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Government insurance, information, and asset prices

Danilo Lopomo Beteto Wegner

University of Queensland, Australia

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ABSTRACT

An investment decision problem is studied, in a framework where the government offers insurance against the possibility of the price of a risky asset falling drastically. The problem is considered under different informational scenarios, i.e., information quality, under which agents have to infer the state of fundamentals of the economy. Changes in information quality is shown to affect equilibrium prices despite no concomitant changes in the fundamentals, creating excess volatility. The possibility of government intervention is shown to increase equilibrium prices, which can be ordered as a function of information quality. Empirical evidence supporting the model is presented.

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1. Introduction

During crisis episodes, the course of action of the government is always subject to a great deal of controversy. No consensus is ever achieved between those who, on the one side, champion the idea of government intervention and those who, on the other, believe in the self-correcting force of markets. Ex-post, government intervention might be required, if the state of affairs is not to be aggravated; ex-ante, if government intervention is taken for granted whenever bad outcomes happen, risks might be taken in excess.

The way the government behaves in crisis episodes has an impact on the payoff of virtually any asset. The reason is that, at least to some degree, there is always a correlation between an asset's payoff and the state of fundamentals of the economy — those factors that indicate how well the economy is performing, and the very same factors the government aims at upon an intervention. Affecting assets' payoffs, the government turns out to play an important role in the investment decision of agents, which in turn affects the demand for assets and, consequently, their prices. Assets' prices are part of the state of fundamentals, causing the action of the government to feed back into itself. Fig. 1 illustrates this process.

One example of the process above is the case of mortgage-backed securities (MBS) in the financial crisis episode of 2008–2009. MBS are securities whose payoffs derive from a pool of mortgages, assembled together and issued as a single asset, a process known as securitization. Securitization creates a secondary market for loans, which helps financial institutions in the transfer of risks, making it easier for them to offer new mortgages.

Of prominent role in this secondary market is Fannie Mae, a company created by the U.S. government in 1938, with the goal of fostering the level of home ownership. Initially established as a government-sponsored enterprise (GSE), it was converted into a publicly traded company in 1968. This change of ownership altered its government guarantee status, from being explicit pre-1968 to being implicit pos-1968.

E-mail address: d.beteto@uq.edu.au.

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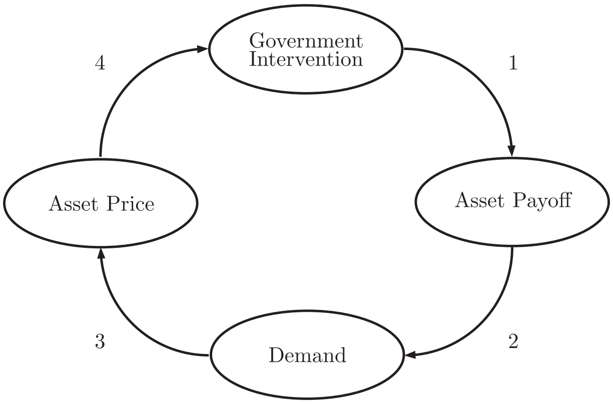

Fig. 1. Impact of government intervention and feedback effect.

This implied government guarantee would constitute arc number 1 in Fig. 1. Since the payoff of a MBS is dependent on the payment of loans it embeds, it is an instrument with a great deal of credit risk. Therefore, the support from the U.S. government conferred to the securities traded by Fannie Mae a lot of appeal, increasing the demand for them, which would be arc number 2.

Given an active secondary market for loans, and a fierce competition for new customers in a business deemed profitable at the time, a plethora of credit became available to those willing to take a mortgage, and together with that came a decrease in lending standards. The increased demand for houses arguably inflated a bubble, arc number 3, and, when the high level of prices could not be sustained anymore, those disqualified borrowers had no way of fulfilling their obligations. By that time, a great fraction of the mortgage market was owned by Fannie Mae, whose collapse would pose a serious threat to all of those who invested in assets like MBS, making government intervention inevitable, arc number 4, completing the process depicted in Fig. 1.

Defining a scenario by the precision of the signals received by the agents of the economy, the effects from the possibility of government intervention should be related to how precise the information available to the agents is. For, agents considering to invest in a risky asset would value more the possibility of an intervention in a scenario with less informative signals, since accurate signals would allow for a decision to be taken regardless of the policy chosen by the government: if the economy will perform well, agents buy the risky asset, otherwise they just invest in the riskless one.

Following this logic, the goal of the paper is to study the effects on equilibrium prices of a policy whereby the government can intervene during a financial crisis, and how these effects are related to the scenario, or precision of information, under which assets are transacted. Not only that, the aim is to compare how those effects change when the government is able to commit to a policy of no intervention. In the setup to be presented, the criterion used by the government to intervene is the social welfare of the agents, defined by the total sum of their portfolios' payoffs. A financial crisis happens whenever this measure goes below a critical level, which results in the government intervening and the social welfare being restored to the critical level.

The problem faced by the agents is to form a portfolio that can consist of a riskless asset and an indivisible risky asset. The payoff of the risky asset is assumed to be perfectly correlated with the state of fundamentals of the economy, modeled as a uniform random variable on the unit interval. The scenario in which agents make their decisions fall into one of the following three: (i) imperfect information, where each agent receives a noisy private signal of the future payoff of the risky asset, (ii) perfect information, where every agent knows what the payoff of the risky asset will be and, (iii) common prior, where all that is known is the probability distribution of the future payoff of the risky asset.

In terms of government intervention, two frameworks are studied, one where agents entertain the possibility of intervention, to be called the government intervention framework, and another one where agents rule out that possibility from the outset, the no government framework.[1]

In order to understand the effects from the interaction between agents' precision of information and the possibility of intervention, the equilibrium price for each combination of scenario and framework is derived and compared to each other, as illustrated in Fig. 2. Among the results obtained, it is showed that (i) the possibility of government intervention raises equilibrium prices, no matter what the informational scenario under which agents form their portfolios; (ii) equilibrium prices cannot be sustained at particularly high levels, and; (iii) the possibility of government intervention matters only when the uncertainty faced by the agents is sufficiently high.

The reason why the possibility of government intervention raises equilibrium prices is that it operates as an insurance, in particular when the agents consider to buy the risky asset. If agents are to pay too high of a price for the risky asset, though, the strategy will be profitable only at high realizations of the state of fundamentals. Given the uniform distribution assumed, such realizations are less likely, and therefore agents will choose to invest their entire endowment in the riskless asset. Thus, an equilibrium in which the risky price is transacted at high prices will fail to hold.

That the possibility of intervention matters only when the uncertainty faced by the agents is sufficiently high shows how pervasive can changes in the quality of information be, and how the possibility of government intervention can amplify the effects from that. For

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[1] From now on, framework is related to the possibility or not of government intervention, whereas scenario refers to the precision of the information held by investors about the future payoff of the risky asset.

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