

## THE ROLE OF POLITICS IN FINANCIAL CRISES IN EMERGING MARKETS

### EL PAPEL DE LA POLÍTICA EN LAS CRISIS FINANCIERAS EN LOS MERCADOS EMERGENTES

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#### ABSTRACT

In this paper, we embed the key political mechanisms, specific to developing countries, into a political-economic model of financial crises. In this setup, financial market failures allow opportune government intervention to restore optimal allocation of resources. However, bad public policies could provoke financial crises. We find that the political interests and individuals' 1-dimensional heterogeneity, in terms of productivity, lead to different preferred policies between the median-productive and mean-productive economic agents, which might in turn induce to bad public intervention. Therefore, the larger the difference between these two reference individuals, the higher the probability of financial crises. We also discuss some features of the financial crises in Argentina (2001-2002) and its similarities with our model.

**Keywords:** Financial Crises, Political Economy, Emerging Markets, Government Intervention.

#### RESUMEN

En este artículo, incorporamos los mecanismos políticos más relevantes, específicos de los países en desarrollo, en un modelo político-económico de crisis financieras. En esta configuración, las fallas del mercado financiero permiten la intervención oportuna del gobierno para restaurar la asignación óptima de recursos. Sin embargo, las malas políticas públicas podrían provocar crisis financieras. Encontramos que intereses políticos y la heterogeneidad unidimensional de los individuos, en términos de productividad, conducen a diferentes políticas preferidas entre los agentes económicos de mediana y media productividad, lo que a su vez podría inducir a una mala intervención pública. Por lo tanto, cuanto mayor sea la diferencia entre estos dos individuos de referencia, mayor será la probabilidad de crisis financieras. También discutimos algunas características de la crisis financiera en Argentina (2001-2002) y sus similitudes con nuestro modelo.

**Palabras Clave:** Crisis Financieras, Economía Política, Mercados Emergentes, Intervención Gubernamental.

#### 1. INTRODUCTION

Financial crises are one of the illnesses of industrialized and emerging economies in modern times. Most would agree that they all involve a sequence of speculation, monetary expansion, or rising asset-prices followed by a sharp fall, and bank runs. Their occurrence and consequences have dramatically increased in the last fifty years of high capital mobility.<sup>1</sup> Emerging countries certainly go through serious consequences given their weak economic and political nature. Therefore, we focus on the financial crises in emerging markets during the nineties and beginnings of the new millennium.

The story, well described by [1], of a typical financial crisis, usually starts with a central bank pegging the foreign currency value of its domestic currency (the exchange rate) by buying or selling international reserves at the pegged rate. Even though this policy seems to work for some time, more foreign exchange is highly likely to be required in order to sustain the peg and international reserves start to dwindle. Among the reasons behind this fall in reserves is that private investors are losing confidence in the ability of the central bank to maintain the peg much longer. Additionally, depositors in domestic banks close their accounts, and expectations of bank failures grow. Investors in the stock market rush to sell their holdings, causing stock prices to plunge; and international lenders refuse to roll over maturing loans. In other words, claimants on the financial system – depositors, stockowners, and international lenders – try to liquidate their claims and, if necessary, convert the sums until so far collected into hard currency.

<sup>1</sup> In particular starting from the summer of 1992, with the inability of the industrial European countries to maintain their exchange rates within the bands agreed under the European Exchange Rate Mechanism (ERM).

Financial institutions are forced to liquidate assets and cancel loans to honour their commitments, and they may impose severe strains on firms and households. Some banks are pushed to the verge of bankruptcy allowing for default rates to rise. The central bank may attempt to fight these trends by raising interest rates, but it would do so at the cost of exacerbating the economic contraction. When this conflict becomes evident to the public, there is a further loss of confidence, and the loss of international reserves accelerates. Finally, reserves become so low that the central bank is forced to stop selling them to the public, ceasing the support of the exchange rate. Free to float, the value of domestic currency plunges. The financial system ends up in severe disarray, and the economy enters into a deep recession.

Up to now, mainly economic causes of financial crises have been exhaustively studied in the first, second and third generation models (see [2, 3, 4] for a review). The political side has been mentioned by its lack of deeper foundation. In fact, only in third generation models we can mention politics as one of the reasons responsible of financial crises. The so-called *bad policy approach*, included in the third interpretation, suggests that bad political intervention can provoke financial crises. Indeed, political imbalances, not always evident from standard monetary or fiscal statistics, are often overlooked. More specifically, government subsidies often guarantee domestic private individuals disregarding repayment probabilities and expected returns. In this context, the government absorbs the resulting losses. This policy may be successful for as long as the government has enough funds to keep it going. However, a crisis must occur, since this insurance fund has a limit and, at some point, the accumulated losses must reach that limit. Indeed, crucial political-economic mechanisms may exist behind financial crises in emerging countries, where governments guarantee domestic private borrowing in spite of the fact that such guarantees encourage domestic borrowers take socially costly actions. Although these mechanisms have been studied in other papers, one of the most influential by [5] among others, we believe this field of study seems not exhausted yet.

In this paper, we aim to fill this gap in the literature of financial crises. We insert the key political mechanisms, specific to developing countries, into a political-economic third-generation model of financial crises. In this setup, financial market failures allow opportune government intervention to restore optimal allocation of resources. However, bad public policies could provoke financial crises. We find that the political interest and individuals' 1-dimensional heterogeneity, in terms of productivity, lead to different preferred policies between the median-productive and mean-productive economic agent, which might in turn induce to bad public intervention. Therefore, the larger the difference between these two reference individuals, the higher the probability of financial crises. We also discuss some features of the financial crises in Argentina (2001-2002) and its similarities with the model presented.

The next section presents a review of the relevant literature with particular attention to the evolution of the economic models on financial crises and their links with political economy issues. Section 3 introduces the basic setup of [6], highlighting the role of government intervention when there is financial market failure. The electoral equilibrium is explained in Section 4. A discussion of the specific case of Argentina's financial crises (2001-2002) is related to the findings of the model and featured in Section 5. Section 6 concludes and presents some remarks about the possible paths of future research.

## 2. LITERATURE REVIEW

A financial system performs the essential function of channeling funds to those individuals or firms that have productive investment opportunities [9]. Economic agents participating in financial markets are expected to make accurate decisions about creditworthy investment opportunities. Usually, borrowers have precise information about the risk and potential returns of the investment projects they plan to undertake in contrast to lenders. Therefore, a financial system confronts asymmetric information that leads to two basic problems in the financial system: adverse selection and moral hazard. These imperfections can also be seen as specific forms of transaction costs [10].

The asymmetric information problems yield to a definition of financial crises explained by [9] as: "a disruption to financial markets in which adverse selection and moral hazard problems become much worse, so that financial markets are unable to channel funds efficiently to those who have the most productive investment opportunities." A financial crisis, thus, results in the inability of financial markets to function efficiently, which yields to a sharp contraction in economic activity.

Financial crises have affected a large number of industrialized and emerging economies without distinction. Harmful episodes of financial crises in emerging markets demand especial attention on the grounds of weak economies by definition. The events of Mexico (1994-1995), Thailand, Indonesia, South Korea and Malaysia (1997-1998), Russia (1998), Brazil (1998-1999), Turkey (2000-2001), and Argentina (2001-2002) bring the problem to our attention. Certainly, there is a vast number of attempts to understand and model financial crises for prevention purposes. However, in economists' view, there can be little credence of successful outcomes of the causes, genesis, and resolution of financial crises, being always ex-post object of study.

A first attempt of a rationale for financial crises was led by [2]. He explains the case of a country with pegged currency and foreign reserves. In this setup, a financial crisis is the product of budget deficits. Since depreciation is not a preferred policy, the government defends the desired parity by using its reserves. Thus, the efforts of investors to avoid undergoing capital losses (or to achieve capital gains) in a collapsed economy conduct to speculative attacks. Such episodes provoke reserves' erosion below a critical level, ending in a balance-of-payment crisis. While that wisdom was largely consistent with the currency crises of the eighties, the crucial fiscal deficits were notoriously absent in the recent episodes of Mexico in 1994 and East Asia in 1997 [1, 20]. Therefore, this so-called *first generation model* of currency crises does not necessarily explain the episodes occurred in emerging markets during the nineties.

It is even less likely that the *second-generation models* of financial crises, started by [3], would help us understand financial crises in emerging markets. These models come forward as a response to the Exchange Rate Mechanism (ERM) crisis of 1992-1993 in industrialized European countries with access to world capital markets and out-of-concern reserves adequacy. In these models, the central bank may abandon exchange rate peg under output negative shocks that generate unemployment pressure. Self-fulfilling expectations play a crucial role since the costs of defending the peg may themselves depend on anticipations that the peg will be maintained. However, again this model does not fit the facts in Mexico in 1994 and East Asia in 1997. Asian countries had high economic growth rates until shortly before the crises episodes [4, 21], making [3]'s argument less compelling.

In the light of the East Asian financial crisis economists observed that the "Asian miracle" became the "Asian crisis" [21]. Moreover, the existing models of currency crisis were unable to explain what had happened. It was not a first-generation currency crisis brought about by excess budget deficits, as in [2].<sup>2</sup> Nor was the crisis caused by a conflict between the austerity needed to defend a fixed exchange rate and the expansion required to eradicate high unemployment, as in Britain's forced exit from the ERM in 1992-93. To understand what happened to Asia, a new *third generation model* is needed, which puts crises in the financial system under a magnifying glass. The third interpretation of financial crises is a variant of the second one, being also of the self-fulfilling kind. It differs, however, in the vulnerabilities that may or may not cause a crisis in the financial system [23]. According to [1] there are two main conceptual approaches in the third-generation models of financial crises: the *financial panic approach* and the *bad policy approach*.

The *financial panic approach* argues that the Asian crisis was the result of a financial panic. The origin of the crises is that international creditors and domestic depositors, anticipating a crisis, suddenly refused to roll over credits or keep their funds in the financial system. This loss of confidence may have been caused by various factors such as: bad news about a particular bank or business conglomerate, bad exports performance, or political turmoil. Consequently, these countries had to quickly seek for short-term funds, ending up in costly liquidations, asset price collapses, domestic bank runs, and credit crunches. In other words, the flight to liquidity caused a real crisis, which in turn justified, ex post, the loss of confidence. It is worth mentioning that those crises forced financial systems to liquidate investments at a loss, even if those investments may have been very profitable in the long run. Then, if foreign lenders and depositors had not panicked, financial systems would not have had to suffer the credit shocks, and the costly disruption of the system would have been avoided, justifying the optimistic expectations. Therefore, in this approach recent crises did not need to happen; it was mainly the market expectations critical to the understanding of the crises.

Although *financial panic approach* and the *second-generation models* have loss of confidence as common denominator, the origin of it makes the distinction. In the second-generation models while governments may not have to abandon fixed exchange rates they may choose to do so if the social cost of defending fixed rates, particularly in terms of unemployment, becomes too large. On the other hand, the first approach is more related to international vulnerability in terms of liquidity.

There are by now a number of versions of the financial panic approach such as [24] and [4, 20, 25]. The latter suggest a model for a small country highly vulnerable to financial panics due to international illiquidity. A country's financial system is internationally illiquid if "the financial system's potential short-term obligations exceed the liquidation value of its assets",<sup>3</sup> thus if holders of the short-term liabilities of the financial system lose confidence and attempt to redeem their holdings, the system will become bankrupt, making the confidence loss self-fulfilling, if and only if, it is internationally illiquid. In other words, the root of nineties crises was a maturity mismatch: short-term international liabilities were far greater than short-term assets. [1] finds that this approach is consistent with observing financial liberalization and credit booms prior to crises. In such view, financial liberalization may be the key to understanding

<sup>2</sup> Krugman admitted the no-applicability of its model to this case arguing: "I was wrong; Maury Obstfeld was right" [22].

<sup>3</sup> As defined in [4].

why the crisis countries became internationally illiquid.<sup>4</sup> The consequence is that financial liberalization may make countries more prone to crises although, in contrast with the bad policy approach, it is intrinsically welfare-improving.

The *bad policy approach* follows the spirit of Krugman's first generation model in asserting that, ultimately, crises are the inevitable outcome of misguided government policy. This approach was originally presented in [26, 27, 28] and it has been exhaustively discussed by [5]. The challenge of this approach is answering why policy imbalances were not evident from standard monetary or fiscal statistics. Supporters argue policies in crisis countries were in fact bad. But, at the same time, they were unusual enough so that their effects did not show up in conventional macroeconomic measures. As [1] summarizes well "while not manifest, the damage on the economy accumulated over time, eventually leading to a crisis and a policy reversal, just as an apparently healthy tree ultimately falls long after its roots begin to rot."

Regarding specific policies, it has been argued that governments in emerging economies often guarantee domestic private borrowing, even though such guarantees encourage domestic borrowers to take socially costly actions (such as investing in excessively risky projects or simply stealing the borrowed funds). While such a policy implies that the government will ultimately absorb the resulting losses, it may look successful for a while -that is, for as long as the government has enough funds to keep it going. A crisis must occur, however, because this insurance fund has a limit and, at some point, the accumulated losses must reach it. Since private agents understand that further borrowing will not be guaranteed, there must then be an attack in which creditors exchange existing private liabilities for the government insurance fund.

In addition to rationalizing the absence of the usual warning signs of fiscal or monetary excesses, the *bad policy approach* is consistent with two notable facts preceding emerging countries crises. First, most of the countries that went into crises had experienced radical reform and liberalization in their financial sectors, including the deregulation of interest rates, the easing of reserve requirements, and the promotion of entry and competition in financial sectors. Second, this view is consistent with a rapid growth in credit preceding crises, an association that has been stressed by [29] and others. Interestingly, both facts are regrettable according to the bad policy approach. By eliminating controls and regulations, financial liberalization may have allowed borrowers to take excessive risk or engage in unprofitable activities. Credit booms, on the other hand, may have represented a faster accumulation of social losses, thus bringing forward the time of reckoning [1].

In any case, in the government intervention arenas politics play an important role. Among the first to address the political dimension of financial crises we count [30] who find that devaluations are preceded by political instability, budget and current account deficits, and fast growth of money and prices. Later, [31] argued that weak governments might be more vulnerable to currency crises. For example, structural political variables are correlated with currency crises: a right-wing government is less likely to experience currency crises; "strong" governments<sup>5</sup> are also less vulnerable. In addition, democracy may be negatively related with currency crises [32]. Political contagion has also been object of speculation [33]. However, elections have had quite a success at explaining financial crises. In a detailed study of the behaviour of real and nominal exchange rates in Latin America, [31] confirmed that changes in exchange rate regimes coincided with elections. In the same line, sudden swings in capital flows and currency devaluation are also associated with electoral years. Three significant financial crises in Latin America (Mexico in 1994, Brazil in 1999 and Argentina in 2001) took place during a corresponding presidential or parliamentary electoral year (see [34] for an analysis of the Mexican case).

Historical facts reveal that with the spread of democracy in Latin American during the nineties, politicians became more aware of social pressures, and they tended to delay costly adjustments [35]. Emerging markets are particularly vulnerable to this delayed-reform problem since, as it has been discussed in [36], countries with weak institutions tend to adopt poor macroeconomic policies. [37] completes the story arguing that weak governments delay the implementation of necessary, but politically costly economic reforms. Therefore, intervention by weak governments leads in turn to bad macroeconomic performance and higher financial volatility, unless there is International Financial Institutions' support. Then, high political-institutional instability is an additional consequence of weak government intervention. In other words, instability in emerging markets derives not from the democratic process itself, but from the background of institutional weakness in emerging democracies<sup>6</sup> [35].

<sup>4</sup>For example, one of the implications of increased competition is that banks will offer better terms (higher yields on savings deposits, for instance) to depositors in order to attract their business. This move tends to not only make depositors better off but also increase the potential short-term liabilities of banks and, hence, to exacerbate international illiquidity.

<sup>5</sup>It considers those with larger legislative majorities and more fragmented legislative opposition.

<sup>6</sup>Indeed, where institutions are weak, and consequently the government's ability to honour its promises over time is called into question, the identity of the winning candidate becomes much more important to investors than in countries with strong and stable institutions.

Despite all the cons that seem to be compelling on the public intervention issue, we have also discussed that there are some arguments associating financial market failures with the case for intervention in credit markets to achieve optimal allocation; i.e. imperfect information has implications for government intervention [6]. The novelty of this work is that it combines both, implications of the economic side and the political side of financial crises, trying to investigate the reasons why Pareto-efficient allocation cannot be achieved by government intervention in a financial market failure setup. In fact, [38] already drew the conclusion that crises would occur even in a planned economy, since planners are fundamentally no different from other men, capable of oscillating between enthusiasm and despair. The somber History of the last decades shows that he was not entirely wrong. An economy is likely to suffer from government failure. To the best of our knowledge the analysis of the effect of government intervention in a credit market failure framework has not yet reached sunset. Therefore, the present work is a step into that direction.

### 3. A MODEL OF FINANCIAL MARKET FAILURE

In this section, we present a model explaining how a financial market failure, caused by asymmetric information, can degenerate in a financial collapse, thus requiring government intervention. We propose a 2-periods model where in  $t = 0$  the interaction of demand and supply of credit determines an interest rate which turns out to be not Pareto-efficient. More accurately, there is rationing in the financial market due to adverse selection. This shortage induces government intervention leading us to the following period. In  $t = 1$  government intervention, through loan guarantees as special case of credit subsidies, restores the financial market failure by increasing the quantity of loans to the optimal level. Since we focus our attention on financial markets, we present the model by [6] due to its clear and intuitive results. Still in [6]'s framework we observe that the right government intervention can be Pareto-improvement.

#### 3.1. THE FINANCIAL MARKET

The model by [6] is close in spirit to [11] and [39]. It considers the fragility of the financial system by examining the conditions under which an economy may experience a brutal contraction of credit and, as a consequence, of activity. These conditions are related to asymmetric information, with emphasis on adverse selection: borrowers have more information about their own riskiness than lenders. [6] illustrates this scenario by analyzing a one-period model of students' loans market. He argues that due to market's inefficient allocation of resources a "social planner may often endorse the type of policy currently effective" through government intervention.

We consider a two-period setting and present [6]'s model for the study of the credit market occurring in the first period. There are different types of firms owned by economic agents, there are commercial banks and a government (henceforth, we use economic agents and firms indistinctively). All economic agents are risk-neutral. We assume asymmetric information problems; hence, banks cannot accurately assess individuals' risk.<sup>7</sup> Each firm invests in a project with cost one, and expects a future payment of  $X$ , with probability of repayment  $P$ . Therefore, economic agents have a distribution given by the density function  $f(X, P)$ . The values of  $X$  and  $P$  vary across firms and only they hold this information. Nevertheless, commercial banks and the government know the density function of the population. Moreover,  $P$  is in function of  $X$ ; they are positive and perfectly correlated. The average probability of repayment is denoted by  $\Pi$ . Borrowers must pay an interest rate  $r$  in case of success and zero in case of failure.<sup>8</sup> As in [13] and [40], we assume that the costs of issuing equity and bonds are prohibitively high, hence firms need bank loans. One must recall that this model aims to feature the reality of emerging countries, and thus, alternatives such as the stock market are not always an available or the best option. Then, adding up the firm per unit (loan) profit function  $P^F$  becomes:

$$P^F = \begin{cases} X - r, & \text{with probability } P \text{ (success)} \\ X, & \text{with probability } 1 - P \text{ (failure)}. \end{cases}$$

From this expression, a firm's expected profit is:

$$E(P^F) = X - Pr.$$

Firms only invests when  $E(P^F) > 0$ . Firms apply for a loan if and only if the expected gains are greater than a reservation utility denoted  $U_0$ . That is  $X - Pr > U_0$  which, for simplicity, we assume  $U_0 = 0$ . Moreover, we find a participation constraint,  $X > Pr$ , where investors decide to invest and borrow as long as the expected return of the project ( $X$ ) exceeds the expected cost of borrowing ( $Pr$ ). Note that the repayment probability  $\Pi$  is considered for banks as the average of  $P$  for those firms who actually invest. In addition, for any density function  $f(X, P)$  the function  $\Pi(r)$  is a well-defined conditional expectation. Therefore, the function relating  $r$  to  $\Pi$  is:

<sup>7</sup> Assuming risk averse agents does not imply different results see [6, p 457].

<sup>8</sup> A successful enterprise is such that the cash flow is high enough to repay the loan and there is failure otherwise.

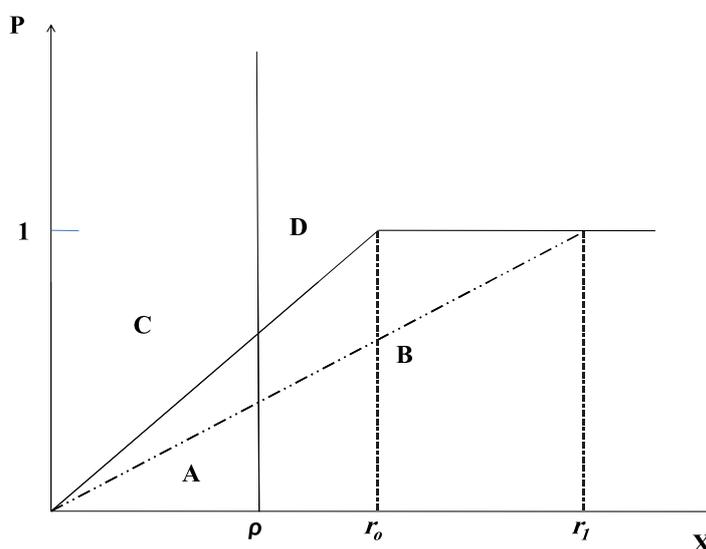
$$\Pi(r) = E \left[ P \mid P < \frac{X}{r} \right]. \tag{1}$$

The average probability of repayment  $\Pi(r)$  in the population of borrowers is a decreasing function of  $r$ .

Banks can also invest in a risk-free asset (i.e. Treasury bill) and obtain a certain future payment  $\rho$  which is exogenous to the model. For the case where firms default, banks receive no repayment on the loan.<sup>9</sup> Then, each project's cost of borrowing,  $\Pi r$ , must be equal to the risk-free interest rate  $\rho$  if the bank is to make any business loans. Then, the equilibrium condition in the credit market can be expressed as:

$$\Pi r = \rho. \tag{2}$$

According to this condition and considering the participation constraint some firms borrow and invest and some others do not, these can be clearly observed in Figure 1. In area  $B$  ( $C$  respectively) are the projects socially efficient (inefficient, resp.) which are (not) undertaken. However, we observe some difficulties in area  $D$ , where there are projects socially efficient but not undertaken, and those in area  $A$  which are socially inefficient and are undertaken. There is no interest rate  $r$  that can make both areas  $A$  and  $D$  disappear. This is observed from an increase in  $r$  from  $r_0$  to  $r_1$  which only increases area  $D$  and decreases area  $A$ . Hence, the market interest rate cannot reach an optimal allocation of resources since it must always be larger than  $\rho$ .

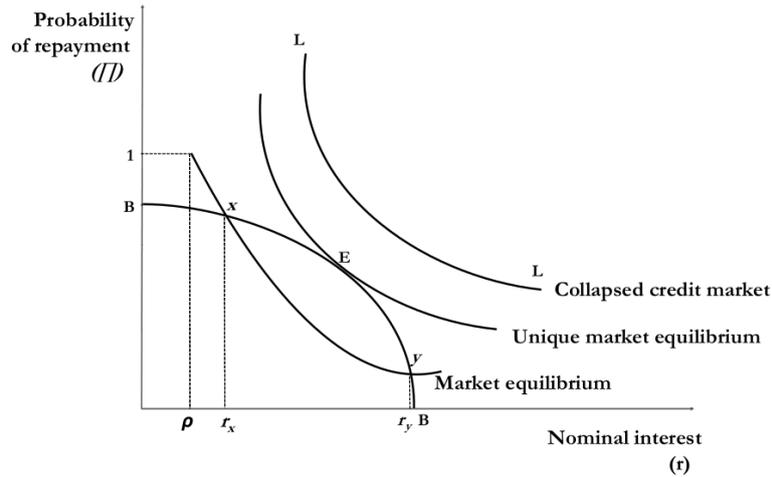


**Figure 1:** Areas of investment.

Source: Mankiw [6: 459].

The two general principles, Eqs. (1) and (2), yield the optimal interest rate  $r^*$ . This optimal interest rate is strictly greater than the risk-free return  $\rho$ , since otherwise it would induce inefficient investments. Graphically (see Figure 2) Eq. (1) is represented by the  $BB$  curve and the  $LL$  curve labels Eq. (2). In a  $(r, \Pi)$  space we can observe three different scenarios. First, when the curves  $LL$  and  $BB$  do not intercept there is no equilibrium in which loans are made. In this case, firms are characterized by a high level of riskiness to give banks their required return. This equilibrium is named as “collapsed credit market”. Second, a “unique market equilibrium” is observed on  $E$ , which can be characterized as critical situation since it vanishes as soon as there is a small increase in  $\rho$ .

<sup>9</sup> According to [6] including a default payment  $\Delta (\Delta > \rho)$ , such as collateral is possible but improvements in the model are not particularly observed; therefore, we set  $\Delta = 0$ .



**Figure 2:** Equilibrium of the credit market.

Third, when the curve  $BB$  intercepts the curve  $LL$  closer to the origin, there exist two intercepts where only  $x$  is stable equilibrium. Indeed, in equilibrium  $y$  banks would have an incentive to lower their interest rate to a point where the average repayment probability  $\Pi$  is greater than necessary to give banks their required return  $\rho$ . Then banks can achieve a higher return by charging lower interest rate below the market rate at  $r_y$ . This problem does not exist in the case of point  $x$ .<sup>10</sup> This situation is named “Market equilibrium” and it deserves particular attention since even if  $x$  is a stable equilibrium, it does not correspond to a welfare maximum due to information asymmetry. In this context, the analysis of welfare *per se* is rather difficult to observe.

### 3.2. THE GOVERNMENT INTERVENTION

Once we observed the behaviour of an unfettered credit market, unable to achieve Pareto-efficiency, we follow [6] who proposes a government loan guarantee program, as a special case of subsidy, where the market rate becomes equal to the risk-free rate ( $r = \rho$ ). This guarantee program aims to disappear areas  $D$  and  $A$  studied before in Figure 1. Hence, the financial market undertakes all the socially productive investments.

The costs of this government credit subsidy consist on a payment of the difference between the return from firms to banks  $\Pi r$  and  $\rho$ , since banks would accept this rate as the minimum preferred (see Eq. (2)). In addition, according to [6] “If the government must raise money using distortionary taxes, then the deadweight losses are an additional cost of the credit program. As with all expenditure programs, the marginal benefit must exceed the marginal deadweight losses if the program is to be socially efficient.” Nonetheless, we underline the fact that [6] ignores the cost of raising revenue, computing the social welfare as:

$$SW(r) = \int_0^1 \int_{Pr}^{\infty} (X - \rho) f(X, P) dX dP. \quad (3)$$

Taking the derivative of social welfare with respect to the interest rate  $r$ , and evaluating at  $r = \rho$ .

$$\frac{dSW}{dr} = \int_0^1 -P(Pr - \rho) f(P, Pr) dP > 0 \text{ if } f(P, Pr) \text{ is nonzero everywhere.} \quad (4)$$

Observe that the optimal interest rate is that  $r^*$  is never below the risk-free return  $\rho$  since it would induce inefficient investment. Moreover,  $r^*$  is generally strictly larger than  $\rho$ . In this framework, an unrestricted market is inefficient and can be improved by government intervention even if the government has not better information than lenders do.

Summing up, [11] show that an equilibrium loan market rate is characterized by credit rationing and [6] shows that there may not exist any equilibrium at all (i.e. a “collapsed market” with no lending). [6]’s results are particularly interesting because they do not rely on the narrow definition of credit rationing. Different from [11], there are no loan ceilings for individual borrowers (since all project sizes are fixed) and identical borrower types receive identical treatment. Although market forces exclude a number of borrowers who would otherwise obtain loans in the absence of

<sup>10</sup> By similar reasoning we observe that at interest rates above  $r_x$ , banks can earn a rate of return above  $\rho$  which provokes a capital inflow and lowers the interest rate. Symmetrically, at interest rates below  $r_x$  the repayment probability is too low to give lenders a return of  $\rho$ , causing a capital out flow and raising the interest rate.

informational problems; the relevant feature is that the basic principle need not be tied to particular forms of credit rationing. More important, [6]<sup>11</sup> and [39]<sup>12</sup> note the possibility that the equilibrium is socially inefficient; however, the policy intervention they propose does not correct the market failure as it is suggested in [6].

#### 4. ELECTORAL EQUILIBRIUM

In the previous section, we have studied [6]'s model where financial markets with asymmetric information ration credit; this equilibrium can be solved through Pareto-efficient government intervention. However, doubts about the suitability of the intervention are unavoidable. Indeed, one can argue that misleading policies could yet worsen financial markets' panorama. Thus, economic fundamentals<sup>13</sup> and international economic reasons seem to lack the tools to analyze financial crises in this scenario. In this section, we investigate the political economy side of the problem, i.e. the relationships between individuals as economic agents, the financial system and the government, which may be another possible source of financial crises.

In the spirit of [7] and [8] we present a general policy problem and the policy preferences of economic agents with respect to the taxes needed to finance government intervention. This model is closely connected to [6]'s model by government intervention through distortionary taxes. It diverges, however, on the fact that the former neglects the importance of tax raising, while the latter completes the analysis by including income taxes, redistributing through subsidies (i.e. loan guarantees) and linking individual's characteristics with the project's particular features.

The first part of the intuition has been largely explained. We move away from [6] on his assumption that government intervention, through loan guarantees, can overlook tax rising. As suggested in [6] one way of raising funds can be distortionary taxes. Hence, there is great importance in analyzing the individual's utility once her income is affected by taxes as the economy's social welfare. Provided that in this model we consider individual's attributes (i.e. productivity, ability to innovate, among others), they can be reflected in two important dimensions: the income level and the project's features (i.e. high or low expected return and probability of repayment). This individual's heterogeneity also affects the preferred public policy. Thus, individuals have different preferred policies implemented by the government.

For instance, low productive individuals, with low income level and holding socially inefficient projects (i.e. low expected return and probability of repayment) may prefer higher income taxes. The explanation behind this behaviour pictures the individual's expectations of achieving financing for her project despite its socially inefficient characteristics. However, since she has low income, she pays proportionally less than the loan guarantee she will receive. At first sight, projects socially inefficient must not be undertaken under any circumstance since they are highly likely to default. However, what makes us think that the government always takes the right decisions and does not subsidize those projects? What incentives would the government have to deviate from the Pareto-efficient policy? To answer these questions, we analyze individual's heterogeneous productivity, income and preferred policy.

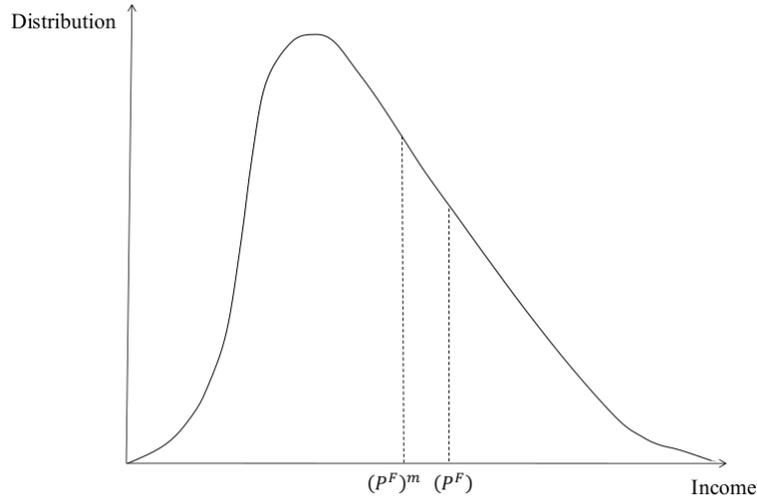
In the light of the median-voter theorem [41] the median individual, in terms of productivity and therefore income, is the decisive one when it comes to choose government intervention – in this case distortionary taxes to raise funds for loan guarantees. Moreover, studies on the distribution of income show that the distribution is skewed to the right, so the mean income individual lies above the median income individual (see Figure 3). The problem emerges when the median income individual – the decisive individual – has low productivity and plans a project with low expected return and low probability of repayment. In such a case, she is certainly a candidate to default. Moreover, since she is the one who chooses the economic policy, she prefers higher income taxes to be redistributed in the economy allowing socially inefficient projects, like hers, to be undertaken. Consequently, this scenario can lead the whole financial market to a general collapse.

We consider a large number of individuals who are, still, firm owners. They treat prices, wages, and tax rates as given, determined in the markets for goods and labour and by the political process, respectively. These economic agents are indexed by their individual attributes. Introducing a notational convention, we use a superscript  $i$  to denote variables specific to individuals of this type. Differences in the choice of labour/leisure allocation, consumption and wages arise solely because of differences in productivity.

<sup>11</sup> They suggest a usury law (an interest rate ceiling) as a solution.

<sup>12</sup> They propose the policy of forcing banks to lend to all borrowers at some interest rate.

<sup>13</sup> The economic fundamentals of financial crises are exhaustively studied in Section 2.



**Figure 3:** Income distribution.

Each agent  $i$  is endowed with an exogenous productivity parameter  $\alpha^i$  and her utility function is given by

$$u^i = c^i + v(k^i), \quad (5)$$

where  $v' > 0 > v''$  (i.e.  $v(\cdot)$  is a well-behaved concave function). Each individual increases her utility with consumption per capita  $c^i$  and leisure  $k^i$ .

Consumption equals the disposable income, which consists of the sum of the net income from labour  $(1 - q)l^i$  where  $q$  is the constant income tax rate and  $l^i$  is the amount of labour (assuming the wage rate is normalized to 1 and, in this case, equals the profit of the individual's firm) and a lump-sum transfer  $z$  from the government, that is:

$$c^i = (1 - q)l^i + z. \quad (6)$$

Productivity determines the time-constraint of the agent in the following way:

$$1 - \alpha^i = l^i + k^i. \quad (7)$$

Eq. (7) allows individuals to have different amounts of “effective time” available. Consequently, there exists a negative relationship between work and leisure. Individuals cannot have more of both at the same time. Indeed, hard-working individuals benefit from less leisure and vacations are not combined with working days. Moreover, there are much interesting consequences behind, since we can differentiate individuals by their level of productivity. Those individuals who are highly productive have the ability to produce a better quality of output (project) per unit of time than the low productive ones. Thus, by considering the productivity level we observe that individuals highly (poorly) productive have a low (resp. high)  $\alpha^i$ . The cumulative distribution function of  $\alpha^i$ ,  $F$ , is distributed in the population with expected value or mean  $E(\alpha^i) = \alpha$  and  $F(\alpha^i) = 1/2$  defined as the median individual.

Assuming the agent is rational and thus behaves as a utility-maximizer, introducing the two constraints, Eqs. (6) and (7), into the maximization problem (5), the amount of labour she optimally supplies is determined by solving the following problem:

$$\max_{l^i} u^i = (1 - q)l^i + z + v(1 - \alpha^i - l^i) \quad \text{where } l^i \geq 0. \quad (8)$$

The first order condition maximizes individual's labour supply:

$$(1 - q) = v_k(1 - \alpha^i - l^i). \quad (9)$$

Before computing the welfare, it is important, at this stage, to make some important remarks linking the financial market model and the policy preference model. Given the tax rate, the left-hand side of equation (9) is a constant and, as a result, so is  $1 - \alpha^i - l^i = k^i$  at the optimum. Therefore, we see that at the optimal quantity of labour  $l^{i*}$  the agent's supply depends on her productivity in the following way:  $l^{i*} = 1 - \alpha^i - k^{i*}$  where  $k^{i*}$  is constant.

Assuming the expected return of the project is directly proportional to the quantity of labour involved in it, we have:

$$X = a(1 - \alpha^i - k^{i*}), \quad (10)$$

or introducing the relation  $k = v_k^{-1}(1 - q)$  we obtain

$$X(q) = a(1 - \alpha^i - v_k^{-1}(1 - q)), \quad (11)$$

where  $a > 0$  is a scaling constant.

In Eq. (10) we associate individual's productivity with the problem of asymmetric information in financial markets. It seems reasonable to establish a relationship between individual's productivity with the expected return of her project. One would expect individuals highly productive also be endowed with intelligence, efficiency, originality, creativity, innovation, etc. to produce projects with also high expected return,  $X$ . At the same time, these qualities allow a highly productive individual to have a high income. Recall, from the first part of the model, that there is a perfect positive correlation between the probability of repayment of a project and its expected return. Then, those projects with high probability of repayment are created by highly productive individuals (low  $\alpha^i$ ).

With Eq. (10) the circuit of relationships is completed. An acquired sequence is as follows: an individual owns a firm and works in it. If she is highly productive, then she will be hard-working, so she is expected to create an original project with high expected return and high probability of repayment. However, her resources are limited and she needs financing. Since her project has high probability of repayment the information captured by the bank is positively evaluated. Then, this project, socially efficient but not undertaken in the unfettered market (See area  $D$  of Figure 1), is undertaken through loan guarantees provided by the government. The other side of the coin deals symmetrically with the low productive individual whose poorly innovative project also presents low expected return and probability of repayment (see area  $A$  of Figure 1). Hence, this project is socially inefficient and should not be undertaken since it is highly likely to default affecting negatively the financial system.

Continuing with the maximization problem of (8) we have:

$$l^i = [1 - \alpha^i - v_k^{-1}(1 - q)] + (\alpha^i - \alpha), \quad (12)$$

$$l^i = L(q) - (\alpha^i - \alpha), \quad (13)$$

where  $L(q) \equiv [1 - \alpha^i - v_k^{-1}(1 - q)]$  is decreasing in  $q$  by the concavity of  $v(\cdot)$ . A higher tax rate thus distorts the labour-leisure choice and induces the consumer to work less. Furthermore, productive consumers work more at every tax rate. Let  $l$  denote average labour supply. Since the average of  $\alpha^i$  is  $\alpha$ , we have  $l = L(q)$ . The government budget constraint can therefore be written as:

$$qL(q) = z. \quad (14)$$

In order to restore financial markets failure, the government taxes  $q$  of the economic agent's income; these resources are redistributed in the form of loan guarantees representing the government's expenditures  $z$ . The proportional tax  $q$  is the policy chosen by individuals regarding their own preferences.

With all the elements to compute the economy's welfare, we introduce Eqs. (12) and (14) in the maximization problem of (8) where the economy's welfare is in function of the policy  $q$  and the productivity of individuals  $-\alpha^i$ .

$$W(q, \alpha^i) = L(q) + v[1 - L(q) - \alpha] - (1 - q)(\alpha^i - \alpha). \quad (15)$$

The first order condition maximizes individual's preferred policy as follows:

$$\frac{\partial W(q, \alpha^i)}{\partial q} = L'(q) + v'[L'(q)] + (\alpha^i - \alpha) > 0. \quad (16)$$

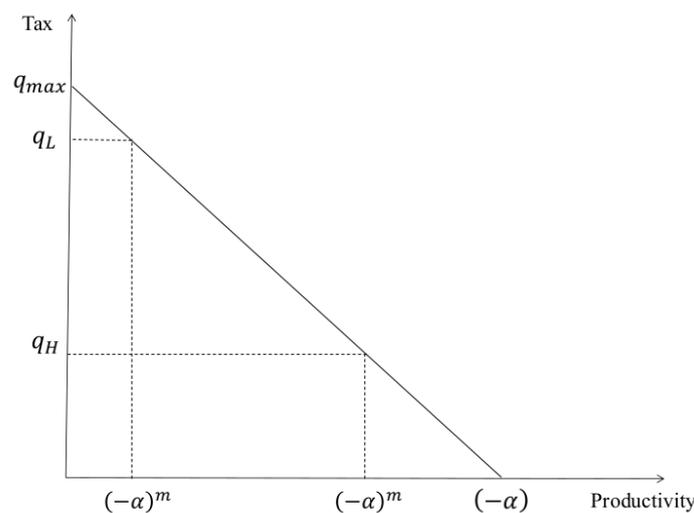
As in [6]'s model the economy's welfare clearly improves with government intervention through the application of economic policies. In this case, the implementation of distortionary taxes to the economy with redistributive purposes

increases the welfare of the population. In other words, loan guarantees financed with income taxes are a Pareto-improvement. Indeed, as we concluded in Section 3, the financial market failure can be corrected with government intervention through loan guarantees.

$$\frac{\partial W(q, \alpha^l)}{\partial q} = -(1 - q) < 0. \tag{17}$$

On the other hand, the first order condition with respect to productivity yields different results. Considering we deal with 1-dimensional heterogeneity differences of productivity, labour, income, characteristic of an individual's project decrease the welfare of the economy as it is proved in Eq. (17). From Eq. (10) we know that highly productive individuals design projects with high expected return and probability of repayment, which can be classified as socially efficient and welfare increasing. On the other hand, poor performance of projects coming from non-innovative ideas leads to decreases in welfare.

By the median voter theorem [41] and [42] one expects the best policy to be the one preferred by the median income individual,  $q^* = q(\alpha^m)$ . However, this conclusion is questionable in this case. We find that there are cases when the median-income individual's preferred policy is not necessarily the best.



**Figure 4:** Tax and productivity.

From Figure 4 we observe that there is a negative relationship between productivity and tax preferences. An individual highly productive prefers lower taxes. This is also true from the point of view of her project. Since her project is pioneering, it is highly likely to be undertaken for its socially efficient characteristics. Thus, this individual has low preferences for loan guarantees. On the other hand, a low productive individual prefers completely the opposite. She prefers high taxes because she knows that she will be benefited with loan guarantees for her socially inefficient project. When this individual reaches the extreme of null productivity, she prefers the maximum tax rate  $q_{max}$ . When an individual is as productive as the average  $\alpha$  she prefers taxes to be equal to zero.

In a polarized economy in terms of income, productivity and characteristics of the projects we may observe two different results. On the one hand, there is a median-productivity individual highly productive whose project is socially efficient. This is good news for the economy since they have to pay lower taxes and their projects are undertaken. On the other hand, if in this economy, the median-productivity individual is unproductive, she chooses to pay higher taxes for her socially inefficient project be undertaken under loan guarantees. However, we know that those projects are highly likely to fail leading the economy to default. In that case, the government intervention is excessive, inducing the financial market to collapse. Thus, the larger the difference between the median and the mean productivity individual, the higher is the probability of financing bad projects leading the economy to a financial crisis.

There are some relevant remarks regarding government intervention, the 1-dimensional heterogeneity, and the positive correlation between income and productivity. Firstly, we are aware of the fact that a bad government intervention could also go on the other direction, meaning that its inefficiency can provoke even more rationing in the financial market. However, this scenario is beyond the scope of this work. Secondly, we simplify the analysis by assuming a 1-dimensional heterogeneity since a 2-dimensional heterogeneity (i.e. heterogeneity in productivity different than the expected return of the project heterogeneity) may yield some unnecessary difficulties to our model. Third, we believe

that low income individuals design socially inefficient projects since creating a project requires a certain level of education (i.e. financial knowledge). In the case of emerging economies education is positively correlated to income [43, 44, 45] and therefore our assumption is plausible. However, there exists the possibility that high income individuals design bad projects and vice versa.

## 5. STYLIZED FACTS - ARGENTINA (2001-2002)

On the onset of the East Asian crisis of 1997, Argentina was referred to as a model state for its economic policy [46]. In fact, during the nineties Argentina achieved outstanding levels of economic growth among developing countries until it turned down at the beginning of the century [47, 48]. The third largest economy in Latin America, after Brazil and Mexico, had no longer the highest living standard in the region [49]. During 2001-2002 Argentina experienced a chaotic situation in economic, financial, political, and social terms [48]. To situate the context of the financial and political crisis, which is of our interest, we briefly describe the most relevant events contributing to this collapse. We begin by explaining the economic policies applied during the nineties, followed by the economic explanation of financial crises and the attempts of solving the problem by the Argentine government. In the framework of our study, we focus on one of the three market-based financial tools to manage the episode by the Argentine government:<sup>14</sup> public guarantees and other enhancements to induce the provision of private financing and the economic agents that demanded such intervention.

In order to restructure its economy on the lines of the Washington Consensus,<sup>15</sup> Argentina adopted in 1989 the economic liberalization program. Two main characteristics can summarize this program: first, the “big bang” approach, where reforms in several sectors (i.e. fiscal reforms, public sector reforms and trade reforms, etc.) were completely disregarded. The second was the establishment of a convertibility regime by law, which required the Central Bank of Argentina (BCRA for its initial in Spanish) to back the whole monetary base with foreign exchange reserves. Then by 1991 the parity one-to-one peso per dollar began [46, 47].

In general terms, the nineties were a period of expansion, where Argentina experienced massive foreign borrowing and most of the private sector was privatized and deregulated (i.e. all the big and medium-size industries, service firms, banks and public utilities) [47, 48]. This helped the service sector to raise its efficiency in communications, electricity, distribution, finance and transport. Macroeconomic indicators showed a growth rate of 8 percent till 1997 but after 1997 its growth rate declined and turned negative to -3.9 percent in 2000 and by 2001 the economy had collapsed with -4.5 percent in 2001.<sup>16</sup> The inflation rate, once as high as 171 percent in 1991, declined to 24.9 percent in 1992 and since then it had been further reduced and turned negative in the late nineties. Moreover, with trade liberalization, foreign trade remained steady with exports and imports both showing a positive growth rate till 1997, but roughly declining afterwards. Imports have consistently remained higher than exports causing a systematic problem of current account deficit. The privatized industry was unable to compete with Asian and the United States exporters and went bankrupt; thus, unemployment climbed. Although, international reserves had also increased, external debt and debt service ratio presented the same trend. The debt service ratio reached 75.8 percent of GDP in 2000 and slightly declined only to 62.8 percent in 2001 [48, 51, 52, 53, and 54].

The economic policy designed by Domingo Cavallo<sup>17</sup> – Ministry of Economy under Carlos Menem<sup>18</sup> Presidency – established that as individuals began to convert their pesos into dollars the BCRA would immediately contract the money supply, causing interest rates in pesos to raise sharply. In such a case, the interest rates for deposits in pesos would be high enough to induce individuals to keep their funds in pesos, allowing the BCRA a secure margin of international reserves. At the same time the impact of a higher interest rate would weaken domestic demand, wages and prices would fall until reaching a competitive level and eliminating the reason for the original fear [46, 47].

However, in reality the story was different as the government was concerned about the side effects of this policy. Indeed, as it is explained in [47] the increase of interest rates would damage the economy rather than stabilize it. Hence, the country did not increase its interest rate high enough because high levels of interest could affect negatively the levels of investment in the economy. In addition, wages and prices proved to be insufficiently flexible for the industry

<sup>14</sup> This classification was found in [50].

<sup>15</sup> Initially coined in 1989 by John Williamson to describe a set of ten specific economic policy prescriptions that he considered should constitute the “standard” reform package promoted for crisis-wracked developing countries by Washington, DC-based institutions such as the International Monetary Fund (IMF), World Bank, and the US Treasury Department. In general terms, these recommendations go from fiscal policy discipline, privatization of state enterprises, liberalization of inward foreign direct investment, deregulation - abolition of regulations that impede market entry or restrict competition, except for those justified on safety, environmental and consumer protection grounds to prudent oversight of financial institutions.

<sup>16</sup> Since 1995, the GDP growth began to recede - with the exception of 1997 - and it turned negative at -3.4 percent in 1999 and -0.3 percent in 2000.

<sup>17</sup> Designed in 1989, Cavallo went through the whole reform process.

<sup>18</sup> President of Argentina during 1989-2000. He belonged to The Justice Party – Peronista.

to become more competitive and the current account remained in deficit starting a dangerous wave of uncertainty regarding the sustainability of the fixed exchange rate. As dollar strengthened relative to most of the other currencies, Argentina lost competitiveness.<sup>19</sup>

In fact, the main fall of Argentine competitiveness came when Brazil's currency, the real, fell sharply in 1999. Obviously, the peso-dollar peg was the source of competitiveness loss and Buenos Aires tightened macroeconomic policy, raising interest rates by almost 36 percent, but pushing the economy into recession [55]. Despite unemployment rates close to 15 percent, powerful labour laws and resistance of unions prevented a fall in production costs through lower wages. Thus, Argentina could not achieve a real devaluation without changing the exchange rate<sup>20</sup> [56]. Hence, the result was an increasing current account deficit, which reached nearly 5 percent of GDP, and therefore foreign debt. As a result of low private saving rates and foreign debt, Argentina experienced a reduction of domestic investment and important deficits in the national and provincial governments accompanied by shameful levels of corruption. While the symptoms of the crisis began to emerge only in 1997, Menem finished his mandate with a major depression and a doubled debt without means to be repaid [57, 58].

In sum, the two proximate causes of the Argentine crisis are usually described as an overvalued fixed exchange rate of one peso per dollar (since 1991) and an excessive amount of foreign debt. Because the exchange rate was fixed at an unaffordable level, Argentina's trade balance was mostly negative. This trade imbalance stood at \$829 million in 1999 and made it impossible for the country to earn the foreign exchange it needed to pay the interest on its foreign debt. Instead, Argentina had to borrow to meet those interest payments, causing the debt to grow ever larger [47]. The external debt increased from 39.2 percent of GNP in 1995 to 55.67 percent in 2000. The debt service as percentage of total exports increased from 30.4 percent to 75.8 percent showing the burden of external debt on foreign exchange earnings. Most of Argentina's foreign debt, owned by the central and provincial governments, soon reached 50 percent of GDP by late 2001. Therefore, the country clearly could no longer borrow to roll over those debts and pay the interest, and it was forced to default and to devalue the peso almost by 29 percent to make its exports competitive.<sup>21</sup>

Fernando De la Rúa<sup>22</sup> took office in December 1999 and worsened the existent recession by its monetary policy, deregulation of financial markets and payment of foreign debt in dollars. Even though the BCRA's international reserves backed completely the one-to-one currency in circulation, it had nearly not enough to cover the total amount in checking and savings accounts that individuals wanted to convert. Consequently, Argentine banking sector suffered several runs during 2001. De la Rúa decided to freeze all savings and checking accounts denying them to their legitimate owners mostly middle and poor class.<sup>23</sup>

The banking sector declared insolvency. In addition, since the Argentine government also intervened the pension system it "literally destroying the savings of pensioners and five million middle class Argentines [49]." The economy plunged to a record minus 15 percent growth in 2001-2002, unemployment soared to 25 percent, and salaries were reduced by 65 percent [49].

President de la Rúa was unable to address basic economic imbalances, and guided by his Minister of Economy Cavallo,<sup>24</sup> opted for various market-based financial tools to manage its financial needs. According to a classification given by [50] these include: (i) voluntary debt restructuring operations without official enhancements; (ii) public guarantees and other enhancements to induce the provision of private financing; and (iii) private contingent credit lines.

First, the so-called mega-swap of June 2001 responded to a voluntary debt restructuring operation without official enhancements. This operation mean 52 old bonds totaling about \$30 billion (in face value) exchanged for five new bonds with longer maturities and higher interest rates [50]. As it is explained in [54] and [58] this decision was taken since the government believed that a stronger and growing Argentina in economic terms, would allow the country to repay its higher debt service; the country needed time to recover. However, with the increase of risk perception, interest

<sup>19</sup> The dollar rose against the Japanese yen after 1995, against the currencies of south-east Asia after their crises of 1997 and 1998, and against the European currencies in 1999 and 2000.

<sup>20</sup> Several countries such as UK in 1992 to South Korea in 1998 and Brazil in 1999 adopted the devaluation policy.

<sup>21</sup> According to [47] Argentina did not devalue sooner-in 1997, 1998, or even 1999- for three reasons. First, a fear that breaking the peg and devaluing the peso would bring back the high rates of inflation experienced during the eighties. Second, because Argentine households and businesses transaction and debts were highly dollarized, the government feared that a devaluation would prompt widespread bankruptcies and personal defaults by raising the peso value of outstanding debts. Third, there was always the hope that the situation would improve over time.

<sup>22</sup> Politician from the Traditional Radical Party, De la Rúa had alliance with a centre-left coalition.

<sup>23</sup> Indeed, by the time of the crisis, rich Argentines had already taken their resources from the Argentina's financial system to deposit them in foreign banks [46].

<sup>24</sup> On the 19th of March 2001, Domingo Cavallo, Minister of Economy under Menem and architect of the currency board ten years earlier, replaced Ricardo Lopez Murphy, who resigns as Minister of Economy.

rates followed the same trend. Liquidity fall inducing the federal and provincial governments issued bonds in the form of scrip to pay public salaries. This quasi-money was allowed to circulate as currency, worsening the situation [58].

Another debt-swap announced in November 2001 was the second financial engineering attempt for financial recovery. [58] explains that the federal government had \$132 billion dollars in debt (\$95 billion in bonds). Around \$60 billion of bonds were refinanced as a tax-receipt loan guarantees,<sup>25</sup> lowering the average interest rate from between 11-12 percent to 7 percent and extending the maturity of the notes by three years.<sup>26</sup> Private lenders baptize the November swap as a “distressed exchange” since it damaged even more their credibility in the government’s policy. Moreover, since interest savings were lower than expected, Argentina could not reach the fiscal targets promised in its IMF program, who then refused to extend a \$1.3 billion draw scheduled for December 2001. At the time, “Argentina found itself cut off from international financial markets, both public (official) and private [58]”. Thus, President De la Rúa announced a decree limiting individual cash withdrawals to \$1.000 per month, setting off the violent protests that culminated in a full-blown crisis, and soon thereafter, his resignation [48].

Third, the BCRA with a group of international banks maintained credit lines in order to provide liquidity support to the domestic banking system. Such support was done through guaranteed sales (with a promise to repurchase) of Argentina’s international bonds in bank portfolios for cash. However, as [50] notes “the mega-swap of June 2001 reduced the amount of eligible bonds, and effectively reduced the size of the facility.” Hence, although Argentina did draw on the facility in September 2001, the credit line was too small to provide the amounts needed.

We focus on the political decision of loan guarantees as one of the instruments to deal with the financial crisis. Note that the Argentine government was already highly indebted at the moment of providing loan guarantees. Financing this additional cost contributed to the country’s default.

One of the explanations behind this economic policy comes from the convulsive social situation in the country. Note that Argentina’s deteriorated economy during the late nineties increased the income gap among its population. Although we have not found evidence regarding differences in productivity itself, there are studies demonstrating that in emerging economies like Argentina, individuals with low income usually have low levels of education and vice versa<sup>27</sup> [43, 44, 45]. Hence, low income population is likely to produce projects hardly socially efficient for the economy.

By the events of December 2001 it is clear that the poor and middle-classes were the most affected by the economic crises [49]. These Argentines went to the streets in protest of their economic situation and the incapacity of the government to propose solutions.<sup>28</sup> Clearly poor and middle classes were a majority at the time [43, 45], so, we can characterize them as the median-income individual. Consequently, social pressures from poor and middle classes may have had an impact on the government’s decision to provide loan guarantees. Then, the Argentine financial crises can be partly explained by our model since the median-productivity individual can be characterized by poor and middle classes, whose needs demanded to be answered by the government, who was induced towards a bad policy that contributed to the financial collapse.

## 6. CONCLUSIONS

Our analysis is in the framework of third generation models of financial crises in emerging markets since it combines economics and politics to find a possible source of these episodes. We begin our analysis on the study of the fragility of financial markets due to asymmetric information suggested by [6]. He demonstrates rationing in the financial market due to asymmetric information since banks have not complete information about borrowers, firms. Therefore, lenders allocation of resources is not fully efficient, and no loan rate, including the market equilibrium rate, can in general reach the first best allocation. Some socially efficient projects are not undertaken and vice versa. Hence, he proposes government intervention through loan guarantees as special case of a subsidy to restore efficiency in the financial market. It consists of paying the difference from the projects’ return and the risk-free interest rate. The results are

<sup>25</sup> It offered the same guarantees than the titles establishing that: The loans delivered in swap for the received titles expiring in 2010, will extend their chronogram of amortizations in 3 years. The interest rate for the guaranteed loans at fixed rate will be of 70 percent of the contractual rate with a maximum of 7 percent annual. The interest rate for the guaranteed loans at a floating rate in dollars will be of 70 percent of the contractual rate with a maximum of LIBOR + 3 percent. The holders of titles at fixed rate would opt for loans at floating rate. The limit of 70 percent of the contractual will be applied until the expiration of the original titles from the moment the rate will be of 7 percent annual or LIBOR + 3 percent as it was corresponding [54].

<sup>26</sup> Article 17 to 24 from the Decree 1387/2001.

<sup>27</sup> Education greatly contributes to differences in income in Argentina explaining two-thirds of the gap [44, 45].

<sup>28</sup> These sectors of the population went to the streets demanding prompt actions of the government (during 2001). The phrase “¡Que se vayan todos!” (Let them all go away!) was part of the demands, referring to the protagonists of the catastrophic political system. Clearly, the majority of the population demanded solutions.

favourable to government intervention. However, in his analysis he ignores the cost of raising funds to be distributed in loan guarantees.

When it comes to income taxation and redistribution, individuals know that in order to receive loan guarantees funds must come from their income. In that context, the government must consider the existence of different preferred policies among individuals. In the spirit of [7] and [8] we propose an economic-political model where there exist a 1-dimensional heterogeneity among individuals which is the link between the two models. Based on differences in productivity, income, and expected returns of the project produced (all positively correlated), individuals also have different preferred policies.

Two interesting results are found in this work. First, our results coincide with [6]'s conclusion related to the desirability of government intervention since it is a Pareto-improvement given a financial market failure due to asymmetric information. The relevance of these results relies on the different assumptions taken. In other words, we find that with or without distortionary taxes the economy is benefited from government intervention through subsidies to the financial market. In an optimal situation, this government intervention will lead the economy to a first best allocation of resources.

Second, government intervention may not always help a financial market achieve Pareto-efficiency, there could exist government failure. It depends on the characteristics of the country's population. We find that heterogeneity among individuals in terms of productivity, income, and probability of repayment of the project play an important role when it is studied in the framework of the median voter theorem. Indeed, a median-productivity individual preferred tax policy is decisive. The problem arises when the median-productive individual has low productivity since her preferred policy would be to support high taxes to finance loan guarantees for socially inefficient projects (like her own project). Those projects are likely to default, bringing the economy to a financial collapse. Finally, we conclude that one possible explanation of financial crisis is: the larger the difference between the median and the mean productivity individual is translated into a higher probability of financing bad projects leading to massive default and financial crisis.

We find the case of Argentina's financial crises (2001-2002) as the closest evidence for our model among emerging markets. Given the country's economic, social, political, and financial difficulties during the late nineties poor and middle classes were the most affected. Thus, we believe that social pressures coming from this vulnerable, but large, part of the population played the role of a median-productivity individual inducing the government take bad policies (i.e. loan guarantees to the private sector and to the government itself). Default was inevitable, this being one of the reasons that contributed to Argentina's financial collapse.

Among some possible extensions of the model we note that a bad government intervention could also go in the other direction, meaning that its inefficiency can provoke even more rationing in the financial market. Although, this scenario is beyond the scope of this work, it could be an interesting analysis. In addition, we consider the case of a 1-dimensional heterogeneity, hence a possible extension of the model may include a 2-dimensional heterogeneity (i.e. heterogeneity in productivity different from the heterogeneity in the expected return of the project). Moreover, there could be the case that high income individuals design bad projects and vice versa.

## 7. ACKNOWLEDGMENTS

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