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# **Reconciling Price and Financial Stability**

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It is a great pleasure for me to be with you today at the University of Zurich to discuss an issue that the recent financial crisis has exposed as a major challenge to central banks; namely how they can best contribute to ensuring financial stability while pursuing price stability as a primary mandate.<sup>2</sup> Before I do this, however, let me say a few words on another dimension of stability: institutional stability. As you are all aware, the Swiss National Bank (SNB) recently experienced an unfortunate event which has few, if any, historical precedents. On a personal level, I deeply regret the resignation of Philipp Hildebrand, under whose leadership the SNB steered Swiss monetary policy over the last two years. On an institutional level, however, I would like to stress that the SNB's institutional strength is the result of teamwork, not only between the board members, but across the Bank as a whole. The SNB's culture is one of excellence and of service. It is the product of a long history and many generations of leaders. It remains as strong as ever. Despite the difficult conditions and the unusual challenges that have characterized the last two years, all important monetary policy decisions have been reached by consensus, a consensus which emerged from in-depth and intensive analyses and discussions. The current course of Swiss monetary policy, particularly the decision to introduce a minimum exchange rate, is the result of a deep-rooted consensus of this kind. The SNB will thus continue to enforce the minimum rate with the utmost determination and remains prepared to buy foreign currency in unlimited quantities. The Swiss franc is still highly valued, but it should depreciate further in the future.

Let me now return to my topic. I will start by presenting general pre-crisis assessments of the state of monetary policy and will then examine how central banks' policies may have contributed to the financial crisis. After considering these issues, I will be in position to assess the alternative courses of action available to central banks in general, and the SNB in particular, to derive principles for a future in which financial and price stability are better reconciled with one another.

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<sup>2</sup> This order of priorities is in line with the National Bank Act, article 5, which clearly states that "ensuring price stability" is the SNB's primary goal while it should also "contribute to the stability of the financial system".

## **I. The Great Moderation: a success of monetary policy?**

Let me start by considering the state of many developed economies, to include Switzerland, before the onset of the crisis. In contrast with the episodes of high inflation which prevailed in the 1970's, rates of inflation were subsequently stable and low for some twenty years. This period, which is commonly referred to as the 'Great Moderation', was also characterized by low real GDP volatility and low interest rates. Slide 1 illustrates these developments in the cases of the United States and Switzerland in this period.

Though there is no definitive analysis of the causes of the 'Great Moderation', monetary policy is regularly cited as a contributing factor.<sup>3</sup> This accords well with observations that major progress had been made in identifying the determinants of inflation, understanding the importance of central bank independence and therefore in improving the conduct of monetary policy. At the methodological level, these developments are generally linked to the concept of 'inflation-targeting'<sup>4</sup> and summarized in a class of macroeconomic models, which Marvin Goodfriend and Robert King<sup>5</sup> have named 'the New Neoclassical Synthesis'. This label tells of an approach that combined key elements of Keynesian and classical thinking. While the new models made conditional forecasting possible and permitted scientifically appropriate policy evaluations, they only included primitive financial sectors. In their current state, they therefore cannot address issues of financial stability or the link between low interest rates and financial excesses.

## **II. The recent financial crisis: are central banks the culprits?**

The recent financial crisis has thrown the positive pre-crisis perceptions of modern monetary policy into question. Indeed, many analysts now attribute a certain degree of responsibility for the financial crisis to central banks, in sharp contrast with the typically benevolent assessment of their contributions to the 'Great Moderation'. Two main lines of argument support claims that central banks contributed to the crisis, as Slide 2 illustrates.

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<sup>3</sup> Other commonly cited causes are: i) financial deepening resulting from developments in the financial markets in the 1980-90's such as options, hedging tools, etc.; ii) less and more stable government regulation and taxation; iii) luck.

<sup>4</sup> The SNB does not describe its approach as 'inflation targeting' as it differs somewhat from classic 'inflation targeting'. See <http://www.snb.ch/en/i/about/monpol> for further details.

<sup>5</sup> Goodfriend and King (1997).

The first is that the precepts of the ‘inflation-targeting’ paradigm were misapplied and that these policy errors have contributed to, or have directly caused, the crisis. The second is that the paradigm itself is deficient, or at least incomplete. Indeed, even when central banks conduct monetary policy optimally, according to the ‘inflation-targeting’ mantra, it is a mistake for them not to recognise that a long period of low interest rates may encourage financial intermediaries to take increased risks with negative consequences for systemic stability.

One clear proponent of the first argument is John B. Taylor. Taylor has argued that the Federal Reserve contributed to the crisis by setting interest rates too low prior to 2007. Although price stability was achieved, monetary policy in the United States was, in his view, inappropriately conducted, given the level of inflation and the size of the output gap, as attested by significant deviations from the ‘Taylor rule’, a benchmark he first proposed in 1993.<sup>6</sup>

The ‘Taylor rule’ recommends that central banks systematically adjust nominal interest rates in response to macroeconomic developments and inflation movements, but, between 2002 and 2005, they were lower than the ‘Taylor rule’ advised, as Slide 3 illustrates. According to Taylor,<sup>7</sup> monetary policy may have been too expansionary, certainly in the United States and the Euro area. Taylor even suggests that, if central banks had set higher interest rates in this period, the subsequent housing bubble and the global financial crisis might have been avoided.<sup>8</sup> According to this view, the crisis stemmed from a misapplication of the ‘inflation-targeting’ precept. The underlying models may be unable to explain why an excessively accommodative policy would lead to a financial crisis. The episode does not, however, imply that the entire monetary policy paradigm has to be revisited, nor that financial stability is incompatible with price stability.

Slide 4 illustrates the ‘supply shock’ hypothesis. Here, the crux of the argument is that monetary policy was too expansionary because the impact of supply shocks on prices was underestimated. This, in turn, prompted miscalculations of the output gap. As one can see,

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<sup>6</sup> Taylor (1993).

<sup>7</sup> Interpretations of the ‘Taylor rule’ can be ambiguous. Interestingly, the formula produces quite different results depending on whether it includes core or headline inflation and how the output gap is measured. It also omits factors such as widening credit spreads, the role of time-varying parameters and the risk of deflation, particularly between 2002 and 2004. See, for example, Bernanke (2010) and Kohn (2007).

<sup>8</sup> Taylor (2009).

in the United Kingdom and in Switzerland, the prices of those goods which were most influenced by imports increased far more slowly than those of services, which were less import-dependent. One plausible explanation for this is that the availability of cheap imports from Asia (or Eastern Europe) acted as a positive supply shock, thus reducing the relative price of imports. If the supply shock had been temporary, it would have provoked lower transitory inflation and the optimal monetary policy response would have been to do nothing, except to let the economic forces at play re-establish an equilibrium and normal inflation levels.<sup>9</sup> In recent decades, however, the pressures associated with globalization have borne greater resemblance to a permanent series of shocks. As these shocks were interpreted as temporary, they were disregarded from a policy perspective, which, it is argued, caused monetary policies to be excessively expansionary.

Both of these views suggest that central banks could have potentially helped prevent the crisis by setting higher interest rates and that they should have done so if the 'inflation-targeting' precepts had been fully understood and optimally followed. In both cases, however, the underlying models would have predicted that such policy failures would have prompted overproduction and excessive rates of inflation, rather than a financial crisis.

The third hypothesis I would like to discuss is the theory of the 'risk-taking channel'. This newer line of argument is that, even if monetary policy was optimally conducted before the crisis, the prevailing low interest rates provided fertile ground for miscalculation and excessive risk-taking by financial intermediaries, thus contributing to the crisis. According to this view, the 'inflation-targeting' paradigm itself is deficient in the sense that it does not take into account the negative externality of a policy exclusively aimed at price stability imposes on financial stability. In Claudio Borio and Haibin Zhu's<sup>10</sup> terms, "changes in policy rates have an impact on either risk perception or risk-tolerance and hence on the degree of risk in portfolios, on the pricing of assets, and on the price and the non-price terms of the extension of funding." In other words, a long period of low interest rates drives financial intermediaries to take increased risks. Empirically, there is a growing body of evidence to indicate that a channel of this kind exists.<sup>11</sup>

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<sup>9</sup> Bean (2006).

<sup>10</sup> Borio and Zhu (2008).

<sup>11</sup> See, for example, Altunbas, Gambacorta and Marqués-Ibáñez (2010).

There are three main versions of the 'risk-taking channel'. Every one of them suggests that, while low interest rates might be the natural consequence of price stability, they may ultimately compromise financial stability. The first hypothesis, is that hedge-fund and wealth managers, who tend to be paid according to the nominal returns on their investments, might be prone to taking additional, possibly excessive, risks when interest rates are low and, as a result, they might receive lower levels of compensation.<sup>12</sup> To the best of my knowledge, empirical studies which support or dismiss this claim have been yet to be carried out.

The second hypothesis<sup>13</sup> is that low interest rates increase the value of the collateral backing up loans. Banks thus have less incentive to monitor their clients' loans.<sup>14</sup> This view is empirically better documented, but the supporting evidence is ambiguous.<sup>15</sup>

Finally, the third hypothesis is that banks with access to cheaper external funding increase their leverage to achieve higher returns on equity. This change in banks' balance sheet structure tends to make the banking sector more fragile. There is some evidence to support this argument. For example, Slide 5 reports the results of simulating how banks in the United States adjust their external funding to changes in monetary policy. It suggests that when central banks increase interest rates, banks significantly decrease their external funding for the next two years or so.<sup>16</sup>

The 'Taylor rule', the 'supply shock' hypothesis and the 'risk-taking channel' theory all have one common feature. Every one of them acknowledges the possibility that interest rates may have been too low prior to the crisis, though their proponents may disagree as to whether, or to what extent, this was the result of a policy or paradigm failure. There is also consensus that this may have contributed to the financial instability that followed, although only the theory of the 'risk-taking channel' clearly suggests how this would have come about.

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<sup>12</sup> Rajan (2005).

<sup>13</sup> Dell'Ariccia, Laeven and Marquez (2010).

<sup>14</sup> Note that this theory closely resembles Ben Bernanke and Mark Gertler's 'financial accelerator' model. However, in this model the increase in collateral value prompts investors to borrow more whereas in the model of the 'risk-taking channel', increased collateral value induces banks to monitor their existing loans less.

<sup>15</sup> See, for example, Buch, Eickmeier and Prieto (2011). This study of the US market between 1997-2008 suggests that looser monetary policy or unexpected house price decreases prompt small domestic banks to increase their exposure to risk. The same conditions seemingly cause foreign banks to reduce their risk exposure, however, while large domestic banks retain the same levels.

<sup>16</sup> Angeloni, Faia and Lo Duca (2010).

### **III. 'Leaning against the wind': an unfavourable trade-off between financial stability and output growth**

If interest rates were indeed too low in the pre-crisis years, it would appear that by raising them central banks could have helped avoid, or at least contain, the crisis. When this calls for deviations from otherwise optimal policy, one talks of 'leaning against the wind'. In economic upturns, this would involve central banks setting higher interest rates than would be necessary to achieve price stability alone. The objective would be to avoid the overvaluation of assets, to constrain excessively risky behaviour on the part of financial intermediaries and hence to prevent bubbles from emerging, or at least to reduce their size.

In contrast, Alan Greenspan was widely credited for supporting a "clean up after bubbles" approach. This basically involves central banks actively sustaining the economy after an asset price bubble has burst, rather than using monetary policy to try to prevent the bubble from developing in the first place. The rationale for this approach is that it is more cost-effective overall, as bubbles are very hard to identify. Erroneously implemented 'leaning against the wind' policies could well impose significant economic costs with no real subsequent benefit.

The huge cost of the recent financial crisis has decreased the weight of such objections to 'leaning against the wind'. It is therefore important to further examine the potential of a preventive policy. Charles Bean *et al*<sup>17</sup> strive to estimate the impact a 'leaning against the wind' would have had on asset prices and real output in the recent financial crisis. The charts in Slide 6 show the simulated impact on credit, real estate prices and GDP growth of a policy which would push US interest rates 200 basis points higher than were actually observed between 2003 to 2006. The slide illustrates that the simulated policy would probably have kept real house prices some 7.5 percent lower than they were at their peak. The simulated policy would probably also have prompted a significant drop in cumulative real GDP growth, estimated at about 3.3 percent. These higher interest rates would, however, only have had a limited impact on credit growth, i.e. they would theoretically have reduced a 30 percent credit growth to around 27 percent. As a result, it is not clear

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<sup>17</sup> Bean *et al.* (2010).

that the simulated policy could have significantly reduced the probability of a real estate bubble developing. Another study of OECD countries by Katrin Assenmacher-Wesche and Stefan Gerlach,<sup>18</sup> estimates that, to obtain a 10% decrease in property prices, central banks would have to sacrifice between 2.3 and 4.0 percentage points of real GDP growth. In turn, Christian Hott and Pierre Monnin<sup>19</sup> estimate that house prices were overvalued by some 25 percentage points in the US in 2005 and by approximately 50 percentage points in the UK in 2006. Together, these two studies suggest that a drop of between 9 and 10 percentage points of real GDP in the US and between 11.5 and 20.0 percentage points in the UK would have been necessary to totally erase the two countries' real estate bubbles. These results highlight the unfavourable trade-off between financial stability and output growth when 'leaning against the wind' is the only instrument available to address the former. They also strongly suggest that, even if central banks had optimally followed the 'inflation-targeting' principles (or the 'Taylor rule') ahead of the crisis, the higher interest rates that would have resulted would not have been sufficient to prevent the emergence of a bubble and the ensuing financial crisis.

#### **IV. How might systemic risk be reduced?**

The unfavourable trade-off I have just highlighted provides a powerful incentive to explore the potential of alternative instruments. This is where 'macro-prudential tools' come into play. These tools focus on directly addressing the vulnerabilities to which the financial system as a whole is exposed. Their strength is that they target the problem directly at the root. Slide 7 summarizes the two main dimensions of systemic risk: the 'structural' dimension, which covers the possible risks associated with individual institutions whose failure would endanger the entire system; and the 'cyclical' dimension, which refers to systemic risks that are not directly linked to individual institutions, but which stem from financial institutions' collective responses to business or financial fluctuations and adverse shocks. 'Structural tools' strive to reduce the impact of institutional failure by strengthening individual institutions. Their potential utility is often cited with regard to institutions

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<sup>18</sup> Assenmacher-Wesche and Gerlach (2010).

<sup>19</sup> Hott and Monnin (2008).



which are considered 'too big to fail' or 'too interconnected to be liquidated' and whose failure would impact the entire system.

'Countercyclical tools' aim to address the cyclical dimension of risk by reducing feedback loops. As Slide 8 shows, these are designed to counter problems associated with the actions of individual financial institutions, which can lead them all to act in the same way after an initial shock, thus amplifying the initial movements of the markets and leading to a new wave of similar reactions.<sup>20</sup> This is because individual financial institutions tend to react to a shock by shedding risks, either because it is rational to do so or because regulation obliges them to do so. If the system is not designed with the explicit aim of stopping such movements, a negative cycle can set in with dangerous consequences for individual institutions and the system as a whole.

Countercyclical measures are intended to modulate, reduce and potentially prevent such instability. The aim of 'capital buffers' is to ensure that, in good times, banks acquire a capital base that is well above the minimum. The buffers can then be released in more difficult times, allowing financial institutions to absorb substantial asset price falls before legal constraints become binding. They should thus help avoid the afore-mentioned procyclical behaviour that typically leads to so-called 'fire sales'.

What is appealing in theory is not necessarily easy to implement in practice. Few doubt that there are challenges to defining and calibrating the indicators used to determine when capital buffers should be triggered, and by how much. However, to quote Borio, "while calibration is not straightforward, the difficulties can be overstated."<sup>21</sup> To support his claim, Borio notes that traditional monetary policy also confronts such challenges when interest rates are set on the basis of indicators, such as output gaps or natural interest rates, which are unobservable and difficult to measure accurately. It is, however, commonly accepted that central banks have, to a large extent, surmounted these difficulties.

Of course, countercyclical buffers cannot be implemented without inflicting some costs to the economy, but the trade-off involved seems significantly more favourable than is the case with 'leaning against the wind' policies. A 2011 study by the Bank of International

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<sup>20</sup> For examples of models which illustrate downward spirals, please refer to Markus Brunnermeier and Lasse Pedersen (2009), Stephen Morris and Hyun Song Shin (2004).

<sup>21</sup> Borio (2011).

Settlements estimates that, by reducing the probability of a severe crisis, the benefit of countercyclical buffers is on average 10 times higher than their costs in terms of real output growth per year.

## **V. The Swiss Case**

Every central bank in the world faces its versions of the challenges I have mentioned. The Swiss National Bank is no exception. Indeed, the SNB's position is particularly challenging as the Swiss economy is small and open, which potentially makes it more vulnerable to any negative fall-out that may stem from the trade-off associated with policies which 'lean-against-the wind'. As the current situation of the Swiss economy makes all too clear, the impact of a high interest rate policy on the exchange rate would surely increase the associated output loss. It is therefore crucial that the Swiss authorities implement the most cost-effective measures to counter the financial excesses that may lead to a crisis.

Indeed, the Swiss authorities are currently pursuing a comprehensive agenda of macroprudential measures. From a structural perspective, in 2011 the Swiss Parliament passed a package of measures aimed at reducing the systemic impact of potential failure of those institutions classed as 'too big to fail'. These banks will now be asked to retain extra capital reserves. They will also be required to improve their liquidity positions, diversify their risks and propose a scheme by which they will ensure the continuation of their systemically important functions, should they find themselves in financial difficulty. This new regulatory regime will come into force on 1<sup>st</sup> January 2013, pending approval of the associated directives by Parliament. Second, after a round of consultations that just ended, the Federal Council is soon expected to decide upon a proposal to introduce a new risk-weighting system for mortgage-related assets. From a cyclical perspective, a proposal to ensure that banks implement countercyclical capital buffers was part of the recent consultations and is also pending approval by the Federal Council. The proposal foresees that the ultimate decision to activate or modify the capital buffer requirement will lie with the Federal Council. This decision will be made on the basis of the SNB's proposal and the FINMA's response to it.

Finally, in order to enhance the SNB's capacity to assess the stability of the financial system and to take appropriate measures, the Bank has also called for improved access to information on financial institutions.

## **VI. Conclusion**

The preceding discussion has, I hope, clarified some of the complex interactions between price and financial stability. Within the Swiss legal framework, I am convinced that the central bank has been given an appropriate mandate. In order of priority, the SNB must ensure price stability, while taking due account of the developments of the economy. It must also contribute to the stability of the financial system. One important lesson to emerge from the analysis of the recent crisis is that an interest rate policy cannot be the sole, or even the main instrument, used to promote financial stability. It is imperative that central banks be endowed with alternative 'macro-prudential' instruments. This assessment is not only the product of careful application of the 'Tinbergen principle', according to which one needs as many instruments as one has objectives. On a deeper level, this conclusion is also based on the recognition that, from a welfare perspective, a 'leaning against the wind' policy would clearly be dominated by instruments which target the root causes of those problems generated by excessive risk-taking in times of low interest rates.

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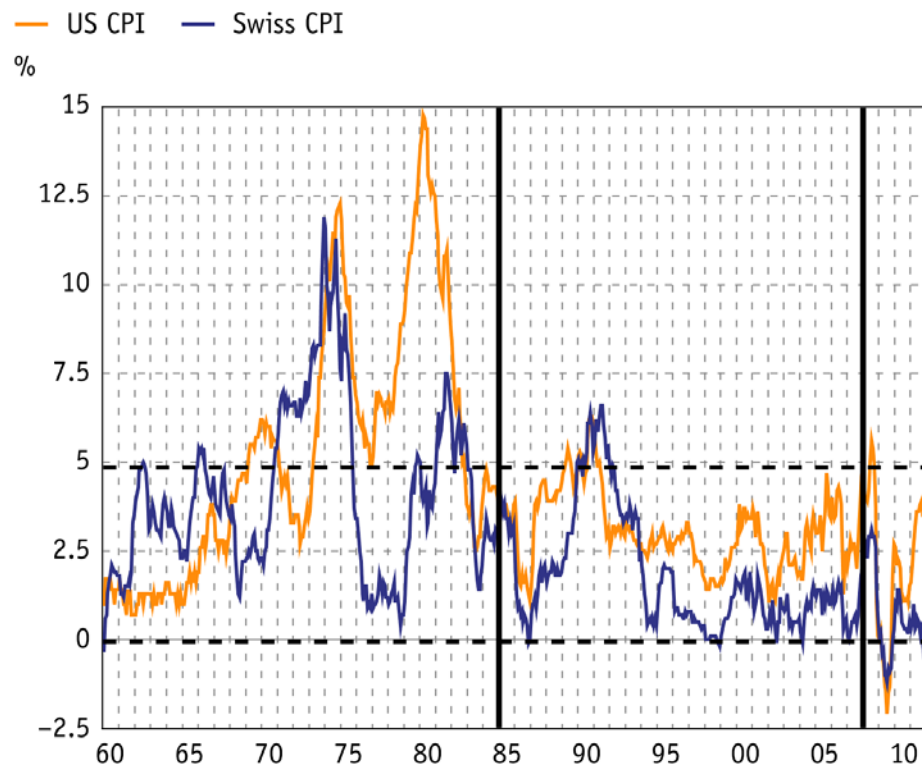
# Reconciling Price and Financial Stability

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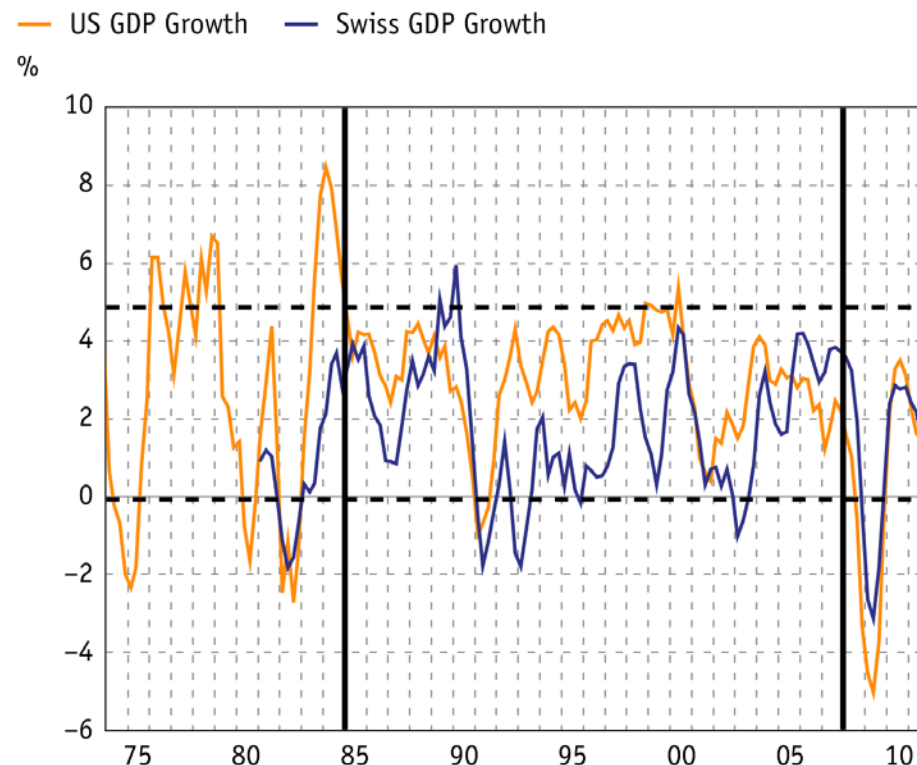
# The 'Great Moderation'

## US and Swiss Inflation Rate



Quellen: SNB Markets Analysis Platform, OECD

## US and Swiss GDP Growth



Quellen: SNB Markets Analysis Platform, OECD

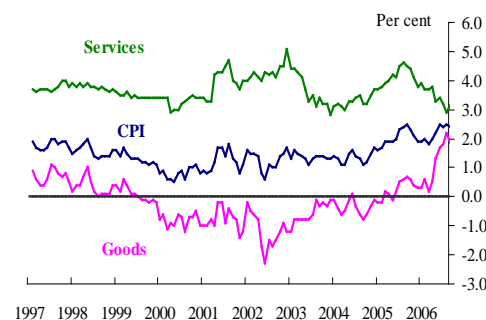


# Did Central Banks Contribute to the Crisis?

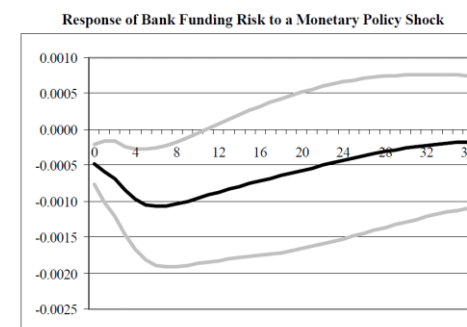
## Taylor Rule



## Supply shocks



## Risk-taking channel

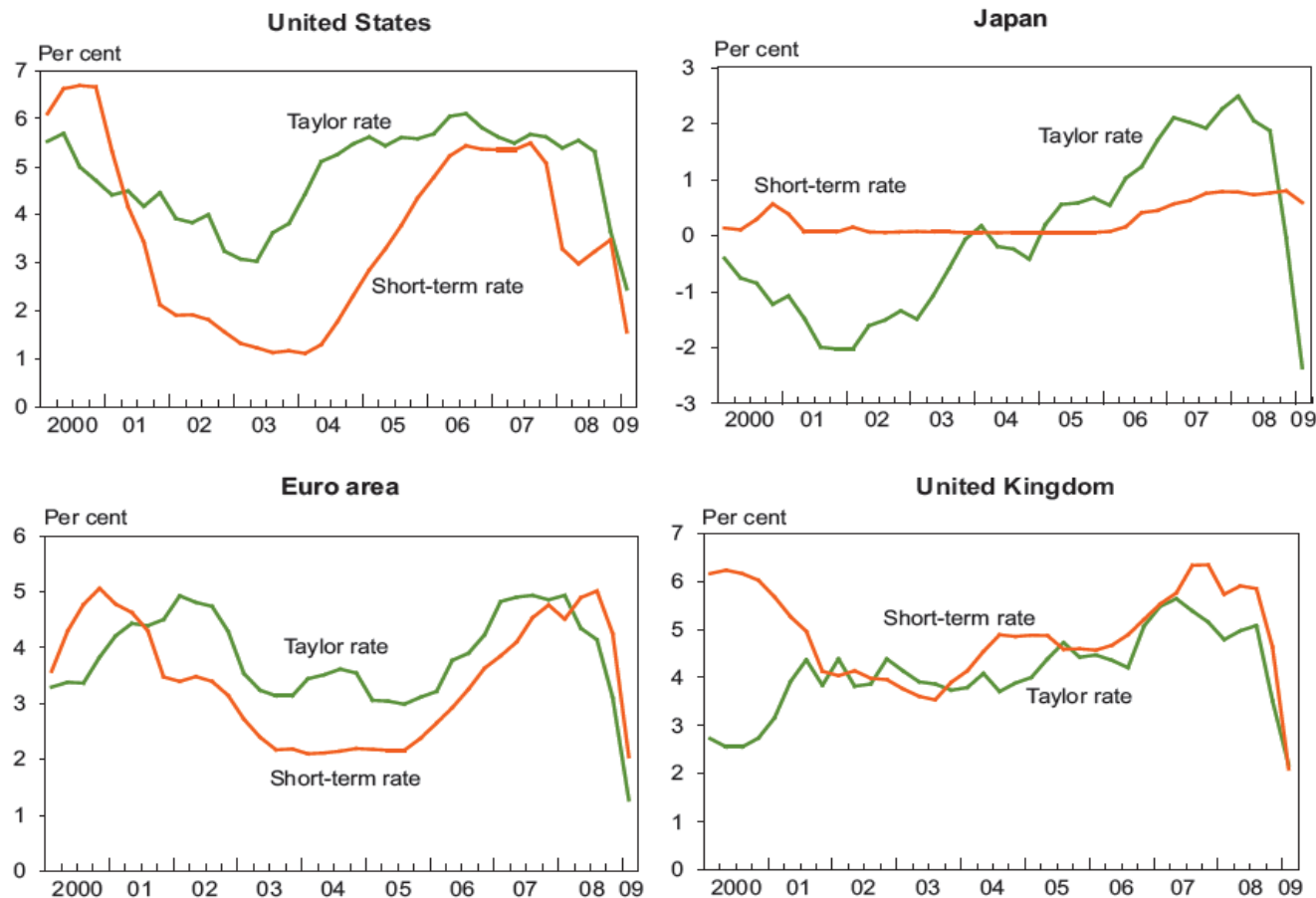


Monetary policy too accommodative?



# The 'Taylor Rule'

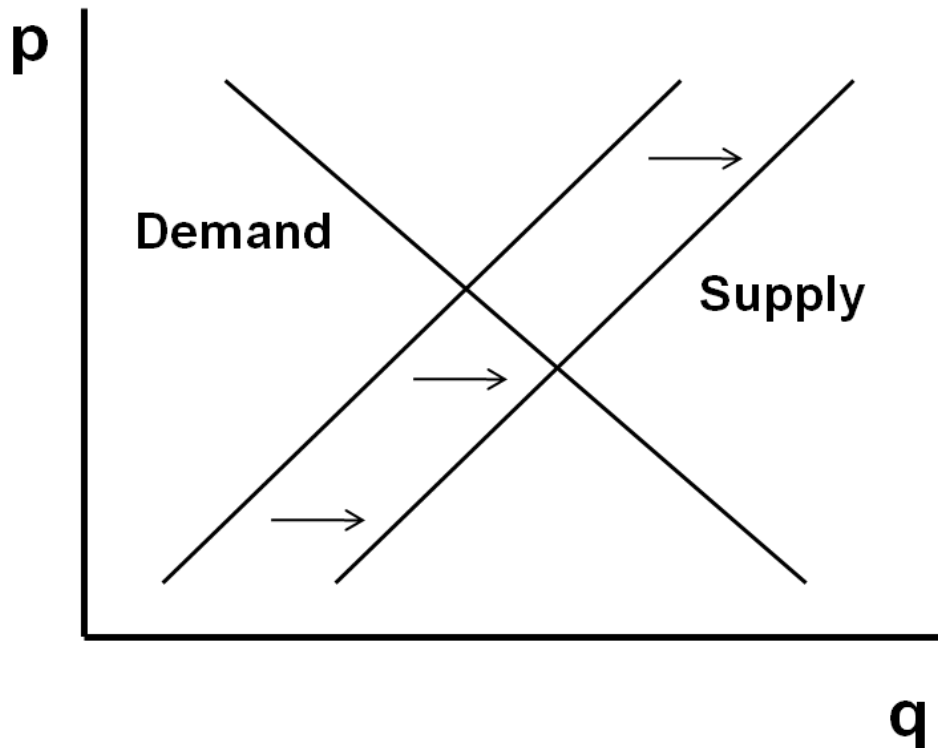
Figure 13. Monetary policy has been accommodative



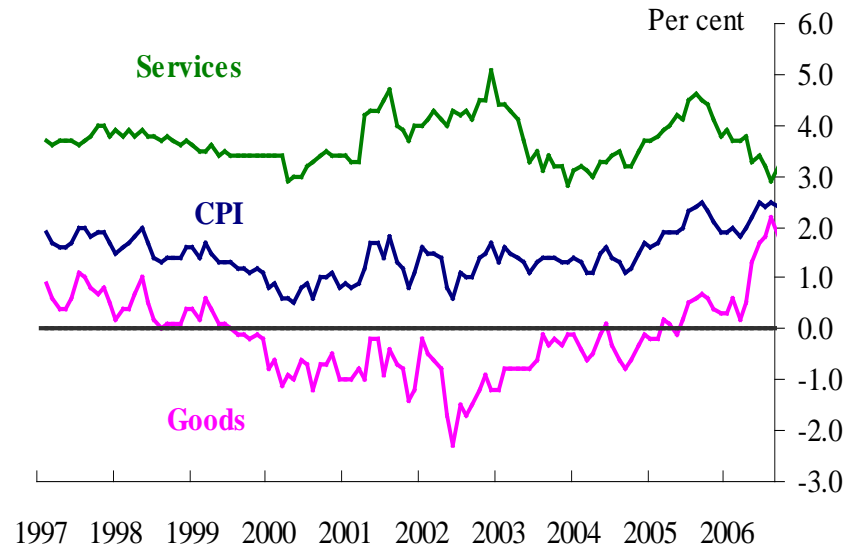
Source: Elmeskov/OECD (2009)



# Supply Shocks: Globalization



## Case UK



Source: Bean (2006)

## Case Switzerland

### Average inflation rate since 1985

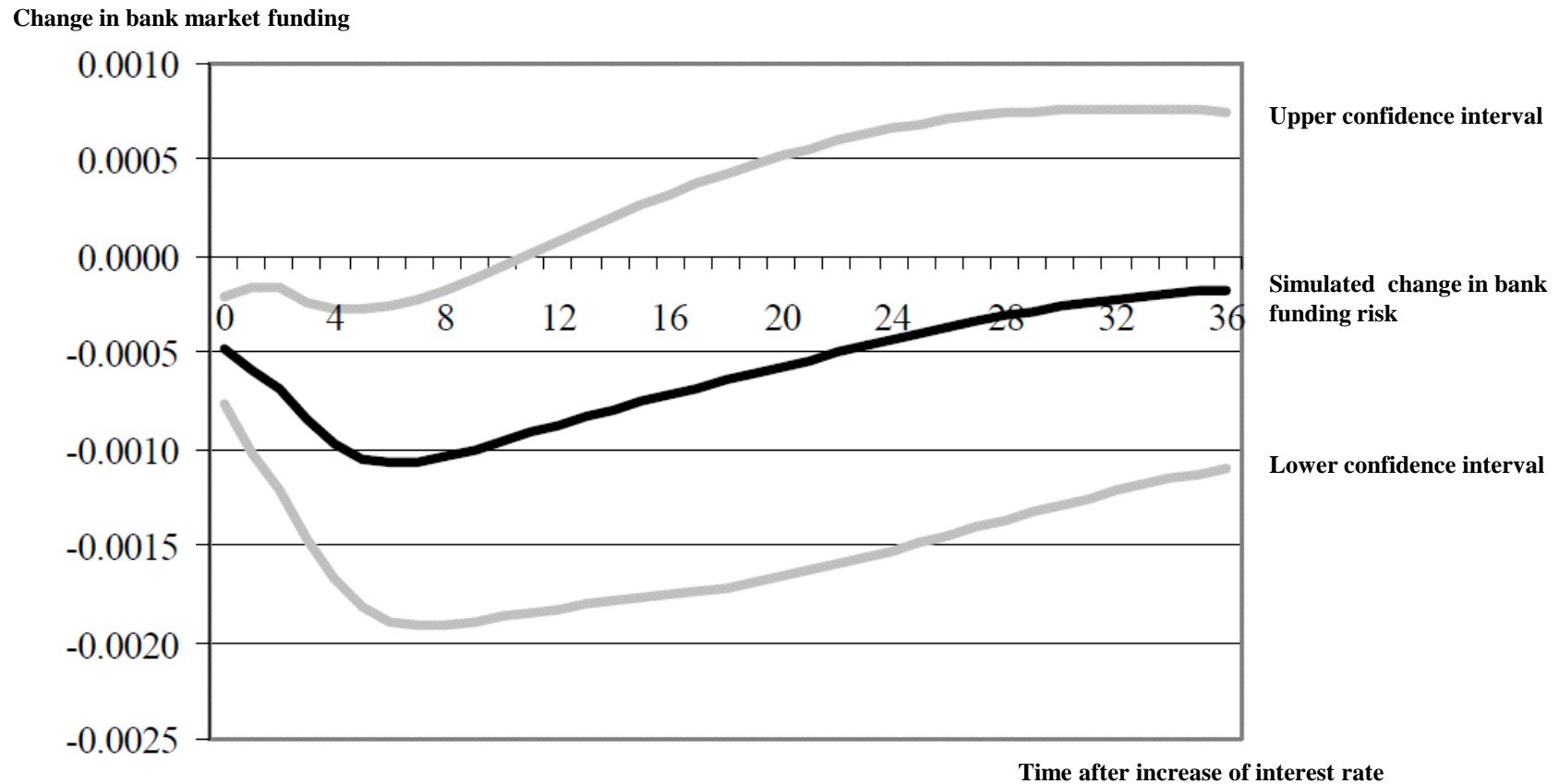
Goods	2.32%
Services	0.88%

Source: Thomson Datastream



# Risk-Taking Channel

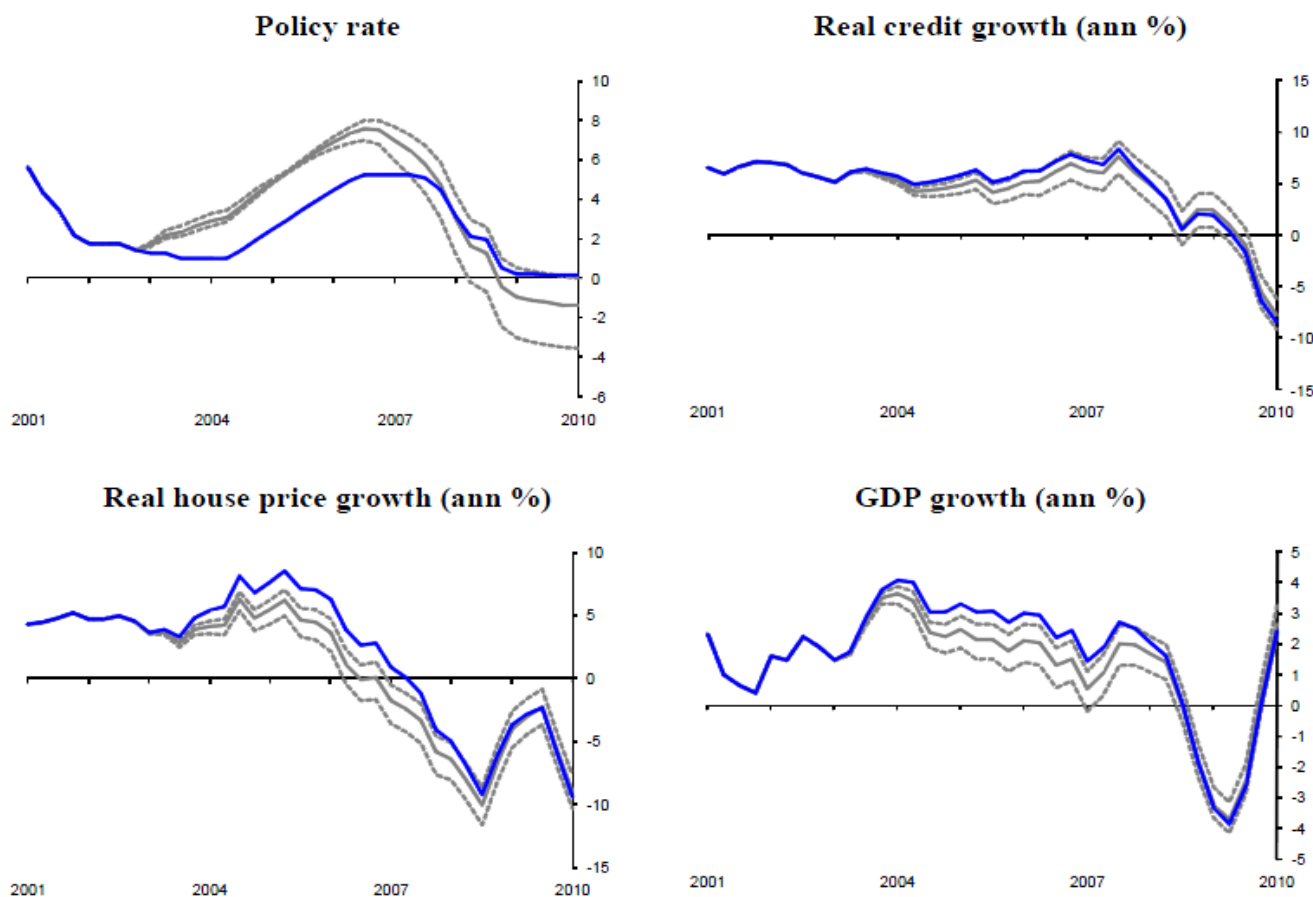
## Response of Bank Funding Risk to a Monetary Policy Shock





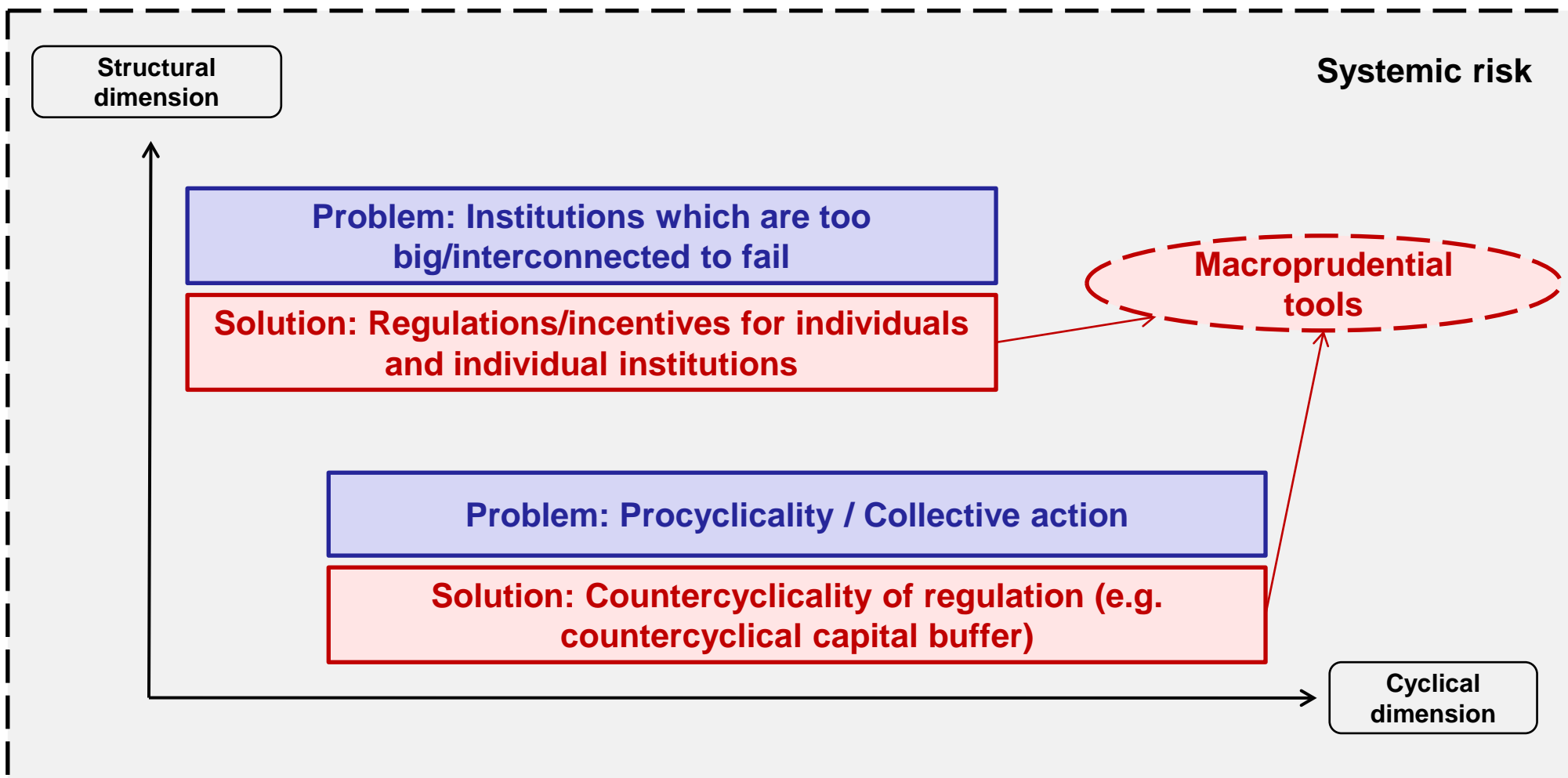
# Simulated 'Leaning Against the Wind'

## Simulation of a "Leaning Against The Wind" Policy 2003-6: US

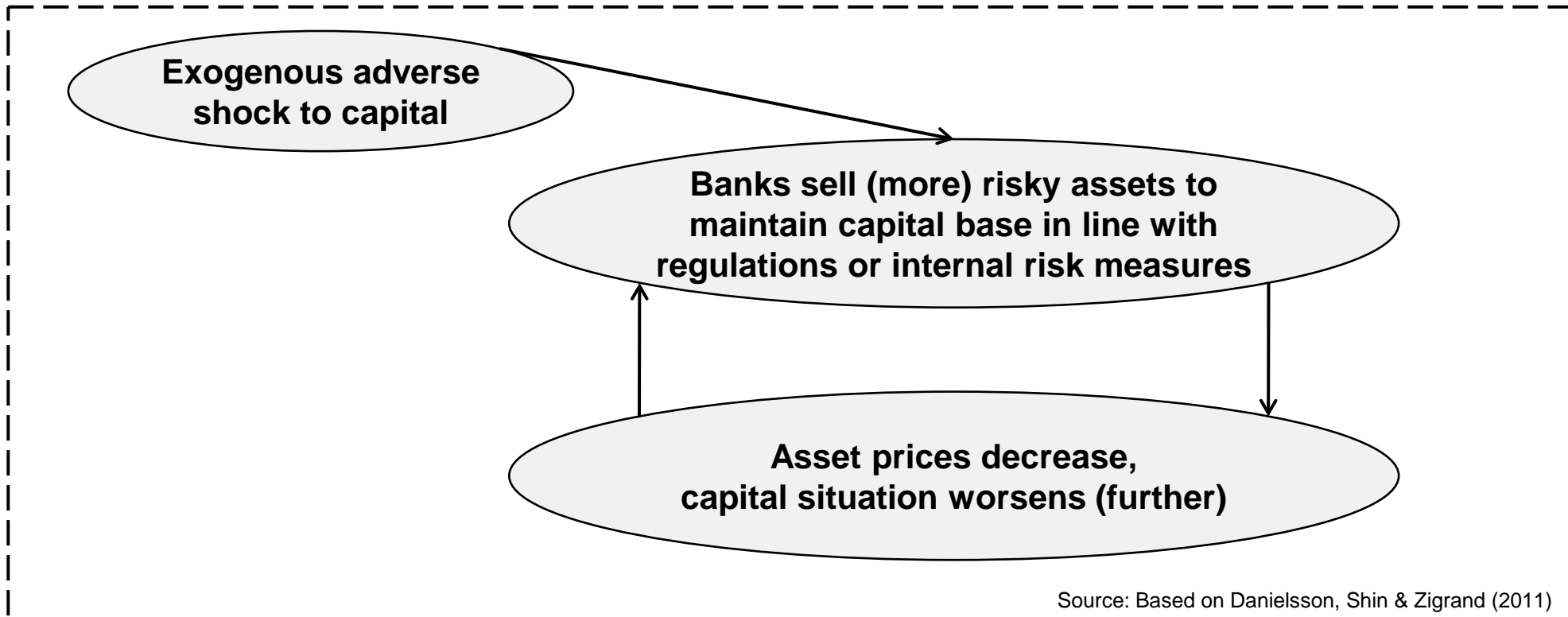


Source: Bean et al. (2010)

# Addressing the Root Cause



# Procyclical Bank Behaviour



- Solution: Banks' capital requirements eased in times of economic stress.
- Countercyclical regulation, countercyclical buffers!