

26. Deposit Insurance and Bank Resolution

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26.1 Introduction

A deposit insurance scheme is a (generally) government run (or sponsored) arrangement whereby certain types of deposits (or depositors) are protected from loss otherwise arising from the failure of a bank. Typically, the amount protected is limited to some maximum specified amount per depositor. The deposit insurance scheme is also intrinsically linked to *resolution* of failing banks discussed later in this chapter.

Government run deposit insurance schemes have become commonplace around the world. As at end 2018 a survey by [IADI](#) (the International Association of Deposit Insurers) had information on 113 respondents operating globally.¹ Figure 1 indicates that the establishment of deposit insurance schemes is a relatively recent phenomenon globally, with 80 per cent of the schemes being created in the three decades since 1986. International organisations such as the IMF, World Bank, and more recently the FSB have generally encouraged the creation of deposit insurance schemes as a necessary part of a “safety net”. The two oldest existing schemes are the FDIC established in the USA in 1933 and a scheme for cooperative banks established in Germany in 1934.² (The World Bank also has a [database](#) of deposit insurance schemes globally, providing data on their features as at 2013)

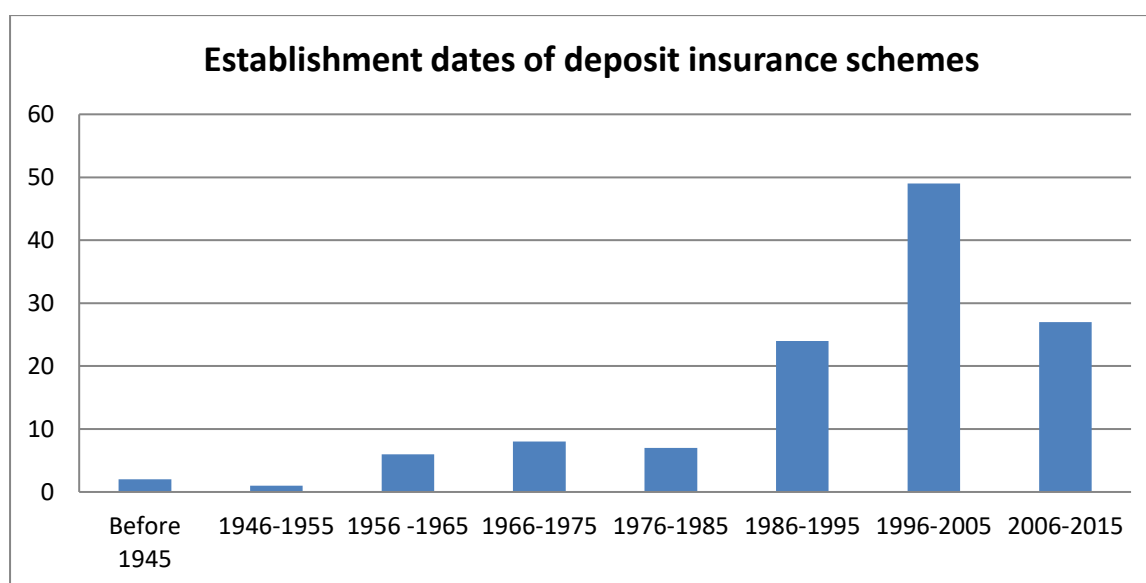


FIGURE 1: GLOBAL GROWTH OF DEPOSIT INSURANCE SCHEMES (SOURCE: WWW.IADI.ORG)

Explicit deposit insurance schemes provide a guarantee that some specified set of deposits will be repaid if a bank or savings institution covered by the scheme fails. This may involve the creation of an

¹ In some countries more than one scheme operates catering for different types of depository institutions, and not all countries responded to the survey.

² There was a deposit insurance scheme established in Czechoslovakia in the 1920s. In the USA there had been some State based schemes in the 19th century. [Calomiris and Jaremski](#) (ARFE, 2016) provide some historical information.

insurance fund by a government or some association of savings institutions, or the scheme may (as in the case of [Australia's Financial Claims Scheme \(FCS\)](#)) involve an explicit government guarantee. Membership is typically mandatory and very few are privately created and administered (although some governments have created schemes and provided for private sector administration). Private schemes face the problem of confidence in their ultimate solvency when needed to make payments. Mandatory membership is to avoid the problem of adverse selection.

Generally, covered deposits are limited to some maximum amount per depositor (requiring aggregation across a range of possible accounts), although there have been cases (generally temporarily following a financial crisis) where all deposits are covered.

Such guarantees involve a potential cost (in the form of payments made to eligible depositors of a failed bank) to the deposit insurance scheme or governments/taxpayers. There are also operational costs associated with running a scheme and, in the event of a failure, making payments. There will need to be access to a pool of funds to make guarantee payments virtually immediately to ensure covered depositors speedy access to their funds. This could involve either the building up over time of a fund from fees levied on banks, or having access to funds from the government which may then be recouped by a levy upon remaining banks. The former is generally referred to as *ex ante* funding and the latter as *ex post* funding. Of the schemes covered in the IADI 2019 survey, only 12 per cent use *ex post* funding, one of which is Australia.

In practice, there may exist “implicit insurance” where public expectations are that government will prevent losses to depositors. As has been observed by some: “There are two types of countries: those that have explicit deposit insurance and those that have insurance but don't know it!” It is often argued that large TBTF (Too Big To Fail) institutions are perceived by the market to have implicit insurance (and thus a competitive advantage) from the government.

In general, such insurance schemes only cover bank (ADI) deposits and not money market mutual funds (known in Australia as Cash Management Trusts), or other non-bank financial institutions (such as finance companies) whose liabilities may be close substitutes for bank deposits.

26.2 The Australian Financial Claims Scheme (FCS)

Australia did not have a deposit insurance scheme until the introduction of the Financial Claims Scheme in 2008. There had been a number of state-based protection schemes (guarantee funds) for credit unions, funded by levies on credit unions, prior to their transition to the ADI framework under APRA, when those schemes were abolished (if not already terminated). The government and regulators had consistently argued that the existence of depositor preference was sufficient to provide protection to depositors, and also that that there was no government guarantee over banks. The

credibility of a “no government guarantee” rhetoric was reduced by the government response to the 2001 failure of the large HIH Insurance Company involving provision of compensation to policy holders, and further reduced by the introduction of a blanket guarantee in 2008 during the financial crisis. The HIH Royal Commission Report (summarised [here](#)) recommended the introduction of a policy-holder protection scheme, prompting the Treasurer to commission a [Study of Financial System Guarantees](#) in 2003 to investigate what financial products might warrant protection schemes and what features might be appropriate.

The FCS was introduced in Australia in October 2008, following the crisis caused by the Lehman Brothers collapse. Its introduction had been planned anyway, but with very different features – particularly a planned cap on the eligible deposit amount of \$20,000. In the event, it was introduced with no limit on eligible deposit amount, which was very quickly scaled back to a \$1 million and 4 years later in 2012 to the current \$250,000 cap. Table 1 provides details of the evolution of the FCS. (See also this 2009 [Parliamentary Inquiry](#)).

The FCS is run by APRA and covers deposits in ADIs and claims on general insurance policy holders. There are no *ex ante* fees, and thus no insurance fund is built up from which claims would be paid. Rather, APRA has access to the government budget to meet any claims, and can then impose a levy (which could be risk-based) on industry participants to repay those funds. To date, there have been no calls on the scheme. Details on the scheme can be found [here](#).

The logic behind not charging *ex-ante* fees consists of several parts (but is not accepted by some commentators who argue the merits of such fees on grounds of avoidance of moral hazard). One is that, should an ADI fail and payouts by APRA be required, APRA stands ahead of virtually all other claimants on remaining assets of the failed institution and is thus virtually certain to be fully compensated for amounts paid out. A second, related reason, is that the balance sheets of the major banks involve only around 30 per cent of their liabilities taking the form of insured deposits. An unthinkable fall in value of bank assets of around 70 per cent would be required before APRA was called upon for payouts – and presumably would, as prudential regulator, have taken actions well before that to prevent such an occurrence. A third consideration is the difficulty in setting a sensible fee schedule when the industry has four giants and many much smaller participants. Fees charged to the latter do little towards financing the costs of a failure of one of the large institutions, and the costs of failure of a small institution would need only very small fee contributions by the large banks. Moreover, it is to be expected that APRA would resolve a failing institution via merger with a healthy institution to avoid the actual failure. To the extent that encouraging such a merger would require some subsidisation, APRA has scope to do so under the conditions of the FCS legislation.

TABLE 1 A TIMELINE OF INTRODUCTION AND CHANGES TO THE FINANCIAL CLAIMS SCHEME

Date	Action
April 1997	The Wallis Report investigates the implementation of a deposit insurance scheme but deems it unnecessary due to alternative deposit protection mechanisms in place. - <i>FSI, 1997</i>
May 2001	Government introduces the HIH Claims Support Scheme, a compensation scheme for policy holders of the failed HIH insurance company
September 2002	APRA provides a submission to the HIH Royal Commission including an argument for consideration of a broad financial sector deposit insurance scheme. <i>Future policy directions for the regulation and prudential supervision of the general insurance industry, 2002</i>
April 2003	HIH Royal Commission recommends introduction of a policy holder protection scheme. - <i>Report of the HIH Royal Commission, 2003</i>
March 2004	The Davis Report commissioned by the Treasurer assesses the case for government support for individuals affected by the failure of prudentially regulated institutions and the potential design characteristics of any such scheme. <i>Study of Financial System Guarantees, 2004</i>
November 2005	Council of Financial Regulators recommendation for introduction of a Financial Claims Scheme Council of Financial Regulators – Failure and Crisis Management in the Australian Financial System, 2005
June 2008	Announcement of planned introduction of a Financial Claims Scheme capped between \$20,000 and \$50,000, Banking sector argued for low cap and introduction of post-funded, \$20K cap, financial claims scheme (also coverage of general insurance) scheduled for parliamentary approval week of Lehmann crisis. Legislation to give APRA priority claim over failed institution assets for recouping insurance payouts
September 2008	The failure of US investment bank Lehman Brothers (which filed for chapter 11 bankruptcy protection) severely disrupted global financial markets and governments and regulators worldwide responded by introducing government guarantees over bank debt, enhancing depositor insurance, and introducing other support and protection mechanisms.
October 2008	The Australian Government introduced the Financial Claims Scheme in conjunction with a guarantee scheme for bank debt. The guarantee of deposits was initially unlimited but reduced to a cap of \$1,000,000 on 28 November 2008.
7 February 2010	Government announces Guarantee scheme for new debt issues and large deposits to be closed on 31 March 2010
December 2010	Government announces that the Financial Claims Scheme is to remain as a permanent feature of the financial system
May 2011	The Council of Financial Regulators (CFR) releases their recommendations for the Financial Claims Scheme following a review of the scheme. The most significant recommendation stemming from the review is a reduction in the cap to between \$100,000 and \$250,000
September 2011	Government announces a reduction in the Financial Claims Scheme cap to \$250,000 to apply from 1 February 2012.
October 2012	Treasury “Post-Implementation Review — Financial Claims Scheme for General Insurance Policyholders”
August 2013	Government announces plans to introduce an ex ante levy of 5-10 basis points on insured deposits at ADIs to be paid into a Financial Stability Fund
November 2014	Financial System (Murray) Inquiry recommends retention of ex post levy rather than ex ante fee approach; agreed to by Government, September 2015
May 2017	Announcement of the Major Bank Levy on 5 largest banks (6 basis points on liabilities other than insured deposits), motivation as budget revenue source, justified by some as implicit guarantee fee

The Wholesale Debt Guarantee of the GFC

Also introduced at the same time as the FCS in 2008 was a Wholesale Debt Guarantee (WDG) Scheme, designed to enable Australian banks to continue accessing the international debt markets which had

been badly disrupted. For a fee, Australian ADIs were able to obtain a Federal government guarantee over new bond issues (and deposits exceeding \$1 million) of up to 5 years maturity. This scheme, run by the Australian Office of Financial Management (AOFM) was closed to new issues in 2010. The total guaranteed reached a maximum of \$170 billion. (More information is available in the 2016 RBA Bulletin article by [Schwartz and Tan](#) and [here](#)).

Many other jurisdictions implemented similar schemes, and there was considerable debate over the appropriate pricing of the fees charged. The guarantee fee was set at 70 basis points for AA rated borrowers and 100 (130) basis points for A (BBB) rated borrowers. The usage was dominated by the four majors who were the only AA rated issuers, and smaller banks claimed that the fee structure disadvantaged them. [Luoung et al](#) (PBFJ, 2018) examine the effect of the WDG scheme on bank funding costs and find that usage reduced overall funding cost and, perhaps more importantly, that some funding benefits remained subsequently consistent with the scheme having increased perceptions of implicit government guarantees.

NZ approach

New Zealand has been one of a few developed countries without a deposit insurance scheme, and the authorities have long held the view that it is undesirable, and that encouraging market discipline by depositors and other creditors is preferable. They have instead advocated an “Open Bank Resolution” model which involves applying a sufficient “haircut” to deposits and other liabilities of a troubled bank to restore it to an acceptable level of solvency and pursuing options for merger or other resolution arrangements while the bank remains open for business. The approach is likely to require at least a temporary government guarantee over deposits (and other liabilities) to prevent a run on the bank, and has not yet been put to the test. Some point to the dominance of the New Zealand banking market by the major Australian banks and APRA regulation of those banks as enabling the NZ authorities to adopt such a “free market” approach.

While this has been the position advocated for a significant time, the GFC led to the situation in October 2008 where a wholesale funding guarantee was introduced (on less favourable terms than Aust), together with a retail funding guarantee. This was on an opt-in (by the bank) basis, was fee based, and included (non-regulated) finance companies. It involved a \$1 million cap until October 2011, and there were a number of failures of finance companies which led to taxpayer costs

Since 2012 the approach has reverted to reliance on open bank resolution (OBR), but this approach is under review as at 2021 with deposit insurance up to \$50K for all licensed deposit takers (funded by levies) proposed to be implemented.

26.3 Theory

The typical arguments advanced in support of deposit insurance schemes reflect a number of features of banking. Foremost among these is the perceived susceptibility of banks to runs, arising from issuing at call deposit liabilities to finance longer term loans, as reflected in the model of Diamond and Dybvig. But also relevant is the risk of contagion (of a run at one bank inducing a run at others) arising from the inability of depositors to discern whether causes of problems at one bank are purely “local” (ie confined to that bank) or “global” (affecting all banks). A further rationale is financial consumer protection concerns arising from the pervasiveness of imperfect information and inability of some depositors to be able to assess and/or understand the risk of loss from holding bank deposits. Finally, disruption to economic activity (and the personal costs) associated with a bank closure and inability to access funds used for payments purposes are also relevant.

The objectives can thus be listed as:

- Prevention of runs
- Reduce risk of contagion
- Protection of uninformed depositors
- Prevent payments system disruption
- Early access to funds during resolution process

However, it is important to remember that the introduction and design of a deposit insurance scheme is a political act, raising the possibility that this does not reflect purely economic logic, but may reflect some form of “political bargain” generating benefits for some influential stakeholders. Calomiris and Jaremski (2016) examine, *inter alia*, the role of political factors in explaining the introduction of deposit insurance. They suggest that private interest theories (whereby deposit insurance introduction reflects a political bargain involving benefits to some favoured groups) dominate public interest theories (in which considerations of economic efficiency gains from increased banking stability prompt deposit insurance introduction).

However, also drawing on economic theory, there are potential costs associated with the existence of deposit insurance. The most commonly heard is the potential for moral hazard. This has several ingredients. One is that bankers, acting in the interests of owners may be induced to take on higher levels of risk. The second is that depositors will pay less attention to bank risk-taking and thus exert less market discipline. (Adverse selection may also be an issue if deposit insurance enables poorly skilled managers to establish banks and thereby increase the overall risk being covered by the scheme).

Calomiris and Jaremski ([ARFE, 2016](#)) provide a recent survey of the numerous studies of whether deposit insurance induces greater risk taking in banking, and argue that there is significant evidence that this is the case. Those studies cover a wide range of countries and types of schemes, and one lesson is that the characteristics of a scheme and the institutional framework within which it operates is relevant for whether moral hazard effects arise.

To assess the moral hazard argument, it is important to identify what the counterfactual situation might be. One extreme possibility is that in the absence of deposit insurance, depositors can fully assess bank risk taking and will respond by demanding appropriately higher deposit interest rates. The other extreme possibility is that depositors believe (wrongly) that bank deposits are perfectly safe, and provide deposits at the risk free interest rate regardless of bank risk-taking.³ In practice, there may be a mix of both “aware” and “unaware” depositors and other creditors, but for the moment assume only one type.

In the latter case of no risk awareness, introduction of a deposit insurance scheme will have no effect on the interest rate received by depositors, and nor will it have any effect of inducing greater risk taking by banks, if it is assumed that pre-introduction depositors only demand the promise of the risk free rate of return. To the extent that the bank owners encourage risk taking, it arises from the existence of limited liability, not the existence/non-existence of deposit insurance.

Figure 2 illustrates this outcome using a simple option analytic framework relating payoffs to stakeholders at the end of one year, when deposits are due for repayment. Depositors provide D_0 of deposits at the risk free rate (r_F) regardless of whether deposit insurance exists or not. The payoff to shareholders in both cases is the same – if bank asset value is below $D_0(1+r_F)$ and the bank fails, they get nothing but otherwise have the excess over that value. Their payoff is described as a call option over the bank’s assets with a strike price of $D_0(1+r_F)$, and their incentive to increase the value of the call option would lead them to take greater risk via investing in more risky assets, or increasing bank leverage.⁴

In this (simplistic) case, depositors benefit from no longer being exposed to risk for which they were previously uncompensated. The bank receives no benefit from the deposit insurance (deposits cost the same) but depositors are protected from loss when the bank fails, with the insurer (government) instead bearing the loss. It is thus to be expected that the insurer will demand compensation for taking

³ For simplicity, the analysis is assuming that bank deposits provide no other services (such as use in payments) which could lead (in the absence of specific fees being charged) to payment of an interest rate below the risk free rate.

⁴ In this framework, increasing leverage implies withdrawing equity from the bank. While the consequent reduction in the current assets of the bank reduces the value of the call option, that reduction is less than the value of equity they have recouped.

on this risk by charging a fee to the bank, and the “actuarially fair” fee should increase with the degree of bank risk-taking. Introducing deposit insurance with appropriate risk related fees means that banks no longer profit from the mispricing of risk by their depositors. In this case of “unaware depositors”, the introduction of deposit insurance does not create or aggravate moral hazard which already existed because of limited liability.⁵

Deposit Insurance Effects – the case of “unaware” depositors

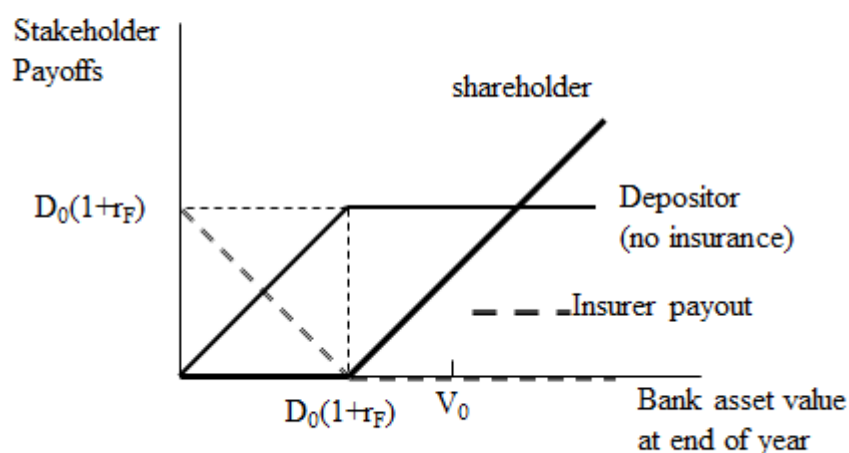


FIGURE 2: DEPOSIT INSURANCE AND MORAL HAZARD

In the alternative extreme case, the “aware” depositors previously received an appropriate risk premium in the deposit interest rate (R), and the bank had no incentive to increase risk because depositors would simply demand a higher risk premium in deposit rates. Introducing deposit insurance leads depositors to now accept the lower risk free deposit interest rate (r_f). If there is no charge for the provision of deposit insurance, the bank shareholders gain from the higher value of their implicit call option arising from its lower strike price ($D_0(1+r_f)$). Depositors gain nothing, since their protection against loss has come at the expense of the reduction in the deposit interest rate. The gain to the bank shareholders is equal to $D_0(R-r_f)$ which is the change in the intrinsic value of the option, plus any change in the time value of the option (measured at V_0 , the current bank asset value).

One consequence of this is that, in the case of ‘aware’ depositors, the introduction of deposit insurance provides a benefit to banks due to the better terms on which they can access deposit funds. Arguably that creates a case for a fee, equivalent to the implicit fee which depositors had been

⁵ This point is made by Fegatelli ([JFS, 2010](#))

charging for the implicit put option they had been granting to bank shareholders⁶ via demanding higher deposit interest rates. In this case, there is a moral hazard effect due to the introduction of deposit insurance, since the market discipline of the “aware” depositors has now disappeared.

arguments.

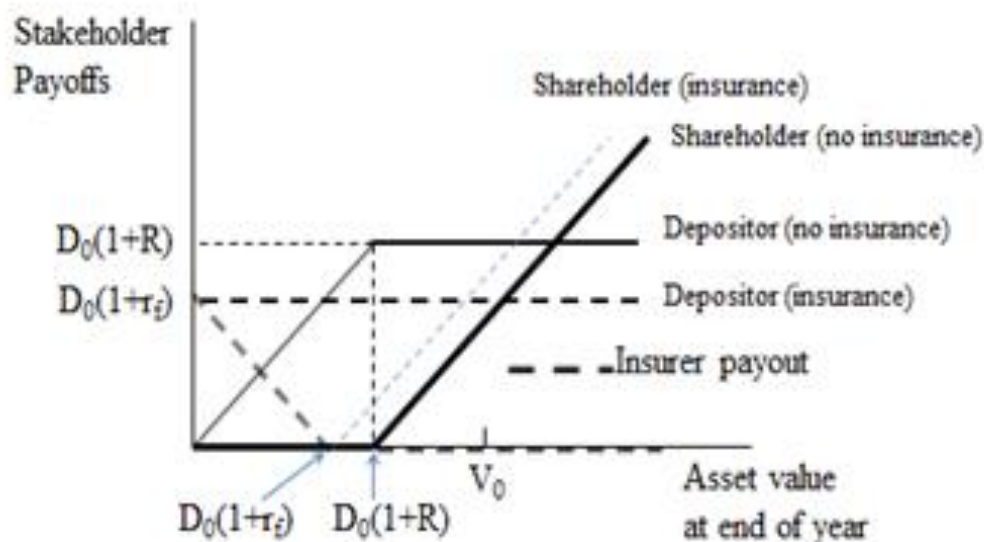


FIGURE 3: DEPOSIT INSURANCE INTRODUCTION WITH "AWARE" DEPOSITORS

Between these two extreme cases a more realistic situation may be where in the absence of deposit insurance, depositors are aware that bank deposits entail some risk (perhaps based on average historical experience) but are unable to identify more risky from less risky banks. Ignoring the “lemons” problem inherent in this scenario (or assuming that there is some impediment to individual bank risk taking that prevents the average risk level from being driven continuously higher) bank deposit rates would involve some risk premium over the risk free rate. Then the introduction of deposit insurance would induce depositors to accept a risk free interest rate, generating a benefit to the bank shareholders, and potentially encouraging individual bank risk taking (if prior impediments have disappeared).

A general approach to the moral hazard problem is that the imposition of risk related fees for deposit insurance, allied with supervision (and risk based capital requirements) can in principle, if not in practice, limit moral hazard concerns. While that may be so, introduction of risk related fees does not

⁶ The put option is the right of the shareholders to put the assets of the bank to the depositors at a strike price of $D_0(1+r_f)$ which they would exercise in the case of bankruptcy, enabling payment of the promised amount to depositors.

necessarily remove the benefit that banks receive from the introduction of deposit insurance and may support the “political bargain/ private interest” theory explaining the creation of deposit insurance schemes. Note that the benefit which banks get from the introduction of deposit insurance is the amount $D_0(R-r_i)$. This reflects the lower deposit interest rate demanded and thus the lower probability of bank failure associated with the bank risk profile prior to deposit insurance introduction. A more general characterisation of this benefit could refer to the fact that deposit insurance schemes reduce the risk of bank runs and thus enable banks to operate with less liquid assets, ie undertake greater maturity transformation, and thus potentially (dependent on assumptions about competition) have higher profits

In the context of Figure 3, a bank with initial assets with market value V_0 and deposit funding of D , now promises depositors a lower future payoff. In addition, it has an option to put the assets to the insurer at a strike price of $D_0(1+r_i)$. “Risk related” insurance premia are typically thought of, and modelled as, the appropriate fee for the new put option (at strike of $D_0(1+r_i)$) which the insurer is providing to the bank. That is, most discussions of deposit insurance pricing do so in the context of considering the value of an option at the strike price incorporating the current deposit interest rate, rather than incorporating the additional benefit from the introduction of a deposit insurance scheme. One reason for doing so is perhaps that it is difficult to assess by how much the introduction of a deposit insurance scheme has changed deposit interest rates. Another is that, in practice, there is potentially a mix of “aware’ and “unaware” depositors, such that market discipline might be exerted by some even in the absence of deposit insurance. This relates to the limits placed on insured deposits on the grounds that informed depositors should be able to assess risk and thus do not require such protection. (In practice, large banks typically will have significant amounts of non-deposit debt financing which, depending on priority (preference) arrangements, may be of junior ranking to depositors and thus have incentives to monitor bank risk taking.

[Gropp and Vesala](#) (2004) have argued that the introduction of explicit deposit insurance may actually reduce moral hazard if there are specific groups of creditors who are excluded from coverage. If its introduction credibly signals the end of implicit insurance then banks which have large uninsured debt financing, are not TBTF, and have low charter value may reduce risk taking due to increased monitoring by those now exposed to loss from failure. They test these arguments using the case of introduction of explicit deposit insurance schemes in four European countries between 1996 and 1999, and find support for their argument.

26.4 Deposit Insurance Characteristics

As noted earlier, deposit insurance schemes are generally government run (or initiated) and compulsory. While an *ex ante* premium is a common way of funding schemes, use of risk-related fees is less common. Of the 124 schemes surveyed by [IADI](#) in 2016, half had flat rate premiums, and while others had differential premiums, the nature of their relationship to assessments of bank risk varies widely. [IADI](#) (2020) examines how differential premium systems work in practice.

Ex ante funding leads to the creation of a fund, providing the insurer with resources to compensate depositors of a failed bank or to facilitate a transfer of the business to another viable bank. The determination of what, if anything, should be a target size for the fund, and how premium rates might be adjusted if the fund is at its target size, are open questions. IADI has a 2018 [discussion paper](#) on this topic.

As with any insurer, there will be a desire to monitor the extent of risk taking by the insured entity, such that deposit insurers will be accorded various inspection and other powers. Moreover, because the payment of insurance occurs when a bank needs to be resolved (liquidated, placed under receivership, merged with a stronger entity, etc) the insurer will need to have close relationship with the bank supervisor – and often both supervision and insurance functions will be undertaken by the same entity. (This is also obviously beneficial in enabling the insurance function to assess the riskiness of banks). (The insurer will also have to deal with a number of practical complications involved in actually providing compensation to eligible depositors).

The caps on amount covered vary across jurisdictions. The GFC led to significant increases in the size of caps. In the USA for example, the cap was increased in 2011 from USD 100,000 to USD 250,000, while in the EU (which is integrating national schemes) the cap was generally increased to EUR 100,000 from amounts often in the order of EUR 25,000. Whereas it is common in general insurance to impose an “excess” (the insured is liable for first \$X of loss) or provide partial insurance cover (eg covering X% of loss), this has been shown by UK experience in the GFC to be unwise. One reason is that those mechanisms are designed to reduce moral hazard behaviour by the insured, which is less relevant in the case of uninformed depositors in banks. But more relevant, such provisions will increase the incentive to “run” if a bank is thought to be at risk of failure.

Closure / Resolution rules (discussed later) are important for the operation of deposit insurance schemes. In principle, if a bank is unable (or likely to be unable) to meet deposit obligations, the supervisor/insurer takes over the bank and pays covered depositors. In practice, there may be “forbearance”, when regulators delay dealing with a troubled bank in the hope that it will recover, with delayed closure incurring at cost to the fund or the taxpayer. Ideally, there will be intervention

before a point of insolvency is reached and a takeover arranged by another bank. This has the advantage that deposit accounts (and the bank's assets) can be transferred to the acquiring bank, reducing complications of actually providing funds to depositors. However, if the bank is insolvent or there are substantial concerns about the true value of the assets, this may require some subsidy which the insurance fund will generally be allowed to pay – if it is the cheapest way of resolving that bank.

It is important to note that the insolvency of a bank could occur with no losses to depositors or the deposit insurance fund. Insolvency occurs if liabilities exceed assets, but only part of those liabilities may be deposits, and there may be priority rules in place which mean that depositors rank above other creditors in a liquidation. That is the case in Australia. In addition, prompt action by a supervisor/insurer should lead to closure of a bank which is “non-viable” but not yet insolvent. In practice there have been numerous cases in the USA and elsewhere that involve banks reporting healthy capital adequacy positions to the regulator, but failing within a few months later with a significant deficiency of assets and imposing costs on the insurance fund. While that could sometimes reflect an event which had occurred in those few months, more often it reflects a recognition that loans or other assets have previously been significantly overvalued in the accounts, or perhaps the uncovering of a fraud which has been underway, but hidden, for some time.

Table 2 provides an illustration of some recent (2016) US bank failures for which data is available, which shows reported deposits and assets as reported in the last provided Call Report (perhaps only 1-2 months prior to failure) and the estimated loss to the FDIC (payouts to insured depositors less recoveries) from the failure. Note that in all but one case, assets exceeded deposits (by 10 per cent in one case)⁷ but the FDIC incurred significant losses from the failure (upwards of 10 per cent of reported assets, and in one case 50 per cent).

TABLE 2: SOME RECENT US BANK FAILURE COSTS (SOURCE: FDIC)

<u>Institution Name</u>	<u>Total Deposits</u> <u>\$000</u>	<u>Total Assets</u> <u>\$000</u>	<u>Estimated Loss (\$000)</u> <u>@ 12/31/2016</u>
<u>ALLIED BANK</u>	64,713	66,336	6,880
<u>THE WOODBURY BANKING COMPANY</u>	21,122	21,426	5,225
<u>FIRST CORNERSTONE BANK</u>	101,040	103,307	12,482
<u>TRUST COMPANY BANK</u>	20,148	18,998	10,931
<u>NORTH MILWAUKEE STATE BANK</u>	61,493	67,115	11,846

⁷ Information is not provided on total liabilities.

Among the innovations introduced globally as part of Basel 3 have been requirements that for inclusion in regulatory capital, hybrid securities issued by banks are required to have “bail-in” features. This means that such securities would convert into equity or be written down if a bank was getting close to insolvency. This should, in principle, reduce the calls upon deposit insurance funds by ensuring resolution of banks well before assets became insufficient to meet insured deposit liabilities. In practice, there is little experience with “bail-in” and to date smaller banks and deposit takers have not been issuers of such securities. (In the USA issuance of explicit “bail in” securities is uncommon. The Dodd-Frank Act introduced the Orderly Liquidation Authority which gives the FDIC the ability to intervene and place a troubled systemically important financial institution into resolution and allocate losses according to a specified schedule – thus providing a form of “bail-in”).

It is important to make a distinction between explicit deposit insurance which provides guarantees over a subset of (essentially retail) deposits and implicit insurance - the possibility that governments might “bail-out” troubled banks by providing funds or guarantees which prevent other stakeholders from losing money. It is widely argued that this is particularly likely for banks which are “Too Big To Fail (TBTF)”, and removing adverse effects of perceptions that TBTF is a reality has been a major part of the post –GFC agenda. Relevant measures have included, higher capital ratios and loss absorbing capacity requirements for systemically important banks, levies on such banks as compensation for TBTF and/or giving incentives to shrink in size.

Deposit Insurance in the EU ([Bocuzzi & De Lisa](#) provides background)

Experiences in the GFC have led to a number of marked changes in banking policy in the EU involving the establishment of the European Banking Union. This includes a Single Supervisory Mechanism (SSM), a Single Resolution Mechanism (SRM) and a unified European Deposit Insurance Scheme (EDIS). An integrated banking system, but with national deposit insurance schemes, raises the question of whether depositors in local branches of foreign banks are covered under the local deposit insurance scheme or the bank’s home country scheme, and resulting consequences for which national scheme bears the costs of a failure. (This issue was prominent following the failure of “IceSave”, the business name of branches of the Icelandic bank Landsbanki operating in the UK and the Netherlands when the parent failed in October 2008. The UK and Dutch schemes paid out IceSave depositors up to the cap involved in the Iceland scheme, anticipating recouping those costs from it, which turned out to be a long and complex process).

The EDIS, which keeps national schemes in place, is expected to be fully operational by 2024. Initially it involves reinsurance arrangements among national deposit insurance schemes before transitioning

via coinsurance arrangements to a situation in which the EDIS is the recipient of fees charged and provides funds for payouts in cases of bank failure. National schemes still have an operational role (making payouts, resolution procedures etc), but coverage levels and fees are set at the EU level.

The EU has also been developing a [single resolution fund](#) to replace national resolution funds of its members. Such resolution funds are separate from explicit deposit insurance schemes and are established by levies on non-insured liabilities of member banks. They have been introduced to avoid costs to the taxpayer associated with resolving a troubled bank, such as would occur by an injection of government funds (a bail out) to ensure its survival. In general the resolution funds available are anticipated to be available for supporting (subsidising) the acquisition of failing institution by another entity, or compensating creditors who would incur greater losses than under normal insolvency proceedings. In the EU case, resolution funds could only be used to recapitalise a failing institution if there has been a bail-in of at least 8 per cent of total liabilities.

26.5 Merton's (1977) Derivation of Value of Deposit Insurance

Merton used an option pricing approach to derive a "fair" price for provision of deposit insurance, and there have been numerous adaptations of that model by researchers since. He assumed a bank funded only by insured deposits and equity, with the amount promised at time T to deposits of B. (Thus, Be^{-rT} is the market value of the deposits if guaranteed—where r is the risk free rate). T is assumed to be the date of next inspection (eg one year) at which time the bank will be found to be either solvent or insolvent. Depositors essentially have a risky deposit worth B (if the bank is solvent) or less (the bank's assets) if the bank is insolvent, plus they have a put option from the insurer, giving them the right to put the bank assets to the insurer at a strike price of B (the promised payment). Together, these generate a risk-free deposit paying B.

Denote the market value of total bank assets by V , and asset volatility by σ . Using the Black-Scholes formula, the value of the put option is:

$$G(T) = Be^{-rT}N(x_2) - VN(x_1)$$

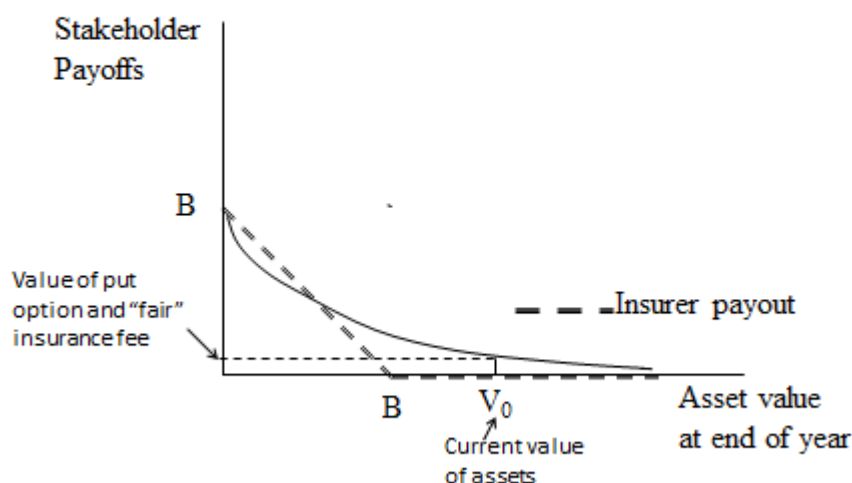
$$\text{where: } x_1 = \{\log(B/V) - (r + \sigma^2/2)T\} / \sigma\sqrt{T}; \quad x_2 = x_1 + \sigma\sqrt{T}$$

Denoting $g = G(T)/D$ as the value of guarantee per dollar of current deposits, then substitute $De^{rT} = B$ in x_1 to give

$$g = N(h_2) - (1/d)N(h_1)$$

$$\text{where } d = D/V; \quad h_1 = \{\log(d) - \tau/2\} / \sqrt{\tau}; \quad h_2 = h_1 + \sqrt{\tau}; \quad \tau = \sigma^2T$$

Merton provides illustrative figures. For $d = 0.95$, $T=1$, $\sigma^2 = 0.006$, $g = 0.01209$ (\$1.20 per \$100). For $d = 0.90$, the value falls to \$0.32 per \$100).



Applying Merton's Approach

There are obviously a large number of significant simplifying assumptions in Merton's model which raise the question of its applicability in reality. First, what is the appropriate value of T (the expiry date of the option)? In practice, deposits are at call or specific maturity such that there is no one date corresponding to the hypothesised option expiry date. A standard approach has thus been to assume that T is the time till the next supervisory examination (occurring on an annual basis).

Second, how is it possible to estimate σ (the asset volatility). In theory this can be derived approximately from equity volatility for listed banks using the leverage adjustment

$$\sigma_E = (A/E) \sigma_A$$

where E is equity market value and A is the market value of assets. The latter is, however, unobservable so that generally the book value of assets is used or it is approximated by summing the market value of equity and the book value of other liabilities. Marcus and Shaked (1984) note that the value of deposits plus equity equals the value of assets plus the value of deposit insurance, such that the simple leverage adjustment is not correct and asset volatility needs to be estimated as part of the solution of simultaneous equations.

Third, in general, only some proportion of deposits is insured. A bank could become insolvent but, depending on the structure of its liabilities and preference arrangements, have sufficient assets to

repay depositors or the deposit insurer in full. Ronn and Verma (1986) analyse this situation (see later also) and relate option derived values for deposit insurance in the USA to actual FDIC rates. They argue that the option based approach, being based solely on market and balance sheet data, avoids judgemental decisions by the FDIC.

Fourth, early intervention by a supervisor is a possibility. Saunders and Allen (1993) have modelled this as the insurer writing a callable put.

26.6 Deposit Insurance Scheme Price and Coverage: International Comparison

The conventional wisdom is that the value of the put option provided to bank owners “should” be reflected in the insurance premium charged. It should be linked to asset riskiness (positively) and capital ratio (negatively). As with any insurer, auditing of risk taking, value of assets insured, etc can be expected. There is a tendency for insurance premia to be charged *ex ante*. In general, policy makers prefer to limit insurance and encourage market discipline by uninsured stakeholders. Alternative approaches involve regulating risk taking directly or by linking the required capital position to some risk measure. Table 3 shows information from the FSB on the nature of schemes in a number of major countries. That is a little dated, particularly for member countries of the EU where an EU-wide scheme is being implemented. Table 4 shows the size of insurance caps (as at 2018) for a number of countries.

TABLE 3: DEPOSIT INSURANCE SCHEME CHARACTERISTICS GLOBALLY

Jurisdiction	Premiums		Assessment Basis	Back-Up Funding
	Risk-based	Rate		
Argentina	Yes	0.015-0.3%	Eligible deposits	Borrow in market and require advanced premium payments
Australia	N/A	N/A	N/A	post-funded scheme, standing appropriation from Parliament, up to A\$20.1 billion per failure
Brazil	No	0.0125%	Covered deposits	Special premiums, advances, private sector loans
Canada	Yes	2.8 , 5.6, 11.1, 22.2 bp	Covered deposits	Can borrow from the Government or markets
France	Yes		Eligible deposits	Borrowing in market and additional premiums
Germany	Yes	0.016%	Liabilities of protected depositors	Extraordinary contributions from institutions; borrowing in market

Hong Kong	Yes	0.0175-0.049%	Covered deposits	Stand-by credit facility from the Exchange Fund
India	No	0.1%	Eligible deposits	RBI supplementary financing
Indonesia	No	0.2%	Average monthly deposits	Government lending and recapitalization facility
Italy	N/A	N/A	N/A	
Japan	No		Eligible deposits	Borrowing from central bank or market
Korea	No		Eligible deposits	Borrowing from the market, or government
Mexico	No	0.4%	A proxy of total bank liabilities	Ability to impose extraordinary premiums, Borrowing
Netherlands	N/A	N/A	N/A	Apportions costs ex-post over the banks.
Russia	No	0.4%	Eligible deposits	Bond issuance, extra premiums, federal budget
Singapore	Yes	0.02-0.07%	Covered deposits	Private sources or central bank
Spain	Yes	0.002 basis points	Eligible deposits	Central bank can provide funding but requires passage of a law
Switzerland	No			Banking sector sources, borrow from market.
Turkey	Yes	11 - 19 bp	Insured deposits	Advance payments from banks, Treasury, CB
United Kingdom	N/A	N/A	N/A	Levies on other deposit takers, borrow from market, government
United States	Yes	2.5 - 45 bp	consolidated total assets minus equity	line of credit from Treasury. Authority to borrow

- Source: Financial Stability Board, [Thematic Review on Deposit Insurance Systems](#)

TABLE 4: DEPOSIT INSURANCE SCHEME CAPS: IN USD AT YEAR-END 2018

Jurisdiction	Per depositor per institution (USD)
Argentina	12,000
Australia	180,000
Bangladesh	1,192
Brazil	64,519
Canada	73,529
Chinese Taipei	97,615
European Union	114,943
Hong Kong SAR	64,103
Hungary	100,000
Indonesia	139,860
Japan	90,098
Korea	44,719
Lao PDR	5,677
Malaysia	60,445
Norway	230,189
Russian Federation	20,152
Singapore	55,314
Sweden	105,897
Switzerland	100,000
United States	250,000
Vietnam	3,213

- Source: IADI, APRA

More (albeit dated) information on deposit insurance systems around the globe can be found from the [World Bank WPS6934](#). There are still many emerging economy countries without explicit deposit insurance. Most countries that had an explicit scheme had ex ante fees (although only 75 per cent of high income countries did so). Around 30 per cent of countries charged risk based premiums rather than non-risk-based premiums (with little variation by country income level)

Official Views on the merits of ex ante funding and the complications provided by depositor preference are somewhat opaque.

- “may be merits to the broader adoption of *ex-ante* funding arrangements, and IADI should consider whether a pre-funded DIS needs to be more explicitly advocated in its guidance” FSB (2012)
- IMF recommended in recent FSAPs (eg Canada and Brazil) that introduction of depositor preference should be considered, EU has mandated it.

- “The treatment of depositors in the creditor hierarchy can have a profound impact on the costs incurred by the deposit insurer and the failure resolution regime more generally” (IADI, 2014).
 - IADI Principle 16.2 “The deposit insurer has at least the same creditor rights or status as a depositor in the treatment in law of the estate of the failed bank”.

Recent Relevant Developments

- EU and UK have recently introduced depositor preference
- EU Single Resolution Fund – levy on “non-covered” liabilities less own funds (equity)
- Bail-in debt requirements (TLAC), FSB proposals for G-SIBs endorsed by G20 (Nov 2014)
 - TLAC must exclude insured deposits and liabilities preferred to normal senior unsecured creditors
- Significant concern over “national depositor preference” and implications for subsidiarisation v branch requirements for foreign banks and eligibility of foreign branch deposits for coverage by national deposit insurance schemes

26.7 Deposit Insurance Pricing; Depositor Preference and Australia

Australian complications for pricing and scheme design include

- Size distribution of ADIs (market share)
- Depositor Preference
- Non-deposit funding
- Size of failure
- Scheme coverage
- Mechanics of operation

A result has been a choice of *ex post* funding for the Financial Claims Scheme, with the structure of depositor preference arrangements a major factor in that choice. The essential argument is that:

- (a) There are many subordinated creditors who rank behind insured depositors and APRA, in their stead, as claimants on the failed bank’s remaining assets

- (b) The composition of bank balance sheets makes it highly unlikely that APRA would not recover all funds paid out to insured depositors. The “fair price” of insurance is thus extremely close to zero.
- (c) To the extent that subordinated creditors demand higher interest rates to compensate for the risk involved, they are effectively providing insurance against loss to insured depositors and APRA. The banks are paying for that via the higher interest rates paid, so to impose deposit insurance fees would be a duplication.
- (d) However, if subordinated creditors assume there is implicit insurance, then their required returns will not involve an appropriate risk premium in interest rates paid by the bank. A case may exist for some form of government insurance levy, but this would not be on insured deposit amounts alone. The risk is one of entrenching perceptions of implicit insurance.

Depositor Preference Types

There are many variants of depositor preference, with a simple categorisation based on the simplified balance sheet shown Table 5 as follows (where $S_{>}$ represents “seniority”).

- *Tiered Depositor Preference*
 - Insured deposits $S_{>}$ Uninsured Deposits $S_{>}$ Other Creditors
 - Deposit insurer may inherit insured deposit seniority
- *General Depositor Preference*
 - Insured deposits $S_{=}$ Uninsured Deposits $S_{>}$ Other Creditors
 - Deposit insurer may inherit depositor seniority
- *No Depositor Preference*
 - Insured deposits $S_{=}$ Uninsured Deposits $S_{=}$ Other Creditors
 - Deposit insurer may have no seniority
 - Deposit Insurance Pricing

Assets	A	Insured Deposits	D_i
		Uninsured Deposits	D_u

		Other Creditors	C
		Equity	E

FIGURE 4: SIMPLIFIED BANK BALANCE SHEET

Precise information on depositor preference regimes globally is not easy to determine but table 7 provides some information

TABLE 5: DEPOSITOR PREFERENCE REGIMES AND INSURER PRIORITY GLOBALLY

	<i>Depositor Preference Regime</i>			
	Tiered	Insured Only	General	None
<i>Deposit Insurer Priority</i>	$D_I^S > D_U^S$ C	$D_I^S > D_U^S = C$	$D_I^S = D_U^S > C$	$D_I^S = D_U^S = C$
Ahead of Uninsured Depositors and General Creditors	EU UK Indonesia	Hong Kong Switzerland	Australia Singapore ^a	
Equal to Uninsured Depositors and ahead of General Creditors			USA Malaysia Russia China Taiwan ^b	
Equal to Uninsured Depositors and General Creditors			India	Canada Brazil Japan Norway Sweden Korea
^a Preference over deposits by other banks ^b Article 38 of Deposit Insurance Act				

Amending the Merton Model for Depositor Preference⁸

The Merton model assumes all deposits insured, but this is easy to amend for insurance of only part of liabilities and different preference arrangements. Let the end of period promised amounts be represented by:

B_i = insured deposits, B_u = uninsured deposits, B_c = other creditors

If there is no depositor preference and the bank fails, the insurer pays out insured depositors (B_i) and receives share ($B_i/(B_i+B_u+B_c)$) of bank assets. This is equivalent to $B_i/(B_i+B_u+B_c)$ of put option on bank assets as shown in Figure 5

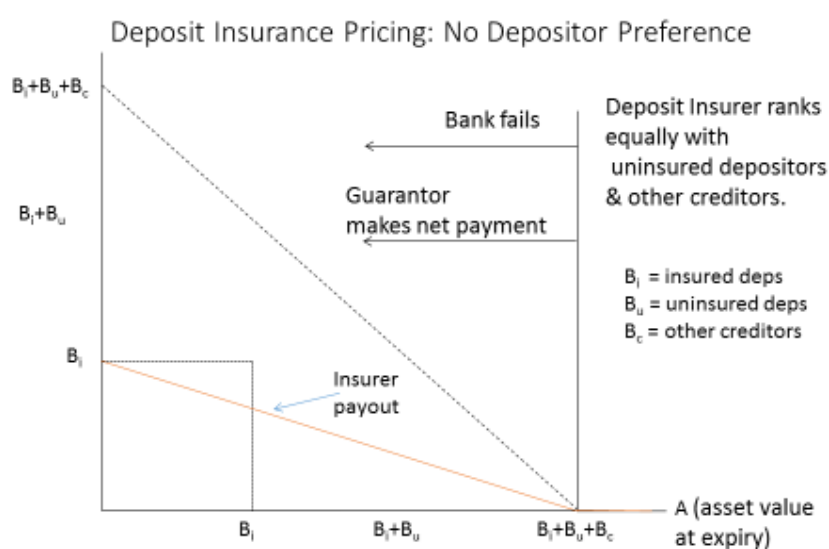


FIGURE 5: INSURER PAYOUT WITH NO DEPOSITOR PREFERENCE

The fair value of deposit insurance under these conditions, and in the following cases, is easily estimated by using the appropriate adjustment to the Merton Model for the option payoff depicted.

If there is general depositor preference the insurer pays B_i and gets $B_i/(B_i+B_u)$ of bank assets if $A < B_i+B_u$ and B_i otherwise as shown in Figure 6.

⁸ For more detail see Davis ([JBR, 2020](#))

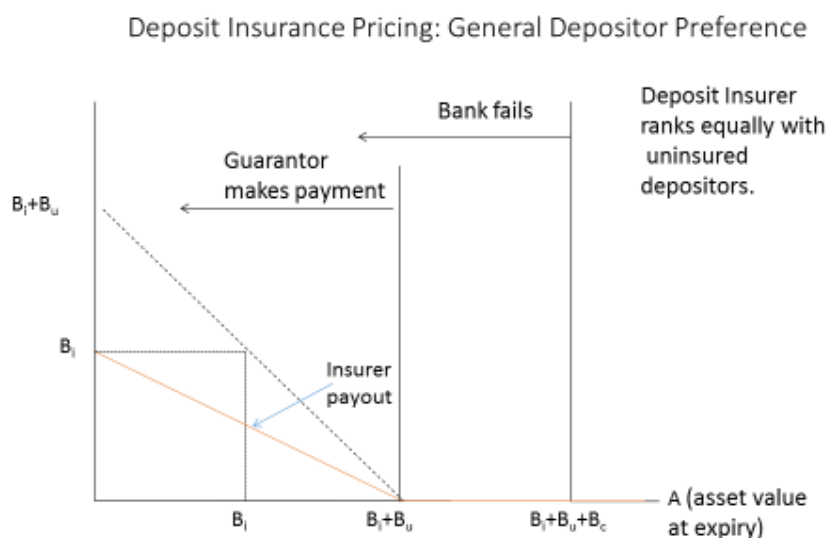


FIGURE 6: THE EFFECT OF GENERAL DEPOSITOR PREFERENCE

It should be noted that If depositor preference applies (and all equal), the fair value *per dollar of insured deposits* is independent of the proportion of deposits guaranteed. Suppose there is partial coverage of x proportion of deposits: $D_p = xD_t$. Then upon failure the insurer payout is

$$(G_p) = x(A-D) = xG_t$$

Where G_t = payout if all deposits covered and $G_p/D_p = g = G_t/D_t$

Note this result could be from either insurance of $x\%$ of each deposit or $x\%$ of total deposits insured, however there will be different implications for stability and depositor monitoring.

If there is tiered depositor preference then the payout of the insurer is as shown in Figure 7

Deposit Insurance: Tiered Depositor Preference

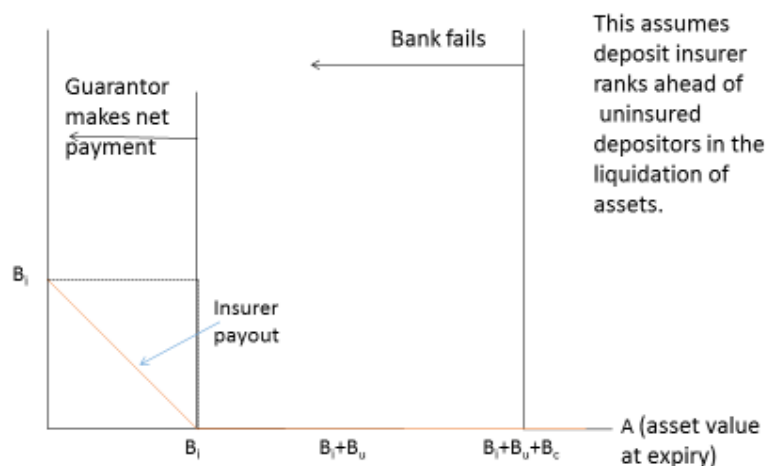


FIGURE 7: THE EFFECT OF TIERED DEPOSITOR PREFERENCE

The differences between the payout situations is shown in Figure 8.

Deposit Insurer Payouts under Different Preference Arrangements

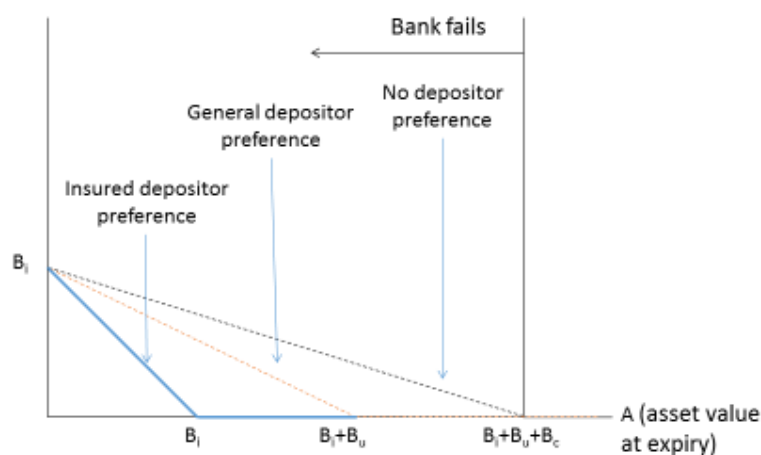


FIGURE 8: DEPOSIT INSURER PAYOUTS UNDER DIFFERENT PREFERENCE ARRANGEMENTS

It is relatively straightforward to estimate the effects of different types of depositor preference on the fair value of deposit insurance using the Merton model. Table 6 illustrates for various assumptions about key parameters. It can be seen that the impact of general depositor preference is very

significant, reducing the fair value in relatively realistic cases such as columns (c) and (d) by about 80 per cent compared to the no-preference case. When tiered preference is assumed the effect is even more dramatic.

TABLE 6: PREFERENCE EFFECTS ON FAIR VALUE OF INSURANCE

Funding Mix	Cases			
	(a)	(b)	(c)	(d)
Insured Deposit (Di)% of assets (BV)	0.8	0.8	0.8	0.7
Uninsured Deposit (Du)% of assets (BV)	0.15	0.1	0.05	0.1
Other Creditors (C)% of assets (BV)	0	0.05	0.1	0.15
Equity % of assets (BV)	0.05	0.05	0.05	0.05
Depositor Preference Assumptions	Fair Value per \$100 of insured deposits			
No depositor preference	\$1.02	\$1.02	\$1.02	\$0.89
General Depositor Preference	\$1.02	\$0.29	\$0.05	\$0.004
Tiered Depositor Preference	\$0.005	\$0.005		\$0

Consequences

Under depositor preference, non-preferred creditors should demand higher returns. They “provide insurance” to depositors against loss and insurer fees for explicit deposit insurance would be double payment!

But this is not the case if there is implicit insurance (perceptions of bail out). The appropriate solution is not fees for explicit deposit insurance, but fees for implicit guarantees which would be based on total (not insured) liabilities and reflect subsidy via lower funding costs. (The Australian Major Bank Levy can be justified in this way – although motivated more as a revenue raising exercise by the government).

Complications

The regulatory agenda including bail-in requirements and other prudential requirements etc is aimed at reducing implicit guarantees, but (arguably) not yet successful

Increased use of collateralised funding by banks and encumbered assets could be expected to affect deposit insurance pricing. There are less assets available for the deposit insurance scheme to access

in order to compensate depositors, but there is also less deposit funding (due to use of collateralised funding). The fair value needs to be calculated by reference to the value of unencumbered assets relative to insured deposits. (Encumbrance occurs via: covered bonds, repo financing, netting of derivatives, central bank liquidity support).

Bail-in AT1 and Tier 2 capital requirements also complicate matters. There is another layer of bank creditors subordinated to insured (and other) depositors, with obvious, if hard to quantify, implications for the value of explicit limited deposit insurance guarantees. Assuming that bail in will occur when capital is still positive, the effect of introduction of such liabilities is to further reduce the fair value of explicit deposit insurance, through reducing either the bank probability of default or loss given default for insured depositors.

Australian Pricing Results

Calculations for the fair price of deposit insurance under the Financial Claims Scheme give actuarially fair premiums ≈ 0 , reflecting balance sheet structures, capital ratios, and depositor preference.

Such values were calculated in the [Study of Financial System Guarantees](#) for a \$50K cap, where there was assumed to be no priority of APRA over uninsured depositors. While the current cap is \$250K, APRA has priority over uninsured depositors. For the major banks, insured deposits are about 30 per cent of total assets. (Note that Table 6 gives a zero value even when that ratio is 70 per cent)! Given APRA's priority position it would require a fall in asset values of around 60-70 per cent before APRA would not recoup all it had paid out! For smaller ADIs the proportion of insured deposits is much higher, but so generally is their capital ratio, giving very small values for any fair value estimate.

Any insurance scheme is problematic in Australia with such a skewed size distribution of ADIs, and most potential failures are handled by APRA involving exit by takeover. To the extent that APRA needs to make payouts, it is able to draw on up to \$20 billion from the government budget, for which it can then impose an *ex post* levy on other ADIs.

[Ex ante v ex post premium payments](#)

In thinking about this issue, it is important to recognise that the main difference is whether the scheme operates with a positive target balance (from ex ante fees) or a zero target balance (and having ex post levies). Regardless of the type, if a payout occurs, there is then a period during which fees are required to adjust the size of the fund back to its target balance. In that sense, the common argument that an ex post levy will impose strains on the banking industry at an inappropriate time after a failure has occurred is misleading. One benefit of the ex post approach is that it does not involve the build up of a fund which has to be managed by bureaucrats.

It is also sometimes suggested that ex post levies are more likely to involve moral hazard since they may not be risk related, but there is no reason that this cannot be done. Others raise issues of fairness – that the failed institution has not contributed to the fund. If that institution has been exploiting the guarantee then that argument perhaps has some merit, although the shareholders lose all their equity value. If the failure is simply down to “bad luck” which could have happened to any of the institutions then there is no issue of fairness.

Systemic Risk and Deposit Insurance Premiums

Acharya, Santos, Yorulmazer ([FRBNY, Oct 10](#)) argue that premiums should increase with probability of joint bank failure (correlation of bank returns and similar asset portfolios). The reason is that a failed bank can be sold to another bank, liquidated (sold to investors), or “bailed out” by government (under resolution mechanisms as discussed in the next section). However, only other banks can extract full value from assets such that the sale proceeds are likely to be less if multiple failures have occurred and there are fewer surviving banks. Other banks unable to afford purchase of failed large bank, so liquidation leads to loss on asset value. If the government compares cost of bailout (taxpayer cost) with cost of liquidation (insurance cost less asset sales) then in crisis, asset sale value less, which increases likelihood of bailout. Allowing for social costs leads to higher than “actuarially fair” premiums and relatively larger gap if banks adopt correlated positions This leads to a conclusion that larger premiums should apply for bigger banks, and that with regulatory intervention and “bail-out” possibility, higher premiums are required to induce low correlation and cover all expected costs of failures.

26.8 Bank Resolution

“A bank resolution occurs when authorities determine that a failing bank cannot go through normal insolvency proceedings without harming public interest and causing financial instability. To manage the bank's failure in an orderly manner, authorities use resolution tools that

- ensure continuity of the bank's critical functions
- maintain financial stability
- restore the viability of parts or all of the bank

Meanwhile, any part of the bank that cannot be made viable again goes through normal insolvency proceedings.” ([European Commission](#))

When failures of financial institutions occur the business of winding-up the institution is generally quite complex. Assets, such as loans, may be illiquid and hard to value and maximising the recovery value may require specialised skills. Creditor priorities can complicate matters and law suits are commonplace. Insolvency processes can take many years, such that even if there are sufficient assets to meet the claims of some stakeholders, there can be inordinate delays in those funds being received.

While financial firms outside of the prudential regulatory perimeter will usually be resolved via the usual liquidation processes applicable to all businesses, special arrangements exist for those within the prudential perimeter. Approaches vary internationally, but there are common practices as discussed in this [2018 FSI Insights paper](#) and the [FSB's 2019 Thematic Review](#) on Bank Resolution Planning. In Australia, APRA, the prudential regulator, has powers to appoint external managers to expedite the resolution of such financial institutions. Indeed, it has powers to intervene before an institution declares that it is at a point of insolvency. The European Union has introduced a [single resolution board](#) to coordinate resolution of banks registered in various member countries but operating across country boundaries.

The Global Financial Crisis identified a range of problems in the failure management and resolution powers of financial regulators globally. While Australian regulators were not confronted with the need to manage the exit of failing or failed prudentially regulated institutions (banks or other ADIs, insurance companies, friendly societies, superannuation funds), the international experience focused attention on whether APRA's powers were adequate. With the development of international standards against which national financial systems are judged, and the need for international regulatory coordination in dealing with complex institutions operating across national borders, appropriately strengthening APRA's powers became important. Deficiencies in APRA's resolution powers had been previously noted in the Study of Financial System Guarantees (2004) and in the [IMF's 2006 FSAP](#) of Australia.

Historically (from its creation in 1998), APRA had intervention powers to investigate, give directions, require enforceable undertakings, amend licence conditions and, in extreme situations appoint an external manager. There was some strengthening of APRA's powers following the introduction of the Financial Claims Scheme in 2008 and [legislation](#) in 2010. These changes *inter alia* made it possible for APRA to obtain access to government budget funding associated with the FCS to deal with a failing institution, including to facilitate a takeover and achieve an open resolution or close the institution and pay out covered depositors or policy holders.

26.9 APRA's "New" Resolution Powers

In March 2018 [legislation](#) was passed clarifying and extending APRA's resolution powers, although the [APRA capability review](#) recommended in July 2019 that APRA needed to report to government on its ability to resource the development and implementation of its resolution frameworks and capabilities. The process of developing the new legislation was slow, with consideration of a 2012 Treasury

[consultation](#) postponed until after the AFSI (Murray) Inquiry – which in November 2014 recommended rapid progression of such legislation.

The Treasury 2012 consultation paper recommended strengthening of APRA's powers with a focus on its:

- Directions powers (to require structural or other changes at a regulated institution)
- Group resolution powers (to deal with NOHC situations)
- Powers to help resolve foreign bank branches in Australia

in line with the FSB's Key Attributes of a Resolution Regime [document](#).

Details on the expansion of APRA's powers can be found in the 2017 [Bill](#) introducing the legislation. As well as the items listed above, the legislation enhanced the "statutory manager" regime by which an APRA appointed (or a judicial) manager can take control of a regulated institution, and clarified APRA's winding up powers (and their interaction with the FCS). It provided APRA with the power to appoint statutory managers to (life and general) insurers in addition to the judicial manager regime.

Importantly, as explained in the concluding comments of the [Bill](#), the ACT "formalises the ability of ADIs, general insurers and life companies to convert or write off certain of their financial instruments if a trigger event occurs", providing a statutory basis for a "bail in" regime.

There are virtually no examples of APRA's use of its resolution powers either before or after the 2018 Act. That include use of its directions powers which can be kept confidential. However, the threat of their use can give teeth to the use of "moral suasion" whereby suggestions by the regulator to an institution to consider merging with a stronger institution, or to raise capital, or reducing dividend payouts to conserve capital, need to be heeded. Many of the vast number of mergers between Australian credit unions over recent decades have no doubt been influenced by suggestions by APRA or its predecessors that this might be a "good idea". Following the GFC, the takeover of BankWest by CBA in late 2008, which may have prevented the former bank's failure⁹, would have been subject to discussions between the banks and the regulator (as well as needing regulatory approval).

While there are no cases providing evidence on how APRA would effect a resolution of a failing institution, there is much evidence from other jurisdictions. Historically, although less relevant in the age of internet banking, the regulator would take over an insolvent bank on close of business on Friday, and reopen on the Monday, arranging a takeover or transfer of business to another bank over the weekend. That could involve government financial support if that is least cost option, although other banks may see value in the franchise and thus be willing purchasers (even though book value is

⁹ Nathan Lynch from Thomson Reuters provides a perspective [here](#)

negative). Alternatively the bank might be placed under government (temporary) ownership, followed by a restructure, which puts “bad loans” into an asset management company (“bad bank”), and sells the remaining “good bank” (assets and liabilities). Because the “good bank” will have assets less than liabilities, the sale will necessitate government subsidy.

As part of its resolution framework, APRA has instituted “living wills” requirements for regulated institutions. These involve pre-specified plans drawn up by the management and boards of institutions which specify recovery plans for dealing with adverse financial shocks (without public sector support) and resolution plans when failure is likely to occur. [Avgouleas et al](#) (JFS 2013) analyse resolution plans and argue that they are particularly relevant for G-SIFIs where inconsistencies in national laws can hinder resolution, and that a major benefit may lie in lessons from their development prompting organisational restructuring. Requirements for recovery plans were introduced for the largest Australian banks in 2011. Figure 9 (from [APRA](#)) illustrates the role of recovery and resolution plans, where the plans need to incorporate appropriate “trigger points” (metrics) at which they become relevant, realistic recovery options and consideration of execution risks. In its forward plan for 2020 APRA included consultation on development of a new prudential standard on resolution and recovery planning, but this has been deferred due to the Covid-19 crisis.

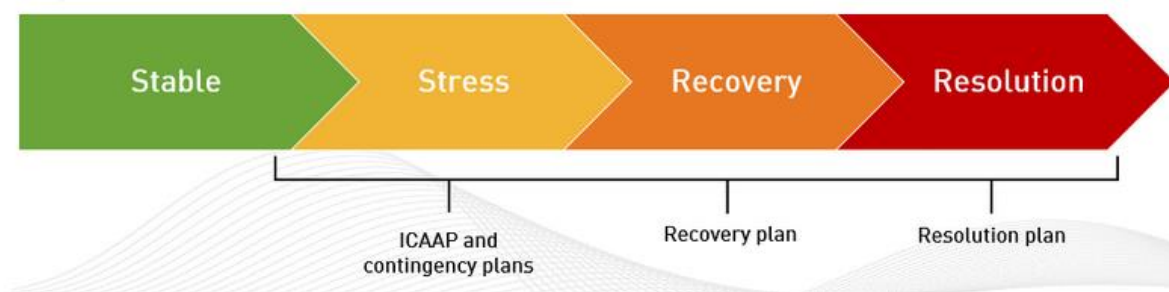


FIGURE 9: THE CRISIS CONTINUUM (SOURCE: APRA)

Regulatory Accountability

APRA has considerable discretionary power in dealing with financial institutions it believes to be potentially at risk of failure. Clearly this power should be accompanied by accountability and performance assessment to determine whether those powers are used appropriately.

At a broad level, the prudential regulator can make two types of errors – failing to identify and act early enough in the case of a troubled institution, or alternatively wrongly identifying a sound institution as troubled and imposing unwarranted interventions on its activities. At a more specific level, reallocations of wealth and social costs associated with resolution of a failed institution should be subject to public purview – at least after the event.

How should such accountability be achieved, and what information should be made publicly available. Clearly, speed and secrecy are important in dealing with a troubled financial institution (and legislated secrecy provisions prevent disclosure of directions made, or other actions, by APRA in dealing with financial institutions which are in financial distress). But ex-post disclosure of the processes, terms and conditions involved in final resolution of a failed institution should arguably be mandatory (but are not).

Another consideration is the extent to which rules might be preferable to discretion in some circumstances. For example, APRA can appoint a statutory manager to an ADI if it considers that it “may become unable to meet its obligations; may suspend payment; or it is likely that the ADI will be unable to carry on business in Australia consistent with the interests of depositors or financial system stability in Australia”. This involves a judgment call on the part of APRA, which must be based on information available to it, and which could lead to either forbearance (about which much discussion occurs in the US context) or premature intervention (which may be more likely in Australia) by the regulator. Similar issues arise in the application of “bail-in” provisions where APRA has considerable discretion to decide that a Point of Non-Viability (PONV) threatens, rather than simply relying on the banks capital ratio declining to a specified level.

Such uncertainty over regulatory response is likely to influence managerial decision making within regulated financial institutions which are at risk of becoming financial distressed. Whether requiring APRA to undertake such actions when certain pre-specified, verifiable, triggers (such as some significant breach of minimum capital requirements) would have preferable effects on decision making in regulated institutions warrants consideration.

Following the 2019 [APRA Capability Review](#) the Government is in the process of streamlining and improving effectiveness of the accountability regime for APRA.

26.10 Trans-Tasman Banking Regulation and Supervision

Subsidiaries of the four major Australian banks are also the major banks in New Zealand. This raises obvious questions about responsibility for supervision, and resolution arrangements should a bank failure threaten. Authorities in both countries cooperate via the [Trans-Tasman Council on Banking Supervision](#) (and other forums) to share information and ensure appropriate collaboration in supervision, crisis-planning, and bank resolution planning. There is a [Memorandum of Understanding](#) between APRA and the RBNZ setting out a framework for cooperation.

In terms of supervision, New Zealand has required the operations of Australian banks in New Zealand to operate by way of a separately capitalised subsidiary, rather than by a branch. This is compatible with supervision of the NZ operations by the Reserve Bank of New Zealand (RBNZ) which is the

prudential regulator. Whereas before the GFC the RBNZ based its approach on disclosure and market discipline and potential exposure to penalties of bank directors and management, it has since moved more into line with the Australian approach – and was ahead of the world in terms of introduction of liquidity requirements. But unlike Australia, NZ long eschewed permanent adoption of a deposit insurance scheme, other than for a short period after the GFC until 2011. In 2020 it is in the process of introducing such a scheme, signalling the end of a stated (but untried) approach to dealing with a bank failure known as Open Bank Resolution (OBR). Under this approach, all creditors (depositors included) would face a haircut to the value of their claims sufficient to ensure bank assets exceed its liabilities, thus recapitalising the bank and in theory enabling it to continue operations. OBR was never put to the test, and many were of the view that it would not work since, even though the government would guarantee the remaining value of claims, runs to other banks were likely.

The relationship between APRA and RBNZ is not without its potential stresses. The RBNZ wants the Australian bank subsidiaries to be well capitalised, which requires the Australian parents to invest funds in those subsidiaries as equity capital. At the same time, APRA wants the Australian banks to be well capitalised at both the Level 1 (Australian banking) operations and the Level 2 (Global banking) operations. While equity investments in the NZ subsidiaries have no implications for the level 2 capital position, exclusion of those investments in calculating the level 1 capital position, reduces the protection to Australian depositors.

In December 2019 (after a long consultation period) the RBNZ released its decision to increase the total capital requirement of the large banks from 10.5% to 18% of risk weighted assets, and the CET1 ratio to 13.5% (although the Covid crisis has led to the start date being deferred from July 2020 to July 2021). Because equity investments in NZ subsidiaries must be deducted in calculating CET1 for the level 1 activities, this increase in NZ requirements will reduce level 1 capital for Australian activities. Also in 2019 APRA reviewed its prudential standard (APS222) relating to (non-equity) exposures to related entities, and reduced the maximum allowable exposure from 50% of Total Capital to 25% of Tier 1 Capital.

26.11 Multinational Banks, G-SIFIs, and Resolution

At the global level, there are special complications involved in the resolution of large banks (and other financial institutions) which operate in multiple jurisdictions. While there are agreed conventions on supervisory responsibilities (foreign branches supervised by the home supervisor and foreign subsidiaries by the host supervisor), new issues come into play when resolution is needed.¹⁰ These are

¹⁰ For the European Community the goal of a single banking market and extensive cross-border banking among member countries has led to the need to coordinate ways of dealing with troubled banks

particularly problematic where G-SIFIs which are TBTF are involved such that resolution requires use of “bail-in” and TLAC to allocate losses, reduce (hopefully) the risk of runs of short-term depositors/creditors, and maintain operational activities.

[Bolton and Oehmke \(RFS, 2019\)](#) is one paper which discusses the alternatives of Single-point-of-entry (SPOE) and Multiple-point-of-entry (MPOE) approaches to G-SIFI resolution. SPOE involves a single global resolution of the whole bank, while MPOE involves separate resolutions of operations in different jurisdictions. They argue that while SPOE is in principle, the more efficient approach, this requires cross-jurisdictional transfers of assets which national regulators may be unwilling to permit. Under MPOE, TLAC is determined in each jurisdiction, reducing efficient sharing of TLAC across national subsidiaries and potentially affecting the extent to which some operational activities (shared systems) occur at a global level or separately at national levels. In the absence of a supra-national regulator or credible commitments of national regulators to agree to SPOE (which are less likely if there is heterogeneity of, or imbalances in, the global bank’s activities across jurisdictions), finding ways of achieving the most efficient form of combination of SPOE and MPOE is an ongoing task.

Bank supervisors and international agencies, and banks themselves, have focused on ways in which the myriad of G-SIFI’s subsidiaries can be structured to facilitate efficient resolution. These may involve allocation (pre-positioning) of TLAC, together with allocations of specific operational activities, to particular entities within the organisation. These issues are further complicated by the choice (where allowed) for foreign activities to be conducted via a branch rather than subsidiary structure. The living wills of large G-SIFIs incorporate considerations of the alternative and likely forms of resolution.

involving both national and EU regulators. This has led to the creation of the Single Resolution Board which together with national resolution authorities forms the Single Resolution Mechanism