THE ARGENTINIAN PESO CRISIS (2014)

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Abstract

The flow work is focused around discovering the aspects that fixed Argentina's during the recent (2014) crisis nation's destiny. Variables focused around prior analysis utilizing the logistic regression model conveyed for a twelve years period (2002-2013 to clarify the occurrence and checking whether conceivable elements could be foreseeable. The results demonstrate that foreign exchange reserves reduction, monetary aggregates (M3) raise, crises in trading partners, oil price and consumer price index level seem to boost early 2014 turbulence and they also predicted accurately the forthcoming crisis. Also the development of the phenomenon was rapid giving positive signs later than the previous works suggested. The capital flight named as the major factor that led to depreciation is statistically unimportant.

Keywords: crisis model generations, contagion, foreign exchange reserves, monetary policy

JEL classification: E02, E47, F37, G01.

1. INTRODUCTION

Past exact references and practice demonstrate that no one might make certain on making a figure could be faultless and valuable on mulling over and expecting financial variables. Particularly when these forecasts are based on previous economic time series data sets. The Early Warning Models (EWS), created prior didn't give any positive signs, or even most exceedingly awful they have given false indicators anticipating an inexistent emergency. The Argentinian crisis of 2014 raised many questions such as: Has the country really recovered from the major economic crisis of 2001 or the present crisis has its causes back to this credit crunch? Was it predictable and under what methodology? Was any connection between other major crises worldwide and the Argentinian one? And finally did the major cause of the depreciation as presented (capital flight) had important role on the crisis. Our sample consists of 9 variables for a twelve year (2002-2013) period just after the 2001 crisis under monthly frequency presenting 14 incidents that followed. The definition of the incident is similar to the one that later authors (Dapontas, 2013) presented extending the classic well known and used definition from devaluation adding reserves sharp decline and interest rates raise to a broader one. The methodology used to the present work is logistic regression. The paper is structured

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as following: The next section describes selected previous empirical relative research. The third part provides a history of the crisis on the structural problems. A description of the data and the variables and the methodology used is provided in section 4 along with the set of models and the results of the empirical model. Finally, in the last section we offer some concluding remarks and possible further research proposals.

2. EMPIRICAL RESEARCH

The exact examination began and roused on the same time that pioneers (Salant and Henderson, 1978), had created the first Theoretical model on currency crises. Practically at the same time (Bilson, 1979) enlivened of the thought of shadow rate utilizing a probit model, found that it really had a forecasting ability but it wasn't important. In their later work (Blanco and Garber, 1986) and (Cumby and Van Weinberger, 1989) on the light of the theoretical models of first generation and the payment stop of Mexico in 1982 and Argentina in 1981, show that the domestic credit growth didn't have forecasting significance for the next period. In a more far reaching work (Klein and Marion, 1994) the authority settlements with abroad had demonstrated anticipating essentialness however inside a time of 24 months Introducing long term variables (Edwards, 1989; Edwards and Montiel, 1989) have introduced long term variables (3 years before the incident) and their effects to the present. They also introduced the compare process and measure between two or more countries based in them. Also social or political variables can affect the crisis as denoted (Edwards and Santaella, 1993) where on crisis an IMF remedy intervene can be possible.

Possible later extensions concern active governmental involvement in crisis management and sterilization of reserve loss (Flood, Garber and Kramer, 1996). Other extensions have shown that speculative attacks would generally be preceded by a real appreciation of the currency and a deterioration of the trade or current account balance, by an upward pressure of real wages and by higher interest rates (Garber and Svenson, 1994). Extensions also include target zone models (Krugman, 1991), post-collapse exchange rate systems other than free floating, the possibility of foreign lending capital controls, imperfect asset substitutability, and speculative attacks in which the domestic currency is under buying, rather than selling pressure especially from abroad.

Based on second generation theoretical models and the national banks' capacity to face the theorists and oppose. Capital flight possibility is introduced later (Klein and Marion, 1994). Eichengreen, Rose and Wypolsz (1995) studied the determinants of currency crises and added to their probit model unsuccessful examiners assaults. Later, Frankel and Rose (1996), utilizing high expansion as a suspicion for cash emergencies, yet just 5 out of 117 occurrences had a positive indicator.

Models extended third generation adding variables which generally succeed to make sure figures. Later, alluding to practice, Krznar (2004) had developed an EWS (Early Warning System) for Croatia applying a set of 40 variables had succeed to forecast and warn the central bank of the country using a logit model and determining the imminent theoretical assault 6 prior months its break. With an inconsequential expense for the extent of the assault Croatia covered this occurrence.

The empirical studies wide literature as regards currency crises seems also rich. The majority of the empirical studies provided under possible frameworks ("warning system" approach (EWS) and "stylized facts", "single-country and multi-country") emphasize variables that were found as leading indicators of crises. The studies were driven by the

desire of authors to analyze potential causes and symptoms of currency crises and to develop a warning system of currency crisis. The "warning system" approach is strongly associated with the work of contemporary to the Asian crisis (1997) authors (Kaminsky, Lizondo and Reinhart, 1998; Kaminsky, 1998; Kaminsky and Reinhart,1999; Wu, Yen and Chen, 2000). The basic idea behind the "warning system" approach is that currency crises even though that the pure self-fulfilling attacks are rare, but that most crises are preceded by deteriorations in the earlier economic fundamentals of the turbulent economy.

Focused studies or "Stylized facts" studies concentrate on specific episodes of financial turmoil. While these models are less geared toward predicting the exact timing of financial crises, rather, they aim at explaining the severity of financial crises. Blanco and Goiber (1986), Sachs, Tornell and Velasco (1996) or Bussiere and Mulder (1999) are actable examples for this kind of model class.

Later based on eastern European crises on the latest years (Liargovas and Dapontas, 2008; and Dapontas, 2012a) using CATREG models or extreme value analysis to predict and explain them In three out of five cases the forecast was successful. The same model applied on the recent European crises where in a six countries sample the model successfully predicted all of them (Dapontas, 2012a). Logistic regression has been deployed along with artificial networking and local learning models (Sevim *et. al*, 2013) predicting the inexistence of crisis in Turkey within 2012 successfully.

There is a major debate on the existence and presence of a possible fourth generation. In an early approach, Chionis and Liargovas (2002) suggested the introduction of a possible fourth generation based on political risk and black market premiums. A latter work Breuer (2004) argues that poor institutional variables are an underlying cause for unsustainable policies. In their two years later work, Simpalee and Breuer (2006) term institutional factors as "social capital" or "social infrastructure". Weak institutional fundamentals are still present. Their analysis is based on second generation modified models (Li and Inclan, 2001; Johnson *et. al*, 2000) using variables such as central bank independence, financial liberation, coordinated wage and corruption. The conflict and overlap between generations is obvious in a determinants of currency crises analysis (Cuaresma and Slacik, 2007). In a PhD thesis Dapontas, (2010) suggested a double dimension on fourth generation crises analysis using the social variables economic freedom UN HDI variables in contrast to the second real economy dimension explaining crisis through contagion banking crises existence. Finally they are past works that seem to reject the existence of possible fourth generation arguing that the past three generations can explain possible crises (Castillo, 2006).

About Argentina and its rich crises history empirical work inspired of its mid- 80's crises has been published. Initially Cumby and Van Weinberger (1989) developed an EWS with one period lag. Others (Flood and Marion, 1995) examined the size and the time of depreciation compared to the time being on a bonded scheme and its breakup. The Argentinian exposure to Tequilla crisis (1994) and its contagion effects are presented along with fundamentals decline for the 90's (Goldstein, 1996). Kaminsky and Leiderman (1998) focused on stabilization programs and possibility of crisis.

3. THE FACTS OF ARGENTINIAN CRISIS

Argentina has a rich and interesting history on twin crises following correcting measures until the collapse of 2001 as a result of a four year economic depression, the contagion from the Russian and Brazilian crises and a dollar-bond peso scheme breakup.

Economy had grown on 9% from 2003 and IMF loans repayment until the end of 2006. The depression of 2008 hit Argentina due to its high explosion to international trade especially to US, Brazilian and European declining economies. Its economy effected on delay in 2009 by slowing growth to 0.8% while previous level of development regained in the following two years with average development reaching 9%. The slowdown begun on the next year, where GDP gained only 1.9% and 3% in 2013.

The prospects for 2014 weren't good. Government's choice to keep utilities frozen (leading to power outages), nationalize the country's largest oil company (making Argentina a net importer of energy despite its huge reserves of oil and gas) and combat inflation by doctoring official figures and threatening journalists who report the real numbers made Argentinians to seek safer ports for their investments. This extensive capital flight made government to implement high restrictive exchange control measures, taxes on foreign stock market dividends. Memories of 2001 returned to the Argentinians rushing to convert their pesos to dollars in the official and parallel market on high discount. The international reserves reached an eleven year low and peso reached the 8.00 pesos per dollar limit on January 23rd on the official and 13.00 to the black market respectively.

The Argentinian government threw in the towel on January 24th by refusing to intervene on foreign exchange market to support their currency and exchange controls loosening were announced. Fiscal measures were also lightened by reducing taxes on peso purchases for 35 to 20 per cent. The problem though worsens in late June, where independent debtors demanded haircut loans payback after. Solution is on negotiation leaving the country under the Damocles sword of bankruptcy losing its creditwortness progressively.

4. THE DATA SET AND THE MAIN VARIABLES USED

The variables used as a piece of the examination are picked in light of theoretical examinations and accurate determinants of crises. We apply a set of variables that have been showed important by endless studies and moreover the circumstances specific to the economy in turbulence. All variables are under monthly frequency with the exception of Economic freedom where initial variable is annual and transformed to monthly seasonal adjustment. Data covers a thirteen year period following the major crisis of 2002 and concluding in early 2014. In order to enhance the probability of perceiving the crisis considers, the procedure of surveying the model applies nine variables, assembled into five gatherings: variables related to monetary policy, to the external sector, to contagion and specific institutional variables related to transition economies. The information source is the International Financial Statistics, the statistical office of Argentina and the Heritage foundation. Information recurrence is month to month except for Economic Freedom file which is yearly. The variables blanket each of the three known and connected generations along with their modified ones and the introducing fourth generation. In later works following the global credit crunch (Liargovas and Dapontas, 2008) suggested a set of variables such as economic freedom. Another approach (Dapontas, 2010, and Dapontas, 2013) suggested a double dimension on fourth generation crises analysis explaining crisis through contagion and banking crises existence. Finally they are past works that seem to reject the existence of possible fourth generation arguing that the past three generations can explain possible crises (Castillo, 2006). The variables included in our model and their economic justification of the choice of the variables to be applied to Argentina is as following:

Variables related to monetary policy

1. *Real exchange rate (REER)*: The Real Effective Exchange Rate of the national currency given by IMF or by count of the genuine trade rates of real exchanging accomplices, against national currency, weighted by their participation. REER counted as an indicator of competitiveness. A decay of REER (overvaluation) has negative impact on competitiveness and the other way around. The decision of this variable was built by a past work (Kaminsky, Lizondo and Reinhart, 1998). As indicated by them, the true swapping scale is exaggerated with respect to its balance level or its normal level amid serene times, in periods going before the crash Thusly, we make a negative connection between this variable and the rate of a crisis.

2. *International exchange reserves (Reserves)*: Foreign exchange reserves communicated in USD. All the past hypothetical or observational models utilized this major as the principle (and before original models the main works associated) measure of crisis likelihood. The higher the change of speculative attacks and currency crisis (negative effect). We ought to note, be that as it may, that the national bank can likewise keep different assets past outside beyond foreign exchange (gold, SDR etc.). In this way, the variable is required to have negative impact if the reserves are utilized as a measure of remedy or savings and positive if not.

3. *Money (Money)*: The money offer including quasi money. Past studies have utilized the measure of money offer by central bank (M2) barring different means of monetary aggregates. According to the first generation models, the months going before the emergency ought to be portrayed by exceptionally expansionary monetary approach (positive effect). However the impact might be negative if the bank arrangement plans to save the money supply level and consistently funds the outside trade request (Copeland, 2008). Additionally the utilization of broad money (M3) is more extensive than M2 utilized within the past experimental structure.

4. *Inflation (ΔP)*: The change of CPI in the course of the most recent month. It is a substitute of macroeconomic blunder that is having an unfavorable impact on a nation's economy. It is connected absolutely with the event of a crisis. The expansion rate assumed a focal part in the analyzed economies and at times met meaning of hyperinflation. (Cagan, 1956).

Variables related to the external sector

5. *Balance of Payments (BoP)*: The balance of payments expressed in USD. The expected perspective is that this variable is relied upon to have positive impact if the balance is positive and negative if there is deficit. Notwithstanding, the hypothetical discourse in regards to the impact of current record shortfall on the event of currency crises is not all that agreeable. As indicated by (Edwards, 2001) deficits "may matter". In a similar work (Sasin, 2001) have attempted to give interfaces between present record deficiencies and currency crises. A large portion of the studies audited don't give solid and numerous association between high current account deficit and currency crises.

6. *Gold price (GoldP)*: The cost of fine troy ounce in London trade advertise in USD. The variable need to do with the hugeness that gold has on worldwide business sector. Much after the break of the golden rule there are national banks keeping gold stores which could be sold in the worldwide markets for foreign exchange (usually USD). In that manner the gold price has an effect on currency crises and it is connected to the money reserves. The effect depends on central bank policy. If the bank tends to keep gold reserves the effect is positive, if not it is negative.

7. *Oil Price (O)*: The Brent oil barrel cost in USD for the alluding month. . The variable is required to have negative impact for vitality send out nations and positive for merchants if the oil value brings up in the worldwide markets and the other way around in case of international prices decline.

Variables related to contagion

8. *Crisis elsewhere (CE)*: It is a categorical binary variable which means the vicinity of a crisis in other country (1) or not (0). The so called crisis elsewhere or, in chaos theory, "butterfly effect", has a significant role in an external currency crisis development. On the off chance that a nation has monetary relations with a nation hit by an episode it is conceivable to be tainted. The fundamental reasons need to do with the financial infection between the two nations additionally with the theorists' conduct. On the off chance that a significant exchanging accomplice of a provincial economy crumples then alternate accomplices will be infected within a period slack of one or two months. In the rubble crisis of 1998 the rubble breakdown was trailed by a deferred crumple in different nations of the previous Soviet Union. At the point when a speculator chooses to assault he will hit various markets in the same area on the same time as it happened in the Asian crisis of 1997.

Variables specific to transition economies (institutional)

9. *Economic Freed (EF)*: The Heritage rate of economic freedom, is an aggregate score comprising of markers on exchange, financial trouble, government intercession, money related arrangement, remote financing, managing an account, wages and costs, property rights, regulation and informal market. It represents that nations may have attained with respect to the execution of structural changes. Market and institutional reforms (.g. the stronghold of a sound fiscal and keeping money framework, the well-working of financial foundations and so forth offer incredible support to the nations in their exertion to keep an emergency. The effect of this variable is expected to be negative.

Taking into account a prior work, (Esquivel and Larrin 1998), we try to combine variables attempt to join together variables which speak to the primary forecasts of the in the first, the second and the third generation models. Variables 1-4 and 6-7are nearly connected with first-generation models. Variable 5 is s connected with first generation modified models. Variables 8 and 9 are associated with the third generation models. Fourth generation models in this analysis are present with their both variations in 6, 8 and 9 respectively.

We use as dependent variable the volatility that has been occurred between two successive months on the official rate against national currency rate or the dramatic foreign exchange reserves reduction or the extreme raise on bilateral interest premium between national currency and international one(in our case USD). The observational writing gives little direction as respects a for the most part acknowledged meaning of "currency crisis". Most of the studies allude to degrading as substantial, remarkable and rare or a set of little and rehashed episodes. Others use the weighted average of monthly depreciation compared to depreciation of the previous year. Given by Greek authors (Chionis and Liargovas, 2002) crisis is define as a crisis when the ostensible devaluation of the month to month normal conversion scale of national money against USD of no less than 10%, regardless of if this comes as consequence of a theoretical assault or not (Liargovas and Dapontas,2008) including by (Dapontas, 2012) an outside trade lessen or reinforce on respective interest spread over than 500 basis points or foreign exchange reserves under one quarter compared to previous month.

We have picked for this study to utilize the binary extreme value model as given by the Eviews™ statistics package. The extreme value model is developed in order to explain specific end goal to clarify spasmodic and non-stationary circumstances, such as disasters, crises and other turbulences. In fact when we use binary models it refers to incidents that 1 - the existences of the situation – is less than half per cent of the population. Especially, crises are unique facts and should be handled so.

The two situations are:

$$\Pr(y_i = 1 \,|\, x_i, \beta) \;=\; 1 - F(-x_i'\beta)$$
$$\Pr(y_i = 0 \,|\, x_i, \beta) \;=\; F(-x_i'\beta)$$

The possibility of crisis is given by:

$$E(y_i \,|\, x_i, \beta) \;=\; 1 \cdot \Pr(y_i = 1 \,|\, x_i, \beta) + 0 \cdot \Pr(y_i = 0 \,|\, x_i, \beta)$$
$$=\; \Pr(y_i = 1 \,|\, x_i, \beta).$$

This can be written as a regression process:

$$y_i \;=\; (1 - F(-x_i'\beta)) + \epsilon_i$$

Where extreme value estimator can make:

$$\Pr(y_i = 1 \,|\, x_i, \beta) \;=\; 1 - (1 - \exp(-e^{-x_i'\beta}))$$
$$=\; \exp(-e^{-x_i'\beta})$$

We are estimating a model with dependent binary variable the existence of crisis (1) or not in a month period, and a set of one month lagged independent variables. We selected one month lag through a preliminary on AIC and SBC criterion data analysis. The sample refers to Argentinian economy for a thirteen years period (Jan. 2002- Jan. 2014) serving both explaining and forecasting for January 2014 incident scope. We choose to cut the sample two months before the crisis incident and the model should forecast the next month's crisis and its following end. Possibility over 50% is a positive sign of existence of crisis. Under this framework we had 19 incidents. The explanatory results are presented on the table below.

Table no. 1 – Explanatory results under 5% significance

Variable	Coefficient	Std. Error
C	50.48548	21.77866
BALANCE	-0.00335	-0.00188
CRISIS_E	6.98716	0.32052
ECO_FREE	-0.40525	0.18585
EFF_RATE	-0.0698	-0.13413
FOR_EX	-0.00523	0.00024
GOLD_PRI	0.00213	0.00873
Oil_PRICE	0.26905	0.00959
M3	0.00063	0.00002
PRICE_LE	0.57546	0.02461
R^2	0.512	0.0317

As presented on Table 1, four variables were positive and important. The contagion of the European earlier crisis seem to explain the development and the enchase of the turbulence. The importance of the European economy as a trading partner for the country

reaches 20% of its external balance for 2013 Europe's debt crisis and global crunch had their effect on their partner. The oil price decline within last year in the international markets had positive effect on crisis development as expected. The role of Argentina as a major oil producer has been increased and attracted investments but the oil devaluation in the market proved within the last year was unbeatable. The money aggregate raise is positive and important even in the earliest first generation currency crises the most common and expected sign is the fiat money creation which happened in this case also giving motives for imported goods consumption rise. Price level raise has driven country to crisis through persistent inflation. The country has hyperinflation tradition driving all earlier crises was expected to develop the present one. None of the pasta Argentineans governments tried to boost the domestic consumption through development using moderate inflation. The speculative attacks exhausted international currency reserves and the imported goods tax worsen the situation the dollarized mentality of the Argentineans is known over the years reflecting currency drain of currency by hoarding dollars rather than any other asset in the crisis

On the contrary four more variables seem to be insignificant. Trade balance which was majorly blamed for the crisis is statistically unimportant. The trade of imported goods and the fear of 2001 crisis didn't express on the trade channel in favour of the foreign exchange market. This can explain the ineffectiveness of the imported goods taxation measures. Economic freedom is also inconsequent. The level of the liberation in the country due to nationalizations, taxation on foreign market on goods and stocks look to be low but it had no immediate set up on developing the turbulence under the political decisions. The volatility of Real Effective rate seems to be also inconsequential. The rise of the index is a known crisis sign but in this case turbulence was fuelled by others factors rather than REER. Finally contrast to oil price the gold price which failed during the pre-crisis period to the international markets joining the relatively level of gold reserves that central bank had on its disposal didn't interchange any gold as happened in 2001.
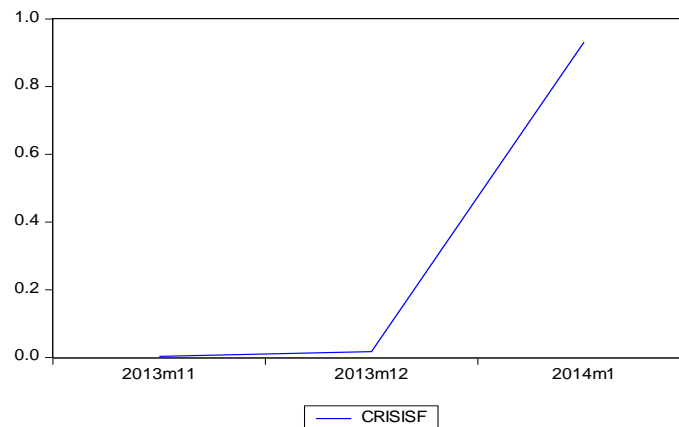

Figure no. 1 – The forecast for the Argentinian crisis (October 2013)

The forecast model as described above displayed on the following chart.

As seen on the probability of crisis raised sharply during the last month of 2013 making the forthcoming on the first weeks of 2014 crisis a certainty. Under this framework we can consider that the government had tine on its disposal if the forecast was made on time to

defend against the speculators and turn around its economic stability. During older generation models the one month time from tranquility to crisis was considered as very short. The latter sign that the authors had was two to three months. In fact the time that policy makers should had known by a positive signal that the incident was coming the time of occurrence was irrelevant. They had to form and deploy a remedy plan immediately and effectively.

5. CONCLUSIONS

Based on our research we presented the Argentinean (January 2014) peso incident with its major characteristics denoting that is another turbulence based mainly on the first generation crisis with additional contagion effects based on third generation. We can expect from a country giving a rich history on turbulences to have a tendency to bigger and more dangerous agitates in the future. Thus its policy makers should be more concerned about their decisions.

The crisis resolving though has a long underway and the devaluation was only the admission that monetary and fiscal policy failed and peso had already been robbed. If they intent that the nature of the crisis is domestic or it's a result of external influences. The analysis indicated clearly that the contagion channel probably from the American and European partners had crucial effect. Domestic demand declined even more and unfortunately Government didn't notice that peso is a fiat currency or it has to be taken as such. The Argentinean exchange rate market didn't take seriously the 2001-2 crisis in contrast to individuals and institutions which selected the US dollar safe port. The measures taken had also bad effect on CPI leaving consumers exposed to price raises on consumer goods. A prices control along with an accepted limit of inflation could be applied.

Capital flight blamed for the crisis didn't seem to have crucial role as happened 12 years earlier and government seem to be popular among voters. However the general rule of applying reforms can be applied and approved due to the forthcoming 2015 elections. A realistic reform plan which can be embraced. Its spread to the regional and global economy though seem to be limited.

As we have seen the velocity of a possible currency crisis raised from a typical two months signal to one. Although the phenomenon speed has been enchased compared to the recent references but its signal was clear enough to be forecasted. Compared to the European debt crisis we can denote that the reform need in the Argentinian case is larger than the European one but it's a matter of political and economic factors will to make the country an important partner for global economic markets.

On monetary policy markets and Argentinians should change their dollarized mentality of the past raising confidence to their national currency and their monetary model has to be based on industrialization process and jobs creating promoting downstream national products exports in order to prevent the country's falling back to external debt.

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