Financial crisis: Theory and Practice

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In the last 50 years, we have had approximately 40 events with characteristics related to financial crisis. The most severe crisis was in 1929, when the financial markets plummet and the US gross domestic product decline in more than 30 percent. Recently some years ago, a new crisis developed in the United States, but instantly caused consequences and effects in the rest of the world.

This new economic and financial crisis has increased the interest and motivation for the academic community, professors and researchers, to understand the causes and effects of the crisis, to learn from it. This is the one of the main reasons for the compilation of this book, which begins with a meeting of a group of IAFI researchers from the University of Barcelona, where researchers form Mexico and Spain, explain causes and consequences of the crisis of 2007.

For that reason, we believed this set of chapters related to methodologies, applications and theories, would conveniently explained the characteristics and events of the past and future financial crisis

This book consists in 3 main sections, the first one called “State of the Art and current situation”, the second named “Econometric applications to estimate crisis time periods”, and the third one “Solutions to diminish the effects of the crisis”. The first section explains the current point of view of many research papers related to financial crisis, it has 2 chapters. In the first one, it describe and analyzes the models that historically have been used to explain financial crisis, furthermore, it proposes to used alternative methodologies such as Fuzzy Cognitive Maps. On the other hand, Chapter 2, explains the characteristics and details of the 2007 crisis from the US perspective and its comparison to 1929 crisis, presenting some effects in Mexico and Latin America.
The second section presents two econometric applications to estimate possible crisis periods. For this matter, Chapter 3, studies 3 Latin-American countries: Argentina, Brazil and Peru in the 1994 crisis and estimates the multifractal characteristics to identify financial and economic distress.

Chapter 4 explains the crisis situations in Argentina (2001), Mexico (1994) and the recent one in the United States (2007) and its effects in other countries through a financial series methodology related to the stock market.

The last section shows an alternative to prevent the effects of the crisis. The first chapter explains the financial stability effects through the financial system regulation and some globalization standards. Chapter 6, study the benefits of the Investor activism and a way to protect personal and national wealth to face the financial crisis risks.
PART I

STATE OF THE ART AND CURRENT SITUATION
CHAPTER 1
ANALYSIS OF FINANCIAL CRISIS MODELS:
CAN SCIENCE EXPLAIN FINANCIAL CRISES WITH THE EXISTENT MODELS?

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Abstract: In order to analyze the models that have been used in the economic and financial history we can see how each model was adapted to its own context to explain the financial crisis of its moment. It is hard to think that the first, second and third generation models of financial crisis are capable to explain the present world financial crisis. In this paper we expound the reasons and propose an alternate methodology, as a part of the non conventional models, the Fuzzy Cognitive Maps could be a methodology to explain the present financial crisis.

Key Words: Financial Crisis Models, Mexico, Fuzzy Cognitive Maps.
1. Introduction

Which empiric models have tried to elucidate the financial crisis? Basically, the first, second and third generation models as well as the non conventional models are considered.

Financial crises are mainly derived by significant change in quantitative variables as well as in qualitative variables, Ozkan et al. (2008), Liu & Lindholm (2007), Protasi (2001), establish a list of indicators of financial crisis: current account deficit which begins to be a critical indicator when exceeds in 5% as a percentage of GDP (Gross Domestic Product), according to Liu & Lindholm (2007). Lacking flow of capital account to cover the current account deficit, or, must be covered by a decrease in net foreign assets. Foreign currency reserves are not sufficient to sustain the exchange rate, since generally a collapse in the outflows of capital comes from not being able to sustain the exchange rate. Interest paid on external debt may not be covered by the capital account. Increase in external debt as a percentage of GDP; GDP decline; Decrease in the rate of nominal Exchange term; and the index of real exchange rate. Weak financial regulation and high investor speculation. Each of these indicators has a threshold and to reach that threshold is when you can anticipate the emergence of a financial crisis, Liu & Lindholm (2007).

2. Financial Crisis Models

The analysis of models initiated since 1979, with the first generation models which explain the changeable financial crisis, as a predictable but inevitable event, derived from the inconsistency of fiscal policy with the exchange and monetary rate, that is to say the purpose of the
monetary authority is to preset a policy of fixed exchange rate, but simultaneously with the budget deficit.

The first generation models arise from imbalances in the public sector (balance of payments) caused by speculative and decline in international reserves, with the work of Paul Krugman (1979), based on the model from Kouri (1976) and the work of Salant & Hederson (1978). However, the Krugman (1979) model is subject to two important limitations, which he concludes: the model is based on a highly simplified macro-economic model; this means that the analysis of the factors from the balance of payments is incomplete. On the other hand, it is impossible to consider assuming only two assets to reflect the reality. In more realistic models the exchange rate would have to be stabilized with an open financial market. Flood & Garber (1984), Connolly & Taylor (1984), Sachs (1986), Wijnbergen (1988) y Dooley (2000), extend the work of Krugman (1979).

The synchrony between reality and the theoretic models from the first generation made think that the unique cause for exchange crises was the public deficit. However, the crises on the emerging countries have shown that the currency crises are related to the stock market crises. García (2005), performs an analysis of several empirical studies which rely on the first generation models, he says that these models have a better explanation for the crises prior to the nineties.

The second generation models of financial crisis appear in the mid-80’s, where expectations test the performance of the auto crisis, where a financial crisis may or may not occur.

Obstfeld (1986), author of the Basic model from the second generation, focuses on the relationship of expectations from the domestic agents on the decrease of the exchange rate, considers devaluation as a decision of the governments, indicating that the financial crisis may appear even if the fundamental variables are
favorable and there are no speculative assaults. Garber (1996), based on the Obstfeld (1986) model and Eichengreen, Rose, & Wyplosz (1996) add the speculative assaults identifying the foundations from the first generation models. Mishkin (1992), assures that one of the reasons of the financial crises is precisely the asymmetric information, being based on the fragility of the structure of debts that are used for speculation.

The third generation models arise after the financial crisis of East Asia and join the monetary crisis and the fragility of the financial sector and contagion from other countries. Valdés (1997), explains how the necessity of liquidity for investors drives to contagion effects. Kaminsky & Reinhart (1998), use contagion concepts: trade relations and direct trade competition between countries or indirectly in a third market. Eichengreen et al. (1996), Kaminsky & Reinhart (1998), demonstrate that growth of private and public credit are indicators of currency crisis, and state that the second generation models cannot be used to explain other financial crises where the trade balance is not an indicator of monetary crisis, as well as the first generation models.

Morris & Shin (1998) build a theoretical game model with asymmetric information about fundamentals of the speculators. Calvo (1998) attributes contagion to lack on financial market liquidity. Kodres & Pritsker (2002), argue that countries with a high degree of mobility in their assets shown with the assets of countries that are experiencing a financial crisis could be vulnerable to contagion via market relations. Forbes & Rigobon (2002), analyze the stock market during 1997 in Asia, 94 in Mexico and the 1987 crash of U.S. stock market, they define contagion as a substantial increase on correlation between stock market during instability.

Corsetti et al. (1999), consider an optimization model of intertemporal equilibrium of a situation of moral hazard (risk transfer),
and is exercised by the banking activity and firms operating under the presumption that they will be insured against contingencies.

Luiz de Mello et al. (2001), considers how exchange rate movements affect foreign debt portfolios, uses a dynamic panel model, the reason of exchange rate movements depends not only on this one, but as well on external debt. The work of Bakeart et. al (2002) and Lagunes & Watkins (2008) motivates Rodríguez, Cortez & Torres (2008) to create an analysis on the contagion effects, for the case of México 1994 as a not anticipated crisis to Argentina 1994, Argentina 2001 anticipated to México and United States 2007 anticipated to México july 2008.

Nevertheless, the analysis of financial crisis mentioned from the first, second and third generation cannot be used as early systems to identify financial crises; the results of these studies are diverse and remain a significant site for further investigation, Liu & Lindholm (2007).

3. Non Conventional Models of Financial Crisis

The episodes of the 90’s financial crisis have induced the development of models with a predictive value on an attempt to convey an empiric action which helps comprehend and clarify better these events; and in any case diminish the negative effects that it has on economy.

Protasi (2001) assures that a financial crisis is impossible to predict, but alert indicators can be built which will aid monitor if a country is heading for a financial crisis. Also, considers that there is a theoretical or practical limitation in attempting to predict a crisis, since it will have a set of parameters associated with variables, to be estimated with cross data and the success of the anticipation of a crisis depends on what are appropriate values for the parameters of the country. Many of the existing empirical studies have focused on modeling currency crisis and
early warning systems, using data sets from field through various economic techniques.

Amongst them, the work of Kaminisk & Reinhart (1998), who proposes an approach to the extraction of the signal, which refers often, as the indicator approach KLR, the preceding financial crisis is based on a probability model, Liu & Lindholm (2007). Alvarez-Plata & Schrooten (2004), Chowdhry & Goyal (2000) and Protasi (2001), are the authors of theoretical and empirical studies on early signal determining factors of financial crises. For a model to be considered as an effective indicator of a financial crisis it must be able to anticipate the crises which are produced out of the estimation period, Protasi (2001).

Kaminsky, Lizondo & Reinhart (KLR) monitor a great deal of monthly indicators which signal a financial crisis if they surpass certain warning limits. Current account deficit exceeds 5% of GDP; a lower level of reserves to three months of imports is alert status for a country. However, its low level of prediction results to be poor when the weighted indicator warns of a crisis in Asia, the probability of occurrence was 37%.

Berg & Patillo (1999) use a probity methodology and add other variables such as the level of current account, the M2 to reserves and the stock of short-term debt, inspired in the Asian crisis of 97.

On the other hand, Frankel & Rose (1996), estimate the crisis probability for a set of countries using similar basic indicators of KLR, but adding indicators of external liabilities. Sachs, Turnell and Velasco (1996) restrict their attention to cross-section data in 1995, analyzing the tequila effect; emphasizing the interactions between vulnerable banking systems, overrated exchange rates and low reserves level. Nonetheless, this model as the one from Frankel & Rose (1996) was statistically insignificant to explain the Asian crisis, according to Protasi (2001).

Although it came to predicting the crisis with a 50% of probability none of these models were capable of anticipating a timing in which
they were bound to happen, specifically with the Asia 1997 example, Ozkan et al. (2008).

The use of Logic Fuzzy with Clustering begins with Dunn (1973), Bezdek (1981), Kaufman & Rousseeuw (1990), Hathaway et al. (1989). Liu & Lindholm (2007) perform an analysis on visualizing early signals of monetary crisis. These authors stopped using the conventional models and examined if early signals could be found with a cluster method using fuzzy logic with a fuzzy exponent, on the monetary crisis of Finland in 1992. The fuzzy theory offers Liu & Lindholm (2007), the media to handle the inherent uncertainty in a great variety of tasks, especially when uncertainty is not a random result but the result of unknown factors and relations that are difficult to explain. In addition, they state that imprecise values can be treated as well as model non-linear relations.

With the Fuzzy clustering algorithm methodology, the use of Logic Fuzzy with Clustering, unlike the traditional use of clusters, is that the use of fuzzy logic makes possible the created sets and gives to each element a sense of belonging between each other, which makes it even more flexible.

Oskan et al. (2008) propose an analysis on monetary crisis based on the decision theory, using fuzzy logic using clusters with medium C-medias, based upon a decision source. It studies hidden behavior of market participants during crisis, and with this analysis creates catalogs to build an opinion based on an array of balance of payments. It includes data from the Turkish economy which covers two monetary crises.

On the other hand, publications using artificial neural networks were found, these classify the phases in which economies can be found; and, if there are indicative characteristics of a possible financial crisis (Oscar Pérez et. al, 2008). An important limitation of previous work is that in
financial crises a large number of interrelated qualitative and quantitative variables are involved.

This is why Fuzzy Cognitive Maps (FCM) appear to be a methodological tool which resolve the introduction of qualitative variables. The application of structured models from first, second and even third generation for financial crises is challenged by the lack of inclusion of qualitative variables or assumptions which determine each model; very few emerging as it was previously reviewed. Nonetheless, the models which include fuzzy logic may be a methodological tool, Ozkan (2007) that solves the relation and impact in each variable, as well as the introduction of qualitative variables, and the significance of their relationship.

Below is a summary where there are the principal authors of each model form the three generations of models of financial crisis and where we focus our approach as proposal, Fuzzy Cognitive Maps (FCM).

As, Liu & Lindholm (2006) and Ozkan (2007), argue that the inclusion of the fuzzy cognitive maps or fuzzy logic, offer tools which are able to deal with the inherent uncertainty in a great deal of variables, especially when uncertainty is not a random result but a result of unknown factors and relations that are difficult to explain. Rodríguez (2004), argues that the (FCM) are a methodology that solves the introduction of qualitative variables in a model; Rodríguez & Cortez (2008) also argue that the FCM appear to be a methodological tool which aids model financial crises for its huge amount of both quantitative and qualitative variables that are involved.

4. Fuzzy Cognitive Maps (FCM)

Close-up to the FCM as a method of financial crisis simulation
The most important change in the use of Cognitive Maps (CM) was given by Axelrod (1976) when he presented the first systematic study of the CM in political science and the theory of decision. This author proposed the use of the CM in the representation of the social scientific knowledge. This methodology was applied during the 80s and is still used in political science. Ten years after the work of Axelrod, Kosko (1986) introduced the blur, what supposes that events are not entirely true or false, this is, they are presented in certain degree Bojadziev and Bojadziev (2007). The contribution of Kosko (1986) led to what we name Fuzzy Cognitive Maps (FCM). The FCM are structures that help represent complex dynamic models. Their use extends to the fields of political science, medicine, economy, and meteorology, among others.

According to Kosko (1986) the FCM are fuzzy graphic structures that represent a causal reasoning. Their blur allows fuzzy degrees of causality among blurred concepts. Their graphic structure allows systematic causal propagations, in particular, chains (liaisons) backward and forward, which permits that the bases of knowledge grow through these connections. Each one of the concepts of the map will be a fuzzy set, so the denomination of the diagram is usually called FCM.

To build a FCM it is necessary to consider 3 stages: 1) the identification of the concepts, 2) the determination of the causal relations and finally 3) the dynamics of the map. Below, each one of them will be explained. In the first stage, the designer of the FCM proposes a nodes collection or concepts to a specific problem. This phase is vital since the inclusion or exclusion of variables could damage the future operation of the FCM. In the second stage, the matrix known as E and the graphic of the FCM are obtained, this is the relations (weights) of causality between the nodes that will intervene in the FCM.

The knowledge that the FCM are not supervised since the causal structure of the world is unknown. To obtain these relations, the designer
of the FCM must select between two possible forms. The first one refers to a subjective form and the second, through the construction of a neuronal artificial network (NAN) to obtain the weights of the nodes across the historical sequence of data.

If the subjective form is chosen, the knowledge will be easy to obtain through the opinion or questioning of specialists in the field under study. Each one of the specialists draws their causal graphics or BCMs, including or excluding the nodes that they believe will intervene in the study. A questionnaire of the influence of a concept versus another can be presented, offering various blurred alternatives, represented symbolically, that will be translated, after, to numeric values associated to the connections.

On the other hand, if the designer of the FCM has no idea of the weights, a NAN to obtain the weights between the nodes could be implemented.

The NAN is similar to the Hopfield one, but the difference resides in the employment of a different learning algorithm known as hebbian differencial algorithm, Kosko (1986) and Kosko (1997).

In the third stage, the threshold function is selected and the dynamics of the map is obtained. The matrix \( E \) is a matrix that can be stimulated through the entrance vectors, which can be done through the multiplication of the vector-matrix. The above can be expressed as follows: 

\[
E = (e_{i,j})_{i=1, j=n} \quad \text{Matrix of causal arches,}\quad \widetilde{C}(t) = C_1(t), C_2(t),..., C_n(t) : \quad \text{Ordered list of records. What happens if…?} \text{ They are questions in discrete time } t, \quad \widetilde{C} \circ E = \sum \widetilde{C} E^i \text{ Refers to an ordered list of consequences. This means that the FCM turns into a dynamic computer system of questions “What if I turn the node i on?” and the answers through the operation of the product, until going up to an equilibrium in longitudinal limit cycles}.
\]
terms \( q=1,2,...,m \). Where \( m \) is the number of repetitions of the exit vector (consequences).

Going further on this methodology, see, Rodriguez and Cortez (2008) where they build a FCM applied to the financial crisis of Mexico of 1994 through expert hypothesis, this is, in a subjective manner. The results obtained correspond to the presentation of a method that helps relate qualitative and quantitative variables. The above could be applied not only to the economic field, as it was done here, but to any investigation field. In the article, a set of variables and relations obtained through economic articles of the time are proposed.

Adding the hypothesis (assumption) the authors observe that the excessive over-valuation gets to augment the risk of the country, decreases trust and lowers credibility to the leaders, so the international reserves are diminished, causing the financial crisis. All of these, in a model where adjustment politics do not influence, makes the economy evolve to a point of economic crisis. The procurement of weights through data patterns would be missing to considerate, since it would be a more reliable way to capture the reality, for this, NAN and diverse auto-adjustment mechanisms of weights could be considered, to ponder the non-linear dynamics of the reality of the financial crisis.

**Conclusions**

The problematic of a financial crisis is extremely complex, where a numberless quantity of financial, economic, social, ethical, technological and human behavior factors intervene and affect in the financial operations. It is not feasible to consider a traditional model that could explain the financial crisis, since every context is unique and unrepeatable.
When the analysis of the models of financial crisis are conceived, the current investigation is an effort to propose a methodology of advanced investigation, that uses blurred logic, construction of Fuzzy Cognitive Maps (FCM). The use of FCM will allow the inclusion of qualitative variables in the model, like speculation or financial regulation.

With the FCM, a systematic process based in fuzzy logic to the principal causes of the financial crisis will be sought to emulate. It cannot be forgotten that a proposal on FCM that shows a simple evolution (but true) and that resembles reality is given. This FCM can be the beginning to more sophisticated FCM. Like investigation lines, it is proposed to simulate a more complex reality of the crisis through data patterns and weights updates.

References


Abstract: This academic paper presents the international crisis not as a cause but as a consequence of the economic and financial characteristics of the people, companies, and public policies and habits of the US and other countries. We present some of the facts of the US country as saving rates, debt, and other factors that help us understand this crisis and to be able to understand the size compared to other crises in other countries or other crises before, such as the 1929 crisis.

We also present the perspective of Mexico and Latin America countries and their characteristics, such as economic indexes and growth in the last 20 years. We also mentioned our dependency to US economy and our disadvantage of not taking opportunities in Asia as a growing economy.

Keywords: crisis, Latin crisis, economic dependency, saving rates.
1. Introduction

The World “crisis” comes from latin roots” crisis” that has, according to Real Spanish Language Academy (RAE, 2009) several meanings such as:

1. Decisive moment in a serious business and of difficult and important consequences.
2. Scarceness, famine.
3. Difficult or complex situation.

In the particular case in the economic-financial situation that the World is living nowadays, including Latin-American countries, fulfills the definition according to the situation and circumstances we are all living in.

The difference in this recent crisis compared to the past crisis, is the development and interaction of the countries, commercial bridges that have been built between them, and the technological advance, in particular of the so called “4th power”, the power of the media, the mass media.

As it has extensively been in the media, this crisis situation, particularly the “subprime mortgage” (low quality home mortgages) was where it all started, practically it ignited the international financial crisis, but analyzing a bit further, this subprime crisis was not the cause but one of the consequences that we will probably have to pay. This was the tip of the iceberg, because, it led us analyze the weakness in the financial and economic policies in terms of consumption and saving from the personal levels to companies and governments, and because of these, the effects of the recession in
the US and the financial epidemic actions in all other countries, will have us re-think the consumption habits and income-outcome policies in this 3 economic agents.

It is a Fact, that one of the main difference with other crisis, like the Mexican “ the Tequila effect “ in 1994, or the “ Samba effect” in Brazil a, is that this last one, originated in US, will be bleeper in its effects, ( recession and unemployment ) and more difficult to predict in its length. The dimensions and consequences of this crisis have been compared to the crisis in 1929, the great depression, due to the next issues:

- Rescue Funds to financial institutions and Industry.
- Demand and debt levels in the US vs World levels.
- Internacional interdependence and financial instruments exhange.
- Unemployment levels and interest rates.
- Decrease in Stock Markets indexes of the most important markets in the World.

As we say here in Mexico, the one who does not know its history, it is deemed to repeat it “, thus why we will see some facts in history that we would try to link to the present situation.

In several digital media, it was shown the thought presented below, by Thomas Jefferson:

“I believe that banking institutions are more dangerous to our liberties than standing armies. If the American people ever allow private banks to control the issue of their currency, first by inflation, then by deflation, the banks and corporations that will grow up around the banks will deprive
the people of all property until their children wake-up homeless on the continent their fathers conquered. “**THOMAS JEFFERSON, 1802.**

This phrase written in 1802 that could be presented as a premonition, it should be analyzed to the detail, because it points out the weakness and strengths of the financial system and the interaction with the World economy.

Milton Friedman reminds us that the capitalism system is not only based in profit but on losses too, and this tells us that economic cycles have been throughout the history of all countries and world economy.

Furthermore, we should ask ourselves the question: is this crisis a cause or the consequence of a wrong political and economical policy thru the years? is the subprime crisis, was it the root of the crisis of better yet, the first of a series of financial events such as card credit crisis, productivity crisis, and many more to see?

Meditating about these thought, we continue our study, with the “**Dow Jones Industrial Average**“ and its path since 1905.

I want to point out 2 things: 1) the 1929 drop, was approximately 90% and the other drop cause by the international turbulence was about 35% to 40% depending in the time period of the comparisons and 2) the recovery time in years for the index to be in the same level it started before the crisis, in 1929, it took the US about 18 to 20 years, and the scene in 2009, is that many countries including the US, will be out of the crisis path this year, at the most. This will be about 2 to 3 years recovery for this crisis to have the same stock index levels, of course, with different level of government support.

Other comparative data to measure the effect of the crisis, is that in this particular case, and to the contrary of what we are used to as latinoamericans, is that the origin of this crisis is with the US, and with turbulence in the financial, housing and banking industry. Some data to analyze is:
- US Male Consumer Age average: 41 years old, Female: 39 years old.
- Joint Annual Income: $67,300 US Dlls
- Basically 2 important assets:
  - House (Mortgage)
  - 401K (Retirement Account)
- Everything else, based on credit.
- 5% of the world population.
- 30% of the world production.
- 40% of Global Consumption (Demand).
- Gross Domestic Product (GDP) US$13.8 trillions

These facts give us a reference frame of the consumption and participation of the US in the World Economy and the effect that cause any country that will have commercial trading with it, particularly the case of Mexico.

Everything started in the year 2001 thru 2004, where the real interest rates started to be negative, and the excess of money and investments were reflected in the real state industry, creating excess liquidity in this investment segment, and a general increase (bubble) in prices and quantities in real state transactions.

Further on, this increase in the housing bubble and the real estate market, reflects its increase in terms of pricing and quantity, that reached its peaked in 2005 with the subprime crisis, that captured all that excess of investments and the so called bubble market, that lasted with a bull trend with at least 20 years. This peak was an adjustment in price valuation of the housing investment.

As it can be analyzed in the above graph, the volume of the new houses as well as the used ones diminish considerably, reflecting differences in pricing up to 25% in the year 2009. This was consider a
correction in the housing market after the housing bubble many years ago.

Here in this housing market, started a generalized confusion between terms of price, value, and risk, primarily in houses, then company stocks, and many other financial assets. Risk started to create panic threatening the continuing and normal operation of the financial services and investments.

On the other hand, since a couple decades ago, the saving rate in the regular US Citizen, was diminishing in critical levels. These conditions have very difficult and important consequences, because any variation in the interest rates or prices in goods or services, or thru inflation, would have a direct impact in the family’s budget, and this would affect their spending habits as well as their demand in products or services such as restaurant, automotive, or appliances. The mentioned industries started to show weak signals in growth and their financial structures.

The US average family income, has not grown in the last years, and this makes the US family’s economic situation more difficult and not very flexible in this crisis situation.

The federal reserve strategy of lowering the interest rates as an instrument to activate the economy thru credit, started to create a very important pressure in the country inflation and the consumption in the country.

On the side of US Federal resources, a public deficit, and a trading deficit had been growing. This complicates the economic situation and its flexibility in the short term and in the long run.

Furthermore, the US had financial and economic difficulties, that would had an impact in many countries in the whole world. It hard to think of any country in the world that would not be affected of this adverse economic and financial environment.
The magnitude of this economical impact that each country will face, will be depending of the funds exchange, money transactions, as well as good and service transactions with the US and other countries. In the Mexican Case and latinamerica, is it very important that we analyze the impact taking into the account this arguments and the level of interaction in the US economy, a developed economy.

2. The Economic And Financial Impact In Mexico

The first thing it came to our mind, when we first heard about the US Crisis, was the last Mexican crisis not so long ago, at least so it seemed, the “tequila“ crisis in 1994. This was refreshing our memory with a clear conscious that it was not a crisis created with in the country, a thing we were not very used to. The Secretary of Hacienda was mentioning in the media, that if the US was coughing, Mexico was not going to get pneumonia, like many other times happened. This time was different, or at least so he said.

He was right in a sense, Mexico as a country, was in a different and more robust economic position as it was 10 years ago.

The graph below shows that Mexico as a country had done its homework and it was ready for some international financial turbulence.
Table 3.1 Indicators. Source: Citi

The index is a ranking of internal and external cyclical and structural measures: inflation, fiscal balances, public debt-to-GDP ratios, current account balances, net international reserves to short term debt, trade as a share of GDP and foreign direct investment as a share of GDP. For each indicator we split the range between the minimum and maximum into ten levels, assigning numbers from -5 to +5, with the negative number associated with more international exposure or a greater vulnerability. The numbers are summed to give the overall vulnerability index.

The Mexican Economic position as it can be seen in the graph, in terms of Consumer price index, Public debt, Fiscal Balance, Current Account, Foreign Direct Investment, and Reserves it is a complete different story ten years ago.

The “official government“ position, as many financial analysts agreed, was a very difficult one, difficult to forecast the depth of the consequences and how long it would take us to recovery again positive GDP for the country.

It is still a reality that our main sources of incomes as a country were at risk with many thoughts:
- Oil Sales, up to 40% of fiscal budget, Oil Prices have gone below 50 dlls;
- Inmigrants Sending Money have decreased up to 12 %;
- Manufacturing exports reduced for the first time in 20 years. 85 % of export to the US, mostly automotive.
- Tourism and foreign investments are paralyzed by circumstances.
- Unemployment levels increasing.

From the inside to the outside, the situation looks very difficult. The main index in the stock market the IPC (indice de precios y cotizaciones) went down 33% to around 18,000 points, after being some months in the ceiling of 32,000 points.

What was the question we had to do as financial authors? What was really the point of this crisis, in our hopeful way to a developing country? These questions made us look back a little bit in the history of the country.

Was not the international crisis nor the crisis before but the structural measures such as devaluation and the loss of purchasing power during the last 20 years. These facts, along with the lack of good level of growth, seemed that the country had not reached its full potential. That this made the poor base society more vulnerable to economic changes and that the last crisis, the “tequila” crisis created around 10 more million poor people. Our levels of poor people in the country were reaching about 45 million people of a 105 million population in the country. Our dependency in oil prices, our dependency in the US as an export destiny, and the close to dying maquiladora program, set us up in a tough position. We had not gone forward with the reform for Oil Refinery, the taxing reform, the education reform, the business creating reform, many things and changes the country needed in order to expand to its potential. The optimal economic growth or the country should be around 5%, in order to fulfill employment rates as well as growth in our domestic market.

Just to mention an example, in the Oil issue, the country congress and our politicians have not come to an agreement to produce economic valued added and not export the oil as a mere product, and this is causing us to import gasoline as a country. In fact, in 2010, we are facing increased prices in gasoline products due to the price in the
commodity in the international arena, but this far from being competitive, in our economic situation, facing a financial shock in public finances, will be hard and will hit poverty more than it has so far.

The loss of purchasing power due to inflation and lack of economic growth, was like a machine creating poor people and polarizing the economy even more. We have to understand this, and understand it well. There are no magic formulas. Hard Work, discipline, patience, education, are values that had to be taken again by the public and the government.

The international crisis caused a deeper view in our strategy as a country and as companies. It has caused to rethink again the root or causes of our situation, and our possible consequences or impact in the future.

How we base our economy, and give added value internally and internationally, will mark our financial and economic position in the future.

3. New opportunities in China, our dependency with United States of America

As a weakness more than a strength, in this crisis period of time, stands out, the dependency that not only Mexico but Latinoamerica has with United States in their regular and common trade.

Mexico has probably 50 to 60% of all the imports and exports to and from the United States, and this dependency has affected Mexico in many industries for the time from 2007 to 2010. It is fair to say, that all the amount of imports and exports to and from Latin-American countries have experiences and increase in amount and its percentage.
As many financial analysts, politicians and government officials have mentioned, our commercial trade with China are very low and have room to grow. Not only in terms of imports but in exports to China.

Conclusions

The final thoughts for all these topics mentioned, would be that this crisis that was generated in the United States, as less a cause, and more of a consequences, or the economic systematic systems and habits of the financial system. The difference and recovery time for every country or every company, will be stated in function of its financial habits and saving rates. If a company was highlyy leverage, will be having problems of liquity, and its administration.

References


PART II

ECONOMETRIC APPLICATIONS TO ESTIMATE CRISIS TIME PERIODS
CHAPTER 3

ANTICIPATING TURBULENT PERIODS IN LATIN AMERICAN EMERGING MARKETS: THE MEXICAN CRISIS OF 1994

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Abstract: Some Latin American markets have been seriously affected by the episodes of financial crises during the last 15 years. One way of dealing with crises is to find mechanisms and policies that may be implemented in order to prevent or face this type of episodes. However, one could also try to characterize and anticipate periods of turbulence in emerging capital markets through historical technical analysis. In this work one does the later by studying the multifractal properties of three Latin American emerging markets around the Mexican crisis of 1994: Argentina, Brazil and Peru. The analysis of returns is made through its singularity spectrum during the period 1989-2000. By using a crisis-switching indicator with an empirical threshold, one shows that sudden changes in one version of the sequence of Holder exponents preceded turbulent periods with about sixty days of anticipation.
Keywords: Financial crisis, multifractal analysis.

1. Introduction

The search of a suitable model for price variations is a common subject in financial engineering. Along the years different suggestions have been made from the first and most known Brownian and Lévy diffusion representations, and the GARCH family, to stochastic volatility models. In this work, one follows the multifractal approach of price variations.

The reason is that even though some of these models capture a good part of the basic price variation properties, like i) lack of return correlations; ii) turbulent periods; iii) fat and asymmetric tails of returns pdf; iv) returns pdf variation across scales; and v) log normal volatility; recent findings Ausloos et al., Brachet (1999) and Sornette Zhou (2006) suggest that there is another feature of price change phenomena that is not incorporated in these models: multi-scaling of the return partition functions.

Based on these findings, works by Agaev and Kuperin (2004), Los and Yalamova (2004), Lovejoy and Schertzer (2002), and Muzy et al. (2000) have proposed some alternatives to interpret multifractal patterns in financial time series around turbulent periods by means of visual induction on the behavior of Hölder exponents. In the first two cases this is accomplished by the wavelet-based approach and in the second by the analysis of local Hölder exponents related to a previously established threshold.

This work follows the suggestions in the above paragraph, and goes one step further by presenting a crisis-switching indicator (CSI) based on the path of minimum Hölder exponents at each time period. By doing this exercise the objective is to show that there is a pattern preceding turbulent periods using some indicators, and not only by
means of visual induction. Other difference between this approach and the former is the use of the moment method in singularity spectrum construction based on box-counting computations.

The reason is that even when this calculation has some disadvantages, it is faster to compute than wavelet methods Muzy et al. (2000) and Sornette and Zhou (2006). The remainder part of this work is divided as follows: in the second section one discusses the story of turbulence analysis and multifractal processes showing the links between mono- and multifractal processes. The third section deals with basic multifractal formalism and introduces the crisis-switching indicator proposed for crisis anticipation. In the fourth section one discusses the empirical results for the Argentinean (MERVAL), Brazilian (IBOVESPA) and Peruvian (IGBVL) markets. The last section concludes the work.

2. Turbulence and Multifractal Formalism

The origins of multifractal theory can be traced back to the works of Kolmogorov (1941a), (1941b) and Mandelbrot (1967) (1972), (1975) and (1997). Under conditions of fully developed turbulence, variables such as the velocity or the local dissipation of energy vary sharply from one location to another and cannot be regarded as deterministic quantities but as random ones.

Let, for instance, \( \varepsilon(\delta, t) \) be the local dissipation of energy at the point \( t \) over a neighborhood of radius \( \delta \). Kolmogorov’s intuition was that the energy is transmitted from the larger scales \( (\Lambda) \) to the smaller ones \( (\delta) \) by means of a injection process defined by a variable \( \eta_{\delta, \Lambda} \) which in fact only depends on the ratio \( \delta / \Lambda \), as

\[
(1) \quad \varepsilon(\delta, t) = \eta_{\delta, \Lambda} \varepsilon(\Lambda, t)
\]
In Kolmogorov’s work the energy injection variable $\eta_{\delta, \Delta}$ has a fixed value, $\eta_{\delta, \Delta} = \left( \frac{\delta}{\Delta} \right)^{-\alpha}$, from which it can immediately deduced that the order $q$ moments of $\varepsilon(\delta, t)$ can be related with those of $\varepsilon(\Delta, t)$ in a very simple way, namely

$$
\langle \varepsilon(\delta, t)^q \rangle = \left( \frac{\delta}{\Delta} \right)^{-q\alpha} \langle \varepsilon(\Delta, t)^q \rangle \propto \delta^{-q\alpha}
$$

All the dependence in equation (1) of the order-$q$ moment is concentrated in the power law $\delta^{-q\alpha}$, what is similar to what experimental measures show, namely:

$$
\langle \varepsilon(\delta, t)^q \rangle \propto \delta^{\tau(q)}
$$

a property which is known as self-similarity. Unfortunately, the exponents $\tau(q)$ obtained in the experiments have not a linear dependence on $q$ in opposition to the usual linear scaling. To describe this “anomalous scaling” Kolmogorov’s decomposition can still be applied but now $\eta_{\delta, \Delta}$ in equation (1) has to be interpreted as a random variable, independent of $\Delta$. The property of self-similarity led researchers to propose a model for its generation based on the existence of local scale-invariant laws. First, it is assumed that at any point $t$ the following equation holds:

$$
\varepsilon(\delta, t) \propto \delta^{\alpha_t}
$$

That is, all the dependency on the scale parameter $\delta$ is conveyed
by the power law factor \(\delta^\alpha\). The exponent \(\alpha\), which is a function of the point \(t\) under study, is called the singularity exponent of the point. Then, the singularity exponents can be arranged in special sets called singularity components \(F_\alpha\), which are defined as:

\[(4) \quad F_\alpha = \{t : \alpha = \alpha\}\]

In order to close the model, it is required that the singularity components are of fractal character. The singularity spectrum associated to the multifractal hierarchy of fractal components is the function \(f(\alpha)\) defined by the Hausdorff dimension \(\dim_H\) of each component \(F_\alpha\), namely:

\[(5) \quad f(\alpha) = \dim_H F_\alpha\]

Following Parisi and Frisch (1985) it is possible to derive a relationship between self-similarity exponents \(\tau(q)\) and the singularity spectrum \(f(\alpha)\). They proved that the self-similar exponents \(\tau(q)\) could be computed from the Legendre transform of the singularity spectrum \(f(\alpha)\):

\[(6) \quad \tau(q) = \inf_\alpha \{aq + d - f(\alpha)\}\]

By means of equation (6) it is evident that the singularity spectrum contains all the information about self-similarity, that is, it describes the statistics of changes in scale.

The basic hypothesis sustained in this work is that the MERVAL, IBOVESPA and IGBVL markets returns' signals are multifractal, meaning
that multi-scaling of returns helps to describe real data in a better way than in a regular monofractal way. This means that the sequence \( \tau(q) \) describes the scaling behavior of returns absolute moments:

\[
\chi(\delta, q) = \sum_t v(\delta,t)^q \propto \delta^{\tau(q)}
\]

In the same sense as equation (2), and with

\[
v(\delta,t) = \frac{|r(\delta,t)|}{\sum_t |r(\delta,t)|}
\]

Being the normalized version of returns \( r(\delta,t) = \ln P(\delta,t + 1) - \ln P(\delta,t) \) over a time horizon or distance \( \delta \), and \( q \) the return moment.

An intuitive interpretation of multifractals in time series analysis consists in thinking of them as a generalization of monofractal models, such as the well-known ordinary Brownian motion, with the difference that in the former case heterogeneity behavior across time is allowed. This of course, has the advantage of avoiding unrealistic long memory assumptions of monofractals and shows a well characterization of fat tail behavior. Figure 1 shows a comparison between returns modeled from an ordinary Brownian motion and the realization of returns in the NYSE\(^1\).

3. Methodology

In this section one discusses a moving average-based crisis-switching indicator.

3.2. Crisis-Switching Indicator

\(^1\) All figures and tables are own elaboration unless stated otherwise.
One alternative to analyze the variation of the former multifractal characterization consists on estimating the singularity spectrum performing a rolling window in a time interval $[t_0, t_1]$. In this sense, one would obtain a series of $F^{[j, j+w]}_\alpha$ sets computed in subintervals: $[j, j+w]$, $j \in [t_0, t_1 - w]$. The minimum value for each set can be computed as

$$\alpha_i = \min \{ F^{[j, j+w]}_\alpha \}.$$  

(8)

Considering a rolling window $[j, j+w]$ such that there is a unique $\alpha_i$ for each time $t$ and a trajectory $\alpha_i$ is constructed for minimum values only. A smooth version of the previous $\alpha_i$ is achieved by means of a moving average estimator $\hat{\alpha}_i$. This leads to an error function of

$$\xi_i = \alpha_i - \hat{\alpha}_i.$$  

(9)

Which is bounded by confidence bands defined as the local maximum (upper bound $\xi^u_i$) and local minimum (lower bound $\xi^l_i$) of previous errors, defining a set of crossing times constructed by the union $\psi = \psi^u \cup \psi^l$ with

$$\psi^u = \left\{ t : \alpha_i \geq \xi^u_i \right\}$$

$$\psi^l = \left\{ t : \alpha_i \leq \xi^l_i \right\}$$

(10)

Where $\psi$ recovers all periods that cross the bands.
Now let $\psi(m)$ be the m-th element of $\psi$, and $M$ be the number of crossing times. Then crossing lines are defined as the set of pairs

\begin{equation}
L^{dc} = \{(\psi(m), \psi(m+n)) : \psi(m) \in \psi^u, \psi(m+n) \in \psi^d\}, \text{ and}
\end{equation}

\begin{equation}
L^{uc} = \{(\psi(m), \psi(m+n)) : \psi(m) \in \psi^d, \psi(m+n) \in \psi^u\}
\end{equation}

With $0 < m \leq M; m + n \leq M$ such that each element in the first set ($L^{dc}$) is called a down-crossing line if $n = 1$, and a pendular movement of a down crossing line if $n > 1$. A similar reasoning applies for the second set ($L^{uc}$), where each element is an up-crossing line if $n = 1$, and a pendular movement of an up crossing line if $n > 1$. Figure 2 shows an example of how crossing lines may actually look like.

Under a turbulence anticipation context crossing lines and pendular movements are used as crisis-switching indicators for the coming of a crisis. However it is important to mention that the time delay from this point to the development of the crisis may be a rather tricky issue to anticipate. This and other estimation facts will be discussed in the next section.

4. Empirical Results

In this section local multifractal analysis (LMA) and the crisis switching indicator (CSI) based on it are tested for the stock markets indexes of three Latin American emerging markets: MERVAL (Argentina), IBOVESPA (Brazil) and IGBVL (Peru) around the Mexican crisis. Table 5.1 shows the data considered for each case divided in two periods.

For each one of the three indexes 2600 data points were used. The pre-crisis period took the first 1100 observations, while the crisis
period used the next 1500 ones. Log versions of time series and its returns were studied for the crisis period. Typical behavior of financial time series such as volatility clustering and fat tails of return’s distribution was found for all three series (see figures 5.3, 5.4 and 5.5). One also verified other properties that usually are harder to analyze such as log normal volatility, absence of returns correlations, and scale variant distribution of returns.

<table>
<thead>
<tr>
<th>Index</th>
<th>Pre-crisis</th>
<th>Crisis Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>MERVAL</td>
<td>10/19/89 - 04/06/94</td>
<td>04/07/94 - 03/31/00</td>
</tr>
<tr>
<td>IBOVESPA</td>
<td>01/02/89 - 07/05/93</td>
<td>07/06/93 - 08/02/99</td>
</tr>
<tr>
<td>IGBVL</td>
<td>01/30/87 - 06/27/91</td>
<td>06/28/91 - 07/01/97</td>
</tr>
</tbody>
</table>

Table 5.1 Periods of analysis

Due to the lack of homogeneous time intervals, the Mexican crisis is manifested at different data points according to the selected time series. Table 5.2 summarizes the most important dates and data points for all indexes. It shows two periods for the contagious beginning, one for MERVAL and IBOVESPA (12/21/94), and other for IGBVL (01/09/95), but clearly one highest peak time in 01/10/95. That is a one day reaction delay for the contagious of Argentinean and Brazilian markets, and a reaction of the Peruvian one almost conditioned to the first two crashes.

<table>
<thead>
<tr>
<th>Index</th>
<th>Dates</th>
<th>Data Points</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Contagious</td>
<td>Peak</td>
</tr>
<tr>
<td>MERVAL</td>
<td>12/21/94</td>
<td>01/10/95</td>
</tr>
<tr>
<td>IBOVESPA</td>
<td>12/21/94</td>
<td>01/10/95</td>
</tr>
<tr>
<td>IGBVL</td>
<td>01/09/95</td>
<td>01/10/95</td>
</tr>
</tbody>
</table>

Table 5.2: Most important days of the Mexican crisis

4.1. Multifractal Local Analysis of Stock Markets
Singularity spectrums (SE) are plotted considering all observations for the three indexes in figure 5.6 [5.4 and 5.6]. A first inspection reveals that MERVAL and IBOVESPA systems may have similar behavior, with a little more frequency of small anomalies in the later case showed by the right tail of its parable. On the other hand, the IGBVL case seems to have much more entropy signs through smaller and bigger anomalies, which are probably caused by its pre-crisis period of rather chaotic economic management when compared with the other two indexes.

Local multifractal analysis (LMA) is made by studying changes over time of local singularity spectrums (LSE) for a given time interval. LSE are computed in all indexes for the crisis period using rolling windows of size 1100, so the first computation in the crisis period is done using all the observations of the pre-crisis period.

A first approach of the potential changes of LSE can be made by plotting them in the pre-crisis period and in the complete data set. Figure 7 shows these computations and suggest a clockwise motion in the three cases when the crisis period is added. So apparently, when a crisis appears the importance of small anomalies relative to the big ones gain more importance for the process. This means that negative moments ($\mu_q$) in equation (11) are becoming more important than positive ones, so while the right tail of the parable gets longer, the left one gets shorter.

4.2. Patterns around Stock Market Crashes

In order to establish some homogenous pattern around stock market crashes, five basic indicators concerning Holder exponents were collected from each LSE in the crisis period: minimum, maximum, mean, mode, standard deviation and the one corresponding to the information dimension. These calculations are managed in the usual way in all cases except for the mean and standard deviation indicators.
Following Los and Yalamova [9], in both cases a normalized version is computed by weighting the Hölder exponents \( H \) by their fractal dimension \( f(H) \).

Figures 5.8, 5.9, 5.10, 5.11, 5.12 and 5.13 show trajectories for some of the indicators mentioned above, letting one suspects of a jump pattern in the minimum series accompanied by an incremental erratic behavior of the maximum series. This finding verifies the adequacy of the crisis-switching indicator selected, which basically detects sudden changes in the minimum path \( H \).

The crisis-switching indicator explained before is tested for the three indexes in figures 5.14, 5.15, and 5.16. In all cases moving average estimations and bands construction were made considering parameters \( t_1 \) and \( t_0 = t - 100 \) for the crisis period only. CSI empirical results show that it only activates for up crossing lines.

As mentioned in the previous section, even though there is a crossing line pattern before turbulence periods, it is rather difficult to establish a common time delay between the crossing day (the day were the CSI is activated), and the crisis or the climax days. Table 3 summarizes some results concerning CSI estimations.

<table>
<thead>
<tr>
<th>Index</th>
<th>Crossing Date</th>
<th>Crossing Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>MERVAL</td>
<td>09/05/94</td>
<td>104</td>
</tr>
<tr>
<td>IBOVESPA</td>
<td>09/20/94</td>
<td>302</td>
</tr>
<tr>
<td>IGBVL</td>
<td>01/03/95</td>
<td>874</td>
</tr>
</tbody>
</table>

Table 5.3: CSI Empirical Results
So it seems that for the Mexican crisis of 12/20/94, one could actually anticipate the stock market crashes in Argentina (MERVAL), Brazil (IBOVESPA) and Peru (IGBVL). In the first two cases about three months before it happened, and for the later just a few days in advance. Of course this leads to a very important question about the optimal waiting time for a crisis to happen after the CSI is activated, with a not clear-cut answer. The empirical test of the CSI trough a more extend period where dragon and vodka effects are taking into account suggest that the maximum waiting time one should consider is 95 data points, that is in between three and four months.

Conclusions

It has been showed that patterns in the so-called multifractal path of the minimum ($H$) apparently existed around the Mexican crisis of 1994 in the Argentinean (MERVAL), Brazilian (IBOVESPA), and Peruvian (IGBVL) markets. It has also been showed that such patterns are expressed under the form of sudden changes in the $H$ trajectory, and that such changes can be captured in a formal way by means of a crisis-switching indicator with about 60 data points in advance.

However, there are many tasks to accomplish before being able to establish the possibility of turbulence anticipation by means of multifractal analysis. For instance, it is not clear why there is not pendular movements in IBOVESPA, when they are present in MERVAL and IGBVL. The same happens for the need of a more profound analysis of the optimal waiting time before a market crash takes effect.

References


Figures

Figure 5.1: Monofractal Model. The figure above shows IGBVL realized returns. The one below shows a Gaussian process with the same mean and variance as realized IGBVL returns.
Figure 5.2: CSI Crossing Lines. Arrows A-B, C-D, D-E and F-G represent up (blue) and down (red) crossing lines. Simple discontinuous lines show pendular movements of a up-crossing line (blue), or pendular movements of a down-crossing line (red). Plus lines represent confidence bands.

Figure 5.3: MERVAL Natural Logarithm and Returns. The time series are plotted for the period: 04/07/94 - 03/31/00.
Figure 5.4: IBOVESPA Natural Logarithm and Returns. The time series are plotted for the period: 07/05/93 - 07/30/99.

Figure 5.5: IGBVL Natural Logarithm and Returns. The time series are
plotted for the period: 06/28/91 - 07/01/97.

Figure 5.6: Singularity Spectrums. The graphic on the left shows MERVAL and IBOVESPA singularity spectrums (SEs). The one on the right does the same for IGBVL.
Figure 5.7: Singularity Spectrum Clock Wise Motion. The graphic shows MERVAL, IBOVESPA and IGBVL spectrums clock wise motion from a pre-crisis period (SE 0) to a post-crisis period (SE 1).
Figure 5.8: MERVAL multifractal Paths (a). The graphic shows the evolution of the maximum (Max H), minimum (Min H), and information (Inf H) Hölder exponents deduced in MLA. The jump in Min H around observation 170 represents the tequila crisis.
Figure 5.9: MERVAL multifractal Paths (b). The graphic shows the evolution of the mean (H Mean) and standard deviation (H Std) of Hölder exponents deduced in MLA.

Figure 5.10: IBOVESPA multifractal Paths (a). The graphic shows the evolution of the maximum (Max H), minimum (Min H), and information (Inf H) Hölder exponents deduced in MLA. The jump in Min H around observation 300 represents the tequila crisis.
Figure 5.11: IBOVESPA multifractal Paths (b). The graphic shows the evolution of the mean (H Mean) and standard deviation (H Std) of Hölder exponents deduced in MLA.

Figure 5.12: IGBVL multifractal Paths (a). The graphic shows the evolution
of the maximum (Max H), minimum (Min H), and information (Inf H) Hölder exponents deduced in MLA. The jump in Min H around observation 860 represents the tequila crisis.

Figure 5.13: IGBVL multifractal Paths (b). The graphic shows the evolution of the mean (H Mean) and standard deviation (H Std) of Hölder exponents deduced in MLA.
Figure 5.14: MERVAL Crisis-Switching Indicator. Both graphics show the trajectory of the minimum (Min H) Hölder exponents deduced in MLA limited by its bands. A potential crisis may occur around observations that cross these bands.
Figure 5.15: IBOVESPA Crisis-Switching Indicator. Both graphics show the
trajectory of the minimum (Min H) Hölder exponents deduced in MLA limited by its bands. A potential crisis may occur around observations that cross these bands.
Figure 5.16: IBOVESPA Crisis-Switching Indicator. Both graphics show the trajectory of the minimum (Min H) Hölder exponents deduced in MLA limited by its bands. A potential crisis may occur around observations that cross these bands.
CHAPTER 4

FINANCIAL CRISIS OF USA AND THE THEORY OF TRANSMISSION. CASE OF MEXICO AND ARGENTINA

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Abstract: Crises models have been one of the most important topics to solve nowadays. In financial crises many variables intervene, nevertheless, when crises are expected, in other words when it is understood what will happen, the effects in other countries won’t be as dramatic as to when the crisis is not expected. In the following paper we explain the not expected financial crisis in Mexico in 1994 and the impact it had in Argentina, the well known “tequila effect”. We also take into account the expected financial crisis that is happening in the United States and the effects that is having in the Mexican economy.

Key words: expected financial crisis, not expected financial crisis, Mexico, Argentina, United States.
1. Introduction

A great number of financial crisis have marked the last phase of the twentieth century: the regulation of the currency exchange attacked during 1992-1993, the “tequila effect” in 1994-1995, the East Asia crisis in 1997, the Russian crisis in 1998 and the Brazilian devaluation in 1999. These crises have had effects in other countries with different economic structures.

The Mexican crisis in 1994 was rapidly transmitted to other Latin American countries. The crisis that began with a small devaluation of the Thai baht in 1997 was split up to other countries especially East of Asia. The Russian crisis in 1998 had global implications, affecting many emergent as well as developed countries. However, recent crises have contained themselves within the national borders. The most notable example is the Argentinean crisis in 2001-2002 which had a profound impact in Uruguay but not in other countries according to Didier (2006).

These differences are precisely what incite economists to explain the cause of the transmission.

The primary objective of the following research paper is to bring an additional comparative study and analysis that interprets the effects a not expected crisis in Mexico had in Argentina, and the effects it had in Mexico an expected crisis in Argentina, in the same way, analyze the effects of the present expected crisis in the United States towards Mexico. The specific objectives are:

- To determine the correlational change in the periods of pre-crisis, crisis and pos-crisis, in order to analyze the effect of the transmission to the three counties studied.
- To prove if there exists transmission during the Mexican crisis in 1994, Argentinean crisis in 2001 and the present 2008 crisis in the United States.
The methodology used in this paper is based in the studies on the effects of transmission and the econometric analysis based in the model by Bakeart et. al (2002) and Lagunes and Watkins (2008).

According to Rajan (2007) the not expected financial crisis in 1994 in Mexico had repercussions in Latin America in countries like Argentina and Brazil, causing one of the worst financial crises of the time. However, Mexico did not reflect many problems with the expected crisis in Argentina in the beginning of 2001. So, what are the relations and correlations that exist between the transmission variables and their effects, more or less harmful, of a not expected crisis and the present crisis in the United States? Restating the hypothesis as follows:

“Prove that the effects of expected crises (Argentina 2001 and United States 2008) are less than when the crisis is not expected (Mexico 1994)”. In order to understand how the transmission effect is defined in crises we will review the literature, explain the crises cases (Mexico 1994, Argentina 2001, United States 2008) and prove the transmission effect in case there was correlations and the estimate of systematic risk.

2. Review of literature

One of the most interesting aspects when discussing transmission is the disagreement that exists on an exact definition. According to Didier (2006), transmission can be defined as the passing on of crises through countries implicated by common collisions. In order for such channels to work a necessary condition, but not sufficient, is a substantial level of international trade and financial integration. The main channels of transmission are trade and finances.

Forbes and Rigobon (2001) divide the explanation of transmission in two groups: the theory of contingent crises and the non-contingent crises. The theory of contingent crises assumes that the passing on of the
mechanisms of transmission change during the crisis, therefore the co-
movements rise after a collision. The theory of non-contingent crises
assumes that any high crossed correlation in the market after a collision is
a continuation of the joining that exists before a crisis, and not precisely is
a transmission.

The correlation analysis has been widely used in empirical literature of
transmission. Considering that a significant increase in the correlation of
the variables of the market analyzed is evidence of transmission, which
will have to be done after a negative economic or financial event in a
country or group of countries (Eichengreen et al., 1996; Dornbusch et al.,
2000; Forbes and Rigobon, 2002; Boschi, M. 2005). In a more restrictive
approach, Bakeart (2005) points out transmission as an excess of
correlation, in other words, correlation above all of what is expected. He
defines transmission as the excess of correlation between markets, given
by the economical foundations. In order to study transmission, he uses
the approach of the price of assets, and comments that transmission will
depend on the perspective of the study, of the given factor in the
model, and the size of the increase in the correlation will depend on the
loaded factor.

In a wide approach, the effect of the transmission will depend on the
trade ties between regions (Valdez, 2001), (Dornbusch et al 2000) and
the financial relations (Forbes, 2003), (Soros, 2008).

3. Case studies

3.1 1994 Mexican crisis case (not expected)

Months before the financial crisis in December 1994, the media and
schools of economics commented that Mexico presented signs of stable
recuperation, the only worry was the composition of capital flows, and
the governmental changes that were near, but due to the growth that
was felt, no one noticed, no one expected. This caused that in December 1994 Mexico lived one of the worst crises in history.

**Main hypothesis on the cause of the Mexican crisis**

For the following analysis we based ourselves in the behavior of the main variables implicated in each of the hypothesis that will be developed as follows.

3.1.1 **The Real Exchange Rate (RER) and the balance of trade**

The RER between the Mexican peso and the American dollar shows how the prices in American goods are compared to the prices of Mexican goods.

In Mexico a semi-fixed exchange rate was used, called “exchange fluctuation bands”. This system is called like this because the exchange rate fluctuates within a “fluctuation band” that relies with two limits. The highest limit is called the band roof, which has a daily and constant slip; on the other hand the lowest limit is called the floor, which is constant throughout time.
Chart 4.1 Represents the exchange rate in Mexico (Exchange Fluctuation Bands)

As we see in chart 4.1, the exchange rate is flexible when it fluctuates within the exchange fluctuation bands. In general it’s a fixed exchange rate because it cannot be superior to the limits which are known to the public. In order to maintain these fluctuation bands, the government intervenes when the exchange rates touch the limits, selling foreign currency or buying it depending on the case.

With the overvalued hypothesis of the RER the movements in the exchange rate have explained all kinds of economic events: crisis in the balance of payment, lack of economic momentum, the behavior of current account, Krugman (1996) establishes that the cause of the 1994 crisis has been primarily that the RER was overvalued.

With the index of the real exchange rate (IRER), one can see a tendency during the period from 1989 to 1994, with a downfall no less than 100, this is to say that the exchange rate was overvalued. The RER in 1989 was 21.85% more overvalued than in 1988, in 1991 was 10.60% more overvalued than in 1991, in 1992 its rate was 8.75% more than in 1991 and 14.67% from 1992 to 1993. The previous caused that less pesos were paid for a dollar generating an incentive to imports and discouraging exports.
In Mexico the real exchange rate was manipulated and controlled in order to keep from deteriorating the balance of trade, this caused the situation to worsen since the exchange rate with fluctuation exchange bands is semi-fixed and requires a great quantity of reserves in order to maintain it.

A deficit in the balance of trade was generated and there was more pressure in order to maintain a semi-fixed exchange rate. The deterioration of the balance of trade is represented in the series of gross exports in chart 4.3. This implies that exports were less than imports. The annual growth rate from 1990-1991 was -175.73% and in average the annual growth rate was -62.6%
The continuing overvaluation of the RER caused deficits in the balance of the balance of trade; this situation was unsustainable, since the value of the currency was controlled by monetary authorities and finally in December 1994 had to be devaluated.

### 3.1.2 Capital flows

According to Calvo and Mendoza (1996), the financial crisis was a capital account crisis (CA). The traditional presentation of the capital account in the balance of payments, distinguishes the financial transactions with the exterior by nature of the financial assets involved (short or long term), and the sector of the local economy (public, private) that carries them out. The account of the public sector registers the transactions of the public sector with the exterior (such as the debt of the federal government with banks from the exterior or the buying of external assets by public companies). Likewise, the CA of the private sector registers the transactions of the private local sector (or national
residents, including private companies, and commercial banking) with the non residents.

The share and cash market that comes into effect with the economic reforms of the time, experiments a strong growth. The foreign investment portfolio (FIP) can be introduced to the share market, and in the cash market (buying of stock by non residents), as well as the public sector’s cash market (buying of governmental stock).

From 1989 through 1994, the CA and the FIP maintain the same tendency. The previous is an indication of the instability that was living Mexico, the FIP is more unstable than the direct and can escape any time investors feel panic.

Chart 4.4 Capital accounts and liabilities in foreign investment in portfolio (thousands of dollars).

During this period the capital flows were massive and with an unequal distribution, which caused a bad distribution of resources (between consumption and investment financial and physical assets, and between different economic sectors). In table 4.1 we can see the growth rate by trimesters in the investment in portfolio. In the fourth
trimester of 1990 with regard to the fourth trimester of 1989, the increase of cash in the stock market was 586%, previously in 1990-1991 drops 34% and recovers in 1993-1994 to a 521.58%. In regard to the cash market, the growth rate shows a great increase in the fourth trimester of 1993.

<table>
<thead>
<tr>
<th>Total</th>
<th>Stock Market</th>
<th>Cash Market</th>
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<tbody>
<tr>
<td>IV 1988-89</td>
<td>-40.60%</td>
<td></td>
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<tr>
<td>IV 1989-90</td>
<td>216.12%</td>
<td>2.90%</td>
</tr>
<tr>
<td>IV 1990-91</td>
<td>527.28%</td>
<td>586.77%</td>
</tr>
<tr>
<td>IV 1992-93</td>
<td>82.18%</td>
<td>34.81%</td>
</tr>
<tr>
<td>IV 1993-94</td>
<td>69.19%</td>
<td>521.58%</td>
</tr>
<tr>
<td>IV 1994-95</td>
<td>-159.36%</td>
<td>105.96%</td>
</tr>
</tbody>
</table>

Table 4.1 Growth rate in the total foreign investment portfolio in the cash and stock market

Investors searched for fast benefits without a long term vision. This incorporation of flows was one of the most important causes of the crisis.

3.1.3 Excessive internal credit

In the case of a deficit in the balance of trade, the central bank sells its foreign reserves to the public, resulting in a decrease of cash supply. In this situation, the central bank in order to sterilize the deficit effects on the monetary base, increases internal credit in the same magnitude.

\[ \Delta H = \Delta IR + \Delta CBC = 0 \]

\[ -\Delta IR = \Delta CBC \]

donde, H: Monetary base, IR International Reserves, CBC: Internal credit

The sterilization lets us maintain the base of supply and demand without change. The deficit in the balance of cash and sterilization can bring adverse consequences, since we need to have a great quantity of reserves and bonds in order to maintain the deficit without devaluating.
Barro (1996) mentions that the vast expansion of internal credit after October 1994 seemed like an attempt to maintain the value of government bonds and bank deposits in dollars. This is, avoid the increase in interest rates, as well as the non-fulfillment of the government to the banks. By the end of 1994, the central bank balanced the flight of capital with a dramatically increase in internal credit and not because of a downfall on the monetary base. It is always possible to fix the exchange rate if the central bank begins with an excess of reserves over the monetary base, and if the bank pays or receives reserves only in exchange for the monetary base. In chart 4.5 we can see that in the monetary base there is a negative correlation between credit and reserves, due to the use of sterilization by monetary authorities. From 1988 to the beginning of 1994 is characterized by the flow of capital which caused an increase in the international reserves, and a stagnation of the monetary base in order to not affect the interest rate. During February 1994 and January 1995 the continuing deficits in the balance of trade, political aspects and the lack of credibility in authorities, caused the flight of international reserves in approximately 80%. The central bank in order not move the rates, increases internal credit 155%, the previous is hard to maintain and the 1994 devaluation is created.

In an economy where there is a fixed exchange rate and a perfect mobility of capital, monetary policy does not work. In other words, monetary authorities do not affect interest rates; nevertheless, any intention in order to achieve an increase in the income through monetary policy will not have effect.
3.1.4 Risk per country and differences in interest rates

Ros (1993) in his article “Financial markets and capital flows in Mexico”, presents a study on the influence of risk in capital flows. In order to analyze the risk per country, Ros (1993) uses two measures: the risk measured as the proportion of the interests paid in the debt of exports and the second measure, the risk as the difference in the real interest rates. Investors analyze these measures in order to measure the risk, therefore proving that there is a relation between the capital inflow and the risk premium. In chart 4.6 one can observe how the risk per country considerably decreased. The proportion of interest to exports dropped from 1.70 in 1990 to 1 between 1991 and 1995.
Chart 4.6 Interests as proportions to exports

One of the main causes of the decrease in interest payments is the reduction in external debt. In chart 4.7, one can observe the balance of the external debt in thousands of millions of pesos. In order to assess the drop in the external debt the monthly growth rate was obtained and the annual average was calculated. During 1988 to 1993 was -22.35%, -9.72%, -17.27%, -17.54%, -11.13% and -6.84% respectively; while the internal debt has a growth rate in 1991 of -17%, of -42% in 1992, of -39.4% in 1993 and of -26% in 1994.
The previous made the risk per country dropped considerably and consequently increased the capital flows of the stock market and the cash market, how we observe in the CA hypothesis. The second measure to analyze the risk situation in Mexico is the difference in real interest rates. In order to calculate the real rate we discounted inflation from the nominal rate. Chart 8 illustrates the difference in annual interest rates. Historically in Mexico there had been differences in real interest rates that fluctuated between 20 to 35%. During Salinas’ presidency this difference dropped drastically as follows: in 1991 to 2.72%, in 1992 to 0.87% and 7% in 1993 and 1994.

The signing of the agreement for external debt reduction and the negotiations of the NAFTA (North American Free Trade Agreement) at the beginning of 1009, contributed to the beginning of the decline of the differential rates. The ongoing decrease of the differential appears to be linked to the decrease of internal and external debt.

Chart 4.8 Differences in real interest rates between Mexico and the United States.

3.1.5 GNP growth
In chart 4.9 one can observe the evolution of the real Gross National Product based in 1993, observing the behavior of the Mexican economy. The tendency of the GNP was increasing until before 1995, where the GNP went from 1,311,661 millions of pesos in 1994 to 1,230,771 in 1995. In the chart we observe this downfall, where the economy dropped a 6.2% in 1995 with regard to the previous year, this brought about the collapse in 1994 which originated the crisis.

3.1.6 Political aspects

Diaz and Cartens (1996) mention that the Mexican crisis has its origins in political aspects such as assassinations and the uprising in Chiapas.

We can say that Mexico suffered three political imbalances during 1994. The first one being the assassination of the PRI’s (Institutional Revolutionary Party) presidential candidate, Luis Donaldo Colosio in March 1994, and the assassination of Jose Francisco Ruiz, PRI’s secretary
general in September 1994. These events originated the flight of reserves already mentioned. The second was the uprising in Chiapas that generated doubt for foreign investors increasing the risk per country.

The last imbalance was during the presidential transition. Barro (1994) mentions that the identity and the governmental change in January 1995 were important aspects, that helped to persuade the financial markets that the commitment to maintain the exchange rate fixed, was not serious. Likewise, he points out that Mr. Aspe (Minister of the Treasury with President Salinas) worked hard in order to recover the credibility in Mexico, but this faded in December 1994.

It has been said that the mistake in December was made by the new government of President Zedillo whose minister of the treasury had no power of persuasion. The new cabinet choose to widen the flotation band of the exchange, but this was not an effective measure in order to avoid economic imbalance, it wasn’t until a flexible exchange regimen was maintained and the devaluation of the currency, when there was a stop to the external imbalance and the overvalue of the currency giving way to the beginning of the worst crises that Mexico has suffered.

3.3 Crisis in Argentina, 2001 (expected)

During the 20th century, Argentina faced severe crises, but none of them as the one at the beginning of the 21st century. The 2001 crisis in Argentina was activated essentially by the following elements: the vulnerability of the Argentinean economy in the global context of recession, the economic policies set forth by Carlos Menem and Fernando de la Rua and the role that the IMF plays, leaving structural problems that were not resolved.

Main hypothesis on the causes of the crisis in Argentina (expected)
For the following analysis we based ourselves in the behavior of the main variables implicated in each hypothesis that will be developed next.

### 3.3.1 Fixed exchange rate

After the continuous appreciation of the American currency against those of Argentina’s main trading partners, the Currency Board Arrangement (CBA), tied equally the Argentinean peso to the American dollar, taking the internal economy in 1999 and 2001 to a significant loss.

The CBA lost its credibility, since it did not respond to Argentina’s financial needs, the dropping of prices of primary sources in Argentina and the flight of capital flows in emergent markets, was a repetitive characteristic. According to Armony (2005), the fixed exchange rate drove it into a vicious circle of high risk for devaluation and debt, with low activity, with overvaluation and increasing debt. As we can clearly see in chart 4.10, the behavior of the exchange rate could not be kept by the end of 2002, after constant devaluations during all of 2003 were shown.
### 3.3.2 Price deflation

According to Cortes (2003), crises appear after an expansion period promoted by the increase in public expenditure financed by issuing cash, which culminates with high inflation, deficit in the balance of payments that required of adjustments given by devaluation followed by a recession. However, the 2001 crisis presented in Argentina, on the contrary, blew up after many years of recession and with a deflation of prices. One can see in chart 4.11, a clear deflation of prices during the period being studied continued with a hyperinflation.
3.3.3 Downfall of GNP and tax collection

The downfall of economic activity had a negative effect in tax collection. Rua’s administration continued all throughout 2000 and the beginning of 2001 failing to attempt the increase of tax collection, seeking external support in order to take to long term the overdue debts. In March, with the continuous downfall of activity and its consequences in collection, the minister of the treasury, Jose Luis Machinea, resigned. In the following chart one can see the behavior of the GNP where it demonstrates the spectacular downfall of economic activity during the period being studied.
3.3.4 Loans to the IMF

When Argentina began showing signs of economic uneasiness in 2000, the IMF was blamed since it was a provider and endower of the economic policies in Argentina, Cooper & Momani (2005).

In March 2000 Rua’s government signed an agreement with the IMF, the Agreement of Payment Moratorium (APM) for 7.2 thousand million dollars as a preventive fund to help calm creditors.

In August 2000 the minister of the treasury, Jose Luis Machinea announced that the budget exceeded 10% from the forecasted.

Argentina had failed to get enough international credit, combined with a regimen of conversion during an era of appreciation toward the American dollar, this meant that Argentina was obliged to drain its monetary reserves and would touch bottom in November 22, 2000.
Argentina asked IMF for another loan under the Agreement of Payment Moratorium for 13.7 billion dollars. Some months later, the executive council of the IMF approved the petition of increasing the funding of the agreement of payment moratorium of 2000. Argentina would have omitted its external loans without a massive rescue package negotiated with the IMF.

### 3.3.5 The playpen (corralito)

In December 2001, the IMF does not rescue Argentina by not approving their demand for refinancing their debt. The government without credit begins to be unable to maintain its international debts.

Banks try to maintain the situation, turning the debt from short term for long term. In December, with the evidence that the banking system had in its assets state bonds hard to collect, a urgent flight of deposits from the banks begun, that Cavallo stopped preventing cash withdrawals (playpen), and not turning them into American dollars, just Argentinean currency. This provoked the Argentineans (that could only withdraw their deposits with debit cards) to do public demonstrations (cacerolazos) that concluded with an uprising in the “Plaza Mayo” (main square) that demanded the resignation of the president under the threat of a political trial. This is how in the middle of a crisis, De la Rua’s presidency concluded.

### 3.3.6 Corruption

According to Armony et al. (2005), a great quantity of economists, politicians and experts explain that the financial crisis of 2001 in Argentina is described by macroeconomic adverse factors mainly by
the corruption of public officials that has had a harmful tendency, has
designed the wrong policy and institutional malfunction.

3.4 Crisis in the United States (expected)

The United States is in the middle of a financial crisis that was not seen
since the Great Depression of the 1930’s. The present crisis is not
comparable with the periodical crises that have affected particular
segments of the financial system since the 1980’s, even though this crisis
has put the entire system on the verge of bankruptcy.

According to Soros (2008), there are two booms to consider: the
property and the long term commodities boom. In particular, the present
situation cannot be understood without taking into account China’s,
India’s and some oil producing countries with economic force, in order
to explain the commodities boom, a system with an exchange rate that
is part floating an part tied to the American dollar and part to other
currency; and the decreasing disposition of the rest of the world to retain
American dollars.

As a result of the Technological crisis that exploded in 2000, as well as
the terrorists' attacks of September 11, the United States Federal Reserve
dropped the referential rate to one percent and it was maintained until
June 2004, which led to a property boom. Something similar happened
in other countries; however the size and importance of the United States
in the financial market kept all eyes in this. Moreover, the United States
mortgage funds have been completely distributed around the world to
some institutional European keepers, mainly German, which became
more involved than the Americans.

The conventional method of assets security analysis does not pertain.
Investment analysts try to predict the process of future profits and from
there estimate the price that investors are willing to pay for these profits;
however, this method is inappropriate for mortgage since the price that investors are willing to pay for the stocks is an important factor in order to determine the future of profits. Instead of predicting the future of profits and the future of valuations separately, one should try to predict the process complete.

It can be concluded that the inadequate analysis and inefficient surveillance, produced an important dropped in the quality of property funds.

2. Methodology

This paper defines transmission as a significant increase in the correlation (that can be positive or negative) between the economic and/or financial variables of two or more countries, induced by an external shock (Edwards and Susmel, 1999). In order to prove the previous we obtained the descriptive statistics of the effects of the crisis in Mexico (1994) on Argentina, as well as the impact of Argentina and Mexico in 2001 and last, the effects of the US economy since 2007 on these Latin American countries.

In order to be more restrictive on the hypothesis of transmission, we applied the Bakeart et. al (2202) model also used by Lagunes and Watkins (2008) in order to analyze the crisis in Mexico, a not expected crisis, and its effects in Argentina, as well as the crisis in Argentina in 2001, considered as expected, affected Mexico, as well as the transmission (if there is one) that the United States economy is causing in Mexico and Argentina.

For each of the three countries studied, we selected the most representative stock exchange indexes, for Mexico the index of the “Indice de Precios y Cotizaciones” (IPC), in Argentina its counterpart would be MERVAL and in the United States the SP500. The estimates are
daily and the prices being studied vary depending on the periods of the crisis, pre-crisis and post-crisis; for which we calculated the logarithmic differences of the indexes of value of each country.

4.1 Econometric model

In order to prove if there is evidence of transmission we applied the Bakeart et al. (2002) with a modified version of Lagunes and Watkins (2008). The initial model is as follows:

\[ R_{b,t+1} = \alpha_b + \beta_{b,t} R_{a,t} + \epsilon_{b,t} \]  \hspace{1cm} (1)

\[ \beta_{b,t} = \beta_0 + \beta_1 D_1 \]  \hspace{1cm} (2)

Where:

\[ R_{b,t} \] = Stockholders return index of the country being transmitted.

\[ \alpha_b \] = Constant term, independent from the behavior of the other stockholders markets.

\[ R_{a,t} \] = Stockholders return index of the country that originates the crisis.

\[ \epsilon_{b,t} \] = Term for random error.

\[ \beta_{b,t} \] = The coefficient that indicates the relationship between the share return of the country that originates the transmission with the share return of the country being transmitted.

As we can see in equation (1), the coefficient \( \beta_{b,t} \) can be broken up in two parts: \( \beta_0 \) is used to estimate the relationship of the share return of the two countries in stable periods, and \( \beta_1 D_1 \) indicates this relationship during the periods in which the country that originates the transmission is in crisis. Variable \( D_1 \) is a dummy variable that takes the value of 1 when the country that initiates the transmission is in crisis and takes the value of 0 when the country that originates the crisis is not in this period.
Below you will see the periods that we will use for each of the crises detected.


\[
R_{MER,t+1} = \alpha_b + \beta_{b,t} R_{IPC,t} + e_{b,t} \\
R_{MER,t+1} = \alpha_b + \beta_0 R_{IPC,t} + \beta_1 D_{crisis} R_{IPC,t} + e_{b,t}
\]


\[
R_{IPC,t+1} = \alpha_b + \beta_{b,t} R_{MER,t} + e_{b,t} \\
R_{IPC,t+1} = \alpha_b + \beta_0 R_{MER,t} + \beta_1 D_{crisis} R_{MER,t} + e_{b,t}
\]


\[
R_{IPC,t+1} = \alpha_b + \beta_{b,t} R_{SP500,t} + e_{b,t} \\
R_{IPC,t+1} = \alpha_b + \beta_0 R_{SP500,t} + \beta_1 D_{crisis} R_{SP500,t} + e_{b,t}
\]

4.2 Hypothesis

The capital markets are related. In order to prove this assumption we state our first hypothesis: “exist a relation between stock yield indexes
from the country that presented the crisis and does subject to transmission”

\[ H1: \beta_{b,t} \neq 0. \]

If the transmission exists between the crisis periods it should be stronger than the relation without crisis which leads to our next assumption that consists in proving that: “the relation between the stock yield indexes is different in calm periods and in crisis periods, this is, we hope that the correlation in crisis periods increases, which indicates transmission:

\[ H2: |\beta_1| > |\beta_0|; |\beta_1| \neq 0 \]

If the coefficient \( \beta_1 \) has negative sign it shows the inverse relation indicating that the infected country experiments a positive effect caused by the crisis in the country that started the contagion. If \( \beta_1 \) is positive and significant, then a direct correlation exists between the markets, which demonstrate a negative transmission; the subject to transmission gets affected in an adverse way by the country that originates the crisis.

### 4.3 Model Estimation

Model estimation is done in two stages like Lagunes and Watkins (2008). In first place, the obtain the relation between markets (\( \beta_{b,t} \)) from equation estimation(1) explained in the methodology (\( R_{b,t+1} = \alpha_b + \beta_{b,t}R_{a,t} + e_{b,t} \)) using the minimum square ordinate method due to heterocedasticity and auto-correlation presence, we repeat the model estimation through the Newey-West correction method. This process repeats for three cases. In second place, the equation (2)

\[ \beta_{b,t} = \beta_0 + \beta_1D_t \]

is included in the equation (1) \( R_{b,t+1} = \alpha_b + \beta_{b,t}R_{a,t} + e_{b,t} \) obtaining the following:
\[ R_{b,t+1} = \alpha_b + \beta_0 R_{b,t} + \beta_1 DR_{a,t} + e_{b,t} \] will help to prove contagion existence.

Si \( |\beta_1| > |\beta_0| ; |\beta_1| \neq 0. \)

4.4 Applications

A) Mexico’s Case

If we analyze the descriptive statistics we can observe the change in average and standard deviation as well as the coefficient behaviors of correlation. If the observe a significant increase in the variables correlation of the analyzed markets, which will result after a negative economic or financial event occurs in a country or group of countries (Eichengreen et al., 1996; Dornbusch et al., 2000; Forbes y Rigbon, 2002) we state a contagion existence.

The table above shows that the average return in Argentina was affected in 74% decrease and in increase in volatility in the crisis period, meanwhile United States market had an increase of more than 600% with a decrease to volatility. The previous facts show that Mexican economy infected Argentina in a negative way and United States economy in a positive way.
### Table 4.2. Behavior of daily stock returns for Argentina, Mexico and United States on the pre-crisis, crisis and post-crisis periods in México 1994

In the previous graphic we can observe that in the crisis period between Mexico and Argentina in which exist an increase in correlations of almost 250% meanwhile in Mexico and United States a small increase of 20%, this indicates that Mexico affected considerably to Argentinean economy, which may cause transmission.

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<tbody>
<tr>
<td><strong>Argentina</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>-0.06%</td>
<td>-0.02%</td>
<td>0.05%</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>2.66%</td>
<td>3.16%</td>
<td>1.85%</td>
</tr>
<tr>
<td>Range</td>
<td>22.86%</td>
<td>22.16%</td>
<td>20.67%</td>
</tr>
<tr>
<td>Minimum</td>
<td>-12.71%</td>
<td>-10.09%</td>
<td>-14.76%</td>
</tr>
<tr>
<td>Maximum</td>
<td>10.15%</td>
<td>12.07%</td>
<td>5.90%</td>
</tr>
<tr>
<td><strong>Mexico</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>0.05%</td>
<td>0.09%</td>
<td>0.13%</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>1.62%</td>
<td>2.40%</td>
<td>1.56%</td>
</tr>
<tr>
<td>Range</td>
<td>12.79%</td>
<td>18.41%</td>
<td>25.37%</td>
</tr>
<tr>
<td>Minimum</td>
<td>-6.53%</td>
<td>-8.63%</td>
<td>-14.31%</td>
</tr>
<tr>
<td>Maximum</td>
<td>6.26%</td>
<td>9.78%</td>
<td>11.06%</td>
</tr>
<tr>
<td><strong>United States</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>0.02%</td>
<td>0.12%</td>
<td>0.10%</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>0.61%</td>
<td>0.50%</td>
<td>1.01%</td>
</tr>
<tr>
<td>Range</td>
<td>4.75%</td>
<td>3.42%</td>
<td>12.10%</td>
</tr>
<tr>
<td>Minimum</td>
<td>-2.43%</td>
<td>-1.56%</td>
<td>-7.11%</td>
</tr>
<tr>
<td>Maximum</td>
<td>2.32%</td>
<td>1.86%</td>
<td>4.99%</td>
</tr>
</tbody>
</table>

Table 4.3 Coefficients of correlation of the shareholding yields of Argentina, Mexico and the United States in the periods of pre-crisis, crisis and post-crisis of Mexico in 1994

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mexico-Argentina</strong></td>
<td>12.97%</td>
<td>45.32%</td>
<td>58.99%</td>
</tr>
<tr>
<td><strong>Mexico-United States</strong></td>
<td>24.95%</td>
<td>30.17%</td>
<td>60.74%</td>
</tr>
<tr>
<td><strong>Argentina-United States</strong></td>
<td>12.64%</td>
<td>17.86%</td>
<td>59.54%</td>
</tr>
</tbody>
</table>
If we apply Bekaert’s Model et al. (2002) with a modified version of Lagunes and Watkins (2008) and supposing a series of cases to observe the effects of delay transmission.

<table>
<thead>
<tr>
<th></th>
<th>$\beta_{b,t}$</th>
<th>$\beta_0$</th>
<th>$\beta_1$</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.4627</td>
<td>0.4009</td>
<td>0.1953</td>
</tr>
<tr>
<td></td>
<td><strong>0.0000</strong></td>
<td><strong>0.0000</strong></td>
<td>0.1374</td>
</tr>
<tr>
<td></td>
<td>0.1039</td>
<td>0.1079</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0.2109</td>
<td>0.1336</td>
<td>0.2442</td>
</tr>
<tr>
<td></td>
<td><strong>0.0000</strong></td>
<td><strong>0.0264</strong></td>
<td><strong>0.0295</strong></td>
</tr>
<tr>
<td></td>
<td>0.0216</td>
<td>0.0278</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>-0.0070</td>
<td>0.0213</td>
<td>-0.0893</td>
</tr>
<tr>
<td></td>
<td>0.8839</td>
<td>0.7238</td>
<td>0.3958</td>
</tr>
<tr>
<td></td>
<td>0.0000</td>
<td>-0.0001</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0.0720</td>
<td>0.1300</td>
<td>-0.1833</td>
</tr>
<tr>
<td></td>
<td>0.2494</td>
<td>0.0376</td>
<td>0.1980</td>
</tr>
<tr>
<td></td>
<td>0.0025</td>
<td>0.0060</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.4 Econometric model results for contagion in Argentina in pre-crisis, crisis and post-crisis periods for Mexico.

Estimating the first equation to prove the hypothesis $H1: \beta_{b,t} \neq 0$ we prove that for zero cases the coefficient is statistically different from zero, due to the fact that in $|\beta_1| = 0$ there is no presence of transmission. When we estimate the model supposing two cases we observe $|\beta_1| > |\beta_0|; |\beta_1| \neq 0$ by which we suppose Mexico and Argentina’s crisis in 1994 contagion, we contrast the previous statement with Wald Test which is useful to analyze how well the estimated coefficients in a regression without restrictions satisfy the stated hypothesis restrictions. We observed that the null hypothesis is not considered, which implies the existence of transmission from Mexico to the Argentinean economy.

The crisis of the Mexican economy in the end of the year 1994 was the trigger for the crisis of confidence in Argentina, Carrizosa et Al. (1996). In fact, according to what was suggested by “the wake-up call hypothesis”, a crisis in a country may encourage another crisis in another
country or countries. Countries seen with weak fundaments that increase their risk aversion and which are translated in increments in the loan rates Agénor, P., Aizenman, J. & Hoffmaister, A. (2008)

**B) Argentina’s Case**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Argentina</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>-0.19%</td>
<td>0.24%</td>
<td>0.36%</td>
</tr>
<tr>
<td>Estándar Desviación</td>
<td>2.29%</td>
<td>3.94%</td>
<td>1.93%</td>
</tr>
<tr>
<td>Range</td>
<td>16.92%</td>
<td>27.41%</td>
<td>15.99%</td>
</tr>
<tr>
<td>Miní mum</td>
<td>-9.07%</td>
<td>-11.29%</td>
<td>-9.02%</td>
</tr>
<tr>
<td>Máximun</td>
<td>7.84%</td>
<td>16.12%</td>
<td>6.97%</td>
</tr>
<tr>
<td><strong>Mexico</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>0.02%</td>
<td>0.05%</td>
<td>0.12%</td>
</tr>
<tr>
<td>Estándar Desviación</td>
<td>2.01%</td>
<td>1.43%</td>
<td>1.09%</td>
</tr>
<tr>
<td>Range</td>
<td>16.68%</td>
<td>8.29%</td>
<td>9.22%</td>
</tr>
<tr>
<td>Miní mum</td>
<td>-9.66%</td>
<td>-4.52%</td>
<td>-5.44%</td>
</tr>
<tr>
<td>Máximun</td>
<td>7.02%</td>
<td>3.78%</td>
<td>3.78%</td>
</tr>
<tr>
<td><strong>United States</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>-0.04%</td>
<td>-0.10%</td>
<td>0.06%</td>
</tr>
<tr>
<td>Estándar Desviación</td>
<td>1.42%</td>
<td>1.68%</td>
<td>1.30%</td>
</tr>
<tr>
<td>Range</td>
<td>10.88%</td>
<td>11.53%</td>
<td>9.58%</td>
</tr>
<tr>
<td>Miní mum</td>
<td>-5.99%</td>
<td>-5.96%</td>
<td>-4.24%</td>
</tr>
<tr>
<td>Máximun</td>
<td>4.89%</td>
<td>5.57%</td>
<td>5.34%</td>
</tr>
</tbody>
</table>

Table 4.4 Behavior of daily stock returns for Argentina, Mexico and United States on the pre-crisis, crisis and post-crisis periods in Argentina 2001.

A different behavior can be observed on the positive average from the stock market during the crisis in Argentina. This can be a consequence of the imposed restrictions by the Argentinean monetary authorities, which discourage investment funds and leave stock market as the only viable option of investment which may become liquid.

The mean and standard deviation from Mexico in pre-crisis and post-crisis experience almost no change, which can be conclusively assumed that the Argentinean crisis did not alter this market behavior after the
crisis, it shows a recover for the three markets as well as a reduction on volatility. This could be a consequence of the eliminating of the restrictions on the availability of cash imposed during the crisis period. This can be interpreted as a rising behavior once the recession on the United States is over.

On the other hand, the correlations show that the Argentinean crisis did not affect Mexico’s or the United States’ economy, for which there is no evidence of transmission.

<table>
<thead>
<tr>
<th></th>
<th>Precrisis</th>
<th>Crisis</th>
<th>Post crisis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10/28/99-</td>
<td>10/29/01-</td>
<td>09/01/02-</td>
</tr>
<tr>
<td></td>
<td>10/27/01</td>
<td>08/30/02</td>
<td>09/01/04</td>
</tr>
<tr>
<td>Mexico-Argetina</td>
<td>56.51%</td>
<td>9.48%</td>
<td>24.18%</td>
</tr>
<tr>
<td>Mexico-United States</td>
<td>61.85%</td>
<td>65.74%</td>
<td>64.40%</td>
</tr>
<tr>
<td>Argentina-United States</td>
<td>49.91%</td>
<td>6.38%</td>
<td>20.52%</td>
</tr>
</tbody>
</table>

Table 4.5 Correlation coefficients of stock returns from Argentina, Mexico, and the United States during pre-crisis, crisis and post-crisis from Argentina in 2001.

By estimating the first equation we prove that Argentinean economy affects Mexican economy because $\beta_{b,t} \neq 0$ (which is shown at p-value) from the equation with zero cases.

If we estimate the model with the variable dummy $R_{b,t+1} = \alpha_b + \beta_0 R_{a,t} + \beta_1 DR_{a,t} + e_{b,t}$, to observe the transmission it results that, Argentina infected Mexico positively because in $|\beta_0| > |\beta_1|$ there is no transmission presence according to the restrictive Bekaert’s et al. (2002) model.

C) United States Case

United States crisis which has its start in 2007 according to Soros (2008) is having adverse effects in Mexican and Argentinean economies. In the graphic we observe that the half of the average returns has decreased in both economies in more than 85% meanwhile in the volatility there is no significant change. By the other hand, United States economy experienced fall downs in their return for more than 185% with a considerable increase in its volatility. Given the statistics above it shows a possible transmission of the United States economy to the studied countries.
The relation in correlations from the graphic above we observe an increase in correlations between indexes in stock market for each country, which apparently shows a contagion in United States economy.
To prove the existence of transmission in its most restrictive way we estimate the regressions (1) and (2) presented in the methodology.

<table>
<thead>
<tr>
<th></th>
<th>$\beta_{0,t}$</th>
<th>$\beta_0$</th>
<th>$\beta_1$</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.6545</td>
<td>0.3676</td>
<td>0.5237</td>
</tr>
<tr>
<td></td>
<td>$\text{p-value}$</td>
<td>$\text{0.0000}$</td>
<td>$\text{0.0000}$</td>
</tr>
<tr>
<td></td>
<td>$\text{R}^2$</td>
<td>0.5244</td>
<td>0.6064</td>
</tr>
<tr>
<td>1</td>
<td>-0.0627</td>
<td>0.0019</td>
<td>-0.1181</td>
</tr>
<tr>
<td></td>
<td>$\text{p-value}$</td>
<td>$\text{0.0109}$</td>
<td>$\text{0.9582}$</td>
</tr>
<tr>
<td></td>
<td>$\text{R}^2$</td>
<td>0.0041</td>
<td>0.0075</td>
</tr>
<tr>
<td>2</td>
<td>-0.0680</td>
<td>0.0067</td>
<td>-0.1360</td>
</tr>
<tr>
<td></td>
<td>$\text{p-value}$</td>
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<td>$\text{0.8558}$</td>
</tr>
<tr>
<td></td>
<td>$\text{R}^2$</td>
<td>0.0049</td>
<td>0.0097</td>
</tr>
<tr>
<td>3</td>
<td>0.0741</td>
<td>0.0063</td>
<td>0.1233</td>
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<tr>
<td></td>
<td>$\text{p-value}$</td>
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<td></td>
<td>$\text{R}^2$</td>
<td>0.0060</td>
<td>0.0113</td>
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Table 4.9 Econometric transmission model results for Mexico during United States pre-crisis, crisis and post-crisis periods.

We observe in the graphic above that the United States value index affects Mexico from 0 to 3 cases, but due to $|\beta_0| < |\beta_1|$ y α que $|\beta_1| \neq 0$ the existence of transmission from United States to Mexico is immediate. This is congruent with the findings observed in the correlations and descriptive statistics.
Table 4.10. Econometric model results for contagion in Argentina in pre-crisis, crisis and post-crisis periods for United States crisis.

Analyzing the descriptive statistics and correlations between Argentinean and United States economies we find transmission indicators, (this can be proved by $|\beta_1| = 0$ $|\beta_0| < |\beta_1|$ which assumes transmission in immediate form from United States to Argentina).

Conclusions

If we consider that the significant increase in the variables correlation of the market analyzed is evidence of transmission, (Eichengreen et al. 1996; Dornbusch et al. 2000; Forbes and Rigbon, 2002; Boschi, M. (2005). In Mexico’s crisis 1994 exist an increase in correlations in IPC and MER returns for 250%, which assumes transmission; this is called the tequila effect. By the other hand, under the Bekaert’s Model (2005) exists the effect of contagion for one case.

We can not get conclusions about the effect that Argentina had over Mexican economy in year 2001 due to the lack of significant changes in the correlations, however if we apply Bekaert’s model (2005)
we observe that exist a positive effect between Argentinean return indexes over Mexico, even though there is no evidence of transmission in crisis period.

To conclude, we can observe that even though under the correlational focus United States economy is affecting in a significant way to Argentinean and Mexican economy and our hypothesis are proved under the econometric model in which there is instant transmission on behalf of the United States.

**Referencias**


PART III

ALTERNATIVE TO
PREVENT THE EFFECTS OF
THE CRISIS
Financial System Regulation: Stability versus Instability

Strategic Considerations

David Cantarero* • David Ceballos**

*University of Cantabria, **University of Barcelona

Abstract: Financial regulation and Globalization are key elements in Financial System stability or instability. Focusing the analysis in financial crisis regulation and Globalization, stability will be reached when frequency and magnitude of crises be reduced (regulation for control of financial risks and fluctuations, and for supervision of globalization of information and capital movements by authorities), and instability will be translated in the contagion of all system of a crisis or in the system fragility by a crisis (regulation failure in defense of Financial System by authorities).

Some preventive politics as financial regulation or prudential supervision are required for the sake of maintaining a stable macroeconomic environment and avoiding inefficient agents, that contribute to system fragility. The aim of this paper is to show an analysis of the theoretical justification and effects on financial stability of regulations proposals of Financial System, which are affected by Globalization, and related with International Financial Institutions recommendations and with the impact of international taxation on capital movement.
Keywords: Financial crisis, Basel II, Instability, Contagion.

1. Introduction

From 1990s until now frequency and importance of financial crises have increased, which have affected to so much Emerging Economies (Latin America and Southeast Asian) as Europe and United States of America: European Monetary System, Mexico, Thailand, Korea, Indonesian, Russia, LTCM, Argentina, Brazil, technological bubble and dot.com..., with different causes and consequences. Every financial crisis supposes a deterioration of (i) system credibility, (ii) credit solvency and/or (iii) productive economy. By these facts, it is desirable financial stability.

Financial notion of stability remits to the idea of a Financial System without abrupt neither continuous fluctuations, above all unfavourable in form of losses. In practice, it supposes a control of financial risk so that unfavourable contingency, when occurs, does not surpass expected losses and affects to solvency and credibility of Financial System, and by extension to Real Economy. They are required, therefore, some preventive politics as financial regulation or prudential supervision for the sake of maintaining a stable macroeconomic environment and avoiding inefficient agents, that contribute to system fragility.

Public regulation implies that in crisis epochs, if it is seen like insufficient, large and generalized losses could be produced by moral hazard, adverse selection, loss of market credibility, speculation... And these losses are quickly diffused by feedback to all Financial System because of the Globalisation of financial products and contracts, by transnationality of economic agents, and by information in real time.

Financial System since the second half of XIX Century are similar to information markets (Eichengreen, 2003), because of telecommunications development. It permits, by greater security and velocity, the boom of capital transfers, and design and sophistication of
financial operations. All these elements imply that Globalisation was not born simply by International Trade growth, but also was joined to birth and expansion of International Financial System.

Globalisation can have evil effects in Financial System by information diffusion, which generates contagion effects and herding behaviour among economic agents (Bikhchandani, 2000). These elements magnify market fluctuations, deriving in financial bubbles and crises. Financial regulation tries to limit this Globalisation influence, thanks to more quality of diffused information and to prevention of fraudulent behaviour. This control generates, at the same time, the subsistence of inefficiencies, because of arbitrage is nor cheap neither quick. Then, there is a trade-off between financial regulation, that tries to reduce frequency and importance of financial crises, and market efficiency, that tries to take advantage of inefficiencies and of regulation failures.

Therefore, financial regulation and Globalisation are key elements in Financial System stability or instability. Focusing the analysis in financial crisis regulation and Globalisation, stability will be reached when frequency and magnitude of crises be reduced (regulation for control of financial risks and fluctuations, and for supervision of globalisation of information and capital movements by authorities), and instability will be translated in the contagion of all system of a crisis or in the system fragility by a crisis (regulation failure in defence of Financial System by authorities).

A financial crisis implies losses above confidence threshold of unexpected losses. This crisis passes to be global if rational or irrational contagion effects are derived on other sectors and/or on other economies. This phenomenon is called “systemic risk” (De Bandt, 2000). It is supposed in the bases of international regulation of Financial System to avoid, in the measure of the possible, “irrational” contagion and to reduce the magnitude of “rational” contagion. This regulation is formed
by implementation of agreements and recommendations of sovereign States, of different forums, as Basel II, or fiscal policies coordination, that they tax capital movement.

The aim of this paper is to show an analysis of regulations proposals of Financial System, which are affected by Globalisation, and related with International Financial Institutions recommendations and with the impact of international taxation on capital movement. In this way, we present a study divided in four parts of financial regulation, its causes and its consequences in stability and instability of Financial System, supported strategically by Game Theory. After this introduction to financial stability and to risks of its instability, we analyse the corresponding international Regulation, to put an end with a study of Strategic Fundaments of the resistance of regulatory measures, followed by Conclusions.

2. Financial system regulation

Financial System regulation is run to desirable system stability with its peculiar and continuous fluctuations. That is to say, regulation has a preventive origin under a regulatory form, but with an intention to be neutral over market or over financial behaviour.

In this way, national and international regulation, that flows of different normative, as Basel II, agreements of capital movement taxation, “permitted” fluctuation bands, fraud persecution..., pretends to avoid and to reduce economic and social problems of stability and credibility losses of Financial System. Because price of Financial System control are high and there are international coordination problems, we consider like financial aim of regulation: to reduce frequency and extension of financial crises. Regulation tries, by means of information and risk management supervision, and of market security control, to limit
contagion effect produced by Globalisation and information distortion, as rumours, accounting reliability, etc, and by destabilizing fluctuations.

In our strategic analysis of financial regulation, we distinguish between regulation that affects to capital movements, and regulation that affects to Financial System fragility, by an excess of risk in financial positions and decisions.

2.1 International Taxation

In the present globalised framework a greater free capital movements, together with the apparition of new financial products, has done that in recent years different tax reforms of capital earnings have been produced at international level with the objective of disincentiving national capital transfers to foreign economies and the consequent pernicious effect for national economy. According to Bacchetta and Caminal (Bacchetta, 1991), “a greater mobility of capital permits investors to choose with more facility the country of the most favourable fiscal processing and, consequently, political tax decisions of each economy are influenced by the decisions taken by the other economies. This interdependency introduces a strategic element in tax politics of different governments, given the existence of important incentives to compete for capital, cutting off tax levels. Some European economies are conscious of the negative consequences of this competitive behaviour and tried to prompt a process of negotiations in order to coordinate or to harmonize taxes, although so far without complete success”. In this sense, “Tobin Rate” appears in this debate as some autonomous financial measures for national authorities, that puts tax international monetary speculation and the existence of tax paradises by its possible evil effects on national economies.
The optimum model of tax politics in terms of efficiency and equity, in an international context of mobility of capital, requires to establish (i) some basic principles of international tax assignment in direct taxation, (ii) the definition of coordination mechanisms that avoid double international imposition and (iii) the establishment so much of tax neutrality criteria (efficiency) (Frenkel, 1990) in international allocation of capital as of equity among agents and nations (Álvarez, 2003).

As summary Table 2.1 collects different criteria of efficiency in international taxation of capital movement, the pursued aims and conditions and instruments for its practice. Logically, this scheme should complement with addition of basic principles of equity among individuals (vertical and horizontal equity) and among nations (fair distribution among different countries of taxable income generated in international transactions among them, for which it is necessary an harmonization in fiscal relations).

<table>
<thead>
<tr>
<th>EFFICIENCY</th>
<th>OBJECTIVES</th>
<th>INSTRUMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutrality of International efficiency on world capital export allocation</td>
<td>Efficiency on investment allocation</td>
<td>Tax system based on residency and exemption-at-source as the general method Full Fiscal Credit</td>
</tr>
<tr>
<td></td>
<td>Equal tax with independence of source of income</td>
<td></td>
</tr>
<tr>
<td>Neutrality of National efficiency on world capital export allocation</td>
<td>To avoid exit capitals. Equal National tax: it equals full profitability marginal of national investment with marginal profitability of net external investment</td>
<td>Deduction in tax base of international tax</td>
</tr>
<tr>
<td>Neutrality of International efficiency on world capital import allocation</td>
<td>Efficient distribution of saving. It equals profitability of investments in the country for residents and not residents. Equity on Distribution of tax base of bilateral transactions. To burden residents’</td>
<td>Tax system based on source and exemption-at-residency as the general method</td>
</tr>
</tbody>
</table>
The paralysis of fiscal process of harmonization in environment of direct taxes, especially in the case of the European Union, is doing that a generalised discount be produced of capital taxation, because measures that seek to attract capital of other jurisdictions are adopted for different economies and to avoid national capital exits. Nevertheless, according to Zubirí (Zubirí, 2001) and Álvarez, Alonso, Gago and González (Álvarez, 2001) there are so much economic arguments exist (improve in the conditions for creation of employment and impulse of economic growth) as politic (displacement of income of medium voter or perception by society of an excessive fiscal pressure, and preference by tax reduction against increase in public expense) to justify lower taxes.

### 2.2 Financial Risk Control According to Basel II

From Bretton Woods International Financial System regulation showed a qualitative change with created institutions of International Monetary Fund and World Bank, which lost part of its effectiveness after the fall of Gold Standard. Afterwards, the first stages of Basel Committee of Banking Supervision have appeared, associated to Bank for International Settlements. With this basis, the first Agreement on Capital Minimums of Basel I is approved in 1988. This agreement was ineffectove in avoiding financial crises of 1990s and beginnings of XXI Century: European Monetary System crisis, Mexican crisis, bankruptcy of Bank
Barings, Asian crisis, Russian crisis, bankruptcy of LTCM hedge fund, technological bubble, Brazil and Argentina crises...

To avoid in the measure of possible or to reduce frequency of these crises, in 1998 initiatives for a New Basel Capital Accord, called \textbf{Basel II}, have began. \textbf{Basel II} concentrates on financial regulation of market risk, credit risk and operational risk.

\textbf{Basel I} defended a risk measurement and control according to a risk typology in function of the counterpart, that was ineffective in the successive financial crises of 1990s, due to that, on one hand, each country and each business have a different risk, although they belong to similar groups, and, on the other hand, each operation supposes a different risk by its characteristics and by the counterpart’s experience.

\textbf{Basel II} introduces these aspects by means of internal measurements of risk through a risk typology according to the operation, the counterparts and the stratification of default rates according to historic statistics. Also, is supposes a risk management based on ratings and benchmarking and a supervision that verify the internal systems quality of financial risk measurements and managements, requiring a minimum of eight per cent of risk exposition as capital to guarantee company solvency.

\textbf{Basel II} in 2005 will try to adapt, in greater measure that in past, capital requirements by credit and operational risks, reducing the distance between required regulatory capital and necessary economic capital. In this way, banking supervision is improved in front of Globalisation, internationalisation, sophistication and competence in financial sector in order to contribute to Financial System stability. For these aims \textbf{Basel II} has three pillars: The first pillar affects to Financial System regulation because it collects recommendations for minimum capital requirements (credit, market and operational risks) and because it defends a minimum solvency coefficient. The second pillar treats
about the revision of supervisor, monitoring and its evaluating function of solvency, and about the quality checking of risk measurement and management systems so that they adapt to regulation that derives from the first pillar. The third and last pillar refers to market discipline as financial mechanism of efficiency, because it incentives efforts to promote Financial System solvency and security through a greater information transparency. In this way, Basel II intends to contribute, not only to Financial System stability, but also to a competitive equality that prevents bad practices and system fragility, that is to say, prevents big financial fluctuations and crises.

In concrete, Basel II fights for an internal model for default probabilities calculations or estimations, that is able to be sophisticated by internal estimation of recovery degree of investment in case of default, and of risk exposed value.

The formula of regulatory capital calculation purposes by Basel II does not limit use of advanced risk measurement techniques through risk exposition estimation, as methodologies of VaR, Conditional VaR (catastrophic loss), Extreme Values, Copulas, etc, by means of sensibility analysis, case generation or simulation.

But this apparent flexibility has its constraints above all in which affects to financial stability, as contagion risk possibility by it procyclicality of Basel II regulation (Borio, 2001).

3. Strategic Fundaments of Financial Regulation

Financial crises are related at macro level with instability of economic nominal fundamentals, as exchange rate, inflation or interest rate. At microeconomic level, crises are associated to local episodes of banking bankruptcies. In this section we will consider the study of financial crises at macro level, because at this level they have a greater influence in
Financial System fluctuations and it is observed a greater international coordination for its prevention, so much in capital movement control as in risk management and measurement supervision. It does not mean, nevertheless, that banking regulation is not affected by general financial regulation, because microeconomic financial crises can have international effects if they are transferred to all the economy and afterwards they pass to rest of the Financial System. In the study of banking crises can be considered a herding behaviour that weaken national credit sector and it is infected to exterior “irrationally” by a confidence loss in nearby countries or economies of the same block. Contagion effects are divided into “rational” and “irrational”. The first appear when contagion effects respond to factors of Real Economy, being consequence of the variation of Fundamentals through the fall of international commerce by financial crises, by business losses transferred to headquarters or by devalued position liquidation. Herding situations in financial liquidation of positions motivated by an unexpected increase of risk perception are called “irrational” contagion, for example by asymmetric information, by feedback of financial fluctuations (panic) or by generalisation of financial management standards (Bald, 2000).

Different models are commented by Barberis and Thaler (Barberis, 2002). In this section we present models that they are useful, didactically or strategically, for the discussion about the effects of instability prevention and regulation in the global Financial System. These financial crisis models are of second generation, because they permit a better synthesis of fluctuation effects thanks to they do not affect to Real Economy. Three financial types of crisis, in function of its nature, are distinguished: of first generation or macroeconomic, characteristic until 1980s, that affects to exchange rates and to balance of payments, generally by an inadequate combination of fiscal and monetary policies or they are preceded by a chronic public deficit (Krugman, 1979); of
second generation, characteristic in 1980s and 1990s, with net effects in
Financial Economy because of the importance of free capital transfers
and of financial globalisation (Obstfeld, 1994); and, of third generation or
twins, that suppose a mix between currency and banking crises
(Kaminsky, 1997). We work with the second typology of crises, that
implies essentially financial effects.

We carry out a strategic analysis as justification of actual
regulation in globalised Financial System. We present this analysis in form
of payoff matrix, using Game Theory for explaining, on one hand,
national and international authorities action (regulation), and on the
other hand, the different economic agents of market (efficiency). In this
purpose, we divide the section in two: a model about capital
movement control, and another about financial stability control.

3.1 International Capital Movements Effects Model

Foreseeable results of fiscal competence processes among
national States can be analyzed basically from simple Game Theory
models as the same as the ones that are used in fiscal decentralization
(Álvarez, 2003; Zubirí, 1987). In this way, we can suppose that we have
two countries A and B that submit to taxation the obtained earnings in
their territory by residents in the other fiscal jurisdiction and that in design
of their own tax system can adopt two different types of strategies:
competitive (with purpose to attract foreign capital by an increment of
the net profit value of taxes by means of the fiscal discount) or not
competitive (or cooperative, designing fiscal system without keep in
mind the possible attraction of foreign capital). Obtained results appear
collected in payoff matrix of Table 2.2.

<table>
<thead>
<tr>
<th></th>
<th>Country B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competitive</td>
<td></td>
</tr>
<tr>
<td>Not Competitive</td>
<td></td>
</tr>
</tbody>
</table>
If it is supposed that both jurisdictions are symmetrical in all relevant characteristics and because of a country is affected by fiscal competence, countries are obliged to adopt a competitive strategy if the others also do it in order to do not lose resources. Then the case (a) (both countries compete because each one does the best for him, given what do its opponents) is the only equilibrium of Nash of this competitive game, for which the doubt is presented of which is the real incentive so that any of both countries initiate this process of competence that also it is known as competitive harmonization.

Logically, the origin of this competitive process would be able to be owed to that be to broken symmetry conditions among countries (some countries would have more incentives than other to collaborate, and it is complex to determine and to distribute benefits of cooperation, what will complicate agreements), the possible break of pacts (given that although these were produced they would be with difficulty sustainable in the time by diverse motives as, for example, a crisis situation in a country can force it to compete) and the fact that governments can base on considerations of short-medium time limit (as is used to be in practice).

Summarizing, there are several incentives so that cooperation among countries do not be produced (Zubirí, 1987). Finally, also the competence among countries by the attraction of foreign capital cannot be produced necessarily by tax reasons but by other motives as the protection of its banking system or of its financial markets as is the
case of various countries in the European Union. In practice, problems as double international imposition produces that mechanisms of coordination are established (methods of tax-exemption and of accusation) for the sake of unilateral character or in international accord framework with purpose to eliminate or at least to correct in part this problem.

3.2 Financial Stability Effects Model

In order to analyze stability in global Financial System, systemic risk possibility is considered. Furfine (Furfine, 1999) distinguishes two typologies: (i) a simultaneous crisis that affects to all market or (ii) a successive crisis where bankruptcy or difficulties of one or several institutions, businesses or economies affects to all system. We will analyze both possibilities, but studying only financial effects and considering that systemic crises can be avoided for a regulation or defence of Financial System by competent authorities. We follow a model of second generation similar to Krugman model (Krugman, 1998) and to Obstfeld ideas (Obstfeld, 1996) with a Financial System with competitive agents:

<table>
<thead>
<tr>
<th>Authority</th>
<th>Market</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEFENCE</td>
<td>(0, 0)</td>
</tr>
<tr>
<td></td>
<td>stability</td>
</tr>
<tr>
<td>NOTDEFENCE</td>
<td>(-1, 1)</td>
</tr>
<tr>
<td></td>
<td>speculation</td>
</tr>
<tr>
<td>DEFENCE</td>
<td>(1, -1)</td>
</tr>
<tr>
<td></td>
<td>fluctuation</td>
</tr>
<tr>
<td>NOTDEFENCE</td>
<td>(-1/2, -1/2)</td>
</tr>
<tr>
<td></td>
<td>crisis</td>
</tr>
</tbody>
</table>

Table 2. 3 Payoff Matrix (Short-term)
In Table 2.3 and Table 2.4 we collect coordination effects and its lack in the actions of supervision and regulation authorities with market agents. The coordination effects can be so much short as long-term in financial stability. Both Tables collect the strategic aspects of stability defence of Financial System, which differ to short and long-term.

In short-term it is observed a “prisoner dilemma”, where the only Nash equilibrium is to go toward crisis in a difficult situation, without regulator or supervisor wastes its resources defending the system against the attack of financial weakness by market (efficient) agents. The justification of this result is because in short-term speculation and forecast benefits of financial instability are higher than a stable Financial System. Financial adjustment in search of a greater efficiency does not generate enough profits in so short time, and then all agents would have losses. Nevertheless, speculation or financial instability produces a zero sum game, where who forecasts correctly the system direction earns erroneously resources used by the others.

In long-term, because of that there is time for recovery or for significant generation of profits by stability, two Nash equilibria exist. The first is the same to short-term of not system defence in a difficult situation, allowing an adjustment towards a more efficiency system. The second is an efficient defence of system with greater profits by stability continuity.

This strategic analysis reveals the best supervisor and regulation action to prevent financial fluctuations or to defend its stability, which is to encourage a long-term strategy in risk control and management of financial participants with a credible, healthy and efficient system. The

<table>
<thead>
<tr>
<th></th>
<th>stability</th>
<th>speculation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NOTDEFENCE</strong></td>
<td>(1/2, -1)</td>
<td>(1/2, 3/2)</td>
</tr>
<tr>
<td>fluctuation</td>
<td>crisis recovery</td>
<td></td>
</tr>
</tbody>
</table>

Table 2.4. Payoff Matrix (Long-term)
Nash equilibrium of stability in long-term can be justified in three different ways:

A. By non-simultaneity of decision between the authority and the market with a leader than the other imitates. In the case that authority was the leader, it is interested in defending stability of Financial System because solvency and a “good” economic growth imply larger and sustained public income. Then, the equilibrium is (defend, defend) or long-term stability. Nevertheless, it can be supposed that market is not interested in defending Financial System stability and it tries to obtain profits of system instability or to force efficient reforms. In this case, if market was the leader, in one difficult situation, would begin not defending the system and causing the crisis.

B. By existence of asymmetric information that causes that the player with smaller information imitates the strategy of the other. In other words, there is a similar situation with previous case of leader – follower. Then, results are in function of the player with larger information and of the confidence in system stability.

C. By self-fulfilled expectations. In this case is considered that market and authority act simultaneously in the election of long-term equilibrium. This equilibrium will be conditioned to existing expectations about future system stability. Expectations will be self-fulfilled because financial agents will believe their occurrence, and they will act in consequence. It is the typical situation of models of “second generation”. In our model the reason for system defence by the authority and by the market are associated to profits of not using their resources and the long-term stable growth of public and private income. The third element of circular logic of this “second generation” model is that authority defend cost is greater when market thinks that its defence will be fruitless (financial weakness), because of lack of
resources (damaged economy) or of lack of confidence (system inefficiency).

The three commented possibilities collect, of a synthetic way, action lines of Basel II proposals. In the first place, that authority (system regulator and supervisor) is who takes the initiative in control of Financial System stability and health. Basel II purposes a supervision of private risk management, it incentives more sophisticated and internal models for risk measurement and management, and a regulation of “important” risk: market, credit and operational risk. In second place, Basel II defences a larger information transparency because, in this way, so much financial market as authority, they know solvency situation of system, improving market efficiency. Excessively risked and fraudulent operations do not survive to market arbitrage and supervision control. In third and last place, Basel II facilitates to financial authorities the possibility of creating a confidence environment for system stability, thanks to international coordination in fluctuation and solvency control.

Nevertheless, self-fulfilled expectations cause some Basel II difficulties or lacks to guarantee Financial System stability. There are financial phenomena that mine investor confidence in belief of long-term system stability. This problem is consequence of procyclicality of risk measures, management and control, and by crisis feedback caused because of most of financial agents follow similar risk standards.

Procyclicality causes that in economic growth epochs or in expansive stock market cycle provisions demands are reduced (smaller risk), because risk measurement is based, when it is estimated internally, in the most probable event (Point In Time, PIT), which is different with cycle evolution. External agencies of risk measurement are used to following an approach of the most unfavorable possibility (Through The Cycle, TTC), with an unchanged probability along the cycle. But this last case can carry to an infravaluation of real risk in its stress testing because
when “bad things” are higher than a threshold all system falls. Borio, Furfine and Lowe (Borio, 2001) carry out an extensive study of procyclicality effects of control measures, which can derive in a financial crisis by greater demands of provisions and cascades of liquidations by a risk rise. In other hand, similar risk monitoring and risk management standards foment herding behaviour in financial trade, generating financial bubbles and panics. Moreover contagion effects appear among investors with different standards of risk measurement, with different horizon, with different profits and losses distribution, with different portfolio diversification..., because of the generation of a downwards or upwards trend in all financial products.

Symptoms (causes) of financial instability and its possibilities of prevention (recommendations and **Basel II**) can be summarized in the following Table 2.5:

<table>
<thead>
<tr>
<th>CAUSES</th>
<th>RECOMMENDATIONS</th>
<th>BASEL II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free capital movement</td>
<td>International coordination</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Tax harmonization</td>
<td></td>
</tr>
<tr>
<td>Economic cycle and expansive credit</td>
<td>Anticyclical provisions</td>
<td>PIT Methodology</td>
</tr>
<tr>
<td></td>
<td>Sophistication of risk measures and</td>
<td>Stress testing</td>
</tr>
<tr>
<td></td>
<td>control</td>
<td>Benchmarking</td>
</tr>
<tr>
<td></td>
<td>To improve credit risk methods</td>
<td></td>
</tr>
<tr>
<td>Financial Market deregulation</td>
<td>Regulation to produce positive</td>
<td>Risk measurement and</td>
</tr>
<tr>
<td></td>
<td>externalities with international</td>
<td>management supervision</td>
</tr>
<tr>
<td></td>
<td>coordination and control</td>
<td>Market discipline</td>
</tr>
<tr>
<td>Financial liberalization</td>
<td>Government intervention to guide</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>liberalization and to ensure fiscal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>and monetary discipline</td>
<td></td>
</tr>
<tr>
<td>Procyclicality of risk measures/</td>
<td>Anticyclical provisions</td>
<td>Sophistication and diversity of</td>
</tr>
<tr>
<td>standards</td>
<td>Flexibility of risk measures</td>
<td>risk standards (measures and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>standards)</td>
</tr>
<tr>
<td>Symptom</td>
<td>Measures</td>
<td>Source</td>
</tr>
<tr>
<td>---------</td>
<td>----------</td>
<td>--------</td>
</tr>
<tr>
<td>Contagion effects</td>
<td>Fiscal measures for intertemporal adaptation of capital requirements</td>
<td>Mayer, 1999; Borio, 2001; and Goodhart, 2004.</td>
</tr>
<tr>
<td>Systemic risk</td>
<td>Averaging measures over the cycle</td>
<td></td>
</tr>
<tr>
<td>Contracyclical adjust over the cycle of the prudential parameter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To improve credit risk methods</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment herding behaviour</td>
<td>Diversification and no-standard portfolios selection</td>
<td></td>
</tr>
<tr>
<td>To improve credit risk methods</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portfolio diversification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexibility in horizons and risk correlations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal risk control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market discipline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Macroeconomic expectations error</td>
<td>Sophistication in risk measures and control</td>
<td></td>
</tr>
<tr>
<td>Risk evaluation error</td>
<td>Information transparency</td>
<td></td>
</tr>
<tr>
<td>Internal risk control</td>
<td></td>
<td></td>
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<tr>
<td>Higher information transparency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market discipline</td>
<td></td>
<td></td>
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</tbody>
</table>

Table 2.5. Symptoms and Prevention of Financial Instability. Source: Mayer, 1999; Borio, 2001; and Goodhart, 2004.

Conclusions

We have considered strategic action of the three stages that take part of Financial System: the authority or International Institutions, Market, and National States. Financial stability, in the informative and dependence context of Globalisation, is subordinated to former action. There are strategic incentives to defend or attack financial stability, according to the solvency, credibility and/or inefficiencies of Financial System.

The optimum design of tax politics in terms of efficiency and equity in an international context of mobility of capital requires to establish (i) some basic principles of international tax assignment in direct taxation,
(ii) the definition of coordination mechanisms that avoids double international imposition and (iii) the establishment of tax neutrality criteria (efficiency) in the international allocation of capital as equity among individuals and countries. The paralysis of fiscal process of harmonization in direct taxes especially in the case of European Union has caused a generalised discount of capital taxation in order to avoid national capital exits.

Foreseeable results of fiscal competence processes among national States can be analyzed basically from simple Game Theory models as the same as the ones that are used in fiscal decentralization. In this way, obtained results from payoff matrix if it is supposed that both jurisdictions are symmetrical in all relevant aspects does that the case in which both countries compete is the only equilibrium of Nash. Nevertheless, the competence by attraction of foreign capital cannot be produced necessarily by tax reasons and it implies agreements to avoid the double international imposition.

In relation with Financial System stability, public authorities and market actions are constrained to recommendations of New Basel Capital Accord of Basel II, by its large acceptance so much by International Institutions as by national States, that it derives in common international regulation of Financial System. Basel II is born for the lack of financial risk measures and management of fluctuation and crisis prevention. To surpass these lacks a higher sophistication in quantitative risk estimation is proposed in management models, supervision and public information.

Effectiveness of these measures and recommendations can be analyzed strategically simplifying the actors in authority (International Institutions) and in market (economic agents), where it is deduced that long-term stability and efficiency depend on Financial System credibility and solvency. It is observed that financial variable fluctuation depends
on rumours, opinions, legislation..., that although they do not affect to Real Economy, they are the base of economic agents' expectations and of their financial action.

Therefore, we can conclude that effectiveness in defence of solvency and efficiency of Financial System is consequence in crises of “second generation”, of strategic considerations of the participants. System instability can be affect to other investors, sectors or economies by contagion effects derived from international relations of Globalisation, from correlations among investment or hedging macroportfolios, from herding behaviour, from generalization of similar risk management standards...

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CHAPTER 6
HOW TO ASSURE YOUR PERSONAL FINANCIAL WEALTH: THE ANSWER IS ACTIVISM

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Abstract: There is no doubt how the investors are worried about the payback of their investments, part of the relationship between the payback and the risk assumed in any investment is related to the conflict between the management and the stockholders. In recent years the agency problem has become more important due mainly to investment frauds.

The objective of this chapter is to discover how the activism can assure your personal financial wealth, related mainly to the process of investment and how to control this process, investments related to risky assets as stocks and bonds, in a broad perspective describes the interaction and relationship between isolated investor and the target firm. The chapter is divided in four major parts, in the beginning we explain the definitions and concepts related to Agency Theory and
Activism, then we support and explain why and how the concept of Activism has been so important in the last decade, the third part of the chapter we explain the investment process and how we can apply the Activism concept into our personal investment portfolio, the last part of the chapter we define and describe how we can manage a design investment portfolio based mainly from Activism perspective.

**Keywords:** Activism, Institutional Investors. Corporate Governance, Agency Theory, Investments, Portfolio, Public Corporation, Principal, Agent, Credit Agency, Accounting Firm
1. Definitions and concepts of Agency Theory and Activism. The conflict

There is a conflict between management and shareholders due to different characteristics and interests according with Jensen and Meckling (1976). One side acts mostly as a consumer path, trying to maximizing their establishment and the income, the management knows the day to day operations and how to make new business or projects, but lacks the capital to make it real. New projects or bigger business means bigger salaries, additional bonus or any other no pecuniary benefits, the indifference economic curve will be related to effort and reward. On the other side are the stockholders, they invest the capital need it to increase operations and profits, also they will be wait for the payback and the additional return related with the initial and additional investments, the stockholders can be related to either debt or equity. The indifference economic curve is related to payback, risk and return of their investments. The conflict rise because at the end, management will be permanently keeps their jobs and salaries, with the minimum effort. The opposite side the stockholders, need someone who can care and duty their investment, maximizing the value of the firm and at the same time assuring to solve the future demand of the firm today. This relationship generates potential opportunistic behavior of management and additional agency cost due to monitoring and control of the firm.
There is an inevitable attribute for the public corporation, which is the implicit separation of the ownership and control (Berle and Means, 1932), that’s emerge to us the problem of agency. At the beginning of any investment or business, mostly of the time the entrepreneur and the management are the same person, the value of the firm, the future, the risk and return are related to the level of effort, expenditures and new projects, as we can conclude all the variables are related to the same person or family. The problem emerge when the small or family business become bigger and with a lot of business opportunities to keep growing in the future, that’s when the additional stockholders are invited to participate in this new exploration. They will invest and solve the problem of scarce capital resources but they will need someone to assure their investments. By the other hand, the initial entrepreneur will be sold part or completely his business to realize his wealth or to own part of the bigger business instead own one small business.

Because now the business is divided into two owners or more, the initial entrepreneur and the new stockholders, both sides needs someone to care day to day business operations and to assure the future of the company. The new management emerges with new institutional and professional processes, at this point and at the same time the stockholders (including the initial entrepreneur) needs also someone to control the management. Needs someone not related and not subordinated to management as well to follow and control the
operations and monetary transactions of the firm, moreover someone to assure the management is focused or concentrated in increase the business in to the future. According to Jensen and Meckling, (1976) the agency relationship is related to one contract under which the principal engages the agent to perform some type of service or activity according to his/her specific interests, including authority and decisions. The agent is called management; the principal is called the shareholder or the finance supplier.

During the process, the principal will motivate the agent to perform specific objectives, using several means such as compensations, monitoring, and measure of the agent’s behavior. By using those mechanisms the principal can assure his/her own wealth in the long run. The agent is, however, motivated by self-interest and is assumed being rational or to being risk averse. The situation can also result in a conflict between the objectives of the principal and the self interest of the agent.

The agency conflict has been analyzed since Adam Smith (1776) and Coase (1937) and has emerged as an important framework to help researches understand the nature of the principal-agent relationship. Different perspectives have been analyzed since then. The corporation can be a nexus of contracts as Jensen et al perceived or as a system of volunteer exchange as Alchain and Demsetz (1972) concluded.
Following the agency theory, the corporation is viewed as a “nexus of contracts” between agents, the principal and other people interested in the firm, such as banks, public institutions or venture capitalists. Conflicts of interest can arise due to the implicit relationship between these parties.

A conflict may also arise due to different people with different expectations (agent principal). One possible solution of this conflict is writing contract, but in a day-to-day relationship, it is quite impossible to write a complete contract with explicit planned behavior of the agent and principal relationship. Because one of the possible solutions is a contract, but contracts have considerable limitations, then other potential solutions may arise during the process. The first solution to the problem is the separation of ownership and control. Hire new management and put someone to control it.

The basic definition of the conflict between, the agent and the principal is the potential economic loss of the principal. This potential loss is caused by the agent. Potential loss can be identified as a loss of wealth, decreasing the value of the firm or inefficient application of cash flow according with Marnet, (2005).

Also the potential loss can be caused by agent opportunism (not necessary operative expenditures), agent incompetence, agent corruption, inadequate decision process or inadequate disclose information process. At the end of the process the potential loss will be
reduced to loss of principal wealth as is described by Maniam, Subramaniam, Johnson (2006) this our base ground to support this part of this chapter.

In the last decade one of the issues that most has being affected to investors is Agent Corruption, cases like Enron, World Com, Xerox, Waste Management, Adelphia, Tyco Co, Global Crossing and lately Madoff Ponzi Scheme. All this events reflects how initial conflict can jeopardize the wealth of the investors in the long run. The fundamental question is why and how this event happens when we have several mechanisms to assure well being of investor investments?

The answer relies in how financial and business system works. There are some regulation entities which assure transparency and legal procedures that any business must follow in order to be inside law. At this level everything is related to information, quantitatively or qualitatively. The word “assure” mostly of the time are related to external agencies that we call risk analyst, credit rating agency or accounting firm. Management informs and provided data to external entities and at the end they analyze and evaluate the information to make final report or emit conclusions about business. Mostly of the time the investors rely their decisions based on these external entities reports. At the end the conclusion from these agencies can quote, “based on the information from the company…..” “According with the information given by the Management then…….” In practical or pragmatic point of view is some
kind difficult to any external agency to discover a fraud or misuse of resources, because in order to identify misuse monetary resources or unethical expenditures it should be revised the day to day monetary transaction, and if we assume that there is thousands of every day transactions, it is just like try to find a “needle in a haystack”.

Moreover, the everyday transactions, monetary transactions or expenses can be legal or seems ethical. But that doesn’t assure that the management is not colluded with any external entity or supplier. This is the most dangerous actions or behavior that as investors can face.

Activism can be defined by the increasing engagement of the investors inside corporate governance issues of the company, according with Black (1997), activism involve changes in corporate governance issues inside the company or propose changes to board of directors to get management or strategy changes. All this changes are according with the public firm and according with the law and regulation entities.

2. Importance of Activism

Analyzing the past decade, linking fraud events and loss of wealth of investors we are far away to control agency problem, more over even with new laws, new regulatory procedures and new regulatory entities, the agency problem has been increase during the last years.
Activism is the procedure to be in close or near to the target firm, close or near means to ask the questions and actions taken by the management, it is the involvement of the major owners to the decisions and actions taken by the management. The activism mostly of the time is made by large and wealthy pension funds, when the pension fund identify one company with constantly decreasing financial performance then they start the process of activism, the company is called target firm. Many questions emerge in this relationship. Why the pension funds just sell off the stocks and buy another with better performance? If the target firm decreases the financial performance then the product market or the financial market will respond according with the economic forces?

The Pension Fund or any Institutional Investors mostly of the time are in the long view perspective, this means they don’t need the money today, they decide to increase the involvement with the target firm because if they activate the sell off process of target firm stock then they can loss more than already losses, remember is not just one pension fund it could be several investors at the same time resulting in a catastrophic drop of the stock price. The involvement process takes time to the investors to really understand the actions, the strategic plan and the consequences of decisions taken in the past, but also to understand the potential financial results in the near future and of course if there is any positive result in their investments. Because they can wait in time and they can involve more closely with the management to improve the financial
performance then they decide to do not activate massive sell off of the target firm.

In the short run, the product market can take advantage of the target firm situation but if the analysis or changes promoting by the management do not result as the expectation then the investors could use the right to promote changes to the board of directors and inside the management. As well in the short run the financial market will punish the stock price of the target firm resulting in different potential scenarios the most common is the takeover or hostile acquisition from one competitor or even private investor groups. In any scenario product market or financial market effect the institutional investor or pensions fund will be affected negatively the wealth of their investors.

In the long run, if the involvement promotes changes inside the board of directors as well in the management then the firm will take strategic changes and new opportunities to improve the financial performance and in time the stock price.

According with Karpoff (1999) and Romano(2000) there is several changes that are promoting by the institutional investment and pension funds, they can promote 1) New CEO 2) Promote changes to the members of the board of directors 3) Promote new control mechanism 4) Make changes to the compensation plans 5) Promote arrangements between the stockholders and the company 6) Restructuring the
company or changes into the private contracts between management and company. 7) Promote new members of the board of directors.

Mostly of the time depending the particular situation of the target firm the changes promoting by the institutional investors results in better and more efficient company and of course in better stock price, but between the changes and the results there is the variable time, that’s the institutional investors major advantage. In our case and then the purpose of this chapter is related to how to take advantage into this particular situation.

Summarizing, there is the activism process to promote changes inside the firm as well there is the variable time between activism and potential benefits. In this particular situation the firm and for us the stock price is more undervalued than overvalued situation. Mostly of the time in this situation the financial markets reacts aggressively and slide the stock price below the fair value or below the net present value of the stock.

3. Investment process, control and Activism and the potential applications in Investments

In Finance we use mostly of the time two forces, we use the greed to analyze and promote new potential firm in our portfolio, but always at the same time we use the opposite force which is the fear. Both forces react according with the data and financial information that we have
available at that particular time but some time wins only one which means sale or buy if the forces are equal then we can wait to better times.

This part of the chapter assume that you already have the portfolio or already have the personal investment profile, which means mostly of the cases know as investors our best fit relationship between risk and returns as well the time perspective framework. The typical portfolio maximizes the relationship between risk and return forces, including typical constrains such time, % weight investing in stock, risk tolerance and sectors to invest.

When one stock price doesn’t reflect the fair value or net present value then we can decide to buy or sell, mostly based in our investment position. But in our case, target firm will be below the fair market value because the negative perspective of company and poor financial performance; just consider the target firm with a lot of changes coming in the near future due to promotions from the institutional investors also consider the particular situation of the company with below fair value stock price and some investors sell off positions, at this point the target firm is our opportunity.

Then now consider your own time framework tolerance, this target firm will change in the future, how long time? How much improvement? Why should be positive change? All answers are related to the particular product and financial market position of the firm, the bigger the change
the longer the time, the lower the price than the fair value then better returns, also at the end companies don’t hire management with low and poor performance in their past.

We can divide the change in two major issues, the first one is, if the company its affected because the product or business problem then the risk will be higher, product or business problem means the consumer preferences are changing to the competition due to lack of quality, lack of competitiveness or the products firms doesn’t meet the consumer expectations. At this level it means drastically changes in production, marketing or even CEO’s. The second major issue is business problem; this means that firm doesn’t have the (internal or external) capabilities or resources to keep operating the business in the future, this problem required more money, more time and big changes inside the firm. Mostly of the time target firms meet into this both problems and consider minimum 12 month investment perspective.

If the firm it’s affected because minor changes, such atypical economic environment or temporary competition effectiveness or short run lack of product improvement, then the changes will be quickly as well the results this is the best time period opportunity because in at minimum 6 months the results will come out.

We always can expect positive changes in one target firm, because first, if there is some not long run solution to the company then the investor will make a massive sell off, and you will find historical low stock
prices as well same management and same results. Remember target firm means companies which reflect potential improvements in their actual conditions. Also target firms opt for changes but not in the entire management or board of directors, they make changes according with the problem.

Target firms are our opportunity in our portfolios because 1) We can relay that institutional investors may affect the actual and future management and board of directors, 2) The process of improvement relays to improve business and operative results and as well the financial results in certain period of time. 3) Initially target firm stock price is undervalued or with below fair market value, in time the stock price will increase as well reducing the business risk. 4) The monitoring process in those promoting changes to target firm will be by the institutional investors or pension fund including all the infrastructure, technology and experience in previous activism process.

4. Management and portfolio design based in Activism perspective

The investments require long view perspective, in our case if we construct long time portfolio then we should explore the Activism process in our investment activity to full fill our risk return profile. Depend our own constrains about our actual portfolio we can set the requirement risk and return best fit combination to our own profile, but beside this we can also
have some space inside our portfolio to explore those target companies. According with Nelson and Peterson (2004) they did not find sufficient empirical evidence to link activism with firm performance, but their study shows results with a window no longer than 100 days, according with the same authors they find better financial results in longer perspective mostly of the cases years. Several similar studies show same results.

How we can implement in our portfolio this approach? How we can decide the target firm? The answers relays mainly in our actual portfolio profile, we can include some % weighted space in our actual portfolio dedicated specially in target firms. Also we can respect some constraints such sectors, time, risk return target firm profile or any additional restrictions previously defined in our portfolio. We can search target firms based on the Council Institutional Investors list, which includes California Public Employees Retirement System (CalPERS), Teachers Insurance Annuity Association College Retirement Equities Fund (TIAA-CREF).

Besides their (CalPERS and TIAA-CREF) future perspective about target firm, we must perform our typical risk return analysis of the stock price as well the recent financial performance of the target firm. After that we should analyze those changes promoted by the institutional investors and our time framework perspective to conclude if the target firm fits our actual portfolio needs. Additionally we should keep monitoring the typical Security Exchange Commission (SEC) 8K reports which include any disclosure of important events from target firm; this is
the typical maintenance process that we need for any portfolio investment. We can repeat the process according with our portfolio rules and constrains.

Conclusions

Poorly performing companies have poorly corporate governance. Some time the actions for the institutional investors like “wall street walk” or “Voting with your feet” are not he most efficient way to keep the desirable risk and return combination. Everything relays how we can improve the company performance; the institutional investors use their rights using the technique Target Firms. Target firms are our prospectus to include in our actual portfolio, are our investments opportunities to analyze and include in our actual risk and return profile. Target firms are companies with product or business problems which the institutional investors cannot activate massive sell off because: time perspective, future opportunity of the business after changing management or board of directors and better times to sell off the stock.

References


