

The jury is in

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In June 2010, the Institute of International Finance (IIF) warned that the new Basel III capital and liquidity standards would be catastrophic for the global economy. After examining the impact of implementation over a five-year horizon, the IIF concluded that banks would need to increase capital levels dramatically and that this would drive lending rates up, loan volumes down and result in an annual 0.6-percentage-point hit to GDP growth in the US, the Eurozone and Japan.¹

Two months later, the Macroeconomic Assessment Group (MAG), a joint creation of the Financial Stability Board and Basel Committee on Banking Supervision composed of nearly 100 macroeconomic modeling experts from the world's largest central bankers, supervisory authorities and international institutions, published their conclusions. Things were hardly dire.² The implied increase in capital would drive lending rates up only modestly, loans volumes down a bit, and result in a decline in growth of only 0.05 percentage points per year for five years – one-twelfth the IIF's estimate.

You might argue that both of these groups suffer from hopelessly irresolvable conflicts of interest. After all, the IIF is an association of the world's largest private global banks trying to find a way to maintain the implicit government guarantees that have made them so profitable for decades. And the MAG is composed of the people who were being blamed for letting the crisis happen in the first place. The incentives of each were pretty clear: the IIF would claim the world is coming to an end in an effort to push the regulators to remain lax; and the MAG would minimise the possibility of any negative effects in an effort to support the imposition of more stringent requirements.

This natural skepticism is confirmed by the fact that, among the group of studies examining the macroeconomic impact of the transition to strong

capital and liquidity requirements, the IIF and MAG estimates were at opposite ends of the spectrum. That said, the broader consensus outside of these two groups was that, as higher capital and liquidity requirements were put into effect, they would put some drag on real activity, but the impact would be relatively small. In other words, those with less personally on the line were closer to the MAG than the IIF.³

Well, the jury is in, and my reading of the evidence is that the optimists were not optimistic enough. Capital requirements have gone up dramatically, and bank capital levels have gone up with them. In the meantime, lending spreads have barely moved, bank interest margins are down, and loan volumes are up. To the extent that more demanding capital regulations had any macroeconomic impact at all, it would appear to have been offset by accommodative monetary policy. So, if Basel III pushed up lending costs and discouraged lending, the combination of low policy rates and unconventional monetary policy was sufficient to mitigate the impact on growth.⁴

Before getting to the details, I should note a number of difficulties in coming to any definitive conclusions. First and foremost, at this writing, the implementation of financial reforms is incomplete. In the case of the liquidity requirement, the international standards are not yet final. And, full implementation of the new Basel III requirements will only be complete at the beginning of 2019. That said, banks have generally frontloaded their capital increases. Most large, internationally active banks already meet the 2019 requirements today.

Second, changes in financial regulation are far from the only influence on macroeconomic outcomes over the past few years. For example, as the EU was

3 Cohen and Scatigna (2014) Tables 1 and 2 summarise results in range of studies.

4 The MAG's (2010a) primary headline estimate of decline in growth of 0.05 percentage points per year for five years assumes no monetary policy response. The group's estimate with endogenous monetary policy is slightly smaller.

1 See Institute of International Finance (2010).

2 See Macroeconomic Assessment Group (2010a and 2010b).

in the process of adopting the new capital regulation directive (CRD IV), the Eurozone experienced a set of sovereign debt crises. As the Japanese Financial Service Authority (JFSA) adopted new capital adequacy rules for internationally active banks, the Bank of Japan engaged in Quantitative and Qualitative Monetary Easing (QQE) that has nearly doubled the Japanese monetary base. And as the US authorities were implementing Dodd-Frank, the Federal Reserve has maintained exceptionally accommodative policy with continued low short-term interest rates and a relatively steep yield curve. But even so, as I will explain, the evidence for the optimistic interpretation is reasonably compelling.

In the remainder of this essay, I seek to substantiate my conclusion that the macroeconomic impact of the increases in capital requirements was either imperceptibly small or was neutralised by monetary policy actions. I start with a very brief description of the increase in capital requirements themselves, followed by examination of the sizeable increase in bank capital (4.5 percentage points for the largest global banks) and the sources of the increase (two-thirds from retained earnings and one-third from capital issuance). Next, I examine standard bank performance indicators, and conclude that bank profitability is down, as are net interest margins and operating costs. This is followed by a discussion of lending spreads and loan volumes – the former are largely unchanged, while the latter are up nearly everywhere outside of Europe.

After a brief discussion of why lending is depressed in Europe, I turn to policy implications. Recall that by reducing or removing government subsidies, the changes in capital and liquidity regulation are intended to increase lending costs and reduce credit supply. In the absence of any monetary policy reaction, this would raise the interest rates borrowers face and reduce the level of debt in equilibrium. The evidence that the impact has been small thus far suggests that, in normal times, by lowering the risk-free rate, central banks will be able to offset this, mitigating the impact on growth.

And, the implication is that macroprudential tools like the countercyclical capital buffer may not be the silver bullet that their designers hoped they could use to counter credit booms. That is, while raising capital standards during a period of euphoria will almost surely improve resilience to the eventual bust, it may not do much to reduce the rate of credit growth itself.

Capital requirements and the level of bank capital

I start with a quantitative examination of changes in capital requirements and the level of bank capital. It

is important to understand that Basel III increased capital requirements considerably – but from a negligible level. While the headline requirement under Basel II was a ratio of 4% of risk-weighted assets, the reality is that banks were required to hold virtually no capital whatsoever. The reason is that Basel II allowed a range of hybrid instruments and intangibles to count as capital, and there were gaps in the coverage of risks in the computation of risk-weighted assets. Hybrids are things that most people would agree look more like debt than equity. They arise from the arbitrage created by the fact that interest payments are deductible from profits before taxes, while dividends are not. And intangibles include good will, deferred tax assets and mortgage servicing rights.⁵

Table 1. Comparing Basel III and Basel II capital requirements (share of risk-weighted assets) for the largest systemic banks: Impact of Basel III capital definition

Basel III range	8% to 10%
Basel II Baseline	4%
Adjustment for hybrid capital	-2%
Adjustment for goodwill, intangibles, deferred tax assets, etc.	-1%
Adjustment for changes in risk weights	-¼%
Effective Basel II converted to a Basel III basis	< ¼%

Source: Basel Committee on Banking Supervision (2010) and authors' calculations.

In constructing Basel III, authorities took the view that capital should be loss absorbing in resolution and that the computation of risk-weighted assets should be comprehensive, including both on- and off-balance sheet exposures.⁶ Banks would be forced to treat hybrids as debt, not equity; and intangibles would not be included in the computation of assets. This more rigorous view led to a dramatic increase in effective capital requirements. While the actual change depends on the exact nature of a bank's activities, Table 1 provides a sense of the size of the adjustments. Using the tighter Basel III definition of capital and risk coverage, the effective pre-crisis Basel II requirement was less than ¼% of risk-weighted assets. By contrast, standards agreed in 2010 require capital of 8% to 10% of risk-weighted assets for the largest systemic banks.

To address concerns about transition costs, the international agreement specified that the new standards were to be phased in a number of years.⁷ But since capital requirements are minima, not

5 Cecchetti and Schoenholtz (2014c) discuss some of the conceptual issues associated with the measurement of capital.

6 See Basel Committee on Banking Supervision (2011) for details.

7 See Box IV.A of BIS (2014) for details.

maxima, there is nothing to stop banks from raising their capital adequacy ahead of the Basel III timetable. And, they have.

As a part of its implementation monitoring program, the Basel Committee performs periodic quantitative impact studies (QIS). Typically, these have included the 200 or so largest banks in the world (as measured by assets). The results of each QIS include banks' capital ratios computed on the fully phased-in Basel III definitions of capital and risk-weighted assets. Table 2 reports the numbers starting with end-2009.

Table 2. Bank's common equity tier I relative to risk-weighted assets: Fully phased-in Basel III ratios

	2009		2011		2012		2013	
	31 Dec	30 Jun	31 Dec	30 Jun	31 Dec	30 Jun	31 Dec	
Large banks	5.7	7.8	7.7	8.5	9.2	9.5	10.2	
Other banks	7.8	8.8	8.7	8.8	9.4	9.5	10.5	

Note: "Large banks" are the 102 global banks with capital in excess of €3 billion. "Other banks" is a sample of 125 smaller banks.

Source: Basel Committee on Banking Supervision (various years).

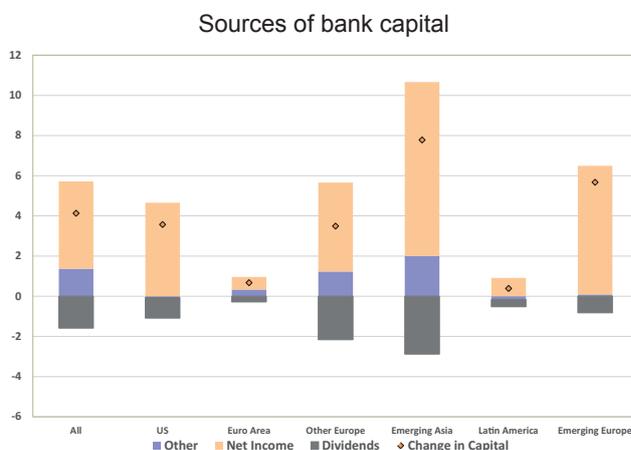
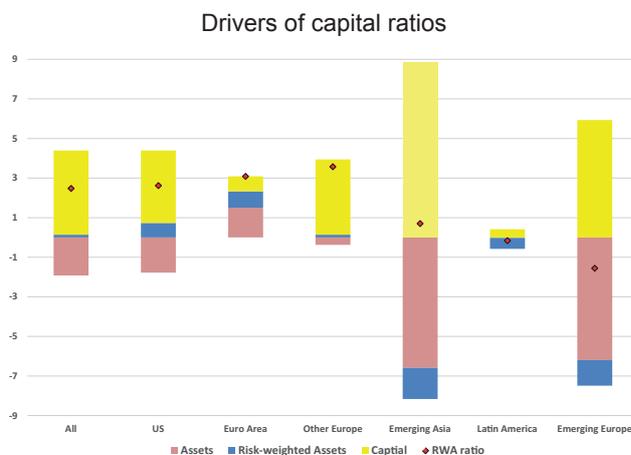
I take two important points away from the information in Table 2. First, since end-2009, capital (as measured by common equity tier 1) has risen by a total of 4.5 percentage points of risk-weighted assets for the 102 largest banks in the world, and 2.7 percentage points for the smaller banks in the Basel Committee's sample. Second, while there are surely differences across banks and regions, end-2013 capital levels exceed those that Basel III requires for 2019.⁸

These numbers are averages. Some banks remain below the 2019 standard. While the published version of the QIS does not report results for individual banks (or single countries or even regions), it does contain information on the capital shortfall for banks that do not currently meet the fully-phased in Basel III requirements. Here, if we accept that the definition of capital is truly harmonised and that all banks are being treated with equal rigor, the numbers are very modest: the December 2013 total was roughly €25 billion for all 227 banks included.

In assessing these speedy increases in capital ratios, it is useful to ask how the banks did it. Did they increase the level of capital or reduce assets? If it was the former, was it through retained earnings or new issuance? And, if it was the latter, did they

reduce total assets, or simply reduce the riskiness of what they were holding?

Figure 1. Capital accumulation boosts banks' regulatory ratios



Notes: The graph decomposes the change in the ratio of common equity capital to risk-weighted assets (left-hand panel) and the percentage change in common equity capital (right-hand panel) into additive components. Overall changes are shown by diamonds. The contribution of a particular component is denoted by the height of the corresponding segment. A negative contribution indicates that the component had a depressive effect. All figures are weighted averages using end-2013 total assets as weights.

Sources: B Cohen and M Scatigna, "Banks and capital requirements: channels of adjustment", BIS Working Papers, no 443, March 2014; Bankscope; Bloomberg.

Cohen and Scatigna (2014) have done these computations. In Figure 1, I reproduce an updated graphic for their sample of 94 banks.⁹ Starting with the left-hand panel, note that with the exception of European banks, banks' total assets increased, contributing to bringing the ratio down not up (the magenta portion of the bar in the graph). The impact of changes in the composition of assets varied across regions. In the US and the Eurozone, banks reduced riskiness, raising their capital ratios (that's the blue portion of the bar). In the rest of the world, it went the other way.

9 This version of Cohen and Scatigna's graphs appear in BIS (2014). As Cohen and Scatigna note, the sample of banks accounts for roughly two-thirds of the assets of the largest 1000 banks in the world, and includes all 29 institutions on the Financial Stability Board's list of systemically important institutions.

8 One explanation for this is that, while regulations may bind in good times, market discipline binds in bad times. In order to demonstrate their strength to investors, banks have been in a race to meet future requirements early.

This brings us to increases in capital, the yellow portion of each bar in the left-hand panel of Figure 1 and the subject of the right-hand panel. The primary driver of the increase in banks' capital ratio was an increase in capital itself. The right-hand panel shows that the increase in capital largely reflected gains in net income (the tan portion of each bar in the right-hand panel). Looking more closely at the result for the entire sample, capital increased by 4.13 percentage points (slightly less than for the Basel Committee's sample of banks), two thirds of which, or 2.76 percentage points, is from retained earnings and the remainder from other sources (primarily net capital issuance).¹⁰

Bank performance

Next, I turn to bank performance. In Table 3, reproduced from BIS (2014), I report pre-tax profits, net-interest margin and operating costs, all as a fraction of total assets for 11 advanced and 4 emerging market economies. Taking these as a whole, I note that profitability is down, net-interest margins are down and operating costs are down. Putting this together with the previous observations, we can conclude that, to the extent that increases in capital were costly and reduced the value of the government subsidies, these costs were borne by the equity holders in the form of lower dividends and the managers in the form of lower compensation (included in operating costs). Most importantly, and contrary to what the pessimists predicted, net interest margins did not balloon.

Table 3. Profitability of Major Global Banks

	Pre-tax profits		Net-interest margin		Operating costs	
	2000-07	2013	2000-07	2013	2000-07	2013
Australia	1.58	1.28	1.96	1.79	1.99	1.11
Brazil	2.23	1.62	6.56	3.55	6.21	3.28
Canada	1.03	1.06	1.74	1.65	2.73	1.78
China	1.62	1.86	2.74	2.38	1.12	1.01
France	0.66	0.32	0.81	0.92	1.60	1.16
Germany	0.26	0.10	0.68	0.99	1.38	1.55
India	1.26	1.41	2.67	2.82	2.48	2.36
Italy	0.83	-1.22	1.69	1.58	2.27	1.84
Japan	0.21	0.68	1.03	0.77	0.99	0.60
Russia	3.03	2.04	4.86	4.15	4.95	2.68
Spain	1.29	0.50	2.04	2.32	2.29	1.75
Sweden	0.92	0.77	1.25	0.98	1.34	0.84
Switzerland	0.52	0.36	0.64	0.61	2.39	1.90
United Kingdom	1.09	0.23	1.75	1.12	2.02	1.55
United States	1.74	1.24	2.71	2.32	3.58	3.03

Source: BIS Annual Report 2014, Table VI.2

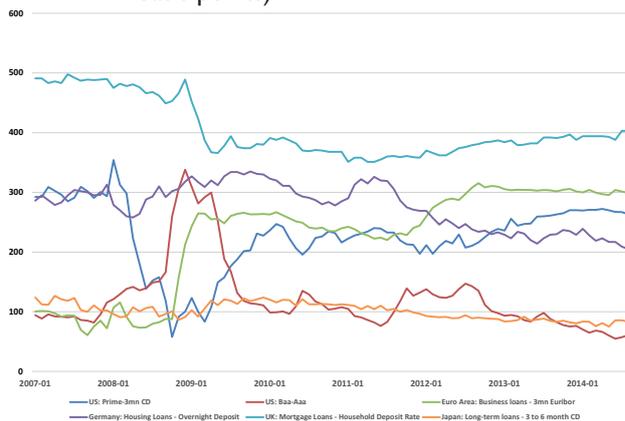
¹⁰ Retained earnings is computed as the difference between net income and dividends. The "Other" category in Figure 1 includes some smaller items such as the revaluation of assets classified as available for sale, but is mostly net equity issuance.

Lending spreads and credit volumes

Macroeconomic indicators reinforce the conclusions drawn from the bank performance data. Figures 2, 3 and 4 report lending spreads, lending standards and bank credit, respectively. With the exception of the Eurozone, lending spreads are down, lending standards have eased and the ratio of bank credit to GDP is up.

Bringing everything together, the consensus was too cautious and the pessimists were wrong. While weak demand by potential borrowers can explain the reduced spreads and is consistent with easing of lending standards, it is not consistent with the generally higher levels of bank credit. So, while there were lots of other things going on for which these informal methods do not control, the story seems compelling. The sizeable increase in capital requirements led to a rapid rise in bank capitalisation with very little in the way of macroeconomic impact. And, returning to the debate between the IIF and the MAG, even the optimists appear to have been insufficiently optimistic.

Figure 2. Lending spreads in selected economies (in basis points)



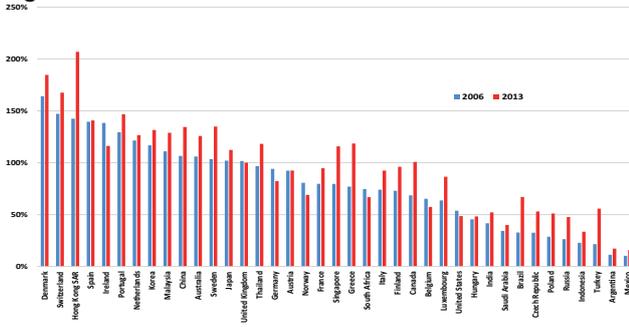
- ¹One to five year business loans.
 - ²Variable rate mortgages.
 - ³One to five years housing loans.
 - ⁴Deposits of non-financial corporates.
- Source: National data.

Figure 3. Survey responses on banking standards¹ (Net tightening, in percentage points)



¹ Difference between banks reporting tighter lending conditions during the previous quarter and those reporting looser conditions. Sources: Bank of England; Bank of Japan; European Central Bank; Federal Reserve Board.

Figure 4. Ratio of bank credit to GDP



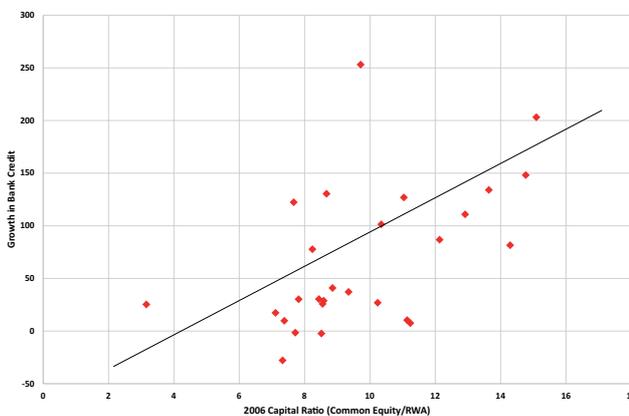
Source: BIS and IMF.

Why is lending still depressed in Europe?

Looking at the data I have presented thus far, Europe stands out. Net interest margins are up in most of continental Europe (Table 2), lending spreads are up and standards tighter in the Eurozone (Figures 3 and 4), and private credit is down in a number of countries (Figure 5). Furthermore, using bank-level data to examine the impact on lending volumes of the unannounced 2011-12 EBA capital exercise, Mésonnier and Monks (2014) conclude that for each percentage point increase in the ratio of capital to risk-weighted assets, loan growth fell by 1.2 and 1.6 percentage points (over a nine-month period).

The explanation, I believe, is twofold. First, there is the way in which the sequence of European stress tests and capital exercises were conducted. Instead of requiring banks to raise additional capital to offset a shortfall – as the 2009 US stress test did – authorities allowed them to meet capital ratios by shedding assets.¹¹ As the left-hand panel of Figure 1 shows, Eurozone banks did not raise capital. Instead, they reduced both their total assets and their risk-weighted assets. Second, a number of continental European banks remain under pressure to further raise their levels of capitalisation.

Figure 5. Growth in nominal bank credit and 2006 capital ratio



Source: BIS and Bankscope.

11 For a thorough discussion of the stress tests, see Greenlaw et al. (2011).

We can get some sense of the relationship between capital and lending by looking across countries. With this in mind, in Figure 5, I plot the ratio of bank capital to risk-weighted assets in 2006 (using national definitions) on the horizontal axis against the percentage change in nominal bank credit over the following seven years (through 2013) on the vertical axis for a total of 30 advanced and emerging market countries.¹² The message of this graph is that the higher the 2006 capital ratios were, the larger the increase in bank lending going forward. In fact, a simple cross-sectional regression of bank credit growth on the capital ratio yields a slope coefficient of 16.3. Given that the standard deviation of the initial capital ratio is 2.7, this means that a one-standard deviation increase in the capital ratio is consistent with credit growing by an additional 44% cumulatively over seven years.¹³

To put it bluntly, banks with debt overhangs do not lend. And, Europe’s banks still need capital to reduce their overhang.

Implications for policy

The muted impact of increases in capital has implications both for how we set the baseline ratio of required capital – the level in normal times – and for the usefulness of time-varying, discretionary capital requirements – tools like the countercyclical capital buffer envisioned in Basel III.

Starting with the level of capital requirements in normal times, in Cecchetti and Schoenholtz (2014b), Kim Schoenholtz and I describe why this is such a difficult problem. We conclude that, in the end, one needs to balance the social costs of imposing higher capital requirements against the social benefits of preventing or mitigating a future costly financial crisis. The uncertainties inherent in this cost-benefit calculus leads us to make a pragmatic proposal: regulators should continue to ratchet up bank capital requirements until the tradeoff between banking efficiency and financial safety shifts appreciably in favor of the latter. Importantly, as capital levels rise, we will become more certain of the costs in terms of increased lending spreads, reduced loan volumes, and shifts of activity to less-regulated intermediaries.

I should, however, provide an important word of caution. As I noted at the outset, the monetary policy response is almost surely one of the reasons that the macroeconomic impact of higher capital and liquidity requirements has been so small. To

12 The countries are Australia, Austria, Belgium, Brazil, Canada, Chile, China, France, Germany, Greece, Hong Kong, Ireland, Italy, Japan, Singapore, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, the UK, and the US.

13 Cohen and Scatigna (2014) analysis of individual bank data confirms this result. Better capitalised banks make more loans.

that extent, the ability of central bank policymakers to offset further increases could be limited by the zero nominal interest rate bound.

That said, the results that I have described from implementing Basel III suggests that, as Admati and Hellwig (2013) forcefully argue, the social costs of higher capital requirements are small. If this is confirmed by further careful analysis, it would mean that we could raise capital requirements further without any appreciable cost.

One of the innovative features of Basel III is its inclusion of a countercyclical capital buffer intended to provide authorities with a tool to combat credit booms (which are inevitably followed by damaging busts). The idea of the buffer is that, when credit is growing relatively quickly, officials should raise the level of required capital by as much as 2½ percentage points of risk-weighted assets. The big question is whether this will work to limit the credit expansion, or just provide an extra buffer against the eventual bust. As Aiyar, Calomiris and Wieladek (2014) note, there are three preconditions for the capital buffer to work: capital requirements have to bind before they are raised, equity has to be costly and difficult to raise in the short term, and alternatives to bank credit have to be relatively unavailable and costly.

The experience I have summarised is not very encouraging for the efficacy of the countercyclical buffer as envisioned in Basel III. The difficulty is at least three fold. First, lending spreads do not appear to be the first-order response to higher capital requirements. Second, loan volumes do not look sensitive to changes in capital so long as banks are reasonably well capitalised. And finally, at the stage in the business cycle when the countercyclical buffer would be needed, banks' business is likely to be booming and profitable, making it cheaper and easier to simply raise equity.¹⁴

Conclusions

In 2010, global banks and the international standard setters engaged in a heated argument over the likely impact of increasing capital requirements. The industry claimed it would be calamitous, while the official community believed it would be modestly painful. With the benefit of hindsight, even the optimists were too cautious. Capital has increased rapidly with very little impact on anything but bank profitability (and possibly managers' compensation). Lending spreads and interest margins are nearly unchanged,

while (outside Europe) loan volumes and credit growth have remained robust. So, in the end, the macroeconomic impact has been small.

While we need to continue to study this episode, doing a proper statistical analysis that controls for macroeconomic conditions and policy responses, the evidence thus far leads me to two tentative conclusions. First, given that social costs of raising bank capital appear to have been small thus far, we should seriously consider further increases, while being wary of a further shift of intermediation to shadow banks. And second, the efficacy of time-varying capital requirements is questionable.

¹⁴ Kim Schoenholtz and I also argue in Cecchetti and Schoenholtz (2014a) that discretionary prudential policy is impractical for all the reasons that associated with the debate of rules versus discretion. These included information and recognition lags, response and decision lags, and implementation and transmission lags, as well as governance and political resistance.

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