Sliding Doors Cost Measurement

A Restrictive Approach to Analyzing the Net Economic Cost of Policy Decisions*

Gregory Connor
National University of Ireland, Maynooth
and
Brian O'Kelly
Dublin City University

October 2010

Abstract

This paper develops a restrictive procedure for evaluating economic policy decisions, by comparing actual economic history to a simulated history where a specific policy decision is replaced with a counterfactual, but credible, alternative. Our procedure is theoretically straightforward, but empirically problematic since it requires the identification of a feasible policy alternative and a model linking a specific policy choice to subsequent economic outcomes. We apply the procedure to the mistaken decision to maintain an excessively lax financial regulation regime in Ireland during the period 2003 – 2008. We measure the differences in banking sector stability and national income that would have occurred if the stricter regulatory regime imposed in Ireland in 2009 had been put in place six years earlier. We find that a few simple, reasonably prudent regulatory controls on the Irish banking sector would have greatly limited the vulnerability of the domestic sector to the 2008 global credit freeze, and almost certainly prevented the 2008-2009 collapse of the domestic banking sector and the consequent deep Irish recession of 2009-2010. On the other hand, the risky and unsustainable inflow of foreign capital mediated by the domestic banks accounts for a substantial part of Irish economic growth during the 2003-2007 period. Without this net foreign borrowing inflow, cumulative gross domestic product over the early period would have been substantially lower.

* We would like to thank the statistics department of the Central Bank and Financial Services Authority of Ireland for providing the data for this study by special request. We would like to thank Anita Suurlaht for research assistance, and Martin O'Brien (CBFSAI) and participants in the NUI Maynooth faculty research workshop for helpful comments. We wish to acknowledge support from the Science Foundation of Ireland under grant 08/SRC/FM1389.

1. Introduction

The financial and economic turmoil of the years 2007 to 2010 has led to considerable regret among financial and economic policymakers about bad policy decisions at earlier dates. A worthwhile exercise in economic analysis is careful delineation of the net economic cost of an earlier bad policy decision. This analysis is conceptually difficult since it requires a baseline case against which to compare observed economic outcomes. Simply calculating the economic costs associated with post-decision bad outcomes conflates bad luck and bad policy choice, since policy errors usually interact with bad luck in producing bad outcomes. Similarly, comparing the actual outcome to that from the ex-post best possible policy decisions at every juncture gives an unrealistically high benchmark, since it compares the actual outcome to that from policy decisions requiring perfect foresight by policymakers. Also, rational evaluation requires that all gains and losses subsequent to a policy decision are included – it is incorrect to evaluate an earlier past decision based on present and future impacts – any intermediate impacts between the past decision date and current evaluation date must also be considered.

This paper suggests a theoretically simple and well-defined procedure for analyzing the ex-post economic cost of a particular past policy decision. We suggest the comparison of actual economic outcomes to those which would have emanated from a real-world-feasible alternative under otherwise unchanged circumstances. We do this by identifying a specific policy choice available at the time of the decision which was "almost" chosen. We call this almost-but-not-chosen policy the *sliding doors*[1] choice. The cumulative economic welfare difference between relevant economic outcomes under this choice and under the actual choice over all post-decision periods is our measure of the ex-post net economic cost of the actual policy decision. We argue that this restrictive evaluation procedure can be illuminating within certain narrow circumstances. The procedure delineates both the costs and benefits of feasible policy alternatives.

We apply the procedure to the vexed problem of analyzing the economic costs of the excessively lax regulation of the financial services industry in Ireland during the period 2003 to 2008. The view that the lax regulatory regime of 2003-2008 was a policy error is widely accepted; some analysts made this point contemporaneous with this policy period (e.g., Kelly (2007), Honohan (2004)) and many others after the subsequent Irish banking crisis (e.g., Elderfield (2010), Honohan (2009), O'Sullivan and Kennedy (2010)). It is also established that this lax financial regulatory regime in Ireland contributed fundamentally to the magnitude of the 2008-2010 economic crash in Ireland; see Honohan et al. (2010), Kelly (2009), Regling and Watson (2010). We take it as given that this lax regulatory policy was a mistake, and analyze the economic costs associated with this policy mistake. Our sliding-doors alternative choice is that the strict and prudent financial regulatory regime adopted in Ireland in 2009 was adopted six years earlier.

[1] The "sliding doors" phrase comes from the common plot device in which fictional characters' experiences are shown in two alternative realities, bifurcating at a single, changed event; the popular movies *Sliding Doors* (1998) and *It's a Wonderful Life* (1945) are two well-known examples using this plot device.

There were other contemporaneous policy errors in Ireland, such as in fiscal policy (see, e.g., Regling and Watson (2010), Conefrey and Fitzgerald (2009)), and planning and regional development policy (see, e.g., Kitchin, et al. (2010)). We attempt to analyze in isolation the effects of the lax financial regulatory regime, not conflating these with the effects of other policy errors.

We find that the lax regulation of banks in Ireland was the pivotal domestic policy error leading to the banking industry collapse of 2008-2010 and the deep Irish recession of 2009-2010. A few simple, reasonable but prudent constraints on bank risk-taking could have prevented the Irish banking collapse. Although Ireland would still have suffered along with the rest of the developed world from the impact of the US-centred 2008-2009 Great Recession, Ireland would not have experienced a domestic banking industry collapse. From a macroeconomic perspective, on the other hand, somewhat surprisingly, the "costs" of the policy error in terms of lost Irish national income are not that large, and may in fact be negative.

The moderated-boom and moderated-bust in national income which would have come with a more prudent regulatory policy has offsetting effects. On the one hand, the policy error contributed substantially to the 14.8% decline in real GDP between 2008 and 2010 (inclusive, 2010 estimated). On the other hand, the stimulative impact of the foreign capital inflow associated with this policy error played a big role in generating the 44.4% increase in real GDP between 2003 and 2007 (inclusive). Even after accounting for bank bailout costs and future deadweight costs of fiscal readjustment, the policy error leads to a net cumulative effect on national income that is difficult to sign and may even be positive.

A clear and significant impact of the lax regime on GDP is in the volatility of its annual growth, which is 7.4% per annum in the actual history, falling to 6.8% under a prudent regulatory regime. The social welfare costs of this policy error, including the recent period of high unemployment, business distress, and labour force dislocation, are associated with the policy error's impact on this second-moment feature of Irish national income growth rather than its impact on the first-moment medium-term cumulative growth rate.

2 A Simulated History of the Irish Banking Sector under a Strict and Prudent Financial Regulatory Regime

Our starting date of January 2003 does not correspond to the beginning of lax financial regulation in Ireland. Rather, it represented the continuation of the extremely lax regulatory regime firmly in place at that time.[2] In the early years of this century, Ireland had one of the

[2] Problems from excessively lax financial regulation go back a number of years in Ireland. For example, John Hurley began his term as Governor of the CBFSAI in 2002. One of Hurley's first challenges was to deal with a major scandal left over from his predecessor: soon after he arrived in office a massive $691 million trading fraud was uncovered at AIB, tied to trading irregularities which had been missed by that bank and the financial regulator. This is one of many such scandals related to lax financial regulation in Ireland in the pre-2003 period; see Ross (2009) for an extended discussion.

most under-regulated financial regulatory regimes in the developed world, and was described in the New York Times as "the Wild West Frontier of European finance" (Lavery and O'Brien (2005)). After the credit crisis of 2008, and in particular the Lehmann Brothers bankruptcy and freezing on the interbank lending market, the Irish financial services sector collapsed dramatically. See Honohan et al. (2010) for a careful review of the Irish banking sector collapse and its causes and consequences; we do not duplicate the discussion here. Our sliding-doors alternative is that a strict and prudent financial regulatory regime was put in place in January 2003, and maintained throughout the 2003 – 2010 period.

At each date t, we divide the aggregated domestic bank balance sheet assets into five categories: PD (for property development loans), RM (for domestic retail mortgages), BOD (for business loans and other domestic assets), MF (for central bank deposits and other assets placed with monetary financial institutions) and FA (for foreign assets other than property development loans). We divide the banking sectors' liabilities into five categories, DD (for domestic deposits), CFB (for covered foreign borrowing, which is that part of foreign borrowing covered by foreign assets), NFB (net foreign borrowing, equal to total foreign borrowing minus foreign assets), DIB (domestic institutional borrowing of the sector) and EQ (shareholders' equity).

Domestic institutional borrowing (DIB) is a small component of the balance sheet; since interbank borrowing between domestic banks is netted out, DIB consists of a relatively small amount of borrowing from Irish domestic non-bank financial institutions (such as insurance companies) which are not included in the domestic banking sector balance sheet. Net foreign borrowing, on the other hand, is very large, and entirely accounted for by interbank borrowing from foreign banks. In fact, interbank borrowing always exceeds net foreign borrowing, so that interbank borrowing is being used to fund foreign as well as domestic assets (see Chart 1). Property development assets are mostly for domestic projects; only a small proportion is for overseas projects (see Chart 2). Note that this domestic-only bank balance sheet does not cover the foreign-regulated subsidiaries of Irish banks such as AIB-UK Ltd.

We use TA for total assets and note that by balance sheet definition:

$$TA = PD+RM+BOD+MF+FA = DD+DIB+CFB+NFB+EQ.$$

We simulate an alternative balance sheet history for the sector assuming CBFSAI strict and prudential led to the following features for Irish domestic bank balance sheets:

1. Domestic bank lending to the property development industry never exceeded 20% of the sectors aggregate bank's domestic deposit base.
2. The domestic banking sector's net foreign borrowing (foreign borrowing minus foreign assets) never exceeded 10% of its domestic deposit base.

Neither of these conditions is particularly strict. We view them as observable sector-wide features of a reasonably prudent bank regulation regime, we do not view them as directly-imposed criteria mandated on individual banks. We do not attempt to model in detail how these sensible risk features of the domestic banking sector arise from reasonable and prudent regulation of all individual banks within the sector. See Honohan et al. (2010) for a discussion of how wildly-irresponsible violations of risk criteria by rogue banks within the sector (effectively ignored by the regulator) led to very inappropriate, competitive responses by other institutions (also ignored by the regulator) and an extremely fragile, mostly insolvent, banking sector at the onset of the global credit crisis.

In our simulation we impose the conditions in two steps, with condition 1 being imposed first. In step 1, if PD/DD > 20% then we shrink PD and NFB equally until PD/TA = 20%. It seems appropriate that the assumed regulatory pressure on the proportion in property development lending comes out of net foreign borrowing (and in particular, interbank borrowing) on the liability side, since this is the "residual" liability, whereas other liabilities are less subject to short-term bank control. Second, if after PD has been adjusted in step 1, NFB/DD is still greater than 10% then we shrink NFB until NFB/DD = 10%. In this case on the asset side we shrink all four domestic asset categories by an equal percentage, so that their relative percentages remained unchanged. We leave foreign assets unaffected. We define adjustable assets, AA, as the sum of PD, RM, BOD and MF.

We use * to denote simulation values of all variables; variables without * denote actual values including variables which are unchanged by the simulation (such as DD). We weaken the dynamic imposition of the two conditions by never requiring bank asset decreases, but only disallowing bank asset increases. The notion is that in practice, rather than being forced to liquidate assets in a given quarter to meet regulatory risk controls, the banking sector is allowed to "grow out" of any regulatory violations as domestic deposits grow. So, in step 1 if $(PD_t,DD_t) < .20$ in a given quarter, then the next quarter we set $PD^*_{t+1} = PD^*_t$ or $.20xDD_{t+1}$ whichever is larger. In step 2, if $(NFB_t/DD_t) > .10$ in a given quarter, then for the next quarter we set $AA^*_{t+1} = AA^*_t$ or the value of AA^*_{t+1} which sets $(NFB^*_{t+1}/DD_{t+1}) = .10$, whichever is larger.

Charts 3-6 show actual and simulated assets and liabilities. Charts 7 and 8 compare the risk features of the actual and simulated balance sheets. Table 1 examines some stability and risk features of the actual and simulated bank sector in the first quarter of the data set, 2003:Q1 and five years later in 2008:Q1 when the US-based credit-liquidity crisis was beginning to rattle global markets. The banking sector in the simulated history is not conservatively run (retail mortgages have grown by 19% per annum over this five-year period; and total assets also by 19% per annum) but it is not in vulnerable to a credit crisis. Oddly enough, if we accept the ceteris paribus experiment, Ireland would still have been a big net importer of bank credit in the simulated history, and so, unlike Germany, France and the UK, not at risk from toxic-asset losses on US-based mortgage-related assets. (These toxic assets never directly infected Irish bank balance sheets; see Connor, Flavin and O'Kelly (2010)). The ingredients for the Irish credit crisis were home-grown, based on a transformation of massive foreign

interbank borrowing into massive domestic property development lending. A few simple, reasonable and prudent constraints by the CBFSAI on bank risk-taking would have almost entirely protected Ireland from this crisis.

3. The Impact of a Prudential Financial Regulatory Regime on the Growth Path of National Income

This section simulates the impact of the alternative, prudential regulatory regime on gross domestic product from 2003 to 2010. To do this, we use macroeconomic models to infer the impact of the foreign credit flow and the increased stock of private sector debt on national income.

Following Lane and Milesi-Ferretti (2010) we assume that the global macroeconomy undergoes a regime shift in January 2008, and we use different model specifications before and after this date. Prior to this date, the net annual *flow* of net foreign borrowing is stimulative, whereas on and after this date, the *stock* of private sector debt (which includes the stock of net foreign borrowing) has a contractionary impact. We call the period 2003:q1 to 2007:Q4 the boom period and 2008:Q1 to 2010:Q4 the bust period.

During the boom period, we treat the increase in domestic-bank foreign borrowing supporting domestic expenditures as a stimulative expansion, with essentially the same effect as a debt-financed increase in government expenditures in a Keynesian model. As in a Keynesian model, we assume that in the short-run the macroeconomic reaction is non-Ricardian: economic agents respond to the stimulus associated with the increased cash expenditures associated with the foreign liability increase, but do not adjust their consumption/investment plans to account for the implied change in net national indebtedness. As in the previous section we use * to denote simulated values. Let NFB_t denote the stock of net foreign borrowing at the end of year t so that the associated stimulative foreign-financed expenditure, FFE, is the annual increase:

$$FFE_t = NFB_t - NFB_{t-1}. \quad (1)$$

We assume that during the boom period simulated GDP is the same as actual GDP except for the differential effect of lower net foreign borrowing. We let $\boldsymbol{m}$ denote the fiscal multiplier, giving the multiplicative impact of net-foreign-borrowing-financed expenditures on GDP. Describing GDP in the actual and simulated histories:

$$GDP_t = A_t + \boldsymbol{m}FFE_t \quad (2)$$

$$GDP^*_t = A_t + \boldsymbol{m}FFE^*_t \quad (3)$$

where A_t denotes all GDP variation not related to net-foreign-borrowing-financed expenditures. Taking the difference between equations (3) and (2), A_t cancels out giving

GDP^*_t in terms of actual GDP_t and the observable difference between the net-foreign-borrowing-financed expenditures in the two histories:

$$GDP^*_t = GDP_t - \boldsymbol{m}(FFE_t - FFE^*_t) \qquad (4)$$

The value of the expenditure multiplier ***m*** in (4) is crucial to our analysis. There is considerable uncertainty in the literature about its value, and how its value varies with circumstances.[3] Barro and Redling (2009) use annual data on military expenditures by the US government to estimate the annual fiscal multiplier, getting an estimate of 0.6 to 0.7. We use the lower end of the Barro-Redling range as our base-case estimate, but also consider other values and re-run the analysis accordingly. The expenditure stimulus associated with the net foreign borrowing is very large. Chart 9 shows the annual increase in net foreign borrowing each year, and Chart 10 converts this into percentage GDP stimulus using the baseline value of ***m*** = 0.6.

After 2007, the economic regime changes. After this date, a Ricardian-type correction occurs. Economic agents become aware of the dangerous overhang of private indebtedness and adjust their behaviour, leading to an economic contraction. In the 2008-2010 bust regime, we rely on the estimates of Lang and Milesi-Ferretti (2010) who find that in developed markets the increase in the stock of private credit to GDP ratio between 2004 and 2007 is linked to the decrease in real GDP growth in each of the two crisis years 2008 and 2009. We measure private sector credit (PSC) as the sum of property development, residential mortgages, and business and other domestic assets:

$$PSC_t = PD_t + RM_t + BOD_t$$

and the same for PSC^*_t using the simulated balance sheet values. The private sector credit ratio (PSCR) is just PSC divided by GNP, $PSCR_t = PSC_t/GNP_t$, and the same for the simulated value, using PSC^*_t and GDP^*_t.

Lane and Milesi-Ferretti use panel data regression across a range of countries to estimate the impact of PSCR and other country-specific variables on the magnitude of the negative growth shock in each country in the crisis years 2008 and 2009 (inclusive). Their linear model of real GDP growth takes the form:

$$g_t = B_t + \boldsymbol{h}(PSCR_{2007:Q4} - PSCR_{2003:Q4}) \qquad (5)$$

with ***h*** = 0.0733 from Lane and Milesi-Ferretti (2010, Table 6, column 4). Note that (5) applies to real rather than nominal GDP growth rates. Letting i_t denote observable inflation in period t gives $g_t = (GDP_t/GDP_t)/(1+i_t) -1$ and $g^*_t = (GDP^*_t/GDP^*_t)/(1+i_t) -1$ where we assume inflation (and the variation in B_t) is unaffected by the simulation. We use the Eurostat Harmonized Index of Consumer Prices for Ireland as the source of the annual inflation rate. Applying (5) to both the actual and simulated economies and rearranging gives:

[3] See Aerbach and Garadnichenko (2010) and references therein.

$$GDP^*_t = (1+i_t)\{1 + g_t + \boldsymbol{h}[(PSCR_{2007:Q4} - PSCR_{2004:Q4}) - (PSCR^*_{2007:Q4} - PSCR^*_{2004:Q4})]\}GDP^*_{t-1} \quad (6)$$

The PCSR calculated from the actual bank balance sheets and annual GDP is 1.36 in 2004:Q4 and 2.06 in 2007:Q4; for the simulated balance sheets and GDP* it is 1.25 and 1.64, respectively.

We make one adjustment to the Lane-Milesi-Ferretti estimates, allowing the linear effect of the private sector credit ratio on GDP growth to extend to the year 2010 in the Irish case, the Lane-Milesi-Ferretti estimation sample ends in 2009. It seems clear that the enormous overhang of excessive private sector credit continued to impact Irish growth in 2010, although this might not be true for other developed markets which recovered more quickly.

Table 2 shows actual and simulated nominal and real GDP, and these are also illustrated in Chart 11, along with the Honohan et al. (2010) simulations of real GDP without the Irish-specific 2008-2010 bust (the Honohan simulation assumes that Irish real GDP growth would have matched the Eurozone average during this period). Note that the Honohan simulation makes no adjustment during the earlier boom period, and instead uses the actual GDP values there. Honohan's "Ireland without bust" simulation has "no-bust" Irish GDP 12% higher than actual GDP in 2010. However this only adjusts for one side of the boom-bust cycle. In our simulation, with both the credit-induced boom and credit-induced bust included, real GDP in 2010 is only 0.84% higher under the prudent regime. Furthermore, this small difference does not take account of the much higher levels of real GDP in the years 2003-2007 in the boom period under lax financial regulation.

Using a risk-neutral present discounted value metric with a risk-free nominal rate of 2%, and comparing the conditional realized GDP paths for the simulated and actual histories gives a cumulative GDP measure of the cost of the lax regulatory policy (assuming risk neutrality toward income volatility). For the actual GDP history we also add in the (approximately) €50 billion cost of the bank bailout, which is not yet paid as of 2010, but which will come out of future income, and a €7.5 billion deadweight cost, reflecting the future income costs of fiscal and economic re-adjustment that must take place due to the boom-bust cycle. Please note that we do not attempt to correct for the very high social costs associated with the boom-bust cycle only the effects on cumulative GDP. Table 3 shows the results for a range of values of the fiscal multiplier $\boldsymbol{m}$. All the costs are stated in nominal 2010 euros, for convenience.[4] In the base case, with $\boldsymbol{m}$=0.6, the net economic cost in terms of lost GDP is *minus* €4.3 billion. A slightly lower value for the multiplier, $\boldsymbol{m}$ = 0.569, solves the numerical problem of giving total GDP cost of exactly zero. In this case, the GDP gains from lax regulation in the boom are equal to the losses during the bust, plus the bank bailout and deadweight costs. For the GDP gains and losses to be equal on their own, without taking account of bank bailout and deadweight costs, the expenditure multiplier must equal 0.16; see Table 3. If the reader feels that the deadweight costs of €7.5 billion are an underestimate, it is simple to adjust the costs

[4] Using 2% to compound/discount cash flows across years.

by adding any additional amount, in 2010 nominal euros, to the total costs shown in the last column. We show an alternative case with high deadweight costs of €30 billion in the table.

The enormous social costs associated with the boom-bust cycle are better captured by differences in the volatility of GDP growth rather than by differences in its cumulative level. Over the 2003-2010 period (inclusive) the Irish real GDP growth rate had a per-annum volatility of 7.39% whereas under the base-case prudent regime this falls to 6.80%.

4. Summary

This paper describes a restrictive approach to the analysis of policy errors, an approach which we call sliding doors economic cost measurement. The analysis relies on identifying a past policy error, and counterfactually replacing it with a feasible alternative policy which was available at the time of the flawed decision. Then, the ramifications of the alternative policy decision, what we call the "sliding doors alternative," are examined and analyzed, by simulating the impact of this alternative decision on economic outcomes, and comparing to the actual outcomes which arose from the flawed decision.

This restrictive procedure is difficult to implement and empirically challenging, but can be illuminating in some circumstances. We apply the procedure to the 2008-2010 Irish banking crisis, and get useful results.

One, we demonstrate that the extremely lax regulation of the Irish financial sector was the pivotal domestic policy error leading to the Irish banking crisis. If Irish financial regulators had acted reasonably prudently over the 2003-2007 period, then Irish domestic markets would have been shaken but not stirred by the US-centred credit-liquidity crisis of 2008-2009.

Two, the macroeconomic effects of the excessively lax Irish financial regulatory policy was to increase the volatility of national income growth, and to reallocate income growth to the earlier "boom" years of the period while removing it from the later "bust" years. The boom-bust growth pattern engendered by this disastrous policy error had enormous social cost in terms of gyrating unemployment, business distress, and labour force dislocation, but the medium-term impact on cumulative national income is not measurably different from zero, and may even be positive.

References

Addison-Smith, D., K. McQuinn and G. O'Reilly (2009). "Modelling Credit in the Irish Mortgage Market," *Economic and Social Review* 40: 371-392.

Aït-Sahalia, Y., J. Andritzky, A. Jobst, S. Nowak and N. Tamirisa (2009). "How to stop a herd of running bears? Market response to policy initiatives during the global financial crisis". IMF Working paper WP/09/204.

Auerbach, A.J., and Y. Gorodnichenko (2010). "Measuring Output Responses to Fiscal Policy," National Bureau of Economic Research Working Paper No. 16311, August.

Barro, R.J., and C.J. Redlick (2009). "Macroeconomic Effects from Government Purchases and Taxes," National Bureau of Economic Research Working Paper No. 15369, October.

Bernanke, B.S., M.Gertler, and S.Gilchrist (1999). "The financial accelerator in a quantitative business cycle framework." In *Handbook of Macroeconomics*, vol. 1, edited by Taylor, J.B. and M.Woodford. Amsterdam: Elsevier, pp.1341–93.

Brunnermeier, M. (2009). "Deciphering the Liquidity and Credit Crunch 2007-08," *Journal of Economic Perspectives,* 23 (1).

Conefrey, T., and J. Fitzgerald (2009). "Managing Housing Bubbles in Regional Economies under EMU: Ireland and Spain," working paper no. 315, Economic and Social Research Institute, Dublin, Ireland.

Connor, G., T. Flavin and B. O'Kelly (2010). "The US and Irish Credit Crises: Their Distinctive Differences and Common Features," Irish Economy Note #10, Trinity College, Dublin.

Eichengreen, B, and K.J.Mitchener (2003). "The Great Depression as a Credit Boom Gone Wrong." BIS Working Paper No. 137, September.

Elderfield, M (2010). Public speech of the Head of Financial Regulation, Central Bank of Ireland. *Delivered at the Leinster Society of Chartered Accountants on March 11, 2010*

Geanokoplos, J. (2009). "The Leverage Cycle" Cowles Foundation Discussion Paper #1715, Yale University.

Goggin, J., and L. Seidschlag (2009). "The International Transmission of Business Cycles between Ireland and Her Trading Partners," working paper no. 279, Economic and Social Research Institute, Dublin, Ireland.

Honohan, Patrick (2004). Response to Dr. Allan Kearns —"Are Irish Households and Corporates Over-indebted and Does It Matter?" Barrington Lecture 2003/04, *Journal of the Statistical & Social Inquiry Society of Ireland*, 33, 180-82

Honohan, P. (2009). "Resolving Ireland's Banking Crisis," *Economic and Social Review*, 40 (2), 207 – 231.

Honohan, P., D. Donovan, P. Gorecki, and R. Mottiar (2010)."The Irish Banking Crisis: Regulatory and Financial Stability Policy 2003-2008," *Report into the Irish banking crisis commissioned by the Minister for Finance of Ireland*. Unpublished.

Irish Independent (2009). "John Hurley: Last of a Breed," *Irish Independent*, October 3rd.

It's a Wonderful Life (1945). Directed by Frank Capra, based on a short story by Philip Van Doren Stern. Liberty Pictures.

Kelly, M. (2007). "Banking on Very Shaky Foundations," *The Irish Times*, September 7th.

Kelly, M. (2009). "The Irish Credit Bubble," working paper 09/32, School of Economics, University College, Dublin, December.

Kitchin, R., J. Gleeson, K. Keaveney, and C. O'Callaghan (2010). "A Haunted Landscape: Housing and Ghost Estates in Post-Celtic Tiger Ireland," National Institute for Regional and Spatial Analysis Working Paper No. 59, July

Lavery, B. and T.L. O'Brien (2005). "Insurers Trails Lead to Dublin," *New York Times*, April 1st.

Lord, M. (2009). "A Nod is as Good as a Wink to a Cornered Banker or Blind Regulator," *Irish Times*, February 25th.

O'Brien, P., C. Ryan and S. Rogers (2009), "Regulator Accepted Anglo's Word that €300 Million Share Deal Was Above Board," *Irish Examiner*, February 18th.

Oliver, E. (2009). "Anglo Believed Financial Regulator Approved Share Deal," *Sunday Tribune*, February 22nd.

O'Sullivan, K.P.V., and T. Kennedy (2010). "What Caused the Irish Banking Crisis?" *Journal of Financial Regulation and Compliance*, 40 (3), 224-242

Regling, K., and M. Watson (2010). "A Preliminary Report on The Sources of Ireland's Banking Crisis," *Report into the Irish banking crisis commissioned by the Minister for Finance of Ireland*. Unpublished.

Reinhart, C.M. and V.R. Reinhart (2008). "Capital Flow Bonanzas: An Encompassing View of the Past and Present," in *NBER International Seminar in Macroeconomics 2008*, edited by J. Frankel and F. Giavazzi, Chicago University Press, Chicago IL.

Reinhart, C.M. and K.S. Rogoff (2009). *This Time is Different: Eight Centuries of Financial Folly*, Princeton University Press, Princeton NJ.

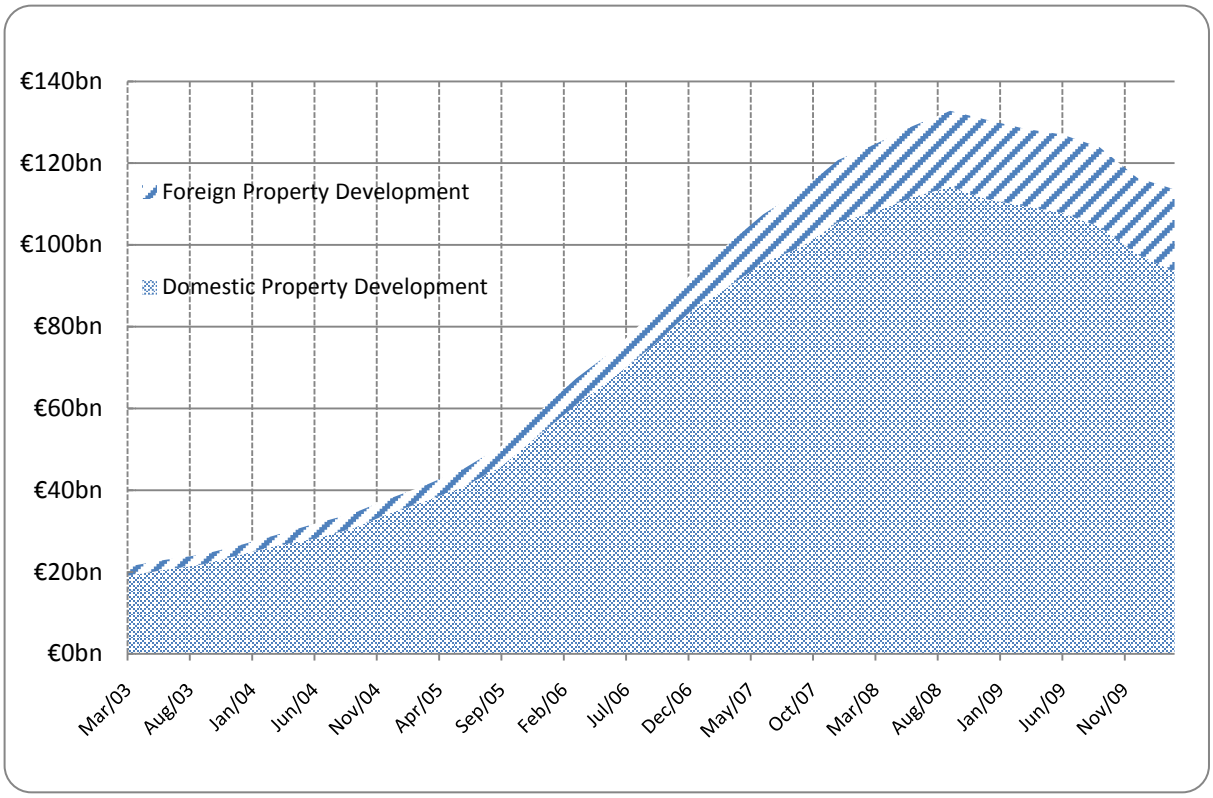
Ross, S. (2009). *The Bankers: How the Banks Brought Ireland to Its Knees*, Penguin Ireland, Dublin, Ireland.

Schularick, M. and A. M. Taylor (2009). “Credit Booms Gone Bust: Monetary Policy, Leverage Cycles, and Financial Crises, 1870-2008,” working paper 15512, National Bureau of Economic Research, Washington, D.C.

Sliding Doors (1998). Written and directed by Peter Howitt, featuring Gwyneth Paltrow, Miramax Films.

Woods, M. (2007). “A Financial Stability Analysis of the Irish Commercial Property Market,” Financial Stability Report, Central Bank of Ireland.

List of Charts and Tables



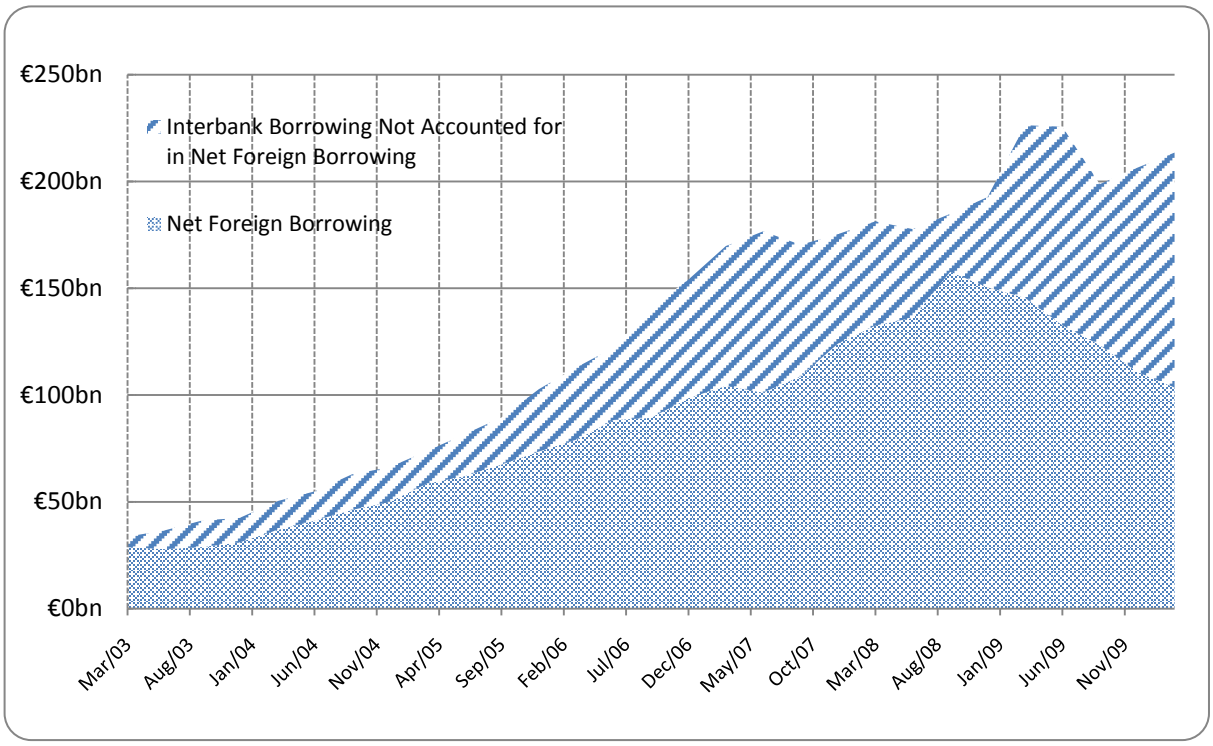


Chart 3: Actual Domestic Banking Sector Aggregate Balance Sheet, Assets

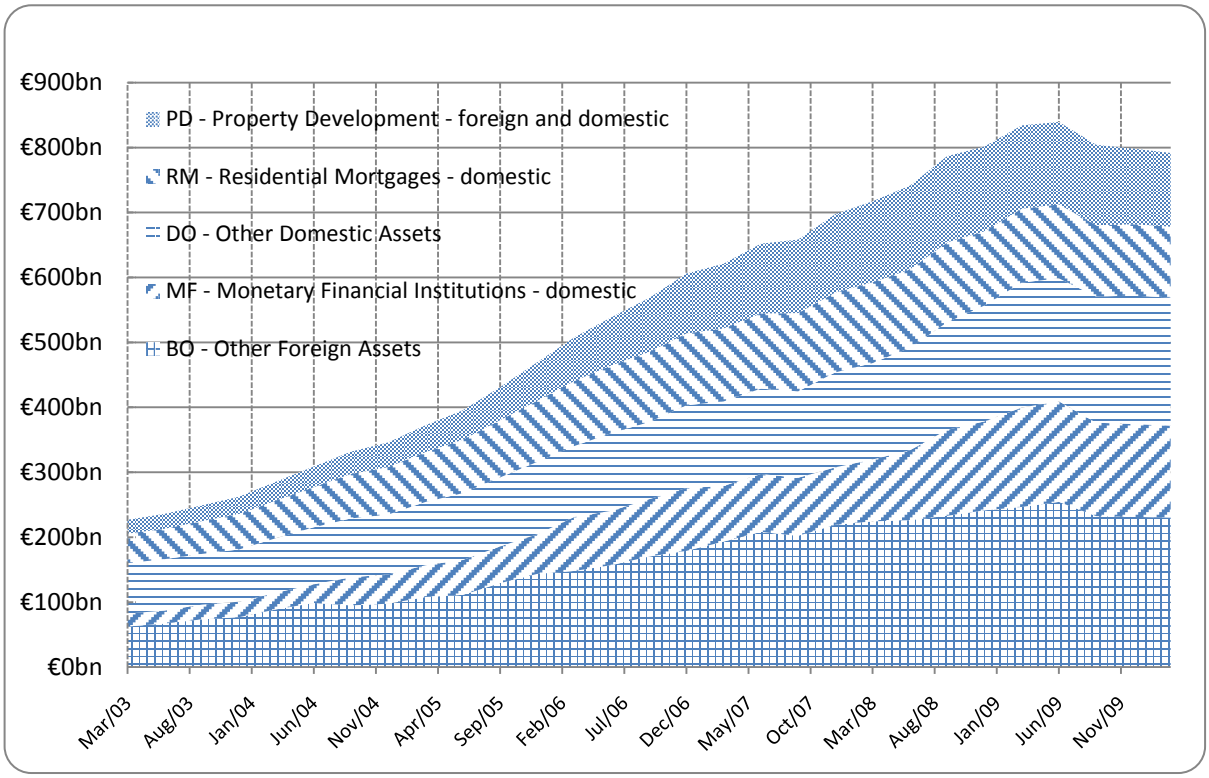


Chart 4: Simulated Domestic Banking Sector Aggregate Balance Sheet, Assets

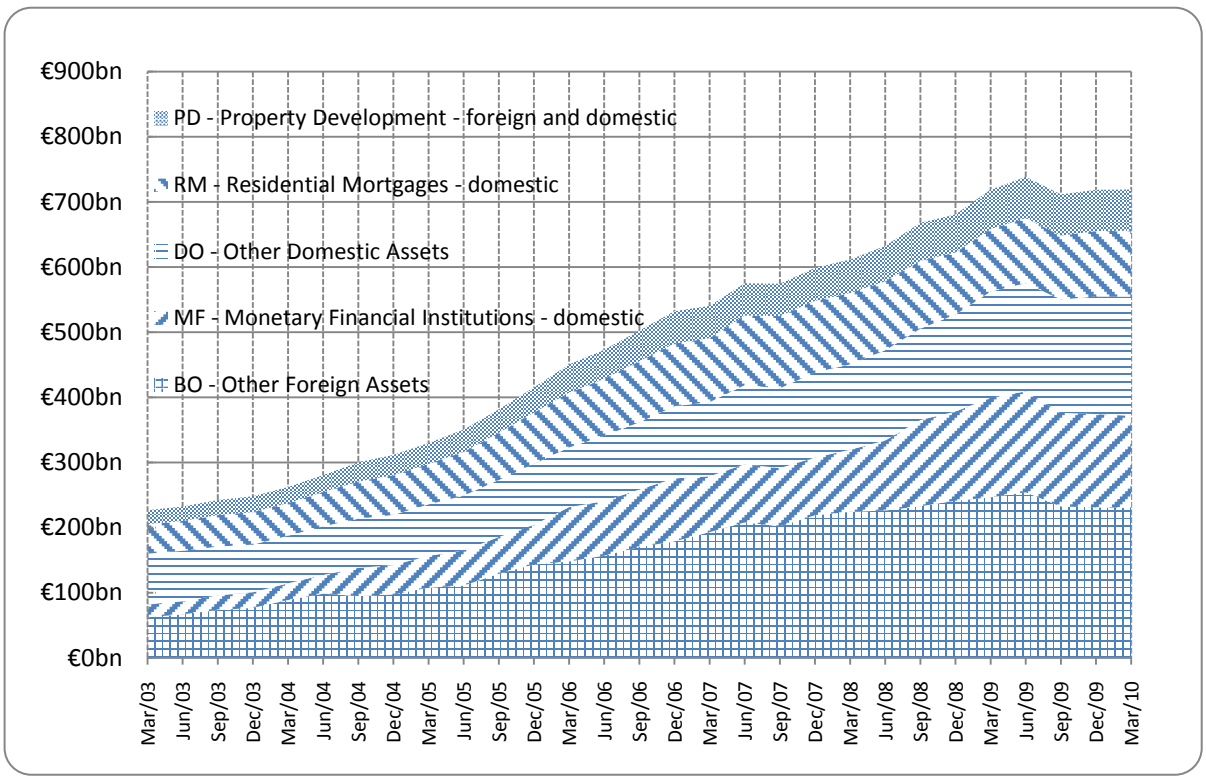


Chart 5: Actual Domestic Banking Sector Aggregate Balance Sheet, Liabilities

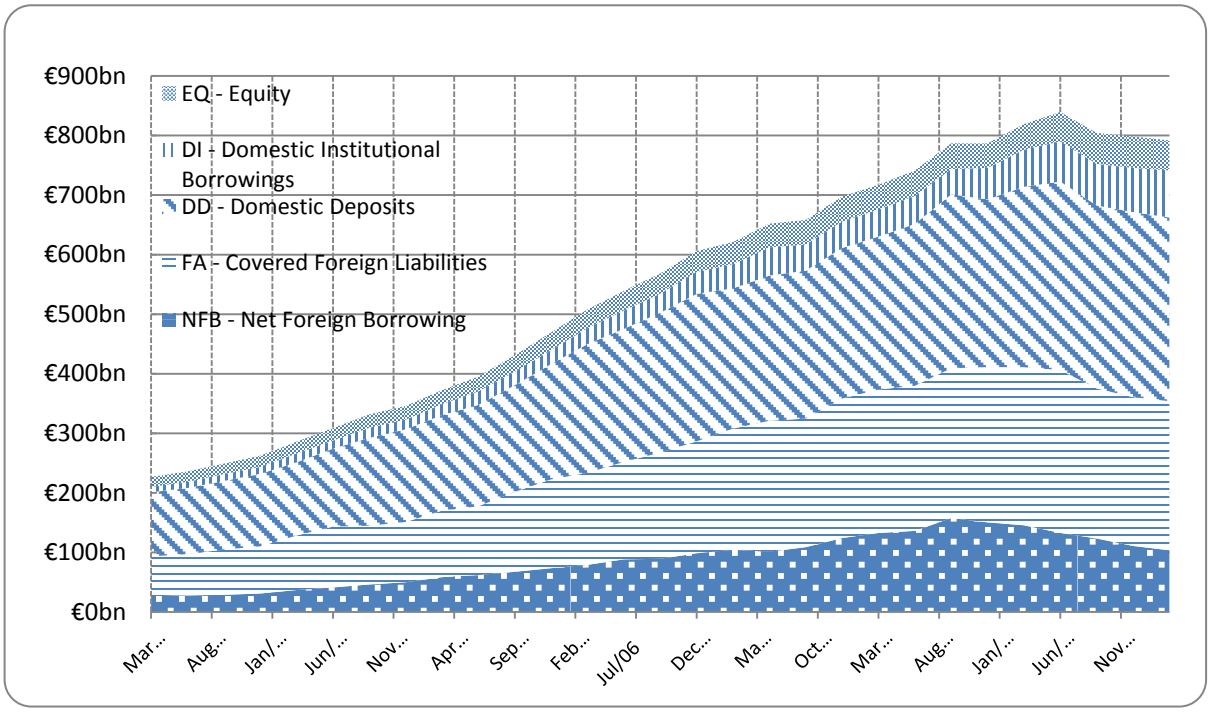


Chart 6: Simulated Domestic Banking Sector Aggregate Balance Sheet, Liabilities

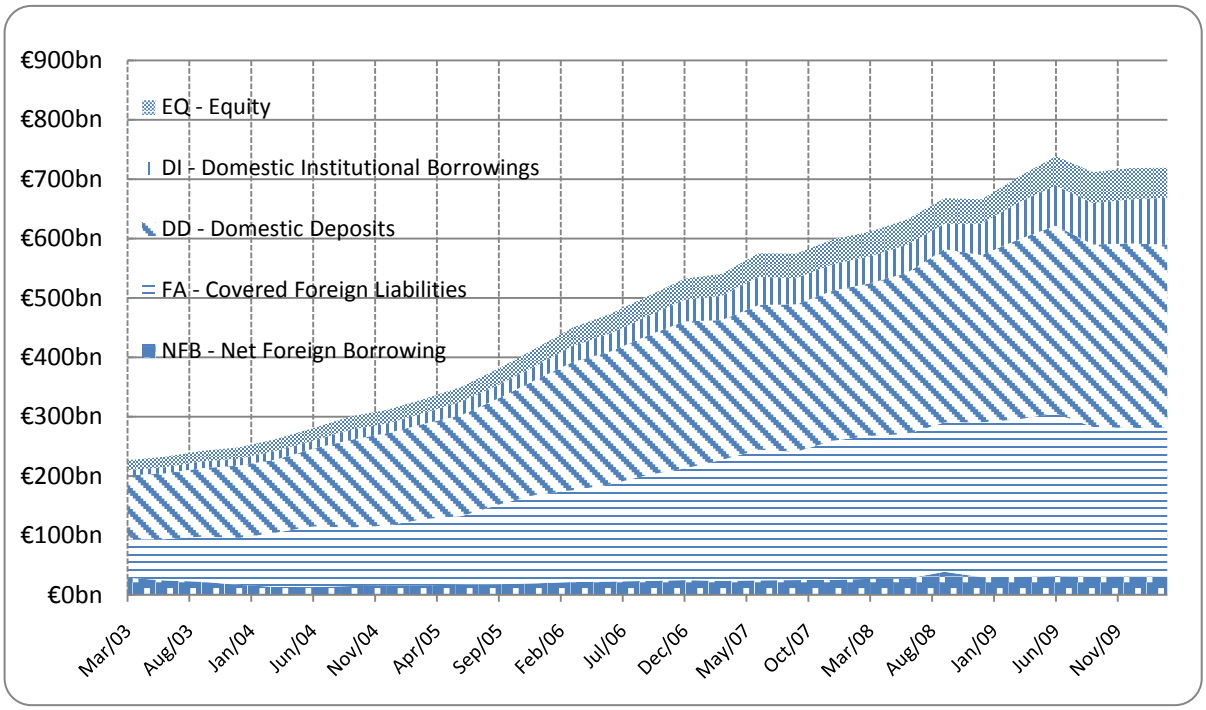


Chart 7: Actual and Simulated Paths of Restricted Ratios

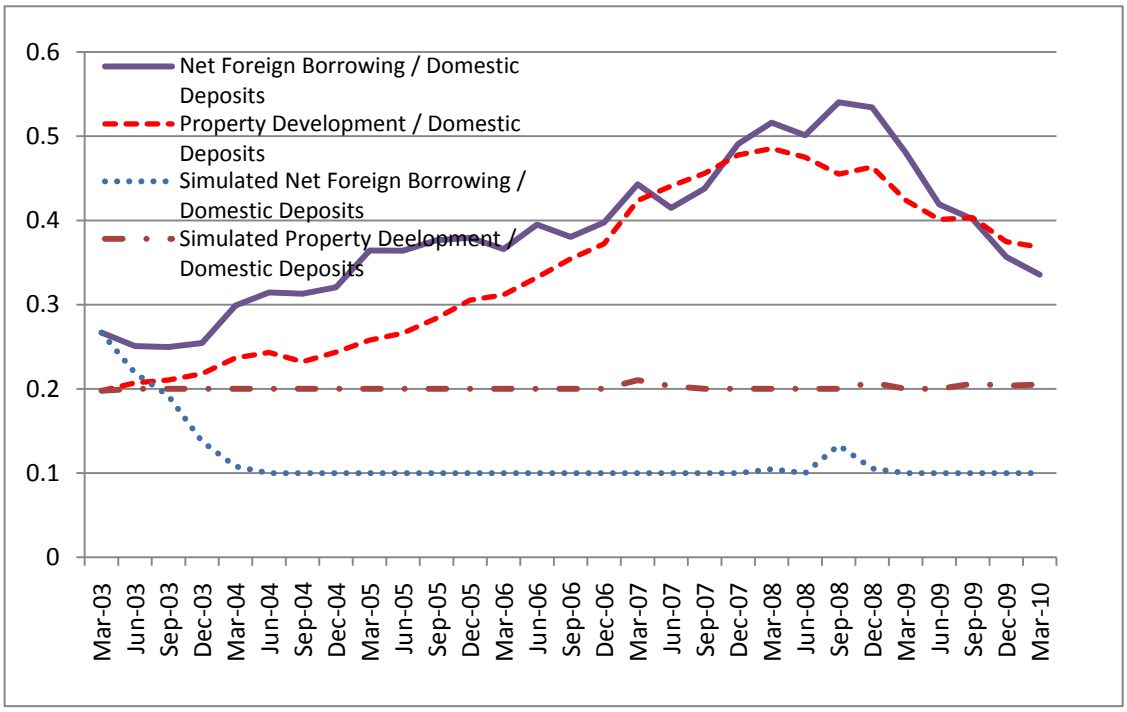


Chart 8: Actual and Simulated Paths of Risk Factors

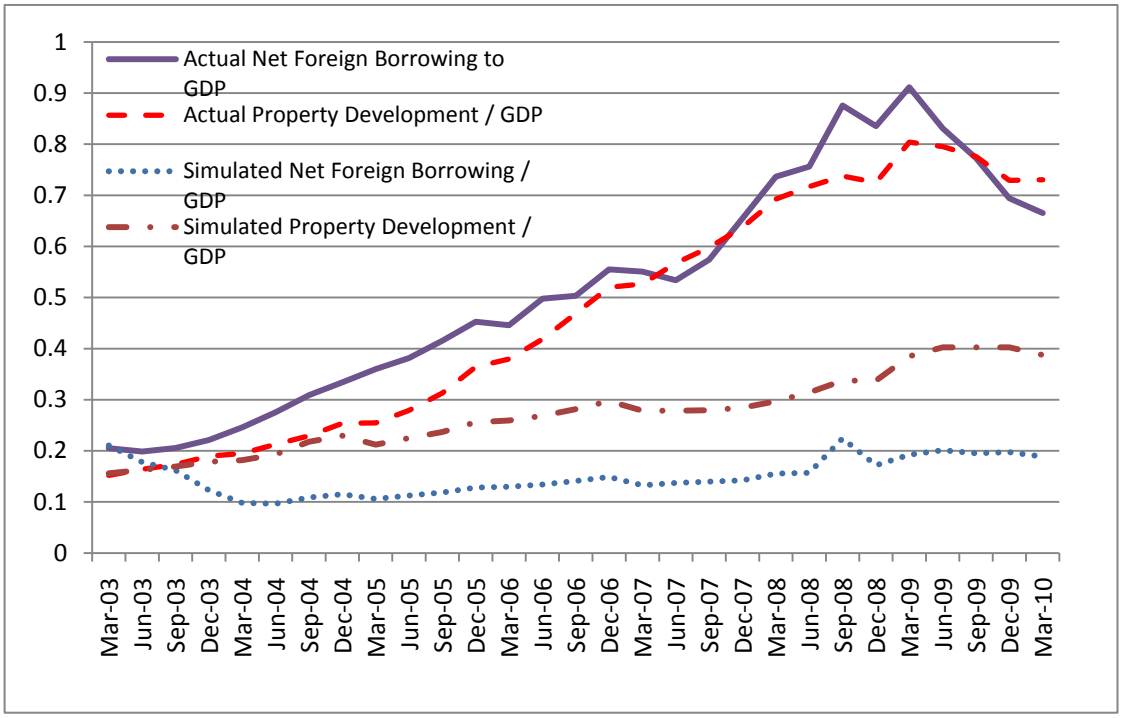


Chart 9: Annual Increase in Net Foreign Borrowing (millions €)

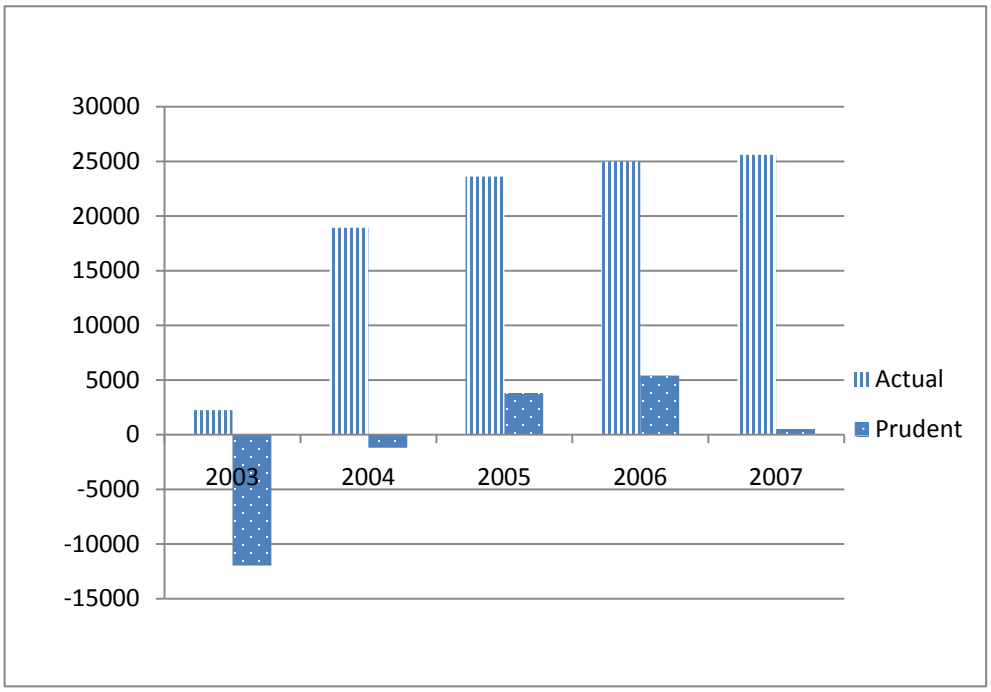


Chart 10: GDP Stimulus Associated with Annual Increase in Net Foreign Borrowing

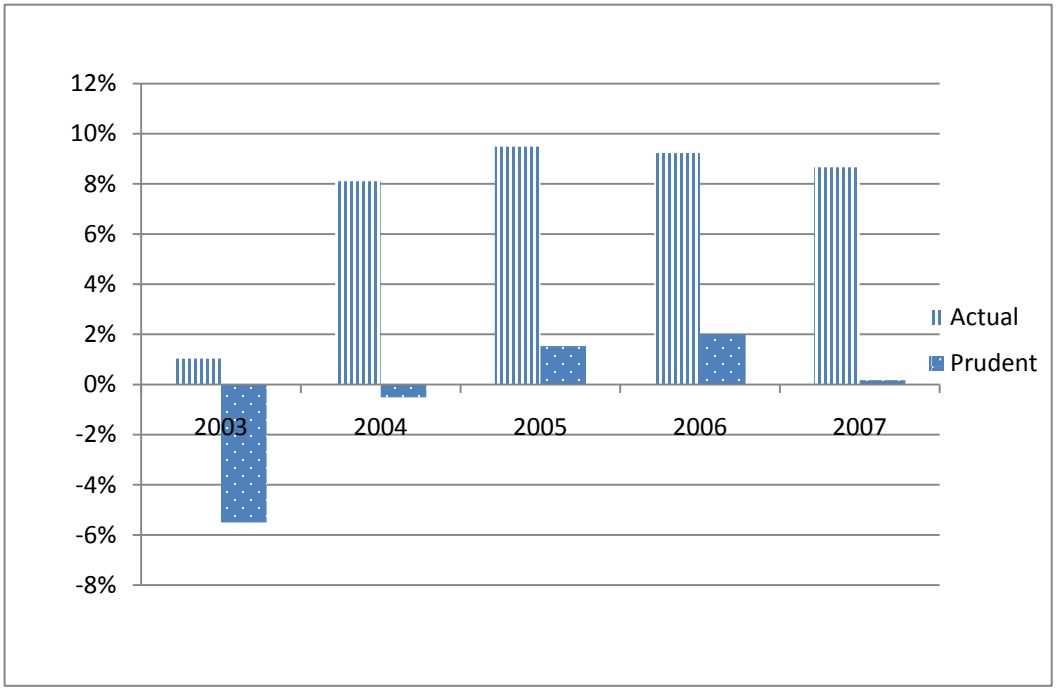


Chart11: Aggregate Real GDP under Actual and Simulated Histories

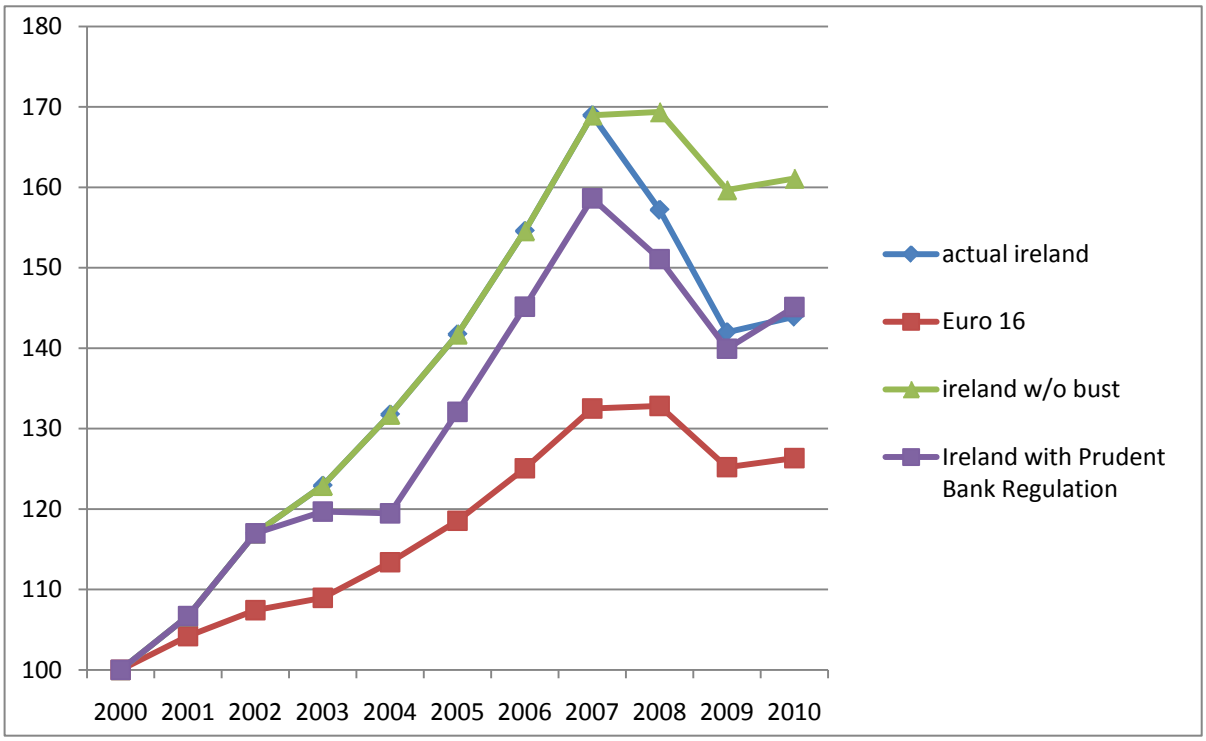


Table 1: Key Risk Features of the Irish Domestic Banking Sector in 2008:Q1 under the Actual and Prudent Regulatory Regimes

	Actual	With Prudent Bank Regulation
Property Development Assets	€124.7bn	€51.4bn
% Total Assets	17.4	8.4
% GDP	69.3	29.7
Net Foreign Borrowing	€132.6bn	€26.9bn
% Total Assets	18.5	4.4
% GDP	73.6	15.5
Residential Mortgages 2003:Q1	€45.4bn	€45.4bn
Residential Mortgages 2008:Q1	€124.4bn	€109.6bn
Residential Mortgages p.a. growth rate (%)	22.3	19.3
Property Development p.a. growth rate (%)	42.4	19.3

Table 2: Nominal and Real GDP under Actual and Simulated Histories

Year	Nominal GDP (Actual)	Nominal GDP (With Prudent Regulation)	Real GDP (Actual)	Real GDP (With Prudent Regulation)
2003	€140008	€136343	€116698	€113643
2004	€149344	€135424	€125098	€113438
2005	€162314	€151267	€134572	€125413
2006	€177343	€166545	€146773	€137836
2007	€189374	€177788	€160443	€150627
2008	€179989	€172990	€149265	€143460
2009	€159646	€157342	€134818	€132872
2010	€155491	€156797	€136650	€137798

Table 3: Alternative Estimates of the Fiscal Multiplier and the Implied Net Cumulative National Income Impact

Fiscal Multiplier	Cumulative GDP Cost of Lax Regulation	Bank Bailout Cost	Deadweight Costs of Adjustment (lost future GDP)	Implied Cumulative GDP Cost of Lax Regulation
0.6	-€61,841	€50,000	€7,500	-€4,341
0.57	-€57,500	€50,000	€7,500	€0
0.4	-€33,676	€50,000	€7,500	€23,824
0.3	-€19,566	€50,000	€7,500	€37,934
0.16	€0	€50,000	€7,500	€57,500
----------	----------	----------	----------	----------
0.6	-€61,841	€50,000	€30,000	€25,659
0.57	-€57,500	€50,000	€30,000	€30,000
0.4	-€33,676	€50,000	€30,000	€53,824
0.3	-€19,566	€50,000	€30,000	€67,934
0.16	€0	€50,000	€30,000	€87,500