Determinants of Bonanza Episodes and Related Effects on Financial Crises in Emerging Market Countries

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Abstract

Although capital inflows affect positively economies in long-run, it is possible to generate somehow destructive effects if there is no any control on financial markets. This study tries to explore main determinants of large capital inflows episodes to emerging markets. It is also investigated whether the large capital inflows episodes lead to financial crises in forms of sudden stop phenomenon, currency and banking crises. To this end, annual data for 44 emerging countries have been used during 1970-2011. The empirical results have shown that the lagged period of large capital inflows episodes (so-called as the bonanza phenomenon) and the related contagion are most important variables to explain these phenomena in international capital markets. Overall, the results indicate that herding behavior is a key determinant of bonanza episodes in the selected emerging market countries.

Keywords: Bonanza, Financial Crisis, Sudden Stop, Herding Behavior, Banking Crisis, Currency Crisis.

JEL Classification: C23, C25, F41, G01.

1. Introduction

Global financial integration in principle not only allows for better international allocation of saving and investment, but also increases vulnerabilities associated with international capital flows. Indeed, while global financial integration generally supports long-term income growth, it can also make macroeconomic management more difficult because of the increased risks of overheating, credit and asset price boom, bust cycles and abrupt reversals in capital inflows.

Moreover, in point of microeconomic view, capital inflows are distinguished to be welfare improving if they are used in a production process, because they change a time profile of consumption and increase a

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high marginal product of capital (MPK). As macroeconomic view, capital inflows expand physical capital, productivity and economic growth (Henry, 2003; Obstfeld, 1994; Kose et al., 2008; Prasad et al., 2003; Obstfeld and Taylor, 2004; Mishkin, 2008; Obstfeld, 2009).

However, it is possible that capital may not completely develop international investment opportunities. The failure of capital flows to fully exploit MPK differentials is known as the Lucas (1990) Paradox (Feldstein and Horioka, 1980). Additionally, International investment can face a number of barriers, such as market segmentation due to legal obstacles, such as transaction costs, liquidity constraints, informational and herding barriers, exchange rate risk and banking crisis (Warnock, 2002; Reinhart and Rogoff, 2004; Caballero et al., 2008, Mishkin, 2008).

On the other hand, the world economy in recent years, with low output growth and low interest rates in high- level income countries, has led to a new situation in which a huge wave of capital flows has run into emerging economies. According to this phenomenon, there are concerns about such windfalls of capital in receiving countries, while policymakers have responded to them with a set of macro and micro prudential policies such as restricting free flows of capital across borders. However, to devise suitable policies over the long term, it is necessary to determine the macroeconomic and financial effects of windfalls of international capital (Caballero, 2012).

The main purpose of this study is to evaluate the role of different factors in the large capital inflows episodes (bonanza phenomenon) happening in emerging market economies. Hence, the "overreaction" approach in financial markets introduced by De Bondt and Thaler (1985) is employed to our theoretical discussion. Secondly, this study tries to evaluate effects of these phenomena for emerging market countries. In other words, a question is raised whether bonanza events lead to financial crises in such countries?

The remaining of the paper is structured as follows. Section (2) reviews literature of capital inflows and the related impacts on occurrence of financial crises. The methodology of research and empirical model to evaluate the related hypothesis of the study will be represented in Section (3). Section (4) analyzes the empirical results, and finally, Section (5) concludes relevant remarks.

2. Literature Review

Although many economists believe that capital flows are welfare improving, opponents argue negative outcomes of international capital flows. The instability of capital flows and especially portfolio flows is the main debate for such belief that financial globalization can be welfare reducing for emerging and developing countries (Rodrik, 1998; Stiglitz, 2002). Additionally, exogenous shocks, which may be internationally or domestically phenomena in their origins, lead to withdrawal of capital flows from emerging markets and are known in the literature as *sudden stops* and *sudden flights* (Calvo and Reinhart, 2000; Rothenberg and Warnock, 2006).

On the other hand, according to literature, analyzing macroeconomic and financial effects of bonanzas in capital flows is critical to conducting economic policy implication in international capital markets. So if surges in capital inflows aggravate macroeconomic imbalances or the risk of financial distress, countries may be tending to create administrative controls to certain types of inflows or outflows (Ostry et al., 2010; IMF, 2010).

It has been argued that surges in capital inflows are related to macroeconomic and financial risks, principally after financial liberalization processes (Diaz-Alejandro, 1985). Also, from macroeconomic perspective, the surges in inflows lead to appreciation of the real exchange rate. Although monetary authorities often try to reduce exchange rate appreciation, the sterilization of large inflows impress challenges to monetary policy and appears to be unsuccessful while mostly costly.

The main concerns about the large capital inflows from a financial perspective, is upward pressure on asset prices and increased exposure to currency and maturity mismatches while these risks will be exacerbated in a fixed exchange regime. Temporary nature of the flows and a sudden reversal has been a big concern in these situations. Moreover, a number of authors argue that current account deficits and the accompanying net capital inflows were at causes of the 2008 financial crisis in the United States (Portes, 2009; Reinhart and Rogoff, 2009, Chap.13).

These studies have discussed that international large capital inflows and particularly in the form of debt will increase financial risks; because the greater accessibility of capital amplifies the resources intermediated by the financial sector, stimulating unnecessary growth in lending and expanding

the inherent asymmetric information and moral hazard problems of banking (Gavin and Hausmann, 1996; Goldstein and Turner, 1996; Mishkin, 1996). Thus, the theoretical literature highlights this bonanza-boom-bust cycle narrative (McKinnon and Pill, 1996; Giannetti, 2007), and inserts it features such as financial liberalization processes (Daniel and Jones, 2007), bailout guarantees, and deposit insurance schemes (Corsetti et al., 1999).

Moreover, the literature discusses a close relation between banking crises and the large capital inflows, since these phenomena can fuel lending booms. For example Mishkin, (2009) has expressed that "Given a government safety net for financial institutions, particularly banks, liberalization and globalization of the financial system often encourages a lending boom, which is fueled by capital inflows" (Mishkin, 2009, p. 156). In the same way, Reinhart and Rogoff (2009) have emphasized that "one common feature of the run-up to banking crises is a sustained surge in capital inflows" (Reinhart and Rogoff, 2009, p. 157).

However, the empirical literature has provided restricted support to such a conclusion (Eichengreen, 2003; Edwards, 2007; Calvo et al., 2008; Agos´ın and Huaita, 2012). But it has found confirmation to a relationship between banking and currency crisis (Kaminsky and Reinhart, 1999; Glick and Hutchison, 2001). Also a sudden stop can activate a banking crisis due to the related balance sheet effects (Calvo, 1998), but the mechanism is associated with a currency crisis.

So there is an agreeable approach towards macroeconomic policy in emerging and transition economies that the general objective of this approach is to reduce vulnerability to external shocks and to lower the probability of external crises, including sudden stops and major devaluation. This view about macro policy has identified the need of maintaining the public and external debts at prudent levels. In addition, the accumulation of international reserves could be used as a self-insurance mechanism, and current account deficits should generally be under control (Edwards, 2007).

In spite of the above view on macroeconomic policy, it is not agreed to some areas such as the suitable degree of capital mobility in emerging and transition economies. Some economists have argued that restraining the degree of international financial integration will reduce speculation and assist countries resist external shocks without suffering from massive

crises. According to this point, countries that control for capital mobility are less probable to experience contagion from abroad.

According to other economists, limitations to capital mobility are unproductive and the private sector finds way of circumventing them so these restrictions introduce costly microeconomic distortions and persuade corruption (Forbes, 2006, 2007). What makes the discussions on capital controls principally attractive is that some of the critics of free capital mobility in the emerging economies are authors that have been staunch supporters of free trade in goods. Accordingly, there are essential differences between markets for goods and markets for securities (Bhagwati, 1998, 1999).

To sum up, there is a predictable insight that episodes of large capital inflows will increase the vulnerability of the financial system and the risk of sudden reversals in capital inflows (Reinhart and Reinhart, 2011). Episodes of large capital inflows, or "bonanza" episodes, may increase fragilities and financial risks via several channels. First, bonanza episodes can be related to large exchange rate appreciation which may lead to a Dutch disease situation. At the same time, a bonanza episode may lead to an sudden reversal of such flows more likely, which may in turn cause enduring output contractions, particularly in the existence of a fixed exchange rate regime. Large capital inflows may also lead to upward pressure in asset prices, increase the experience of the economy to foreign liabilities, and fuel foreign-financed credit booms, which may consequently turn to burst when capital flows are reversed.

3. Model and Methodology

The main question here is that: what are determining the large capital inflows episodes?. What specific variables do have critical role in large capital inflows episodes? Although several studies refer to fundamental and control variable such as GDP, inflation, GDP per capita as a measure of development level and etc, psychological factors have critical role in this regards. This study has a different approach to identify the determinants of bonanza episodes and uses the hypothesis of 'overreaction' in financial market.

De Bont and Thaler (1985) in a seminal work introduced "overreaction" in the stock market and demonstrate that, as is the case with many other human activities, financial markets show an excessive reaction to new information or unexpected events. One of their major

conclusions is that an obvious reversion in prices (negative returns) can be predicted by the observation of excessive previous positive returns; in other words, an upward overreaction consequently calls forth a dramatic downward adjustment.

An important expression of this literature is the recognition of an overreaction, which is associated with psychological factors that shove a price much beyond what would be determined by fundamental factors. Therefore, examples of markets with frequent overreaction behavior are those showing excess volatility. Such is the case of capital flows to emerging markets, where an unexplained volatility has been found.

The approach of this paper is different, defining episodes of large capital flows to emerging markets, which are known as capital booms, as those that are larger than a standard deviation above the historical trend and represent at least one percentage points of GDP.

3-1. Definition of Bonanza Episodes

Following Cardarelli et al. (2010), the large capital inflows episodes are determined based on deviations of the net capital inflows-to-GDP ratio from its long-run trend.[1] Since the overall volatility of net foreign capital inflows can be different across countries, the episodes are defined as sudden and large movements relative not only to the trend experienced by each specific country during that period, but also to the volatility that the country experiences in general. The normalization of net inflows by GDP is a way to take into account the relative amount of the inflow surge given the size of a country as well as the macroeconomic fluctuations likely to be experienced. So the large capital inflows episode (bonanza) for country i at time t is established as follow:

$$B_{it} = \begin{cases} 1 & if \ TDev_{it} > \sigma_{TDev_i} \ and \ \dfrac{NF_{it}}{GDP_{it}} > 1\% \\ 0 & o.w. \end{cases} \qquad (1)$$

where $TDev_{it} = \dfrac{NF_{it}}{GDP_{it}} - trend_{it}$ and σ_{TDevi} are the deviation of net

financial account-GDP ratio from its historical trend and the standard deviation of de-trended series for net capital inflows in economy i respectively. Hence, each episode is identified as a series of years in which

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[1]. It should be mentioned that in this study, financial account and portfolio flows will be considered as explanatory variables being added to the model.

this criterion holds. If there is only one year in which B_{it} equals 0 and the corresponding net capital inflows-to-GDP ratio is positive, the two episodes are combined together in one single episode.

3-2. Bonanza Model

Suppose that   is distribution function (standard normal or logistic), so for the periods with high rates of capital inflows and the occurrence of bonanza episodes, the following equation is specified as

$$\Pr(B_{it} = 1 \mid B_{it-1}, ContB_{it}, X_{it-1}, c_i) = \Phi(\gamma_b B_{it-1} + \gamma_c ContB_{it} + X_{it-1}\beta + c_i) \quad (2)$$

where B_{it} is a notation for bonanza phenomenon in country i at period t, $ContB_{it}$ is a dummy variable to show contagion of high capital inflow and X is a matrix for control and fundamental variables.

Contagion of Bonanza is a dummy variable to show the contagion in the international capital market. This variable takes value 1 whenever the numbers of bonanza in year t and year t-1 are more than twice the number of annual average of bonanza in the sample, while the variable takes 0 otherwise.

It should be noticed that during large capital inflows the optimism of investors will be improved, because investors evaluate the behavior and responses of other participants in international capital markets (Agosin and Huaita, 2012).[1] Therefore, the large investment attracts new investment and then creates a boom in financial market that can be self-sustaining for some time. Moreover, this variable is an appropriate measure to decide about the strategies used by private and institutional investors during periods when the capital inflow to an individual country or group of countries is huge. In other words, this variable is a measure and proxy for herding behavior of capital flows into an economy.

Moreover, the lagged variable in the right hand side of (2) will show the effects of excessive responses in the periods. According to Agosin and Huaita (2012), the optimism of investor increases during the periods of large capital inflows, because of the herding behavior that is seen in a financial market. Since a high rate of investments leads to attract new investments and create a boom in capital inflows into countries that it may be self-sustaining for specific periods. Moreover, when a large amount of

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[1]. It is assumed that investors only have herding behavior and they do not use previous information or they do not have any learning behavior.

capital flows into particular countries, the inclusion of this variable is appropriate to decide about strategies that are used by investors and financial institutions as well. It is evident to the existence of herding behavior in capital market.

Matrix X contains variables that could be deduced as determinants of capital flows. These variables are the rate of GDP growth, the change in the terms of trade (TT), the ratio of external debt to GDP (ED), and the current account deficit as a share of GDP (CAD). Other variables included refer to domestic or external conditions. The real foreign interest rate (R_f) and the rate of growth of $G7$ countries ($G7GDP$) reflect external conditions affecting capital flows, and the real domestic interest rate (R_d) and the fiscal deficit (BD) are of domestic fundamentals.

3-3. Data Structure

This study focuses on 44 emerging countries shown n Table (5) in Appendix B. The sampling time series are from 1970 to 2011, while the data used and their sources are reported in Table (6) in Appendix B.

4. Empirical Results

In this section, we try to present evidence on a relationship between large capital inflows episodes (bonanza phenomenon) and sudden stop and currency and banking in emerging markets. Moreover, the validity of results is evaluated by non-parametric statistics such as Pearson and LR statistics.

Table (1) summarizes information on bonanza phenomenon occurring in the selected emerging countries. According to available information and presented definition for bonanza phenomenon in Section (3-1) in Eq.1, there are 177 events explaining the phenomenon in these countries. This table (1) also shows whether the bonanza phenomenon in a specific country during three years leads to financial crises such as sudden stop, currency and banking crises. These results are presented for each country.

Table1: List of Large Capital Inflows Episodes during 1970-2011

Country	Year	Crises	Country	Year	Crises	Country	Year	Crises
Brazil	1981-82	S,C,B	Colombia	1981	C,B	Estonia	1997	S,C
	2000-01	C		1985	C,B		2006-08	S
	2007	C		1993	C	Hungary	1993-95	S,C,B
China	1985	C		1996-97	C,B		1999	S,C
	1993-95	C,B		2007	-		2008	S,B
	2004	-	Egypt	1979	C,B	Jordan	1978	-
	2010	-		1988-89	S,C,B		1991	S,B
India	1994	B		2005	-		2006	-
	1996	B	Malaysia	1982	B	Kuwait	1991	S
	2007	C		1992-93	S	Latvia	2006-07	S,B
Indonesia	1983	-		1996	S,C,B	Lithuania	2006-07	S
	1995-96	S,C,B		2004	S		2011	-
	2010	-		2011	-	Mauritius	1977	B
Iran	1978	S	Nigeria	1983	S,C		1980	S,C
	1980	S		1994	S,B		1988-90	-
	1985	-		1998	S,C		1999-00	S
	1991-93	S,C	Pakistan	1993	-		2008	-
	1996	-		1996-97	S	Morocco	1976-77	S
	1999	C		2006-07	C		1990	-
	2009	-	Peru	1977	S,C	Oman	1978	S
Mexico	1981	S,C,B		1982	S,C,B		1986	S
	1991-93	S,C,B		1994	-		1998	S
	1997	C,B		1997	S,C,B		2007-09	S
Russia	1997	C,B		2007	-	Romania	1990-92	C,B
	2007	S,C,B	Philippines	1980-82	S,C,B		2007	S,C
Korea	1980	C		1998	S,C,B	Slovakia	2002	S,B
	1985	S,B		2010	-	Sri Lanka	1982	C

	1996	S,C,B	Poland	1995-96	S,C,B		1989	C,B
	1999	B	So. Africa	1984	C		1993-94	-
Turkey	1993	S,C,B		1997	C		2000	-
	2000	S,C,B		2005-09	C		2006	-
	2005	C	Thialand	1995-96	S,C,B	Sudan	1981	C
Argentina	1979	C,B		2010	S		1991	C
	1993	B	Ukraine	2005-07	S,C,B		2005-06	S
	1999-00	S,C,B	Vietnam	2007	S		2009	C
	2005-06	S	Bahrain	1990	S	Tunisia	1978	C
Bangladesh	1981	C		1994	S		1982-84	C
	1986	B		2003	-		1993	B
	1989	-	Bulgaria	1988	S,C	Venezuela	1987	S,C
	1994	-		1992-93	S,C		1991-93	S.C.B
	2009	-		2007-08	S		1998	-
Chile	1981	S,C,B	Czech	1995	S,C,B	HongKong	2009	S
	1990	-		2002	S	Singapore	1990-91	S
	2008	-					2004	-

Source: Authors

Note: The letters **S, C, B** indicate whether the episode is followed by a crisis in the three years after the end of the episode. **S** stands for sudden stop, **B** for banking crisis and **C** for currency crisis.

Moreover, Table (2) shows the number of the bonanza phenomena for all selected emerging countries during 1970-2011. Also it includes information on the share of the large capital inflows episodes and the related contagion in a particular year out of total sampling years.

According to Table (2), and the results presented previously in Table (1), there are 177 phenomena for the large capital inflows in the selected emerging countries during 1970-2011. The more numbers for this phenomenon were occurred in 1993 and 2007, indicating 7.26% and 8.94% out of total episodes, respectively.

Moreover, according to the definition of contagion occurring in the large capital inflows episodes, the contagion for bonanza in international capital markets was occurred for 1993, 1994, 1996, 2006 and finally 2007 years .

These results showed that international capital flows were hosted substantially by emerging countries during 2006-2007, out-flowing from developed countries and this fact led to recently global financial crisis.

Table (3) summarizes the results of non-parametric analyzing by the number of frequency for each phenomenon, conditional probability and independence tests for investigating an interaction between sudden stop, currency and banking crises and the large capital inflows episodes to emerging countries during 1970-2011. More specifically, statistics and their probabilities for two independence tests using χ^2 Pearson statistic and Likelihood Ratio statistic are presented in the last rows of Table (3). The null hypothesis for these statistics is that the objective phenomenon (sudden stop, currency and banking crises and generally financial crisis) is statistically independent to one period lagged variable of the bonanza.

According to Table (3), there are 177 events for the bonanza phenomenon with one lagged period (13.23% of 1338 observations), 102 events for sudden stops phenomenon (7.62% of 1338 observations), 281 events for currency crisis phenomenon (21.08% of 1333 observations), 225 events for banking crisis phenomenon and generally 463 events for financial crisis (34.60% of 1338 observation).

While the non-conditional probabilities for sudden stops, currency and banking crises and generally financial crises are 7.62%, 21.08%, 16.88% and 34.60% respectively, in order to the bonanza occurring leads to one type of financial crises, the conditional probabilities are 30.51%, 30.51%, 26.55% and 57.06%, respectively. In other words, almost 57% of the large capital inflows episodes lead to one type of financial crises including sudden stop and currency or banking crisis. Also results show that 52.94% of sudden stop, 19.22% of currency crisis and 20.89% of banking crisis events and generally 21.81% of financial crises events have been occurred after the bonanza episodes during the period under consideration.

As the independence hypotheses have not been accepted , the results imply a correlation between financial crises, including in general, sudden stop, currency and banking crises, and previous-year large capital inflows episodes into emerging market countries. This non-parametric analysis replicates the results of Reinhart and Reinhart (2009), who found a greater conditional probability of crises after bonanzas.

Table2: The Large Capital Inflows Episodes (Bonanza) and Contagion of Bonanza during 1970-2011

Year	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Frequency of Bonanza	0	0	0	0	0	0	1	3	3	2	4	7	6	3
Contagion of Bonanza	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Share of Particular Year in Total Sample	0.00	0.00	0.00	0.00	0.00	0.00	0.56	1.68	1.68	1.12	2.23	3.91	3.35	1.68
Year	**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**
Frequency of Bonanza	2	4	2	1	3	4	6	6	5	13	9	6	9	7
Contagion of Bonanza	-	-	-	-	-	-	-	-	-	✓	-	-	✓	-
Share of Particular Year in Total Sample	1.12	2.23	1.12	0.56	1.68	2.23	3.35	3.35	2.79	7.26	5.03	3.35	5.03	3.91
Year	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Frequency of Bonanza	3	5	5	1	2	1	3	6	10	16	8	7	4	2
Contagion of Bonanza	-	-	-	-	-	-	-	-	-	✓	-	-	-	-
Share of Particular Year in Total Sample	1.68	2.79	2.79	0.56	1.12	0.56	1.68	3.35	5.59	8.94	4.47	3.91	2.23	1.12

Source: Authors

Note: Contagion of Bonanza is a dummy variable to show the contagion in the international capital market. This variable takes the value 1 whenever the number of bonanza in any year (period t) and the previous year (period t-1) are more than twice the number of annual average of bonanza in the sample and 0 otherwise.

Table3: Two-way Tabulations and Independence Tests of Sudden Stops, Currency, Banking, Financial Crises and Previous Year Capital Flow Bonanzas during 1970-2011

		Sudden Stop			Currency Crisis			Banking Crisis			Financial Crisis		
		0	**1**	**Total**	**0**	**1**	**Total**	**0**	**1**	**Total**	**0**	**1**	**Total**
Bonanza	**0**	1113 / 95.87 / 90.05	48 / 4.13 / 47.06	1161 / 100 / 86.77	929 / 80.36 / 88.31	227 / 19.64 / 80.78	1156 / 100 / 86.72	978 / 84.6 / 88.27	178 / 15.4 / 79.11	1156 / 100 / 86.72	799 / 68.82 / 91.31	362 / 31.18 / 78.19	1161 / 100 / 86.77
	1	123 / 69.49 / 9.95	54 / 30.51 / 52.94	177 / 100 / 13.23	123 / 69.49 / 11.69	54 / 30.51 / 19.22	177 / 100 / 13.28	130 / 73.45 / 11.73	47 / 26.55 / 20.89	177 / 100 / 13.28	76 / 42.94 / 8.69	101 / 57.06 / 21.81	177 / 100 / 13.23
	Total	1236 / 92.38 / 100	102 / 7.62 / 100	1338 / 100 / 100	1052 / 78.92 / 100	281 / 21.08 / 100	1333 / 100 / 100	1108 / 83.12 / 100	225 / 16.88 / 100	1333 / 100 / 100	875 / 65.4 / 100	463 / 34.6 / 100	1338 / 100 / 100

	Sudden Stop	Currency Crisis	Banking Crisis	Financial Crisis
Observations	1338	1338	1338	1338
Pearson Coefficient	151.70	10.91	13.62	45.46
P-value	0.00	0.00	0.00	0.00
LR Coefficient	103.53	10.10	12.27	43.20
P-value	0.00	0.00	0.00	0.00

Source: Authors

Note: Each cell presents frequencies in first row, row percentages in second row and column percentages in third row. The Financial Crisis variable shows that in a particular year at least sudden stops, currency or banking crises are occurred.

Overall, in this section, the determinants of the large capital inflows episodes have been investigated and the model specified in the previous section for this phenomenon has been estimated. To explore effects of such determinants on the bonanza phenomena occurring, six cases of the model, depending on using explanatory variables, have been estimated, and the related results are reported in Table (4).

In Case 1, the probability of bonanza occurring has been considered as a function of the large capital inflows episodes in period t-1 (B_{it}) and contagion of such flows (*ContB*).The previous-year bonanza variable is strongly significant where its marginal effect is high. According to these results, if an economy experienced a bonanza phenomenon in period t-1, this phenomenon, also, occurs in period *t* by probability value of about 10.5%. These results confirm the hypothesis that psychological factors influence behavior of international investors regarding capital inflows to emerging market countries.

Moreover, the results for Case 1 indicate that contagion in international capital markets leads to the large capital inflows transferring to emerging market countries. Hence contagion from other countries is another variable that raises the probability of bonanza occurring. The marginal effect of this variable on probability of bonanza episode in all estimated regressions of all cases is highly significant.

Table4: Determinants of Large Capital Inflows Episodes in Selected Emerging Countries during 1970-2011

Variable	Case 1	Case 2	Model03Case 3	Case 4	Case 5	Model06Case 6
B_{it-1}	10.52*** (5.30)	10.49*** (5.26)	6.88*** (3.35)	6.25*** (2.91)	8.17*** (3.79)	10.75*** (3.43)
$ContB$	11.91*** (5.99)	-	11.24*** (5.41)	11.70*** (5.57)	11.41*** (5.35)	13.23*** (4.19)
$ContB*D_1$	-	13.72*** (3.25)	-	-	-	-
$ContB*D_2$	-	13.39*** (4.19)	-	-	-	-
$ContB*D_3$	-	6.25* (1.61)	-	-	-	-
$ContB*D_4$	-	14.51*** (4.05)	-	-	-	-
CAD	-	-	-1.13*** (-6.19)	-1.14*** (-6.06)	-0.86*** (-5.76)	-1.01*** (-4.82)
Gr	-	-	0.26 (1.19)	-	-	-
ED	-	-	-0.05* (-1.80)	-0.03 (-1.43)	-	-
GDP	-	-	-	0.72 (0.31)	-	-
DEP	-	-	-	0.03 (1.33)	0.005* (1.87)	0.11* (1.79)
$FL1$	-	-	-	-	17.29 (1.43)	13.73 (0.75)
BD	-	-	-	-	-	0.09 (0.52)
r^d	-	-	-	-	-	0.13 (1.06)
r^f	-	-	-	-	-	1.01 (1.29)
$G7G$	-	-	-	-	-	-0.63 (-0.73)
Inf	-	-	-	-	-	-0.03 (-0.32)
$M2$	-	-	-	-	-	-0.01 (-0.25)
Constant	-22.87*** (-21.69)	-22.87*** (-21.67)	-20.97*** (10.89)	-24.46*** (-3.24)	-27.93*** (-10.15)	-41.08*** (-7.61)
Observations	1338	1338	999	974	1068	868
McFadden R-squared	0.06	0.06	0.13	0.13	0.12	0.13
LR Statistic	59.25	62.75	104.95	102.37	104.26	89.89
P-value	0.00	0.00	(0.00)	(0.00)	(0.00)	(0.00)

Source: Authors

Note: Average marginal effects (times 100) are reported for all explanatory variables. Figures in parenthesis are z-statistics with robust standard errors. All regressors are lagged in one period, with except for $ContB$ *, ** and *** are significant at 10%, 5% 1% levels, respectively

Four dummy variables have been suggested for different regions to investigate the regional effect on contagion.D_1, D_2, D_3 and D_4 denote dummies for Latin America, Asia (except for Middle East), Middle East and North Africa and Euro Zone, respectively. According to results of Case 2, generally, none of regions has affected significantly contagion being as an international phenomenon in capital markets.

Various variables have been added to the bonanza model where the related estimates have been presented through Cases (3) to (6) in Table (4). According to the reported results, One lagged period ratio of current account deficit to *GDP* (*CAD*) is a significant determinant of bonanza probability.. Although the relevant coefficient of marginal effect in different cases is highly significant, it is quite small. Moreover, the ratio of foreign debt to *GDP* (*ED*) and financial depth index (*DEP*) are significant determinants at significance level of 10% while their marginal effects are low. Finally, the marginal effect of financial liberalization variable (*FL1*) is not statistically significant, so it has no effect on bonanza probability.

Due to Case 6 indicated in Table (4), more fundamental variables have been added to the bonanza model to explore their marginal effects on bonanza probability. The results obtained indicate that budget deficit (*BD*) international interest rate (r^f), economic growth of *G*7 countries (*G7G*), inflation (*Inf*) and money balances (M_2) have not affected significantly the probability of bonanza occurring.

The obtained results reveal the fact that in the selected emerging countries, the large capital inflows are not based on fundamental analyses, more specifically, these results are evident to show for the effectiveness of behavioral and psychological factors being imposed on decisions of investors. Therefore, the most important variables are those which can increase the probability of bonanza occurring and are observable in behavioral finance and investors affected by other investors. Generally, the results in Table (4) indicate that there is evidence for existence of herding behavior among international investors in selected emerging counties.

5. Conclusion

The capital inflows to emerging and developing countries have positive effects on the economies. However, if these flows be more excessive, they can have destructive effects on such economies and lead to financial crises.

This study tried to investigate the determinants of the large capital inflows episodes (bonanza) to 44 emerging countries during 1970-2011. Moreover, the hypothesis was tested whether occurring of bonanza phenomena led to financial crises (such as sudden stop, currency and banking crisis) in the past.

The results showed that the large capital inflows episodes have not been affected by the fundamental variables, while the most significant factors on probability of crisis occurring were the one lagged period of these events and relevant contagion of international capital market. Thus, the implication is that investor's behavior is affected by other participants in international capital markets and it is evident to presence of herding behavior in financial markets.

As a policy implication, emerging market countries should try to control the capital inflows in their economies and prevent of suddenly short-run capital inflows, since such capitals are naturally challengeable and can lead to deeper financial crises. As a policy instrument, Tobin Tax is a suitable and effective way to decrease disturbing crisis effects.

Appendix

Appendix A. Selected Emerging Market Countries

The emerging market countries in this study have been selected according to the BBVA's[1] criteria for emerging market economies. The criteria used by this institution have been confirmed by international organizations such as World Bank. According to BBVA research (2010), emerging counties are divided in two groups.

The first group is named as "EAGLEs[2] countries" and the second group is "other emerging countries". According to GDP index in the first group, there are two sub-groups. The first sub-group is consisted by countries which it expects in 10 next years; GDP in these countries will be larger than the mean of GDP in G7 countries (excluding the US). These countries are Brazil, China, India, Indonesia, Iran, South Korea, Taiwan, Mexico, Russia and Turkey.

For the second sub-group, it is expected that GDP in these countries will be smaller than the mean of GDP in G7 countries (excluding the US) but it will be larger than GDP in Italian economy. These countries are Argentina, Bangladesh, Chile, Colombia, Egypt, Malaysia, Nigeria, Pakistan, Pure, Philippine, Poland, South Africa, Thailand, Ukraine and Vietnam.

The second group of emerging countries is consisted by Bahrain, Bulgaria, Czech Republic, Estonia, Hungary, Jordan, Kuwait, Latvia, Lithuania, Mauritius, Morocco, Oman, Qatar, Romania, Slovakia, Sri Lanka, Sudan, Tunisia, United Arab Emirates and Venezuela.
Also in this study Hong Kong and Singapore are added to the sample, because both countries have experienced the large capital inflows episodes and sudden stops in various periods.

The period in this study generally is during 1970-2011, but sometimes information for some countries is not available. All information about countries and their period is summarized in Table5.

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[1]. Banco Bilbao Vizcaya Argentaria
[2]. Emerging Growth-Leading Economies

Table5: List of Countries

	Country	Period		Country	Period
The first sub-group The first sub-group of EAGLEs Countries	Brazil	1975-2011	**Other Emerging Countries**	Bahrain	1980-2011
	China	1982-2011		Bulgaria	1980-2011
	India	1975-2011		Czech Republic	1993-2011
	Indonesia	1981-2011		Estonia	1995-2011
	Iran	1976-2011		Hungary	1982-2011
	Mexico	1979-2011		Jordan	1972-2011
	Russia	1994-2011		Kuwait	1975-2011
	South Korea	1976-2011		Latvia	1992-2011
	Turkey	1974-2011		Lithuania	1993-2011
The second sub-group The first sub-group of EAGLEs Countries	Argentina	1976-2011		Mauritius	1976-2011
	Bangladesh	1976-2011		Morocco	1975-2011
	Chile	1975-2011		Oman	1978-2011
	Colombia	1971-2011		Romania	1987-2011
	Egypt	1977-2011		Slovakia	1993-2011
	Malaysia	1974-2011		Sri Lanka	1978-2011
	Nigeria	1977-2011		Sudan	1978-2011
	Pakistan	1976-2011		Tunisia	1978-2011
	Pure	1977-2011		Venezuela	1978-2011
	Philippine	1977-2011			
	Poland	1985-2011		Hong Kong	1998-2011
	South Africa	1971-2011		Singapore	1978-2011
	Thailand	1975-2011			
	Ukraine	1994-2011			
	Vietnam	1996-2011			

Appendix B. Data

The used variables, their definition, symbols and resource are summarized in Table (6). The information for variables is during 1970-2011.

Table 6: Definition, Symbol and Resource of the Used Variables in the Estimated Model

Variable	Definition	Symbol	Resource
Sudden Stop	SS_{it} are established in the following manner where the annual change in capital flows are as follows: $$SS_{it} = \begin{cases} 1 & if \;\; \Delta\frac{NF_{it}}{GDP_{it}} < \Delta\overline{\frac{NF_{it}}{GDP_{it}}} - \sigma_{\Delta\frac{NF_{it}}{GDP_{it}}} \;\; and \\ & \left|\Delta\frac{NF_{it}}{GDP_{it}}\right| > 5\% \;,\; Whenever \; B_{it} = 0 \\ \\ 0 & o.w. \end{cases}$$ where NF_{it} is net financial account. Thus, this episode is known as a series of years in which this measure is satisfied.	SS	IFS, WDI, Research Calculation
Bonanza	According to section 3-1.	B	IFS, WDI, Research Calculation
Contagion of Bonanza	According to Table (2).	$ContB$	IFS, WDI, Research Calculation
Net Capital Inflows	Capital flows data from Balance of Payments statistics IFS dataset. Net capital inflows are computed adding reported assets and liabilities in IFS data. Aggregate net inflows are equal to the balance in the financial account (line 78bjd). Flows are disaggregated into three categories: (i) FDI, (ii) portfolio-equity, and (iii) debt.	NF	IFS, WDI, Research Calculation
Currency Crisis	If annual depreciation of any currency versus the US dollar (or the relevant anchor currency – historically the UK pound, the French franc, or the German DM and presently the Euro) be of 15 percent or more, the currency crisis occurred. So: $$CC_{it} = \begin{cases} 1 & if \;\; \Delta ER > 15\% \\ 0 & o.w. \end{cases}$$ where ΔER is the changes in nominal exchange rate for any country.	CC	Ilzetzki et al., 2010 IFS, Research Calculation

Banking Crisis	Binary variable taking value 1 during a year of banking crises	BC	Reinhart and Rogoff, 2012 Leaven and Valencia, 2010
GDP per capita	Gross domestic product per capita (constant 2000)	GDP	WDI
External Debt	Ratio of public and private external debt (long- and short-term) to GDP	ED	WDI
Current Account Deficit	The ratio of current account deficit as GDP	CAD	IFS, WDI
Terms of trade	Ratio of export to import deflators, both obtained from real and nominal trade data.	TT	WDI
Domestic Interest Rate	Deposit money market rate adjusted for consumer price inflation	r^d	IFS, WDI
Foreign Interest Rate	Three-month US-dollar LIBOR, deflated by US consumer prices	r^f	IFS, WDI
Inflation	The annual change in consumer price index (constant 2000).	Inf	WDI
Excessive Growth	The deviation of the annual economic growth form historical trend.	GR	WDI
Money	The ration of liquidity ($M2$) as GDP	$M2$	IFS, WDI
Financial Depth index	The ratio of allocated deposit to private sector as GDP	DEP	IFS, WDI
Financial Liberalization	Dummy variable that takes the value of one if an elimination of interest rate controls has taken place in any of the previous five years. Elimination of interest rate controls is proxied as a positive change in an index of interest rate controls.	$FL1$	Computed using data from Abiad et al. (2010)
		$FL2$	Fraser Institute Data (2011)
Interest rate controls	Index of interest rate controls, considering both deposit and lending rates. Index is based in regulation of rates, considering if rates are set by the government or subject to binding ceilings or bands, or if rates are freely floating. Index takes discrete values from 0 to 4, with 4 being fully liberalized.	-	Abiad et al. (2010)
Budget Deficit	The ratio of budget deficit as GDP	BD	WDI

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