

INCOMPLETE MARKETS AND FINANCIAL INSTABILITY. THE ROLE OF INFORMATION

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ABSTRACT: *Considering the way that the world economy has evolved over the last 30-40 years, there was a transition from a predominant real economy to a predominant financial economy. Once, there were prevalent economic crises (when the real economy was important); today, the economies all around the world face prevalent financial crises; therefore, it is extremely important to study the role of financial markets, especially the incomplete markets feature (given by the imperfect information). The paper aims to analyze the relationship between imperfect information and incomplete financial markets and the way they are affecting the financial stability.*

KEY WORDS: *financial instability; imperfect markets; incomplete markets; imperfect information; monetary policy; financial markets.*

JEL CLASSIFICATION: *E44, G12, G14, G21, G23.*

1. INFORMATIONAL CHANGES, TRADE, WELFARE AND FINANCIAL INSTABILITY

The value of information in a competitive economy in which agents trade in the asset markets in order to reallocate risk is very important, because information allows a welfare improvement when portfolios can be freely reallocated. If markets are sufficiently incomplete, the welfare effects are arbitrary: there are changes in information that may improve or worsen the situation of all financial units.

Information can reduce or improve the welfare in a market setting decision-making context. Thus, the negative effect on welfare of an increase in the available information to the market participants is due to changes in prices, induced by a change in information, that alter the budget sets of financial units.

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If the markets are incomplete, there is a second welfare effect. Additional information allows the agents to achieve a larger set of state-contingent payoffs by conditioning their portfolios on this information. Thus, the value of information in a financial market economy has a negative component and a positive component.

Regarding the welfare changes, the financial units' welfare before a change in information is different from the agents' welfare after a change in information. If markets are sufficiently incomplete, equilibrium welfare effects are arbitrary: there are informational changes that improve or worsen the situation of all agents or of any subset of agents. Therefore, the pecuniary externalities created by the price changes can outweigh the value that a change in information might otherwise have for any individual agent. Thus, when both the positive and negative effects are present, the net effect can go in any direction. The welfare effects involve changes in real asset payoffs (through changes in the price level), in asset prices, and in relative spot commodity prices (Gottardi & Rahi, 2010). These asset fluctuations may lead to financial instability episodes.

2. IMPERFECT MARKETS, IMPERFECT INFORMATION, BILATERAL TRANSACTIONS AND FINANCIAL INSTABILITY

In many bilateral transactions, the seller takes into account the possibility of being underpaid. There are many types of contracts seen as solutions to the "smart buyer problem" (the buyer has superior information about the valuation of the good and about the common value component), which involve the grant the seller upside participation. In contrast, the lemons problem calls for offering the buyer downside protection. Therefore, the contracts associated with the lemons problem can also be the case of the smart buyer problem.

There are plenty examples of buyers with private information, where the less informed seller faces unfavorable terms of trade, which creates a trade friction (the inverse of the lemons problem, where the seller knows more about the value of the asset, so the buyer hesitates because the seller may overestimate the value to raise the price). In the smart buyer problem, the buyer knows more about the value of the asset, so the seller hesitates because the buyer may underestimate the value to reduce the price. This difference implies different signaling incentives.

There are three important aspects of the smart buyer problem: a) the problem is important in practice; there are trade situations that suffer from the smart buyer problem (royalties, cash-equity bids, earn-outs, debt-equity swaps, gross points and concessions); b) although the lemons problem (which gives the uninformed party downside protection) and the smart buyer problem (which gives the uninformed party upside participation) require opposite theoretical solutions, the resulting contracts are similar; c) although the two information asymmetries determine identical contracts shape, they can lead to an opposite relationship between contract shape and underlying value (Burkart & Lee, 2012).

In the smart buyer problem, the buyer has informational edge over the seller; in the lemons problem, the seller has informational edge over the buyer. These two types

of situations have different signaling incentives: an informed buyer wants to induce a low value, while an informed seller wants to induce a high value.

This difference is also reflected in the solutions of these problems. Signaling a high value involves downside protection, where the uninformed party is recompensed if expectations are not met. Signaling a low value involves upside participation, where the uninformed party is recompensed if expectations are surpassed (Burkart & Lee, 2012). These claims (figure 1) represent standard securities, debt for the buyer and equity for the seller.

Therefore, the solutions to the lemons problems and to the smart buyer problems result in equivalent contracts. For example, debt issuance is linked to private information of the issuer, where debt protects less informed investors from buying overvalued securities. But debt is also optimal when the issuer deals with better informed investors. Thus, debt protects the issuer from selling undervalued securities.

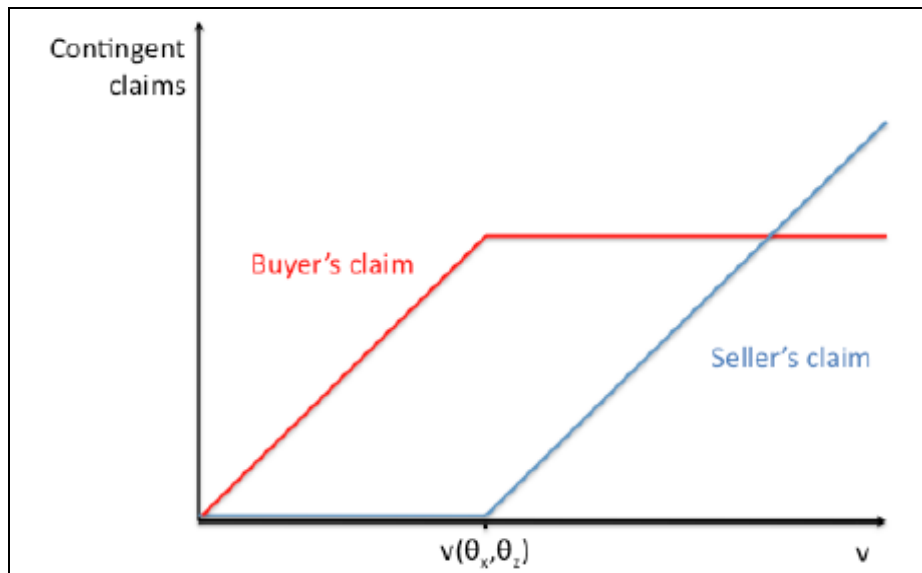


Figure 1: The graph illustrates the security design solution under limited liability. It plots the value of contingent claims granted to the buyer and the seller as functions of total realized value (v). The seller receives equity (blue line), and the buyer receives debt (red line)

There are many other examples. If we take into consideration the cash-equity payments in mergers and acquisitions on the financial markets, the reason for the use of equity involves the assumption that target shareholders have private information about the target. The use of equity is rational when the acquirer has private information about the target. Similarly, royalties can convey information from licensors to licensees, but from licensees to licensors also. Analogous arguments are available to other contractual provisions, such as earn-outs.

The solution equivalence is due to the fact that the claim structure is identical, and due to the fact that the lemons problem and the smart buyer problem involve asymmetric information about a common value component.

Because the contractual solutions are identical, real-world contracts are not sufficient in identifying the underlying information problem. For example, signaling costs are tolerated by the seller in the lemons problem, while they are tolerated by the buyer in the smart buyer problem. Thus, the identification of the party that is willing to pay the third-party verification helps discriminate between the two information problems. But in real life it is not easy to attribute these expenses to any of the party.

It is possible to study the way the contracts relate to the common value, which denotes the distribution of rents across common value types. This relation changes with the identity of the informed party.

Figure 2a illustrates the relation between trade quantity x (the signaling instrument) and common value θ_x . If the informed party wants to buy, the relation is positive (green line); if the informed party wants to sell, the relation is negative (grey line).

Figure 2b illustrates the linear sharing rules, where the seller's equity stake α is the signaling instrument. In smart buyer problems, α and θ_x are inversely related (green line), so the sellers receive more equity when common values are lower. In lemons problems, they are positively related (grey line), so the sellers keep more equity when common values are higher.

If we take into consideration a financial unit that issues equity, we may suppose that:

- ◆ the issuer is better informed than the investors (who are unwilling to pay a high price if the issuer faces smaller risks);
- ◆ the investors are better informed than the issuer (who wants a high price if the investors face larger risks).

Thus, uninformed investors buy less for more, and uninformed issuers sell less for less, the relations between quantity and price being opposite.

If we take into consideration a cash-equity offer in mergers and acquisitions on the financial markets, the less informed acquirer is not willing to pay a high price if the owners are not willing to accept a large part of the consideration in equity. In the contrary, a more informed acquirer has either to pay a high price either to offer a large part of the consideration in equity, the relations between equity considerations and price being opposite.

In some markets, information frictions are mitigated by expert intermediaries, who buy and resell the assets. The intermediary contracts imply an information problem. If it is taken into consideration an entity that wants to sell but it has no expertise in assessing its value (θ_x), the seller contracts a specialized dealer, that buys the asset for θ_x and pays a supplementary amount if the asset is resold for more than $\theta_x + \varepsilon$, where ε is the dealer commission. Because the dealer is experienced, the last buyer is unable to buy the asset for less than θ_x .

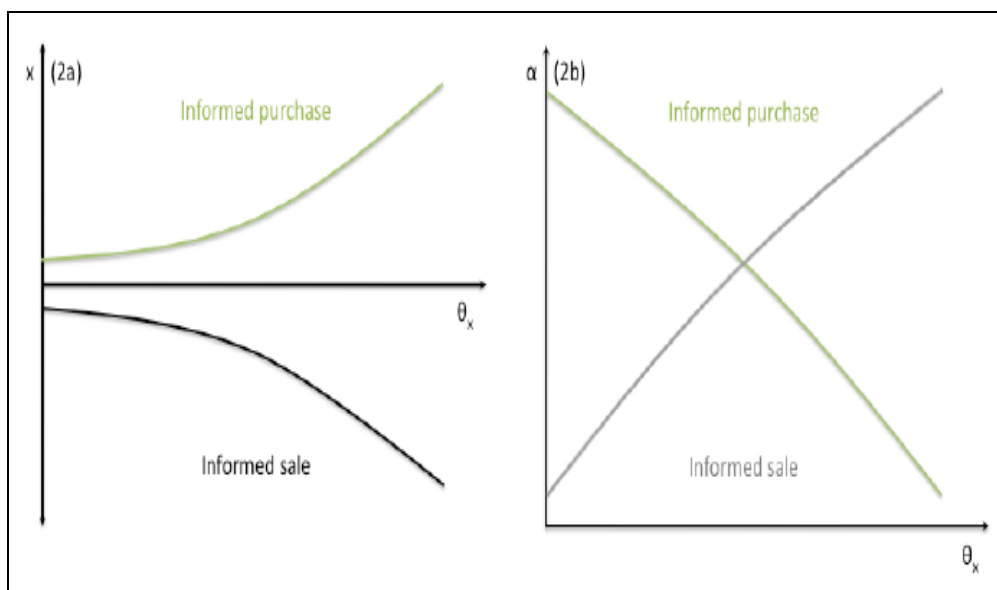


Figure 2: The two graphs illustrate that the smart buyer problem (informed purchase) and the lemons problem (informed sale) can imply opposite predictions about the relationship between the underlying common value and the signaling instrument. The left graph shows this for trade rationing; the right graph shows it for linear sharing rules

Therefore, informed intermediation has two advantages: a) the intermediary does not buy the asset for its own use, case in which the seller is back to the original problem; b) the resale generates information regarding θ_x , highlighting the inefficient signaling through trade failures. In the real life, such informed intermediation is provided by market-makers (the case of stock exchanges) or underwriters (the case of capital markets).

Regarding the information problem, it is important to emphasize that the intermediary has different contracts with the informed parties and with the uninformed parties. In the case of the smart buyer problem, the intermediary has a contingent contract with the seller and a cash transaction with the buyer. In the case of the lemons problem, the intermediary has a contingent contract with the buyer and a cash transaction with the seller. This asymmetry regarding the way that the intermediary interacts with the seller and the buyer implies an information problem.

3. COMPLETE / INCOMPLETE MARKETS AND FINANCIAL INSTABILITY

Credit risk associated with interbank lending may lead to domino effects (the failure of a bank leads to the failure of other banks even if they are not directly affected by the initial shock), leading to financial crises, which are the most severe form of financial instability. The risk of contagion depends on the pattern of interbank linkages. In a complete market structure, banks hold deposits with banks of other regions in order to ensure the necessary liquidity against liquidity shocks in their region, which

may have two meanings: a) a geographical region; b) any grouping of banks. If one bank faces a shock, it has to acquire the necessary liquidity by withdrawing on its deposits at other banks before liquidating long-term assets (premature liquidation of the long-dated asset is very costly; for example, abandoning the real investment projects or interrupting the long-term lending relationships).

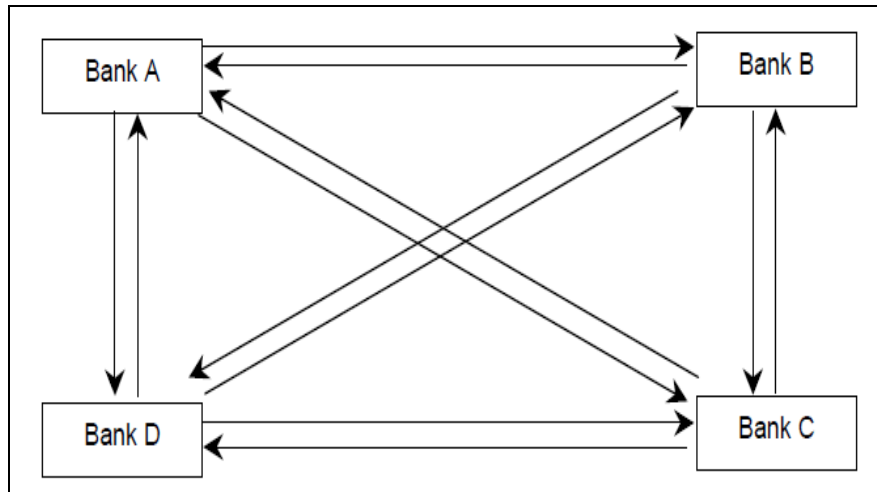


Figure 3. “Complete market structure”

The interbank market can redistribute liquidity, but cannot create liquidity, which may lead to a contagion if the aggregate liquidity need is higher than the aggregate holdings of liquid assets. In order not to liquidate the long term assets, banks withdraw their deposits at other banks, spreading their illiquidity throughout the financial system. The possibility of contagion depends on the structure of interbank claims. Therefore, there is a small probability to occur in a complete structure of claims, where every bank has symmetric linkages with all other banks in the economy (figure 3). Incomplete market structures, where banks have links only to the neighboring institutions (figure 4) are more fragile.

Interbank lending arises from consumers’ uncertainty about *when* and *where* to consume. Interbank credit lines diminish the overall amount of liquid (but costly) reserves. Thus, contagion can appear even if all banks are solvent. If a high proportion of depositors from a great number of banks believe that they will not obtain payment, it is beneficial to them to withdraw their deposits, meaning that the banks will liquidate their investments, and will determine a bank run where all the depositors will withdraw their deposits and the banking instability transforms into financial instability. With the exception of the contagion resulted from the behavior of the non-banks, the interbank connections enhance the resiliency (the ability to resist shocks) of the financial system; the weaker the resiliency, the higher chances of endogenous financial instability episodes. Thus, the interbank credit lines offer a subsidy to the insolvent bank, which will spread part of its losses to other banks (Upper & Worms, 2001).

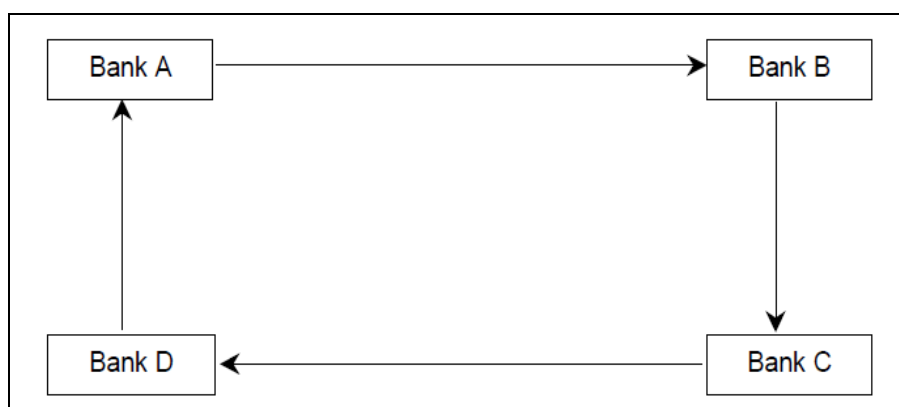


Figure 4. “Incomplete market structure”

Therefore, interbank lending contributes to loosening market discipline. A complete structure of claims diminishes the risk of contagion, while incomplete structures increase the fragility of the financial system, leading to financial instability.

4. INTER-DEALER TRADING, MARKET MECHANISM AND FINANCIAL INSTABILITY

Regarding the determinants of agents' choice of market mechanism in the context of inter-dealer trading, in some dealership markets (the foreign exchange market, the government bond market, the stock exchange equity market), inter-dealer trading has a great percentage from the total trading. In addition, these markets offer dealers two choices of trading mechanisms: a) dealers can trade directly with each other; b) dealers can place an order through one of the inter-dealer brokers (Saporta, 1997).

The inter-dealer trading has important effects on the price formation mechanism. In the foreign exchange market, the inter-dealer trading has an important role in disseminating the information.

To study the dealers' choice of inter-dealer trading and to analyze the implications of the choices for the outside investors, it can be used a three-stage model: 1) dealers decide if they enter the market-making of the asset; 2) one of the dealers trades with an informed outside client; 3) the dealer, who has executed the outside investor's order, decides whether it wishes to unwind the inventory trading directly with another dealer or whether to submit an order to the inter-dealer broker (Saporta, 1997).

The direct inter-dealer market is a standard competitive quote-driven market, where price competition between dealers leads to price schedules that in equilibrium reduces to nullity the expectations of the dealers of making a positive surplus. The inter-dealer broking system is a typical order-driven trading mechanism, where dealers pay a fixed brokerage fee in order to submit their orders to the broker. The broker clears the market and determines the price. In equilibrium, dealers expect a positive surplus.

Trading motivation in the inter-dealer market is a result of the second stage dealer-client, where the client have private information about the value of the asset and wants to trade a fixed amount for liquidity reasons. The market is opaque (for example, the foreign exchange market, the government bond market, the stock exchange equity market), where the transaction details about the trade between the client and the dealer remain confidential until the end of the inter-dealer trading session.

The dealer's third stage choice of inter-dealer trading is related with the number of dealers who enter the market-making industry, because there are differences between the institutional structures of the two inter-dealer market mechanisms. In the direct market dealers compete in prices; in the brokered market dealers compete in demand schedules.

If there are two or more dealers that compete for the incoming inter-dealer order flow, the risk-sharing opportunities from the direct market are not dependent of the number of dealers. But the risk-sharing opportunities from the brokered inter-dealer market increase the number of dealers who enter the market-making industry. Thus, there are some dealers that outweigh the competitive benefits of the bilateral market if the number of dealers exceeds the number the risk-sharing benefits of the brokered market; in this situation, the brokered market predominates; in an opposite, the direct market predominates.

Regarding the transparency and information asymmetry on dealers' choice of inter-dealer trading venue, the increase in information asymmetry or financial market transparency diminishes the liquidity of the brokered order-driven market much more than in the situation of the direct quote-driven market. Therefore, the increase in information asymmetry or market transparency determines an increase in the required number of market participants needed for the order-driven system to prevail.

But, in the absence of information asymmetry, a raise of the risk-aversion, a raise of the volatility of the asset and a raise of the liquidity trading shifts the inter-dealer trading from the direct market to the broker (this is applicable for those markets where trading on private information is not significant, such as the government bond market), which finally leads to financial instability.

5. IMPERFECT INFORMATION, MONETARY POLICY AND FINANCIAL INSTABILITY

Regarding the effects of imperfect information on the monetary policy rules, there are three important aspects: a) setting a self-oriented monetary policy rule which responds to unexpected shocks in a predictable manner leads to welfare gains, even if central banks do not have perfect information about the financial sector; b) better information about the state of the world economy has ambiguous welfare implications (on the one hand, better information allows policymakers to respond appropriately to common shocks; on the other hand, because the better information allows policymakers to respond to a wider set of shocks, this can generate spillover effects which are not necessarily internalized); c) gains from international monetary coordination under perfect information are greatest when productivity shocks are negatively correlated between countries (Tan & Tanaka, 2008).

The gains from international monetary policy co-ordination are sensitive to the economic frictions, like financial market structure, nominal rigidity and exchange rate pass-through. International monetary co-ordination is irrelevant in a world of complete financial markets, because the availability of state-contingent assets eliminates the need for international risk-sharing through monetary policy. The gains from international monetary co-ordination are higher in the situation of the incomplete financial markets than under the situation of financial autarky. In addition, the gains from international monetary co-ordination are higher when financial markets are incomplete and the initial holdings of foreign assets are asymmetric across countries.

In addition, the activist policies (Nash policies or coordinated policies) induce high levels of welfare gains in comparison to passive policies if central banks learn about the 'true' monetary transmission mechanism and if central banks update their beliefs regarding the foreign productivity shocks after observing domestic shocks.

Therefore, the presence of nominal rigidities and credit frictions leads to a inflation variability - output variability trade-off. Since an output reduction leads to a reallocation of resources toward less productive agents, it will result in large future deviations of output from its efficient level. Therefore, there is a trade-off between the rise in inflation after the shock and the reduction of the future output relative to its efficient level. A large reduction in output variability can be achieved by allowing only a small amount of inflation variability. Thus, the financial instability reflects itself in economic instability, affecting the real economy as well.

CONCLUSIONS

To sum up, information plays an extremely important role in the financial markets. Thus, given that financial market participants interact between them depending on the available information and depending on the risk aversion, there are processes in the markets that can be destabilizing, both for financial markets and for other markets (through spillover effects), but also for entire national economy, regional economy or world economy.

Thus, the behavioral patterns caused by information and / or the type of information have either wave-type effects (which erodes the resistance of the financial system over time in a slowly manner) or mass-type effect (which sharply erodes the resistance of the financial system). Understanding the information and understanding the lack of information and the behavior induced by the lack of information are essential in approaching the action strategies of the financial market participants, which may trigger the mechanism of propagation of financial instability.

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