The Danish mortgage banking model was created in 1797 with the Kreditkassen following the 1795 Great Fire in Copenhagen which destroyed a large proportion of the city and left many homeless and created an instant and wide-ranging demand for housing. In order to meet this demand a pooling system was designed to obtain the necessary level of capital at a reasonable rate. Though bubbles were not entirely prevented throughout the history of the Danish system it is extremely robust and has acted as a moderating influence on the housing market in Denmark.

The structure of the Danish system is interlocked with the provision of social housing and certain forms of health-care (i.e. assisted living) that provides an Exchequer dimension that exists outside the scope of this legislation. This legislation has borrowed heavily from the provisions of the Danish Mortgage-Credit Loans and Mortgage-Credit Bonds, etc. Act 2010 (Number 1261 of 2010), which incorporates 200 years of best practice in this area and provides a ready model of a regulatory framework for the balance-principle.

The aim of this process is to provide capital to allow the banking and housing markets to mend. The Irish banking sector continues to mend its balance-sheets. That places a priority on banks having large capital backstops and limiting lending to the wider economy. The continued concerns about existing mortgage arrears and the recession-reduced household disposable incomes available to serve mortgages that are currently being serviced weighs heavily on the banks with respect to their lending decisions.

The functions of the balance-principle are proposed here. In essence the assets of the bank are matched on the liability side by bonds issued on behalf of the bank. The income paid on the bond is tied both in terms of its interest and its principle to the interest and principle paid by the borrowers. The bank thus in essence acts as a clearinghouse and matching organization, matching funds from savers to borrowers, less a small margin for administration. This is an extremely conservative approach to
banking and while not immune from the crisis Irish mortgage banks have generally performed well and have weathered the crisis.

Why does Ireland need the balance-principle banking model?

First, Ireland has generated a duopoly model of banking, which makes it distinctly unattractive to foreign actors. Therefore, Ireland’s available access to credit for mortgages is determined by the ability of those existing Pillar Banks (one all-but nationalized and the other with a significant share owned by the state) to obtain credit on the international capital markets. The 29/30 September 2008 banking guarantee undermined the gap between the sovereign’s credit and that of the banking system. Now that the sovereign remains in a Troika programme until 2015 the causality line goes in the opposite direction with the financial system tarred with the same brush as the sovereign. The IMF has also identified the difficulties of the Eurozone crisis as contributing to the ongoing problems of high yields, which impacts on the access of Irish banks to capital and the rate it has to pay for it.


Figure 1. The Escalating Cycle of Turmoil

Sources: Bloomberg L.P.; and IMF staff estimates.

The process of market linkages:

**Shocks affecting European banks and sovereigns are transmitted and amplified to U.S. banks by derivatives markets through indirect and direct channels. The indirect channels arise from feedback loops generated by the interactions among counterparty risk, market funding, and the use of hedging strategies. These indirect channels have affected U.S. banks the most during the current crisis, with stresses feeding back and forth between them and European counterparties. Direct channels arise from potential losses to U.S. banks’ holdings of derivatives claims on European counterparties. These holdings appear small on a net basis, but data disclosures are not sufficient to assess the exposures adequately, which has contributed to the volatility of CDS [Credit Default Swap] spreads and equity prices of U.S. banks.**

*Derivatives markets increase the interconnections among banks, sovereigns, and...*
other markets and institutions, contributing to the transmission and amplification of shocks. As shown in Figure 2.4.1, a negative European sovereign risk shock could trigger a negative feedback loop affecting European banks, U.S. banks, and other markets and institutions.

A negative feedback loop could start with a widening of European sovereign yields owing to an increase in sovereign risk. European banks holding European government debt suffer mark-to-market losses, and the deterioration of their balance sheet increases their default risk (Figure 2.4.1, link A), leading to higher funding costs (link F). If the European bank has entered into derivatives contracts with a U.S. bank, it would be forced to post higher collateral (link E). Because derivatives markets are opaque, counterparties to the U.S. bank may have difficulties assessing its real exposure to the European bank. Thus, the U.S. bank could face higher funding costs and experience a widening of its CDS spreads on the market perception that its default risk has increased due to its exposure to the European bank (link H). The U.S. bank may reduce its exposure by assigning the derivatives contract to a different derivatives dealer in exchange for a fee—that is, by novating the contract (link E). Novation could concentrate risk among fewer dealers and thereby increase systemic risk in the derivatives market. The U.S. bank can also choose to hedge the risk of the European bank with market instruments, such as CDS protection or long put options purchased from other banks and institutions (link G).

The potential of negative feedback loops to affect U.S. banks is real, as illustrated by events in the second half of 2011. As concerns about the solvency and liquidity of European banks mounted, the spotlight turned to U.S. broker-dealers. Market participants erred on the side of caution by reducing or hedging their exposures to U.S. broker-dealers. As a result, the price of default protection for U.S. broker-dealers widened faster than that of European banks in September 2011, demonstrating how interconnectedness could rapidly evolve into systemic risk (Figure 2.4.2).

Furthermore, spillovers flow in both directions, as U.S. bank actions could negatively affect European counterparties. Credit risk in derivatives contracts is managed by requiring the counterparty to post collateral, but sovereigns are not required to do so.

When dealing with sovereigns, banks hedge the credit risk by purchasing sovereign CDS protection, contributing to widening CDS spreads that lead to further rounds of hedging—a cycle referred to as the CVA [Credit Valuation Adjustment] feedback loop or CDS doom loop. For example, a fixed-rate receiver 10-year euro swap with Italy would have cost a dealer bank a CVA charge of 20 basis points in August 2010 but more than eight times as much, about 170 basis points, in November 2011, at the height of the European sovereign debt crisis (Figure 2.4.3). Similarly, the CVA increased sharply, to 130 basis points if the counterparty was Spain, and 60 basis points for France. The rapid increase of the CVA charges required a substantial increase in protection buying, which contributed to higher European sovereign CDS spreads. In addition, CVA desks also hedge by trading swaptions, leading to increased volatility in the swaption market.

The stress episodes experienced in 2011:H2 suggest that data on direct derivatives exposures may underestimate the impact of spillovers from derivatives markets on
U.S. banks. At end-2011:Q3, direct European derivatives exposures, measured on a fair-value basis and excluding credit derivatives, were small, amounting to 34 percent of the Tier 1 capital of U.S. banks, and concentrated mainly on Germany, France, and the United Kingdom (Figure 2.4.4). Exposure to any single individual country did not exceed 10 percent of Tier 1 capital, and total exposure to peripheral countries was about 5 percent. Because official data on net credit derivatives exposures is not available, the best guidance is offered by data released in the banks’ quarterly and annual reports, which suggest low exposures. The two stress episodes described above, however, illustrate that direct exposures are not all that matters and that substantial data gaps remain. (IMF. Global Financial Stability Report. April 2012. pp. 40-42)

In order to break the links between the banking sector and the sovereign and the sovereign and the banking sector it is useful to put in place a highly regulated tabula rasa approach to kick-starting the mortgage market again. The balance-principle model has the added benefit that it is already compliant with the Basel III system for international financial regulation.
The process in essence works as below:

### Table 5. Main Features of Covered Bonds, Danish Mortgage Bonds and Mortgage-Backed Securities

<table>
<thead>
<tr>
<th></th>
<th>Covered Bonds</th>
<th>Danish Mortgage Bonds</th>
<th>Asset/Mortgage-Backed Securities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mortgage Loan Production</strong></td>
<td>Bunded Process</td>
<td>Bunded Process</td>
<td>Unbunded Process</td>
</tr>
<tr>
<td><strong>Type of Securitization</strong></td>
<td>On-Balance sheet</td>
<td>On-Balance sheet</td>
<td>Off-Balance sheet</td>
</tr>
<tr>
<td><strong>Source of Cash Flows</strong></td>
<td>Issuer cash flows</td>
<td>Issuer cash flows</td>
<td>Collateral cash flows</td>
</tr>
<tr>
<td><strong>Risk exposures:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Credit risk</td>
<td>Issuer</td>
<td>Issuer</td>
<td>Investor/credit enhancer</td>
</tr>
<tr>
<td>- Prepayment risk</td>
<td>Issuer</td>
<td>Investor</td>
<td>Investor</td>
</tr>
<tr>
<td>- Market risk</td>
<td>Issuer</td>
<td>Investor</td>
<td>Investor</td>
</tr>
<tr>
<td><strong>Structure of loan pools</strong></td>
<td>- Dynamic pool, with main heterogeneous assets</td>
<td>- Dynamic pool, with substitutable and mainly heterogeneous assets</td>
<td>- Eligible assets defined by law</td>
</tr>
<tr>
<td></td>
<td>- Eligible assets defined by law</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Over collateralization</strong></td>
<td>Usually defined by law</td>
<td>Usually defined by law</td>
<td>Required to achieve high rating</td>
</tr>
<tr>
<td><strong>Credit quality</strong></td>
<td>Asset quality, strength of the originating institution and legal framework</td>
<td>Asset quality, strength of the originating institution and legal framework</td>
<td>Asset quality and over collateralization, Strength of the issuing structure, and quality of the guarantor</td>
</tr>
<tr>
<td><strong>Investor protection</strong> (bankruptcy of the issuer or originator)</td>
<td>Bankruptcy privilege and asset segregation</td>
<td>Bankruptcy privilege and asset segregation</td>
<td>Bankruptcy Remoteness</td>
</tr>
</tbody>
</table>


The market, if based on the balance-principal is very stable:

![Option-adjusted spread to government bonds](image)

**Note:** The Danish 30-year callable bond is the 5% Nykredit 2032. The US 30-year callable bond is the 30-year Fannie Mae Current Coupon.

**Sources:** Merrill Lynch; Danske Bank.

The balance-principle comes about because all loans are securitized, that is all loans are aggregated up and a bond for the same value of these issued. As the loans are repaid then the bond income is generated. If and as principal amounts outstanding are prepaid then so too does the holder of the bond then see their outstanding amount reduce as some is prepaid. If repayments fall then also the interest paid will fall.

In addition to the balance-principle this structure provides a regulatory framework to ensure that households do not become overleveraged due to excess borrowing on housing. This means very rigid and transparent Loan-to-Value Ratio calculations with supporting documentation. Even though this does appear onerous at first it does ensure that the securities that are issued are very safe and that the banking system is very robust. It does place the onus on the political system to make decisions with respect to social and other forms of housing and planning that are systematic, comprehensive and orientated towards the short, medium and long-term needs of the economy and society. On the part of this new banking sector, the time horizon for analysis will be necessity become longer and the desire to create bubbles, or to fuel them, will be dramatically reduced.

The aim of this bill is to provide the basic superstructure upon which a balance-principle banking system can be built, leaving particular regulations to the Central Bank of Ireland to further develop with sensitivities to local conditions.