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## Capital Restrictions Policies, Currency Appreciation and Foreign Debts

CHOKRI ZEHRI<sup>1</sup>

<sup>1</sup> Assistant professor of economics; Prince Sattam bin Abdulaziz University; College of Sciences and Humanities in Al-Sulail;  
Department of Business Administration – Saudi Arabia, E-mail: c.alzhari@psau.edu.sa

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### ARTICLE INFO

Received February 18, 2020  
Revised from March 23, 2020  
Accepted May 27, 2020  
Available online September 15, 2020

**JEL classification:** F37, F38, F41

**DOI:** 10.14254/1800-5845/2020.16-3.12

**Keywords:**

Capital controls,  
Exchange rate,  
Foreign borrowing

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### ABSTRACT

There are two fundamental reasons why governments should force capital controls, to constrain the appreciation of exchange rate, and to deal with the excessive resort to foreign debts that lead to more crisis vulnerability. Subsequently, this paper looks at the impact of capital controls to decrease the volume of foreign borrowing and the exchange rate vulnerability through the analysis of a panel of 60 developed and developing countries over the period 1995-2019. A panel vector auto-regression approach was utilized to develop the empirical study. Results show that capital controls as an instrument of restrictive policies are unable to reduce foreign debts and also fail to limit the exchange rate appreciation. There is no clear evidence that policies using capital restrictions are related to a high level of financial market instability.

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### INTRODUCTION

With the beginning of capital account liberalization in 1973, progression approaches have quickened dependent on the indicators of financial liberalization. An economic opening has permitted nations, particularly in the developed countries, profit to a large type of financing, especially in the form of borrowing, which was already non-existent (Abiad, Oomes, and Ueda, 2008; Bekaert, Harvey, and Lundblad, 2005). Also, the procedure of capital account liberalization ascending the dread of the exchange rate appreciation. Unfavorable judgment has been formulated at capital account liberalization since the mid-1990s in diverse structures, for example, raised inequalities and poverty, financial instability, and expanded macroeconomic imbalances (Broner and Ventura, 2010; Rodrik, 1997; Bayoumi, and Koujianou, 1989). As of late, discussions were watched due to the expansion in the volume of external debts for poor countries as well as for rich countries. The normal outer of foreign borrowing of all categories of income nations indicated an extensive increment in the low-and middle-income nations toward the start of the 1980s. It was noticed that a critical increment in these debts happened toward the start of the 1990s.

It is arguable if capital controls ought to be looked like a viable instrument for policymakers for handling capital flows. This subject has gotten one of the central arrangements in the G20 under

the French Presidency in 2011 and has been discussed significantly by the IMF and other universal establishments (Hoenig, 2013). It seems that just restricted advancement has been made so far notwithstanding the sound finishes of G20 on the management of capital flows. Development of financial markets is considered as an important step for economic growth with capital liberalization and access to foreign financing is a fundamental source for the variegation of hazard and investment (Pasricha, Falagiard, Bijsterbosch, and Aizenman, 2017). Despite what might be expected, policymakers have been centering the dangers establishing from free capital flows for the financial and macroeconomic solidness targets of developing nations. This analysis inspects the performance of capital restrictions policies to decrease the external debts and the over-evaluation of the currency. Although there are large essays on the impacts of capital controls, regrettably, there are fewer examinations that investigate this matter. Besides, these relationships have no theoretical basis. Subsequently, this examination contributes to the previous studies about the capital controls to reduce the foreign borrowing and the problems of currency through a different approach of a PVAR model suggested by Love and Zicchino (2006). This regression joins the upsides of the conventional Vector Autoregression (VAR) with the benefits of panel data. Fundamental VARs take into account the examination of a set of endogenous factors operating at the same time. The investigation has utilized ongoing indexes of restrictions on capital flows suggested by Chinn and Ito (2017) and other indexes from Fernandez et al. (2016) to clarify the evolution of foreign borrowing.

The examination is divided between developing and advanced nations. This division can help approve the findings. Developing countries are normal to have more powerful findings than rich nations in light of their excessive use of capital restrictions. Thus, the capital controls have developed during the time of the study, and the effect desired may vary given the time scale. Consequently, the analysis has isolated the examination into two-time interval, before the crisis (1995-2008) and after crisis (2009-2019). We expect that the second period is more symbolic considering that restrictions policies are utilized more extensively after the crisis. The paper is composed as follow: the second section shows a literature summary on the relationship of capital restrictions policies and external debts / over-evaluated exchange rate. Section III introduces the empirical analysis, the model's specification and the findings of the regressions. Section IV examines these findings and Section V presents the policies needed to deal with these issues.

## 1. RELATED LITERATURE

The international reserves accumulation formed by a nation depends on various reasons for an act in the foreign exchange market in order to protect a fixed exchange rate regime, for creating a protective stock as prevention against crisis and to deal with an eventual fluctuation of the national currency. The preventive reason was often one of the essential motivation for the detention of reserves. This methodology has been, consequently, the attention of various examinations on international reserves starting after the collapse of the Bretton Woods framework. At any time there are signals of expected crises, the adequacy of international reserves becomes a central debate to avoid it. According to this practice, emerging countries must set up a treasury to prevent eventual external financial imbalances. There are many kinds of shocks. Landell-Mills (1989) suggests that exchange reserves should envelop the urgent spending for imports based primarily on the act of international reserves as a necessary tool for adjusting the country's external accounts.

It is necessary for an economy buying from outside indispensable goods needed for consumption or local production to have a sufficient regulating stock of international reserves despite weak foreign financing. From this statement, the ratio relating foreign exchange to imports is based on a measure of reserves sufficiency. This measure draws its foundations from a direct economic explanation which is especially appropriate for poor countries. At the beginning of 1990, the detention of international reserves was analyzed as a requirement to guarantee the immediate reimbursement of foreign borrowing. This explanation has become true with the wide integration of  
150 emerging financial markets into the international financial system. With this debate of interna-

tional reserves adequacy, the incorporation of short-term external debts is constructive to provide important information's from the international financial markets.

Twenty years ago, a more developed statement of the adequacy of reserves to short external debts is proposed by the Greenspan-Guidotti rule. The studies begin to observe the negatives impacts of sudden stops of capital flows on the macroeconomic conditions happening after recurrent crises in emerging markets during the past two decades. This has motivated more attention to the regulatory role of the international reserves that can deal with the inconvenience of external account imbalances. Jeanne (2016) suggests that exchange reserves are considered as a guarantee arrangement that can reduce the likelihood and magnitude of sudden reversals. It is often suggested that a minimum of 10% of GDP reserves is appropriately needed to prevent international shocks. Finally, theoretical studies fail to explain the emerging economies' accumulation of reserves as an efficient guarantee for the threat of sudden stops.

According to Alberola, Erce, and Serena, (2016), the reserves adequacy rule makes it possible to ensure liquid assets to the householders, and also can resolve the shortage of foreign financing in crisis periods. Thus, a sufficient stock of international reserves promotes the capacity of the central bank as a lender of last resort. This practice constitutes a lesson learned following the 2008 financial crisis and in periods of imbalances in capital markets. Several studies have also focused on the relationship between reserves accumulation and external debts (Gelos, Sahay, and Sandleris, 2011; Alfaro and Kanczuk (2009); Bianchi et al., 2013). According to Alfaro and Kanczuk (2009), an optimal strategy for managing capital flows fails to support an excessive accumulation of reserves. On the opposed, Bianchi et al. (2013) disprove this opinion and suggested that reserves constitute ideal insurance for future and uncertain changes in the cost of external debts.

An opportunity offered to a government is to build up a stock of foreign exchange when the cost of borrowing is low. The government may in the future issue reserves and long-term bonds once the cost of debts becomes greater. Thus, a country is encouraged to hold exchange reserves following a prediction that the cost of borrowing will increase in the future. The mercantilist literature supports the accumulation of reserves, but this support becomes more difficult in the world of international finance if the country accumulates the reserves as prevention against the undesirable hazards of international capital markets. The local currency can depreciate following an accumulation of reserves or following a deliberate instrument as is presented by Obstfeld et al. (2009). The authors show that several emerging economies buy financial assets in dollars and sell the national currency, which caused the depreciation of the local currency. In terms of international trade, the accumulation of international reserves can artificially promote the commercial sector by providing a sort of comparative advantage. However, this policy has failed to improve welfare in both theoretical and empirical studies. Until 2007, the precautionary reason was preferred over the mercantilist approach to explaining the accumulation of international reserves (Delatte and Fouquau, 2012). Likewise, Aizenman (2008) presented in a theoretical study that the mercantilist approach for accumulating reserves leads to a deterioration in well-being. This approach must be combined with precautionary measures in order to ameliorate the social welfare.

Some studies explain the international reserves accumulation by the excess of government restrictions applied to the domestic financial market. According to Dooley, Folkerts-Landau, and Garber (2004), a continual current account excess and high foreign exchange stock are mainly the consequences of these government restrictions. As a result of large credit banking restrictions, domestic companies use their precautionary savings to accumulate more exchange reserves. The high restrictions on credits to the private sector generate a disparity between investment and local savings. The study of Dooley, Folkerts-Landau, and Garber (2004) is part of the literature studying the early warning signals of crisis, and empirically examined the impact of accumulating foreign reserves during the 2008 crisis. Several economists have approached this question differently and the results have sometimes been contrary. In their empirical study giving the 2008 crisis, Obstfeld,

Shambaugh, and Taylor (2009) use many explicative variables and the adequacy ratio of international reserves is among the most influential variable used.

The authors have detected that reserves become more significant when associated with short-term debt. Unfortunately, their analysis neglects the role of restrictions policies in link with the reserves accumulation. A policy paper (2010) established by IMF during the 2008 crisis has shown that greater possession of international reserves is an interesting way for emerging countries to reduce the impact of the crisis on their economies but also they must accept a decrease in returns. The practicality of reserves is not assured forever it rather depends on a determined threshold. The countries with more liberalized capital movements are the most affected by considerable imbalances. Similarly, some studies (Frankel and Saravelos (2012); Comelli (2014)) find that international reserves are important determinants for the recent crisis and also as an early indicator of financial imbalances. The importance of international reserves is noted in several studies. For example, Liping (2010) and Aizenman et al. (2011) viewed reserves as one of the important variables during the 2008 crisis. In several economies, especially the emerging, the strong pressure on the financial market lead to a compromise between the depreciation of the exchange rate and the loss of foreign exchange reserves. According to these studies, most of the emerging countries studied prefer a depreciation of their currency rather than reducing their international reserves. Aizenman et al. (2011) find that the fall in foreign exchange follows a logistic curve and must not exceed one-third of the global volume of reserves before the crisis. Ruiz-Arranz and Zavadjil (2014) find that higher international reserve stock is often linked with greater 'after-crisis' economic growth.

## 2. MODELS SPECIFICATION AND DATA

This part begins with a presentation of the empirical method to analyze the adoption of restrictive policies. Particularly, the main target is to determine the factors that separate countries referring to their selection of restrictive policies, the choice to raise or decrease these restrictions or the global level of controls reached and preserved by a government. The model followed to determine these factors  $Z_{i,t}$  of an economy  $i$  which relates the level of controls on capital flows is given by the equation:

$$CONTROLS_{i,t} = \partial_t + \phi Z_{i,t-1} + \theta_{i,t} \quad (1)$$

While the model which associate the factors  $Z_{i,t}$  to the diverse changes in capital controls is written as follows:

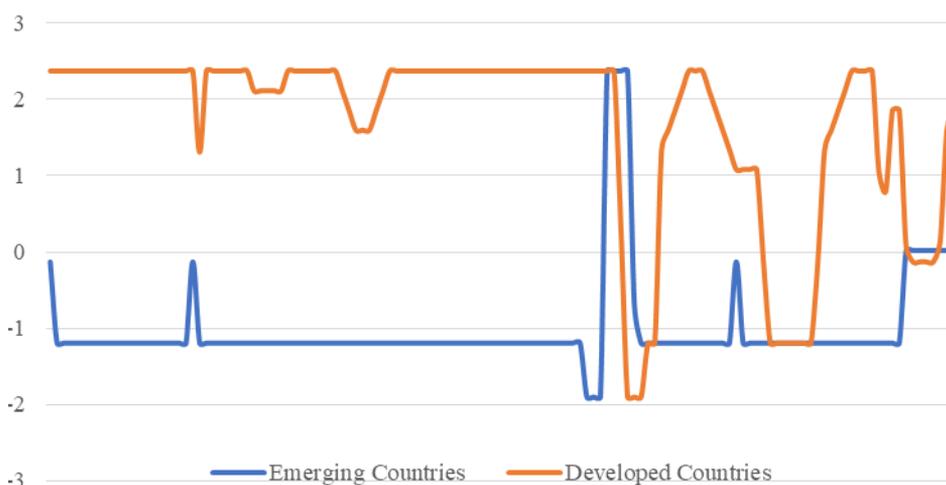
$$\Delta CONTROLS_{i,t} = \partial_t + \phi Z_{i,t-1} + \theta_{i,t} \quad (2)$$

$\Delta CONTROLS_{i,t}$  represents a dummy variable, it takes the value 1 when the economy decides to raise capital controls in the year  $t$  and the value 0 if the economy keeps the same level of controls. The regression is executed for cases if restrictions are decreased in a second model designation. Thus,  $\Delta CONTROLS_{i,t}=1$  when the economy eases restrictions in year  $t$  and  $\Delta CONTROLS_{i,t}=0$  if current restrictions maintained unchanged. We use a panel vector autoregression to tests the two equations. To take into account the presence of a frequent and regular time scale in capital controls, we introduce a time effect  $\partial_t$  in both models. For equation 2, capital controls are reintroduced for a few years specific to the dates of application of these controls. For this reason, the selection of temporal dummy variables is less visible while robust errors can be observed during the regressions. An important fact is the endogeneity of capital controls. The empirical literature is rich with the influence of capital controls on several determinants of the financial and macroeconomic sphere, which give more importance to this concern that equivalent effects cannot be clearly described. This is due to the endogeneity of restrictions policies that can have a direct and indirect result of the variables similarly constructed. Fortunately, this problem does not arise here, because

the analysis focuses on the characterization and describing of these aspects ( $Z_{i,t}$ ) which are different before and after the crisis. Also, the expected reason is that these aspects can be influenced by controls. This analysis tries to study partly this concern by measuring the values taken by these factors for previous periods, " $Z_{i,t-1}$ ".

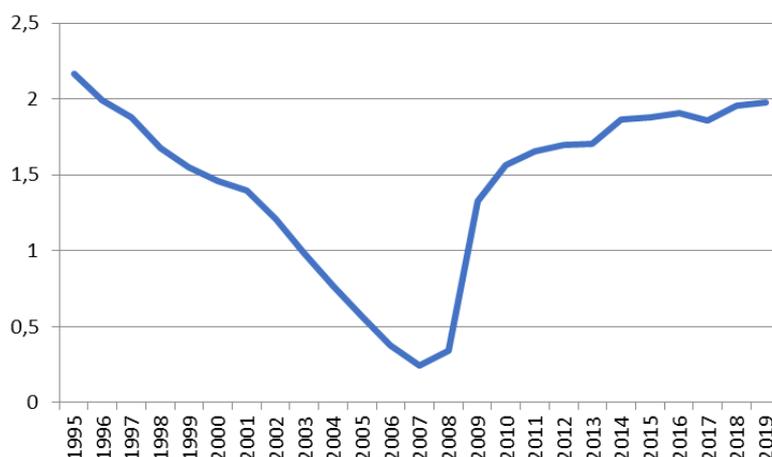
We study in a second stage the temporal conduct of these factors  $Z_i$ , previously and following the 2008 crisis. We mainly search to know if the macroeconomic fundamentals in some countries motivate a reinforcement of capital controls in a given year in comparison with the countries which apply these controls in a consistent manner and also with the countries which have decreased the actual controls. The analysis of countries modifying their capital control by strengthening, reducing or keeping it unchanged, is similar as for the second equation. Besides, the eventual endogeneity of restrictive policies allows that the associations aimed in this study cannot be interpreted as causal links. The study is performed for a panel of 60 developed and emerging economies during the period 1995-2019. The choice of the countries sample is motivated by the availability of data on capital controls. A central concern is the introduction of the capital controls aspect into empirical modeling, which is very difficult. The capital controls are reflected by the index of Chinn & Ito (2017) "kaopen" and by four indexes presented in Fernandez et al (2016) "Ka, Kai, Kao, and Eq". Mostly, all indexes are de jure allowance, which gives signs about the expectations of government decisions in comparison to the real result of de facto capital account liberalization .

The previous proxies of capital controls allow a study for a big sample of countries and for lengthy years; therefore, we have chosen these proxies to reflect the capital controls aspect. The choice of these proxies is also decided when similar results are founded with several empirical robustness tests carried out for other indicators of financial openness (Bekaert, Harvey, and Lundblad, (2011); Quinn, Schindler, and Toyoda, (2011)). These capital control indexes (Chinn & Ito (2017) and Fernandez et al (2016)) are set so that a higher value represents a larger range of restrictions of capital flows.



**Figure 1:** Progression of Controls Since 1996

Figure 1 shows the change of capital controls after 1996 for developing and developed economies. The figure present clearly a general tendency approaching restrictions and liberalization, thus, important differences are observed between countries along the analysis period. This evolution defines a clear illustration that remarkable disparities between countries in restrictive policies become evident in recent years.



**Figure 2.** Restrictions on Capital Flows

Figure 2 shows the evolution of restrictions on capital flows over the period of the study. The graph is interesting with an almost decrease pace of capital controls before the crisis. The increase in these controls is clearer after the global financial crisis. Since 1995, it is remarkable that 2009 is defined as a starting year for an increased restrictions proceeded by emerging economies.

**Table 1.** Summary Statistics

Variable	Mean	SD	Min	Max
<i>Capital Control Indexes</i>				
Fernandez et al (2016) indexes				
Ka	0.37	0.219	0	1
Kai	0.29	0.424	0	1
Kao	0.39	0.418	0	1
Eq	0.41	0.420	0	1
Chinn and Ito (2017) index				
Kaopen	0.86	1.559	-1.90	2.37
<i>Main Variables</i>				
Foreign Debt	0.73	1.332	1.62	3.21
Exchange policy	0.74	1.12	1.45	3.92

A summary of the statistics of the regressions variables used is presented in Table 1. To reach an adequate comparison between the estimated parameters of our variables, all the factors were normalized to a zero mean and a standard deviation of the unit. Among the four indexes of Fernandez et al (2016), the first variable is 'Ka' which represents the control of capital outflows. The other three variables are 'Kao, Kai and Eq', which are the controls on capital inflows. These different indicators have shown an association of capital controls with foreign debt. The indicator presented by Chinn and Ito (2017) is 'kaopen'. It measures the restrictions on capital flows (inflows and outflows) for a country. It is specified as the 'global liberalization' of each economy. We use the level, variation, and volatility of capital flows as proxies of changes in capital controls. We analyze the global inflows and outflows along with the empirical study. A proportion of change is determined in comparison to the level of controls in the previous year. All capital flow indicators are calculated as a percentage of GDP. Consequently, in order to differentiate between the size of capital flows relative to the importance of other factors, in particular by analyzing foreign debt, we have normalized these capital flows in association to GDP. Table 2 presents the definitions of variables utilized in these regressions.

**Table 2.** Variables Definition

<i>Variables</i>	<i>Definition</i>
Current account	It measures international transfers of capital and trade balance.
Depreciation tendency	The loss of value of a country's currency against one or more foreign reference currencies.
Differential interest rate	A difference in the interest rate between the domestic and foreign country.
Foreign borrowing	External debts.
FX reserves	Cash and other reserve assets held by a central bank or other monetary authority that are primarily available to balance payments of the country.
FX regime	The way a monetary authority of a country or currency union manages the currency in relation to other currencies and the foreign exchange market.

### 3. RESULTS

This part displays and interprets the findings of the equations defined previously. We investigate the act of exchange rate to stimulate restrictions policies. The regressions results for the levels of capital controls in Equation 1 and for the changes in controls in Equation 2 are presented in Table 3. The results revealed significant confirmation that the level and variation in capital controls are linked with exchange rate regimes. Therefore, there is a strong relationship between the policies, foreign exchange, and capital control.

**Table 3.** Control Capitals Level and Variation

<i>Variables</i>	<i>Level</i>		<i>Variation</i>	
	<i>Pre-2009</i>	<i>Post-2009</i>	<i>Pre-2009</i>	<i>Post-2009</i>
<i>Current account</i>	-0.257 (0.232)	-0.634 (0.624)	-	-0.288** (0.057)
<i>Depreciation tendency</i>	-0.297*** (0.0578)	-0.325 (0.821)	0.310*** (0.009)	-
<i>Differential interest rate</i>	0.687*** (0.001)	0.634** (0.046)	0.410*** (0.001)	0.690*** (0.003)
<i>Foreign Debt</i>	0.650** (0.031)	0.698*** (0.002)	0.768** (0.032)	1.413*** (0.003)
<i>Level_FX reserves</i>	-0.0321 (0.0375)	0.368 (0.0489)	-	0.281 (0.0621)
<i>Float_FX regime</i>	-1.240*** (0.002)	-0.086*** (0.001)	-1.680*** (0.003)	-0.647*** (0.002)
<i>Countries</i>	60	60	60	60
<i>R-squared</i>	0.285	0.314	0.469	0.484

Standard errors in parentheses. \*\*\*, \*\*, \*, indicate significance at 1%, 5% and 10%

The results show that capital controls are considerably influenced by other aspects than foreign exchange policy and foreign debts and are more likely to cause an increase in these re-

strictions. Besides, a depreciation tendency of the currency fluctuation is linked with a small likelihood and a large potentiality to decrease post-crisis restrictions. The association between capital controls and foreign exchange policy is above all conditioned by the exchange rate regime preferred by a country. Countries that have a float exchange regime and target inflation through their monetary policy are less able to institute restrictions on capital flows to accomplish their strategic objectives. Besides, after the crisis, countries targeting inflation have fewer margins and less flexibility to act through capital controls compared to countries not targeting inflation. Table 4 displays the results of the regressions of segregating restrictions into inflows and outflows. As well for inflows and outflows, the results are very similar. Alike, the results are not different taking into account the differences between the groups of countries, some coefficients have, however, less significant coefficients using selective countries models (Table 5).

**Table 4.** Inflows and Outflows Controls

	<i>Inflows</i>		<i>Outflows</i>	
	<i>Pre-2009</i>	<i>Post-2009</i>	<i>Pre-2009</i>	<i>Post-2009</i>
Current account	-0.0366 (0.226)	-0.172** (0.038)	-	-0.043** (0.044)
Depreciation tendency	-0.0354 (0.329)	0.0613 (0.285)	-0.0632 (0.141)	-
Differential interest rate	0.0356** (0.032)	0.0514 (0.167)	0.0914*** (0.002)	-
Foreign debt	0.0768 (0.184)	0.0654 (0.275)	0.0587 (0.169)	0.322* (0.064)
FX reserves - level	0.0354 (0.225)	0.0297 (0.157)	-	-
FX regime – float	-0.287*** (0.002)	-0.098* (0.075)	-0.571*** (0.004)	-0.871*** (0.003)
Countries	60	60	60	60
R-squared	0.122	0.245	0.765	0.847

Standard errors in parentheses. \*\*\*, \*\*, \*, indicate significance at 1%, 5% and 10%

**Table 5.** Selected Countries Sample

	<i>Developing countries</i>		<i>Developed countries</i>	
	<i>Pre-2009</i>	<i>Post-2009</i>	<i>Pre-2009</i>	<i>Post-2009</i>
Ka	-0.852 (0.023)	-0.739 (0.568)	-	-0.899* (0.398)
Kai	-0.514 (0.331)	-0.421 (0.756)	-0.297 (0.210)	-0.198** (0.036)
Kao	-0.0301 (0.191)	-0.0542 (0.131)	0.0497*** (0.0021)	-
Eq	0.687 (0.542)	0.0355 (0.878)	0.731 (0.395)	-

Kaopen	-0.231*** (0.002)	-0.452*** (0.004)	-0.275*** (0.008)	-0.522*** (0.007)
Countries	30	30	30	30
R-squared	0.482	0.341	0.642	0.245

Standard errors in parentheses. \*\*\*, \*\*, \*, indicate significance at 1%, 5% and 10%

The results in Table 6 display for both, level or variation in capital flows, that there is no clear indication that they represent a fundamental indicator of restrictions policies. This refers to the case that massive inflows, outflows and also average variation in these flows are usually associated with a reduced level of restrictions on capital flows. Besides, having excessive inflows and outflows of capital in the previous year, reduce the likelihood that countries increase controls. According to the previous results, it is not important to not interpret them causally. Countries with large flows have the ability to differ in other directions from economies with similarly small fluctuation or a lower level of flows. Specifically, in the present sample, capital flows are defined according to the size of the economy in comparison to the extent of the financial system. There has been important to distinguish the fluctuation and the volume of flows from other potential aspects that affect the choice of restrictions policies like related to foreign borrowing, for example.

**Table 6.** Capital Controls in Level and Variation

	<i>Pre-2009</i>	<i>Post-2009</i>	<i>Pre-2009</i>	<i>Post-2009</i>
Capital outflows	0.637*** (0.001)	0.587*** (0.006)	-0.647*** (0.005)	-0.492*** (0.002)
Capital inflows	-0.272* (0.096)	-0.292* (0.081)	-0.381 (0.401)	-0.372** (0.043)
Net capital flows	0.313*** (0.001)	0.751*** (0.003)	0.232*** (0.008)	0.211*** (0.005)
Change capital outflows	-0.714 (0.317)	-0.413 (0.398)	-0.587 (0.431)	-
Change capital inflows	0.205 (0.371)	0.0754 (0.381)	-	-
Change net capital flows	-0.471** (0.020)	-0.413** (0.043)	-0.190** (0.044)	-0.031*** (0.006)
Global liberalization	0.351 (0.324)	0.271 (0.549)	0.251 (0.471)	-
Countries	60	60	60	60
R-squared	0.0351	0.0256	0.230	0.325

Standard errors in parentheses. \*\*\*, \*\*, \*, indicate significance at 1%, 5% and 10%

## CONCLUSION

The objective of this research is to determine if restrictive policies have an essential act in reducing the level of foreign debts and limiting the appreciation of the exchange rate. The main contribution was not only to explain why governments resort to capital controls but also to determine the effectiveness of restrictions policies in decreasing foreign borrowing and exchange rate overvaluation, respectively.

The results show that the countries with more capital controls dispose of undervalued exchange rates and also have more exchange rate fluctuation. Besides, the fixed exchange rates regimes and the policies targeting others' targets than inflation gives governments more capabilities to expand restrictions policies on capital flows, this fact is clearly observed in the mid-1995s.

The results presented no empirical confirmation on the relationship between restrictions policies on capital flows with the size and fluctuation of these flows. Likewise, policymakers do not seem to decide the use of capital controls as a response to excessive fluctuation or stress in the financial markets. The most widely supported idea of these decisions on capital flow policies is rather based on problems about the domestic economy, notably, in relation to inflation, the fluctuation of production and a large development of the credit market.

Thought, the use of capital controls is usually due to the lack of an independent and autonomous monetary policy. Countries with fixed exchange rate regimes and small financial systems are less free to use exchange rate policies to ease pressures on the national currency. Consequently, policymakers faced the challenge to use capital control policies. This recourse is essentially due to the volatility, even if reduced, of capital inflows. Recently, several countries have rapidly introduced capital controls (Greece, 2015) and others believe that the previously established controls should be continued for additional periods (Argentina, 2019), showing that this risk becomes a truth.

## ACKNOWLEDGEMENT

The author is very thankful to all the associated personnel in any reference that contributed to/for this research .

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