-0,03%	-0,1221	0,18%	0,1836
-10	0,10%	0,3271	1,46%	1,1303	0,37%	1,74365	0,55%	0,5535
-9	0,26%	0,7953	1,72%	1,2928	-0,42%	-1,0106	0,13%	0,1172
-8	0,33%	1,2909	2,05%	1,511	0,29%	1,31833	0,41%	0,3772
-7	-0,08%	-0,3617	1,97%	1,4384	0,77%	3,86896	1,19%	1,0619
-6	0,53%	1,826	2,50%	1,7837	-0,02%	-0,0932	1,17%	1,0227
-5	-0,02%	-0,1068	2,48%	1,7511	0,13%	0,42792	1,30%	1,0997
-4	0,26%	1,2021	2,73%	1,9111	-0,38%	-1,2991	0,92%	0,7521
-3	0,02%	0,0923	2,76%	1,8967	0,43%	2,153	1,35%	1,0891
-2	0,24%	0,8577	3,00%	2,0257	0,28%	1,24569	1,63%	1,2944
-1	-0,60%	-1,9719	2,40%	1,585	-0,09%	-0,3882	1,54%	1,2039
0	0,50%	1,3214	2,89%	1,8567	-0,68%	-2,4258	0,86%	0,6587
1	0,85%	2,2545	3,74%	2,3332	-0,74%	-2,2543	0,12%	0,0879
2	0,82%	1,735	4,56%	2,7278	0,14%	0,52912	0,26%	0,191
3	0,84%	2,23	5,40%	3,1534	-0,05%	-0,2463	0,21%	0,1514
4	-0,28%	-0,6934	5,13%	2,9156	-0,18%	-0,4089	0,03%	0,0194
5	-0,21%	-0,662	4,92%	2,7515	1,47%	4,23373	1,50%	0,9979
6	0,38%	1,3877	5,29%	2,9288	0,52%	1,82934	2,02%	1,3232
7	-0,56%	-1,7159	4,73%	2,5743	0,28%	0,89517	2,30%	1,4754
8	1,01%	3,3932	5,74%	3,0835	1,23%	3,46986	3,53%	2,2088
9	-1,54%	-3,9558	4,20%	2,2113	-0,78%	-3,1644	2,75%	1,7024
10	-1,36%	-2,8469	2,84%	1,4488	-0,09%	-0,3022	2,67%	1,6211
11	-0,83%	-0,9656	2,01%	0,9389	-0,48%	-1,3226	2,19%	1,2998
12	1,87%	3,7938	3,88%	1,7666	0,59%	1,92351	2,77%	1,6217
13	-0,89%	-2,5367	2,99%	1,3432	0,46%	0,83628	3,23%	1,7991
14	-1,32%	-4,7014	1,67%	0,7458	-0,57%	-2,1471	2,66%	1,4647
15	1,28%	3,3725	2,95%	1,2968	0,68%	2,5808	3,34%	1,8214
16	-0,34%	-0,9232	2,61%	1,1318	-1,57%	-4,7872	1,77%	0,9522
17	-0,09%	-0,2774	2,51%	1,079	-0,11%	-0,5795	1,66%	0,8868
18	-0,22%	-0,7271	2,29%	0,9768	0,84%	1,7239	2,50%	1,2908
19	-0,40%	-1,1163	1,89%	0,796	0,84%	2,07491	3,34%	1,6872
20	-0,05%	-0,2409	1,84%	0,7727	-1,00%	-3,046	2,34%	1,1653

Day	Property & Construction Industry				Service Industry			
	AAR	T-test	CAAR	T-test	AAR	T-test	CAAR	T-test
-20	-1,38%	-4,2349	-1,38%	-4,2349	-0,40%	-1,3357	-0,40%	-1,3357
-19	-0,56%	-1,7919	-1,94%	-4,2961	-0,46%	-1,452	-0,85%	-1,9728
-18	0,53%	1,5916	-1,40%	-2,4954	0,67%	1,33561	-0,18%	-0,2721
-17	-0,15%	-0,4163	-1,55%	-2,3369	0,01%	0,05013	-0,17%	-0,2309
-16	-0,39%	-1,3883	-1,94%	-2,6924	-0,32%	-1,4256	-0,49%	-0,649
-15	0,01%	0,0479	-1,93%	-2,5704	0,36%	1,85563	-0,13%	-0,1622
-14	0,75%	2,7673	-1,17%	-1,4703	0,31%	0,56042	0,19%	0,1943
-13	0,49%	1,8665	-0,69%	-0,8175	1,12%	1,9546	1,31%	1,1688
-12	0,61%	2,4161	-0,08%	-0,0907	0,56%	0,99373	1,87%	1,4901
-11	0,19%	0,8452	0,11%	0,1237	0,67%	1,23207	2,54%	1,8579
-10	0,90%	2,3917	1,01%	1,0312	0,54%	1,81399	3,08%	2,1994
-9	-0,06%	-0,208	0,95%	0,9377	-0,56%	-1,8572	2,51%	1,7555
-8	0,23%	0,9251	1,18%	1,1298	0,29%	1,3262	2,81%	1,9379
-7	0,51%	1,8222	1,70%	1,5658	0,17%	0,55574	2,97%	2,0106
-6	0,86%	1,7959	2,56%	2,1576	0,22%	0,9088	3,19%	2,1293
-5	-1,03%	-3,1745	1,53%	1,2423	-0,30%	-1,2663	2,89%	1,9021
-4	-0,27%	-0,7274	1,25%	0,9759	0,14%	0,64835	3,03%	1,9753
-3	0,70%	3,432	1,96%	1,505	0,34%	1,64154	3,37%	2,1788
-2	0,33%	1,518	2,29%	1,7378	-0,02%	-0,057	3,35%	2,1215
-1	0,64%	1,19	2,93%	2,0577	0,05%	0,18602	3,41%	2,1213
0	-0,55%	-1,7168	2,38%	1,633	-0,29%	-0,974	3,12%	1,9084
1	0,16%	0,3125	2,54%	1,6463	-0,30%	-1,0897	2,82%	1,7017
2	0,28%	0,8176	2,81%	1,7829	0,10%	0,3031	2,91%	1,7283
3	1,19%	3,194	4,00%	2,468	0,15%	0,5096	3,07%	1,7905
4	-0,04%	-0,1432	3,96%	2,3973	0,52%	1,38978	3,59%	2,0458
5	1,40%	3,0868	5,35%	3,1284	0,28%	0,88795	3,86%	2,17
6	0,77%	2,2101	6,13%	3,5074	1,11%	2,67634	4,97%	2,721
7	0,04%	0,1099	6,16%	3,4633	0,54%	1,17375	5,51%	2,9243
8	0,97%	3,5489	7,13%	3,9601	1,18%	2,6212	6,69%	3,4532
9	-1,09%	-2,5148	6,03%	3,2581	-1,13%	-2,0385	5,55%	2,7557
10	-0,06%	-0,1402	5,98%	3,1501	-0,09%	-0,2515	5,46%	2,6663
11	-0,76%	-1,3898	5,21%	2,6395	-0,74%	-1,6183	4,72%	2,2481
12	1,08%	2,9002	6,29%	3,1309	1,36%	2,44331	6,08%	2,7985
13	0,74%	1,4885	7,04%	3,3977	0,03%	0,08879	6,11%	2,7723
14	-0,77%	-2,6166	6,27%	2,9968	-0,41%	-1,1775	5,70%	2,5564
15	0,77%	1,9193	7,04%	3,3047	0,65%	1,62645	6,36%	2,8036
16	-0,26%	-0,7292	6,78%	3,1359	-0,66%	-1,5106	5,69%	2,4664
17	0,88%	2,9741	7,65%	3,5091	0,12%	0,39439	5,82%	2,4971
18	-0,07%	-0,1953	7,59%	3,4385	0,43%	1,65698	6,25%	2,6663
19	-0,84%	-2,8333	6,75%	3,0316	0,30%	1,22088	6,56%	2,7804
20	-0,70%	-3,0964	6,04%	2,701	-0,26%	-1,2047	6,29%	2,6572

Day	Resource Industry				Technology Industry			
	AAR	T-test	CAAR	T-test	AAR	T-test	CAAR	T-test
-20	-2,00%	-2,3717	-2,00%	-2,3717	-0,49%	-1,2655	-0,49%	-1,2655
-19	-0,79%	-0,826	-2,79%	-2,1903	0,16%	0,44009	-0,33%	-0,6268
-18	0,01%	0,0119	-2,79%	-1,9745	0,14%	0,362	-0,19%	-0,2868
-17	-0,32%	-0,7785	-3,10%	-2,1132	0,13%	0,57543	-0,06%	-0,0833
-16	0,06%	0,217	-3,04%	-2,0307	0,06%	0,30985	0,00%	0,006
-15	0,51%	1,726	-2,54%	-1,6619	0,65%	1,30766	0,65%	0,7472
-14	0,07%	0,1651	-2,47%	-1,5548	-0,30%	-0,8712	0,35%	0,3777
-13	-0,65%	-1,6601	-3,11%	-1,9054	1,53%	2,94236	1,88%	1,7525
-12	0,81%	1,3119	-2,30%	-1,3179	-0,75%	-0,7736	1,13%	0,783
-11	0,25%	0,9906	-2,05%	-1,1624	1,52%	1,22768	2,65%	1,3931
-10	-0,51%	-1,4369	-2,56%	-1,4235	1,66%	2,03144	4,31%	2,0807
-9	0,12%	0,2954	-2,44%	-1,3213	-0,76%	-1,4283	3,55%	1,6615
-8	0,13%	0,5252	-2,31%	-1,2372	0,19%	0,46308	3,74%	1,7195
-7	-0,62%	-2,0816	-2,92%	-1,5484	0,44%	1,50228	4,18%	1,9041
-6	-0,07%	-0,2425	-2,99%	-1,5672	0,82%	2,8409	5,00%	2,2587
-5	0,08%	0,2772	-2,91%	-1,5068	-0,50%	-0,9382	4,51%	1,9796
-4	0,19%	0,4513	-2,72%	-1,3769	-0,07%	-0,2518	4,44%	1,9312
-3	-0,06%	-0,3095	-2,77%	-1,3992	0,50%	2,49006	4,94%	2,1427
-2	1,05%	1,6887	-1,72%	-0,8276	-0,48%	-2,7117	4,46%	1,9287
-1	-0,79%	-2,0512	-2,51%	-1,1855	0,03%	0,10924	4,49%	1,9289
0	0,61%	1,2414	-1,89%	-0,8728	-0,59%	-1,3482	3,89%	1,6449
1	-0,13%	-0,2519	-2,03%	-0,9076	-0,42%	-1,2036	3,47%	1,4516
2	0,04%	0,1048	-1,99%	-0,8768	-0,37%	-1,0975	3,10%	1,2824
3	0,72%	1,1633	-1,27%	-0,5394	0,18%	0,50656	3,28%	1,3434
4	-0,70%	-1,4278	-1,97%	-0,8202	-1,01%	-2,3177	2,28%	0,9178
5	1,21%	1,511	-0,76%	-0,3006	0,82%	2,11632	3,10%	1,2332
6	1,07%	2,317	0,32%	0,1226	1,20%	2,6119	4,30%	1,6827
7	0,08%	0,1696	0,40%	0,1516	0,66%	0,87992	4,96%	1,8621
8	0,70%	2,0556	1,10%	0,4159	1,08%	2,21632	6,04%	2,2319
9	-0,66%	-1,8468	0,44%	0,1652	-1,19%	-1,6804	4,85%	1,7352
10	-0,30%	-0,8306	0,14%	0,0505	0,64%	1,43395	5,49%	1,9382
11	-0,84%	-1,1868	-0,71%	-0,2542	-0,39%	-0,6664	5,10%	1,7613
12	0,49%	0,6837	-0,21%	-0,074	0,99%	2,34934	6,09%	2,0818
13	-0,92%	-2,2231	-1,14%	-0,3917	0,52%	0,77465	6,61%	2,2025
14	0,00%	-0,0079	-1,14%	-0,3897	0,88%	1,14845	7,49%	2,4183
15	1,23%	2,0679	0,09%	0,0294	-0,04%	-0,0828	7,45%	2,3722
16	-0,33%	-0,9983	-0,25%	-0,082	-1,17%	-5,0704	6,28%	1,9944
17	0,40%	1,0778	0,16%	0,0523	0,82%	1,77384	7,10%	2,2319
18	0,04%	0,0593	0,20%	0,0645	-0,32%	-0,845	6,78%	2,1155
19	-0,21%	-0,4734	0,00%	-0,0016	-0,78%	-2,1604	6,00%	1,8599
20	-0,60%	-2,0757	-0,60%	-0,1918	-0,56%	-3,0895	5,44%	1,6837

Day	Agro-food Industry				Consumer Products Industry			
	AAR	T-test	CAAR	T-test	AAR	T-test	CAAR	T-test
-20	-0,49%	-1,6312	-0,49%	-1,6312	-0,49%	-0,9535	-0,49%	-0,9535
-19	0,16%	0,8987	-0,33%	-0,9611	0,90%	0,84601	0,41%	0,3455
-18	0,16%	0,3307	-0,17%	-0,2887	-0,28%	-0,5685	0,13%	0,1037
-17	-1,17%	-2,8308	-1,35%	-1,8567	-0,13%	-0,3896	0,00%	0,0017
-16	-0,02%	-0,0683	-1,37%	-1,6947	-0,08%	-0,1635	-0,08%	-0,0543
-15	0,89%	0,8477	-0,48%	-0,3658	-0,51%	-1,544	-0,59%	-0,4038
-14	1,54%	2,1988	1,05%	0,7047	0,16%	0,48868	-0,42%	-0,2854
-13	0,94%	1,1305	2,00%	1,1665	0,10%	0,58736	-0,33%	-0,218
-12	0,39%	0,8856	2,39%	1,3488	0,69%	0,96979	0,37%	0,2212
-11	0,04%	0,1701	2,42%	1,3595	0,59%	1,40957	0,96%	0,5611
-10	0,05%	0,1304	2,48%	1,3554	-0,69%	-1,8234	0,27%	0,1517
-9	0,40%	1,0076	2,87%	1,5369	0,33%	0,59115	0,60%	0,3251
-8	0,31%	0,5486	3,18%	1,6296	0,55%	1,67253	1,15%	0,6153
-7	-0,14%	-0,481	3,03%	1,5378	-0,34%	-1,1962	0,81%	0,4267
-6	-0,53%	-1,4129	2,51%	1,2495	0,69%	1,34316	1,49%	0,762
-5	-0,22%	-0,7071	2,28%	1,1245	0,93%	1,13333	2,43%	1,1415
-4	-0,25%	-0,678	2,03%	0,9842	-0,05%	-0,1761	2,37%	1,1049
-3	0,35%	0,8228	2,38%	1,1302	2,11%	1,15572	4,48%	1,5903
-2	0,03%	0,085	2,41%	1,1298	-0,22%	-0,8	4,27%	1,5061
-1	0,93%	3,3388	3,35%	1,5543	-0,37%	-0,8898	3,89%	1,3593
0	-0,26%	-0,4269	3,08%	1,379	-0,13%	-0,2643	3,76%	1,2929
1	-0,69%	-2,3617	2,39%	1,0595	-0,31%	-0,5948	3,45%	1,1678
2	0,62%	1,1014	3,01%	1,2932	-0,11%	-0,3225	3,34%	1,1229
3	0,91%	1,3133	3,92%	1,6145	1,73%	1,33858	5,07%	1,5639
4	0,06%	0,0692	3,97%	1,5482	1,06%	1,01011	6,13%	1,7988
5	0,69%	1,6988	4,66%	1,7945	1,01%	1,25596	7,14%	2,0395
6	-0,62%	-0,9445	4,05%	1,5095	0,78%	0,80389	7,92%	2,1798
7	1,33%	1,5707	5,37%	1,9118	-0,10%	-0,2901	7,82%	2,1441
8	0,06%	0,2523	5,44%	1,9267	1,45%	2,35981	9,28%	2,5067
9	0,60%	1,7098	6,03%	2,1222	0,40%	0,33341	9,67%	2,4882
10	-0,28%	-1,1786	5,76%	2,0185	-0,94%	-1,6903	8,74%	2,2244
11	0,05%	0,1147	5,81%	2,0123	-0,36%	-0,4196	8,37%	2,083
12	0,21%	0,7243	6,02%	2,0751	2,08%	2,16459	10,46%	2,5297
13	0,83%	1,616	6,85%	2,3253	-0,08%	-0,2887	10,37%	2,5031
14	-0,23%	-0,6969	6,62%	2,2312	-1,03%	-2,7078	9,35%	2,2455
15	-0,12%	-0,4236	6,50%	2,1808	0,90%	1,39863	10,25%	2,433
16	-0,90%	-3,2047	5,60%	1,8712	-0,54%	-1,3859	9,70%	2,2945
17	-0,01%	-0,0184	5,59%	1,8606	0,64%	2,74923	10,35%	2,4424
18	0,33%	1,2719	5,92%	1,9621	0,05%	0,05197	10,39%	2,4028
19	0,25%	1,151	6,17%	2,039	0,49%	1,05265	10,88%	2,5012
20	0,17%	0,456	6,34%	2,08	0,02%	0,05415	10,90%	2,4982

Annex 7 - AARs and CAARs of the tightening of capital controls in Argentina

Day	Argentina			
	AAR	T-test	CAAR	T-test
-20	-0,21%	-0,1485	-0,21%	-0,1485
-19	-0,61%	-0,5383	-0,82%	-0,4549
-18	-0,98%	-0,6918	-1,80%	-0,7858
-17	-1,02%	-0,3793	-2,82%	-0,7985
-16	-1,34%	-0,8982	-4,17%	-1,0853
-15	2,26%	1,0772	-1,90%	-0,4351
-14	0,35%	0,2347	-1,55%	-0,3355
-13	-2,64%	-1,1116	-4,19%	-0,8062
-12	-1,80%	-0,6258	-5,99%	-1,0083
-11	0,11%	0,0525	-5,89%	-0,9383
-10	-1,39%	-0,8986	-7,28%	-1,126
-9	-0,34%	-0,2334	-7,61%	-1,1498
-8	-0,69%	-0,5502	-8,30%	-1,2317
-7	0,06%	0,04	-8,24%	-1,1938
-6	-0,58%	-0,339	-8,82%	-1,2403
-5	-0,91%	-0,6898	-9,74%	-1,3457
-4	-0,27%	-0,1862	-10,01%	-1,356
-3	-0,25%	-0,3147	-10,26%	-1,382
-2	0,87%	0,6909	-9,39%	-1,2469
-1	0,39%	0,2192	-9,00%	-1,1626
0	2,61%	1,3039	-6,38%	-0,7986
1	-1,00%	-0,7326	-7,39%	-0,911
2	0,73%	0,4177	-6,66%	-0,8027
3	-0,96%	-0,3745	-7,62%	-0,8775
4	1,54%	0,6982	-6,08%	-0,6783
5	1,00%	0,5605	-5,07%	-0,5553
6	-2,20%	-0,9811	-7,27%	-0,7734
7	0,65%	0,43	-6,62%	-0,6953
8	-0,14%	-0,1113	-6,77%	-0,7039
9	-1,14%	-0,5832	-7,90%	-0,8058
10	-1,24%	-0,469	-9,14%	-0,8999
11	-1,06%	-0,3586	-10,20%	-0,9643
12	-0,69%	-0,3912	-10,89%	-1,0155
13	1,50%	0,7094	-9,39%	-0,8589
14	-1,51%	-0,7029	-10,90%	-0,9784
15	-0,60%	-0,2395	-11,49%	-1,0071
16	1,01%	0,6359	-10,48%	-0,9093
17	2,99%	1,116	-7,49%	-0,6332
18	-0,63%	-0,3072	-8,12%	-0,6762
19	-1,50%	-0,824	-9,61%	-0,7917
20	0,71%	0,5266	-8,90%	-0,7284