

Behavioural Macroeconomics & Financial Instability

Behavioural macroeconomics take account of the decision-making rationale of economic agents at a micro level. These decisions depend on the psychological and cognitive processes. Unlike the orthodox approaches, it is important to model this irrationality, which is done by behavioural macroeconomic models. Keynes pointed out psychological propensities and irrationalities as animal spirits and the major reasons for market failure. The General Theory also debates liquidity preference to be influenced by psychological and uncertainty factors rather than only interest rate rationality. The context of rationality doesn't always hold; for this to happen, agents should align their decision-making process with models like APT, CAPM, or Markowitz model, etc., which is difficult in reality. Following the neoclassical synthesis, the new classical economist ignored the concept of sticky wages and incorporated explicit behavioural micro foundations on price and wage decisions.

To demonstrate how behavioural macroeconomics explain financial instability and the importance of policies, the American International Group (AIG) during the global financial crisis can be a use case scenario. With a huge flow of foreign funds from Russia and other Asian countries during the late 90s, banks made mortgages easier and initiated Collateralized Debt Obligation (CDO). An investor who purchased Credit Default Swaps (CDS) paid AIG premiums and AIG promised investors to pay for the losses if the CDOs went into default. At the end of 2007, CDS contracts reached roughly \$60 trillion in global business, but with the fall of the housing market, subprime mortgage adjusted their rates and with increasing repayments, CDOs started collapsing. With the liquidity crunch, AIG had insured too many CDOs to possibly pay up and pushed towards bankruptcy until it got bailed out by the FED considering its Systemically Important Financial Institution (SIFI) status. Regulatory frameworks like BASEL III, Dodd-Frank Wall Street Reform and Protection Act, CDS writing limits were introduced after the crisis.

Moving on with Delli Gatti et al., (2010) framework of credit network, the two layers of firms are downstream, D, indexed with i, producing consumption good and upstream firm, U, indexed with j supplying intermediate factors of production to D. The firms and banks (indexed by z) are exogenous in the model. The equations used in the model are:

$$\text{Equation 1: } Y_{it} = \phi A_{it}^{\beta}$$

$$\text{Equation 2: } Q_{it} = \gamma Y_{it}$$

$$\text{Equation 3: } r_{jt}^i = \alpha A_{jt}^{-\alpha} + \alpha (l_{it})^{\alpha}$$

$$\text{Equation 4: } B_{xt} = W_{xt} - A_{xt}$$

$$\text{Equation 5: } R_{zt}^x = \alpha A_{zt}^{-\alpha} + \alpha l_{xt}^{\alpha}$$

$$\text{Equation 6: } \Pi_{it} = u_{it} Y_{it} - (1 + r_{zt}^i) B_{it} - (1 + r_{jt}^j) Q_{it}$$

$$\text{Equation 7: } \Pi_{jt} = (1 + r_{jt}^i) Q_{jt} - (1 + r_{zt}^j) B_{jt}$$

$$\text{Equation 8: } A_{it+1} = A_{it} + \pi_{it}$$

The first equation shows the production of D where A_{it} is the net worth. Delli Gatti et al., (2010) suggests to think of it as an optimization problem. The second equation reflects production of inputs by U , r is an indicator of interest rate as shown by equation 3, where the leverage ratio of D is increasing while the net worth of U goes down. If the expenses of the firm are greater compared to net worth, they take credit from banks at the lending rate as shown by equation 5. The matching process occurs when a firms tend to choose the bank that offers a lower interest rate and switch only when another bank offers a better rate. Equation 6 and 7 show profits for firm D and U respectively. Equation 8 represents the net worth for the firm inclusive of the profits. Higher net worth of firms compared to that of banks will make borrowing expensive. If the net worth is negative or bad debt portions are increasing significantly, the lender's net worth decreases, and due to the interconnected network, the spillover effect comes into play, leading to bankruptcy of other actors inside the network accumulating to disasters like financial crisis or instability. Alternatively, network-based financial accelerator effect can occur whereby falling net worth means expensive borrowing cost for other firms, which further decreases their net worth. The paper includes stochastic elements to depict how shocks or crises impact the overall stability of the financial network.

The macro- and microprudential perspectives compared

	Macroprudential	Microprudential
Proximate objective	limit financial system-wide distress	limit distress of individual institutions
Ultimate objective	avoid output (GDP) costs	consumer (investor/depositor) protection
Model of risk	(in part) endogenous	exogenous
Correlations and common exposures across institutions	important	irrelevant
Calibration of prudential controls	in terms of system-wide distress; top-down	in terms of risks of individual institutions; bottom-up

Figure by (Borio, 2003)

Thus, the role of the government and the central bank is very crucial in policy formulations.

In the interconnected network with one bankruptcy leading to another, and so on, it will reduce the economic output, which can result in a financial crisis. Complexity, concentration and contagion lead to systematic collapse and require static micro-prudential regulation and dynamic macro-prudential intervention. The economy goes through cycles of expansion and contractions, an impact on a large firm might lead to a spill-over effect, and small micro level shocks accumulated can create a multiplied effect on a macro level. Regulation policies are thus needed to prevent such events happening. Example can be a deposit insurance and discount window access that combats micro level market failures, but can also result in the rise of shadow banking making the whole system more unstable. Frameworks like the BASEL III accord to impose discipline, capital adequacy requirements and supervision, SIBs to control the spillover of large firms' slowdown, etc., are some of the regulation policies the behavioural model suggests. Some differences between the macroprudential and micro-prudential policy implications overview and stresses strengthening the earlier one to reduce systematic risk, control instability, and its consequences. Policy makers need to use policy rates focused both on the objective of price stability as well as financial stability.

To further support the theory with an empirical case, the financial crisis of Iceland in 2008 with the three largest banks in Iceland, Kaupthing, Landsbanki and Glitnir collapsing is a prime example. According to various official sources, the combined assets of the banks were 11 times

Iceland's GDP at the time of collapse. The Domino's effect soon came into play, leading to a slowdown of the whole financial system, and Iceland didn't have a last resort capable of bailing out; most of the corporate loans were foreign-exchange indexed, resulting in bankruptcy of the majority of private firms and the currency plunged.

The three banks that collapsed were initially local level banks, which, after privatization in 2003, rapidly went into money market, international scale-ups and acquisition of foreign firms using lending as their prime tool. Going aggressive in the internationally connected financial network, the government intervened, taking control of the banks and setting up capital control measures to ensure that their currency Krona does not fall drastically. Although the International Monetary Fund offered assistance, the central bank of Iceland couldn't help as most of the funds were based in the international market. The three banks had grown massively, were largely leveraged, and their lending pattern as reported by the special investigation commission looked alarming. Speculation, deregulation, questionable business practices, and regulatory weakness were some behavioural implications in the economy.

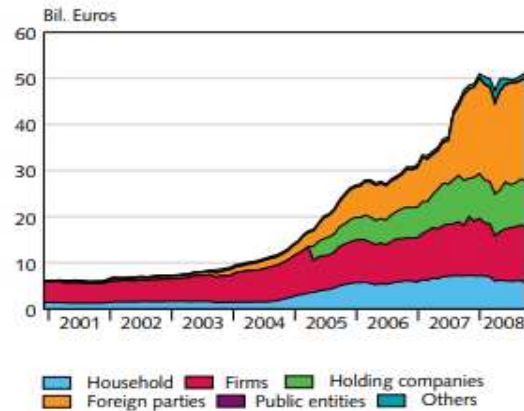


Figure from (SIC, 2010)

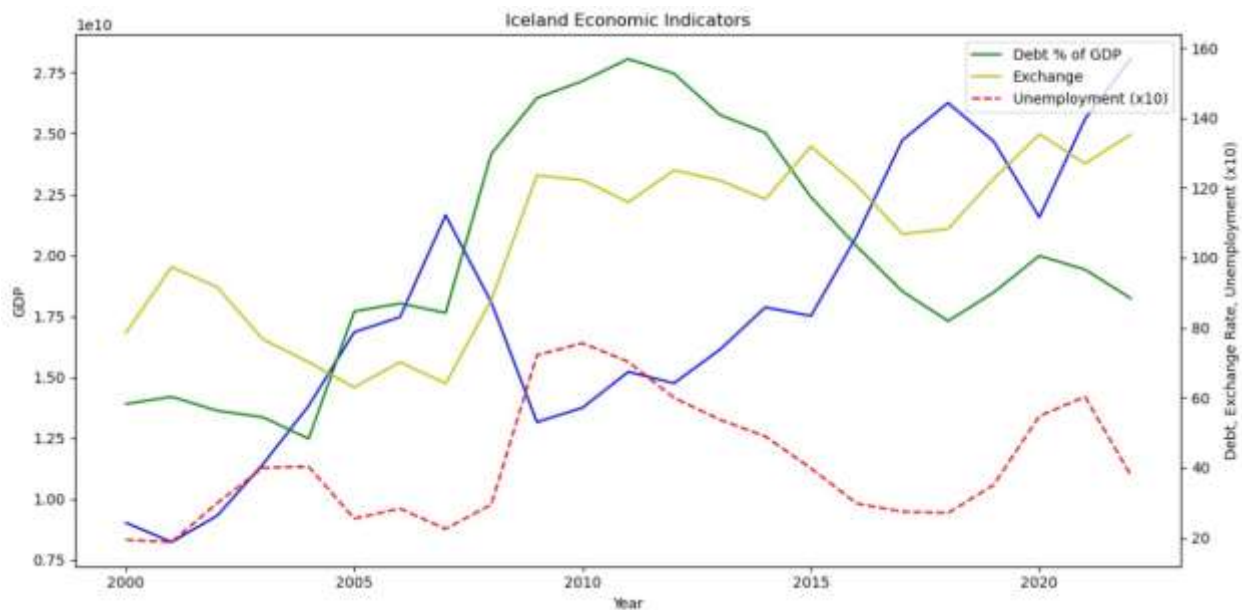


Figure Authors Representation

The impact can be seen in the economic figures of Iceland from 2007 onwards, where unemployment and government debt were at their peak. The strength of their currency was boiled down significantly because the banks had to repay the foreign deposits. After the crisis, a lot of banking reforms and financial regulation scrutiny were conducted. To combat the conditions, Iceland raised its interest to 18%, daily currency auctions, and agreements with the British and Dutch governments for reimbursement of deposits. Started with the failure of Lehman Brothers,

which raised CDS rates in Icelandic banks, which went into bankruptcy, as the global interbank lending was frozen. Foreign currency being a part of domestic money supply was a major reason for the macroeconomic deterioration in Iceland. High tax burdens generating very little tax income for the government, misguided inflation targeting, higher interest rates leading to increased foreign borrowing, and the central bank failing to improve foreign reserves are major policy implications not addressed back then. This empirical case shows how the behavioural point of view regarding wage and price flexibility, financial regulation policies (including monetary policy) for market reforms are critically important for financial stability.

References

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