Irish Economy Note No. 12

"Sliding Doors Cost Measurement:
A Restrictive Approach to Analyzing the Net Economic Cost of Policy Decisions
and an Application to Irish Financial Regulation"

Gregory Connor
National University of Ireland, Maynooth

Brian O'Kelly
Dublin City University

November 2010

Sliding Doors Cost Measurement

A Restrictive Approach to Analyzing the Net Economic Cost of Policy Decisions and an Application to Irish Financial Regulation[*]

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

November 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.

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-

---

[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.

doors alternative choice is that the strict and prudent financial regulatory regime adopted in Ireland in 2009 was adopted six years earlier.

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 and the subsequent, very deep recession.

From a macroeconomic perspective, on the other hand, somewhat surprisingly, the "costs" of the policy error in terms of cumulative lost Irish national income are not that large, and in total (as opposed to per capita) units may even be zero. 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 11.7% 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 28.8% 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 real growth rate, which is 5.13% per annum in the actual history, falling to 4.08% under a prudent regulatory regime. The social welfare costs of this policy error, including the recent period of high unemployment, business distress, fiscal imbalance, 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

In the early years of this century, Ireland had one of the 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)). 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] After the credit crisis of 2008, and in particular the Lehmann Brothers bankruptcy and the freezing of 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 equal to 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 regulation led to the following features for Irish domestic bank balance sheets:

---

[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 Allied Irish Bank, 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.

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 the other three 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 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 $.20 \times DD_{t+1}$ 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 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 excessive and, eventually loss-making, domestic property development lending. A few simple, reasonable and prudent constraints by the CBFSAI on bank risk-taking would have mostly 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 effect of the foreign credit flow and the increased stock of private sector debt on national income. We take the simulated-prudential balance sheet from the last section as fixed, that is, we do not allow for a second-order effect of the altered macroeconomic environment feeding back to the simulated balance sheets.

3.1 A Macroeconomic Model with Regime Shift

Following Lane and Milesi-Ferretti (2010) we assume that the global macroeconomy undergoes a regime shift after 2007, 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 has a contractionary impact; see Eichengreen and Mitchener (2003) and Schularick and Taylor (2009) for related analyses. We call the period 2003:Q1 to 2007:Q4 the boom period and 2008:Q1 to 2010:Q4 the bust period.

3.2 Property Development Expenditures Financed by Net Foreign Borrowing as an Exogenous Expenditure Shock in a Keynesian Model

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. In the standard Keynesian treatment an exogenous increase in government expenditures increases national income by a multiple m through its stimulative effect on the economy. Let G, GDP denote government expenditures and national income, and ΔG and ΔGDP the exogenous shock and endogenous response of G and GDP, respectively. The standard model in its simplest form is:

$$\Delta\text{GDP} = m\Delta\text{G}. \tag{1}$$

Assume for simplicity that taxes are fixed. Letting B denote government borrowing we have ΔB = ΔG and hence:

$$\Delta\text{GDP} = m\Delta\text{B}. \tag{2}$$

Although the standard model uses government expenditures (or equivalently in the case of fixed taxes, government borrowing), it is well known that other exogenous sources of spending, and in particular those associated with foreign capital inflows, can give rise to the same effect. There is a substantial research literature on this macroeconomic impact of foreign capital inflows, see, e.g., Fernandez-Ariaz and Montiel (1996), Calvo and Leiderman (1996), Corbo and Hernandez (1996), Reinhart and Reinhart (1998), Montiel and Reinhart (1999), and Kaminsky, Reinhart and Vegh (2005). The existing literature mostly focuses on developing countries where the effect has been most clearly discernible. Ireland, as a developed economy with a sophisticated capital market, does not seem an obvious candidate for experiencing a destabilizing macroeconomic boom based on foreign capital inflows, yet this is exactly what befell the Irish economy. Ireland was a small, open economy in a large new single currency zone during a global credit glut, and with very imprudent domestic bank regulation. These features interacted to cause the domestic Irish property bubble and subsequent banking crisis, via a destabilizing foreign capital inflow intermediated by the banking sector. See Kelly (2009) for related analysis.

Let ΔEPDE denote the exogenous property development expenditures supported by foreign borrowing by the banks, denoted by ΔFB where by definition ΔFB =ΔEPDE. Analogous to (1) and (2), we can describe the effect on national income as either:

$$\Delta\text{GDP} = \boldsymbol{m}\Delta\text{EPDE}, \tag{3}$$

or equivalently

$$\Delta\text{GDP} = \boldsymbol{m}\Delta\text{FB}. \tag{4}$$

We use (4) since the exogenous increase in foreign borrowing is observable in our 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 from 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.[3]

The multiplicative coefficient $\boldsymbol{m}$ is typically called the fiscal multiplier, but in our application it is better termed the exogenous expenditure multiplier, since the spending shock comes from foreign-borrowing-based property development expenditures rather than government-debt-based government expenditures.

---

[3] Perhaps "non-Miller-Modigliani" might be better nomenclature than "non-Ricardian" in the context of this private-expenditure channel. In the neoclassical finance model, rational economic agents would respond to foreign bank borrowing by domestic banks by "undoing" the foreign borrowing on own-account – decreasing their personal expenditures by an equivalent amount and placing the saved proceeds into foreign lending. Unfortunately, this was not the response of Irish citizens during the property bubble!

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; we assume that the associated stimulative foreign-financed expenditure, FFE, is the average annual increase in net foreign borrowing over the last two years:

$$FFE_t = \tfrac{1}{2}[(NFB_t - NFB_{t-1}) + (NFB_{t-1} - NFB_{t-2})] = \tfrac{1}{2}(NFB_t - NFB_{t-2}) \qquad (5)$$

We use the two-year average increase since Auerbach and Gorodnichenko (2010, Figure 2) find that it takes eight quarters for the full stimulative effect of exogenous expenditures (in their case, government expenditures) to impact GDP during business expansions.

We assume that during the boom period simulated GDP is the same as actual GDP except for the differential effect on foreign-borrowing-financed expenditures of lower net foreign borrowing. Describing GDP in the actual and simulated histories:

$$GDP_t = A_t + mFFE_t \qquad (6)$$

$$GDP^*_t = A_t + mFFE^*_t \qquad (7)$$

where A_t denotes all GDP variation not related to net-foreign-borrowing-financed expenditures. Taking the difference between equations (7) and (6), 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:

$$GDP^*_t = GDP_t - m(FFE_t - FFE^*_t) \qquad (8)$$

The value of the expenditure multiplier m in (8) is crucial to our analysis. There is considerable uncertainty in the literature about its value, and how its value varies with circumstances, see Freedman, et al. (2009). Barro and Redlick (2009) use annual data on military expenditures by the US government to estimate the fiscal multiplier, getting an estimate of 0.6 to 0.7, but argue that the multiplier for non-military expenditures is likely to be somewhat lower. Auerbach and Gorodnichenko (2010, Table 1), using a structural vector autoregression on US data, estimate that the fiscal multiplier is 2.48 during recessions and 0.57 during expansions (we are applying the analysis during an expansionary period for the Irish economy). An open economy like Ireland may have a lower expenditure multiplier than a relatively closed one like the USA. We use m =0.5 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 (5) – (7) with the baseline value of m = 0.5.

3.3 The Credit Crisis Regime

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 Lane 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 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 $GDP*_t$ in place of 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:

$$g_t = B_t + \textbf{\textit{h}}(PSCR_{2007:Q4} - PSCR_{2003:Q4}) \tag{9}$$

with $\textbf{\textit{h}} = 0.0733$ from Lane and Milesi-Ferretti (2010, Table 6, column 4) and B_t denoting all explanatory variables not differing between the sliding doors simulation and actual history. Note that (9) 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 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 (9) to both the actual and simulated economies and rearranging gives:

$$GDP*_t = (1+i_t)\{1 + g_t + \textbf{\textit{h}}[(PSCR_{2007:Q4} - PSCR_{2004:Q4})- (PSCR*_{2007:Q4} - PSCR*_{2004:Q4})]\}GDP*_{t-1} \tag{10}$$

The PCSR calculated from the actual data is 1.36 in 2004:Q4 and 2.06 in 2007:Q4; for the simulated economy it is 1.19 and 1.62, 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 based on the model described above. Chart 11 illustrates the paths of actual and simulated real GDP for the base case of *m* = 0.5. Also shown is the Honohan et al. (2010) simulation of real GDP without the Irish-specific 2008-2010 bust. The Honohan simulation assumes that, in the absence of the Irish domestic banking crisis, 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 et al.'s "Ireland without

bust" simulation has "no-bust" Irish GDP 10% 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 1.2% higher under the prudent regime. Furthermore, this 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.

It is worth reiterating that our point estimates are imprecise, and we do not claim to show that the bank-related net foreign borrowing inflow explains all of the boom-bust cycle. Other policy errors (in fiscal policy, tax policy, land-use policy) likely played a significant role in exacerbating the cycle.

4. Measuring the Economic Losses Due to the Lax Regime

4.1 Impact on Cumulative GDP

As shown in Chart 11, lax bank regulation and the associated foreign capital inflow first increased, and then sharply decreased, Irish GDP. The investment of this capital inflow into negative-return property development assets also left a large overhang of domestic bank losses, which have been substantially "socialized" by the Irish government's bank bailout policies. 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.

Table 3 shows the cumulative GDP costs for a range of values of the fiscal multiplier m, since there is considerable uncertainty about the correct value to use in this context. All the costs are stated in nominal 2010 euros, for convenience.[4] In the base case, with m=0.5, the net economic cost in terms of lost GDP is €11.4 billion. A slightly higher value for the multiplier, m = 0.58, 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 0.17; 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 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 analysis above relies on total rather than per-capita GDP. Chart 12 compares the growth rates of total and per-capita Irish GDP over the period. Since there was substantial population

---

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

growth during this period, the per-capita growth in GDP is more muted during the boom. There is not an offsetting decline in population during the 2008-2010 bust. In per-capita terms, the outcome for the Irish economy over the full period is poor. Real per capita GDP is essentially the same in 2010 as in 2002, with a cumulative eight-year growth rate of minus 0.31%. Chart 12 takes no account of the estimated €57.5 billion bank bailout and readjustment costs, which although not an immediate drain on income are a substantial downward shock to per-capita wealth.

What would have happened to Irish per capita GDP with prudent bank regulation? In order to extend our sliding doors cost measurement to consider per-capita GDP it would be necessary to specify how the sliding doors alternative impacts migration flows. This is empirically problematic. Extensive net immigration into Ireland during the period was an important enabling feature of the Irish boom. Growth in the Irish-resident labour force kept wage rates down and ameliorated problems with labour scarcity. In essence, the large level of net immigration during this boom period served to match the foreign capital inflow with a parallel labour inflow. Hence the migration inflows are related to the capital inflows, and the capital inflows differ in our sliding doors simulation. Specifying and quantifying the functional link between capital inflows and migration goes beyond the empirically feasible range of the model. Rather than produce untrustworthy per-capita GDP simulations, we only attempt to measure the total-GDP impact of the sliding doors alternative.

4.2 GDP Volatility and Other Economic Costs

The simple calculation in the previous subsection only measures the sliding-doors cost in terms of the aggregated path of GDP. There was also a large increase in the variability of growth, attributable to the policy error. For 2003-2010 (inclusive) the volatility of actual per-annum real GDP growth rate was 5.13%; under the base-case prudent regime this falls substantially to 4.08%. At a deeper level, the social costs associated with the boom-bust cycle (gyrating unemployment, business distress, labour force dislocation) are tied to this heightened volatility rather than to the aggregate level of GDP over the period.

The boom-bust cycle and its dependence on tax-revenue-rich property development also engendered a painful fiscal imbalance, see, e.g., Regling and Watson (2010). Not all of this fiscal imbalance, though, can be ascribed to lax bank regulation; it also reflects serious errors in fiscal management during the period.

4. Summary

This paper describes a restrictive approach to the analysis of policy errors, an approach which we call sliding doors cost measurement. The procedure 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 them 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 lax regulation of the Irish financial services sector during 2003-2007, 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 2008-2010 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, fiscal imbalance, business distress, and labour force dislocation, but the medium-term impact on cumulative national income is not measurably different from zero.

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.

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.

Calvo, G.A., L. Leiderman and C.M. Reinhart (1996). "Inflows of Capital to Developing Countries in the 1990s," *Journal of Economic Perspectives*, 10 (2), 123-39

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.

Corbo, V., and L. Hernandez (1996). "Macroeconomic Adjustment to Capital Inflows: Lessons from Recent Latin American and East Asian Experience." World Bank Research Observer, 11(1), 61-85

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*

Fernandez-Ariaz, E., and P.J. Montiel (1996). "The Surge in Capital Inflows to Developing Countries: An Analytical Overview," World Bank Economic Review, 10 (1), 51-77

Freedman, c., M. Kumhof, D. Laxton and J. Lee (2009), "The Case for a Global Fiscal Stimulus," International Monetary Fund Staff Position Note, SPN/09/03.

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.

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

Kaminsky G.L., C.M. Reinhart, and C.A. Vegh (2004). "When it Rains, it Pours: Procyclical Capital Flows and Macroeconomic Policies," in *NBER Macroeconomics Annual 2004*, vol. 19, edited by M. Gertler and K. Rogoff, MIT Press, 11-82.

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

Lane, P., and G.M. Milesi-Ferretti (2010). "The Cross-Country Incidence of the Global Crisis." IIIS Discussion Paper No. 333, July, Dublin, Ireland

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

Montiel, P., and C. Reinhart (1999). "Do Capital Controls Influence the Volume and Composition of Capital Flows? Evidence from the 1990s," *Journal of International Money and Finance*, 18(4), 619-635

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., and V. Reinhart (1998). "Some Lessons for Policy Makers Who Deal with the Mixed Blessing of Capital Inflows," in *Capital Flows and Financial Crises*, edited by M. Kahler, Council on Foreign Relations, New York, 93-127

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.

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.

List of Charts and Tables

Chart 1: Foreign and Domestic Property Development Assets of the Domestic Banking Sector
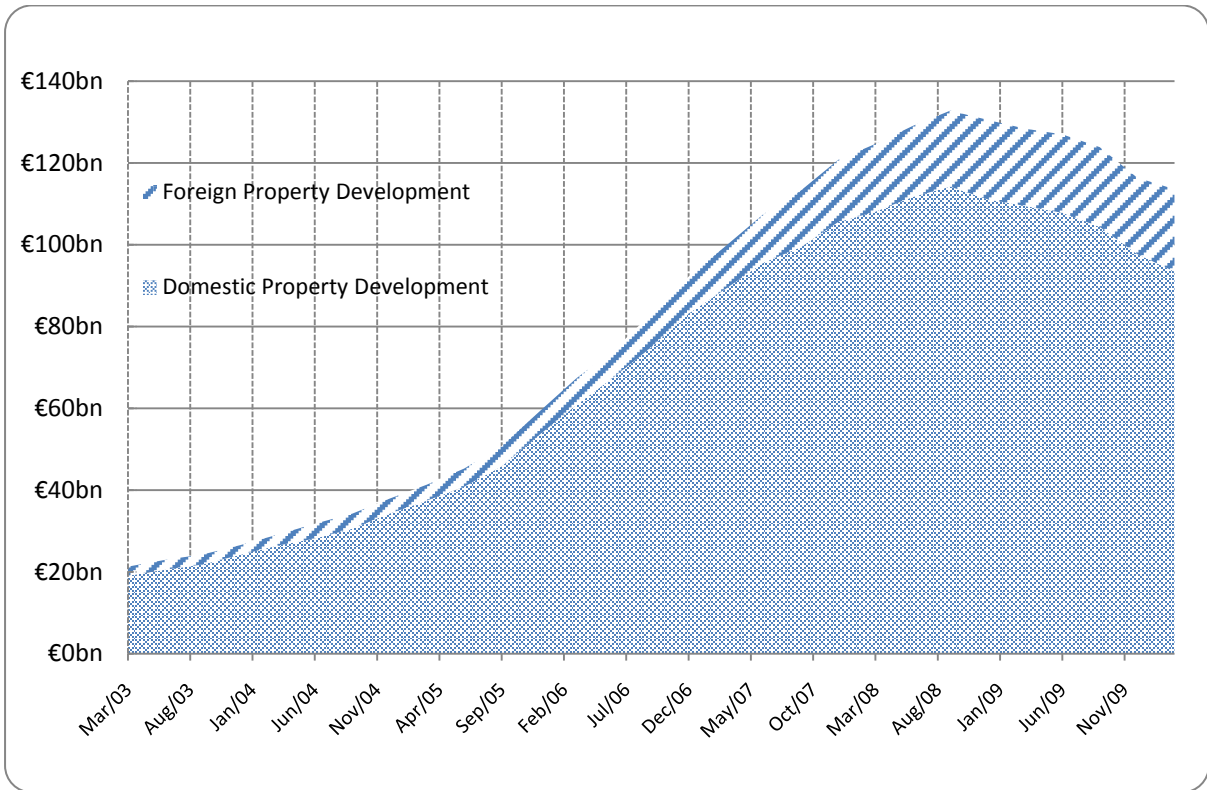

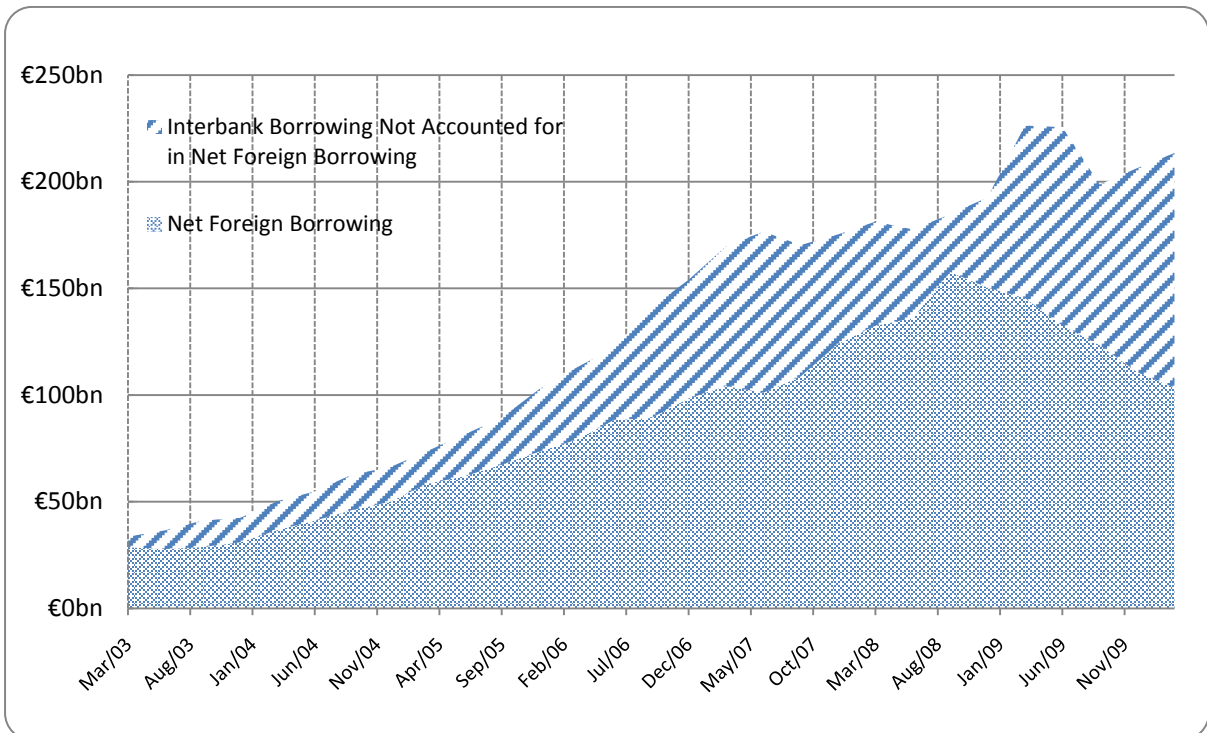Chart 2: Interbank Lending and Net Foreign Borrowing

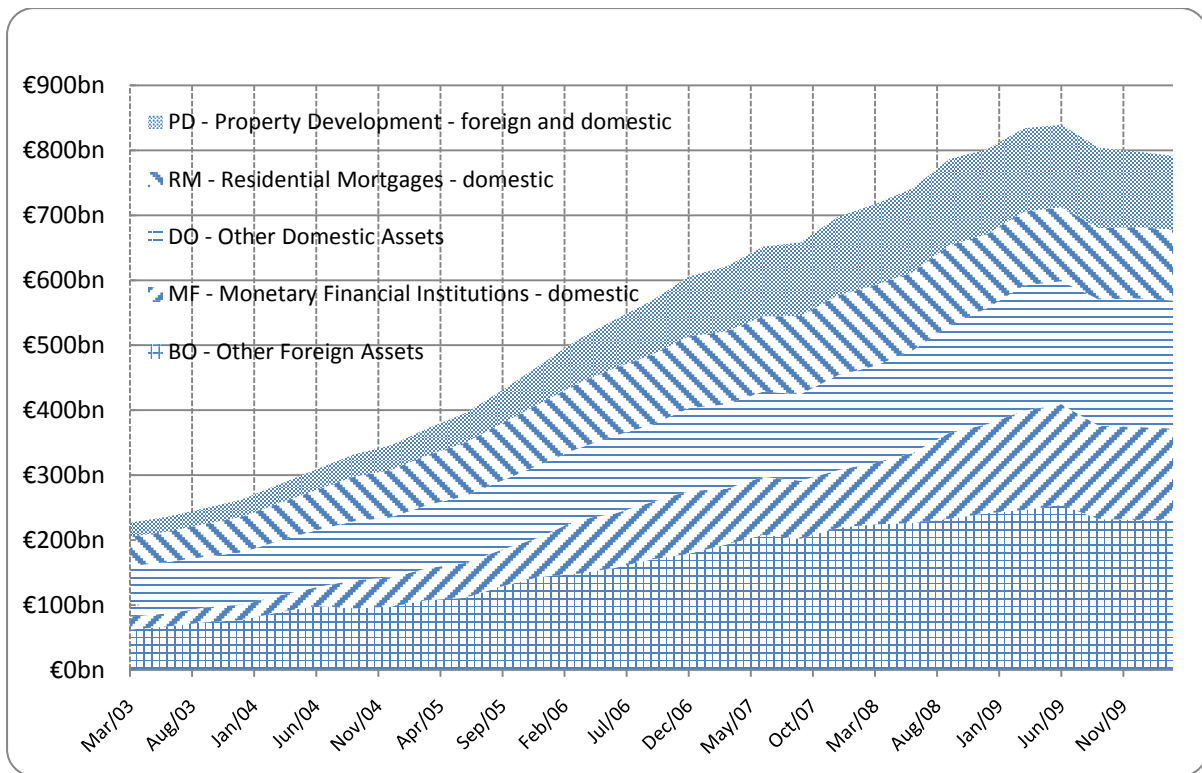## Chart 3: Actual Domestic Banking Sector Aggregate Balance Sheet, Assets

Legend:
- PD - Property Development - foreign and domestic
- RM - Residential Mortgages - domestic
- DO - Other Domestic Assets
- MF - Monetary Financial Institutions - domestic
- BO - Other Foreign Assets

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

Legend:
- PD - Property Development - foreign and domestic
- RM - Residential Mortgages - domestic
- DO - Other Domestic Assets
- MF - Monetary Financial Institutions - domestic
- BO - Other Foreign Assets
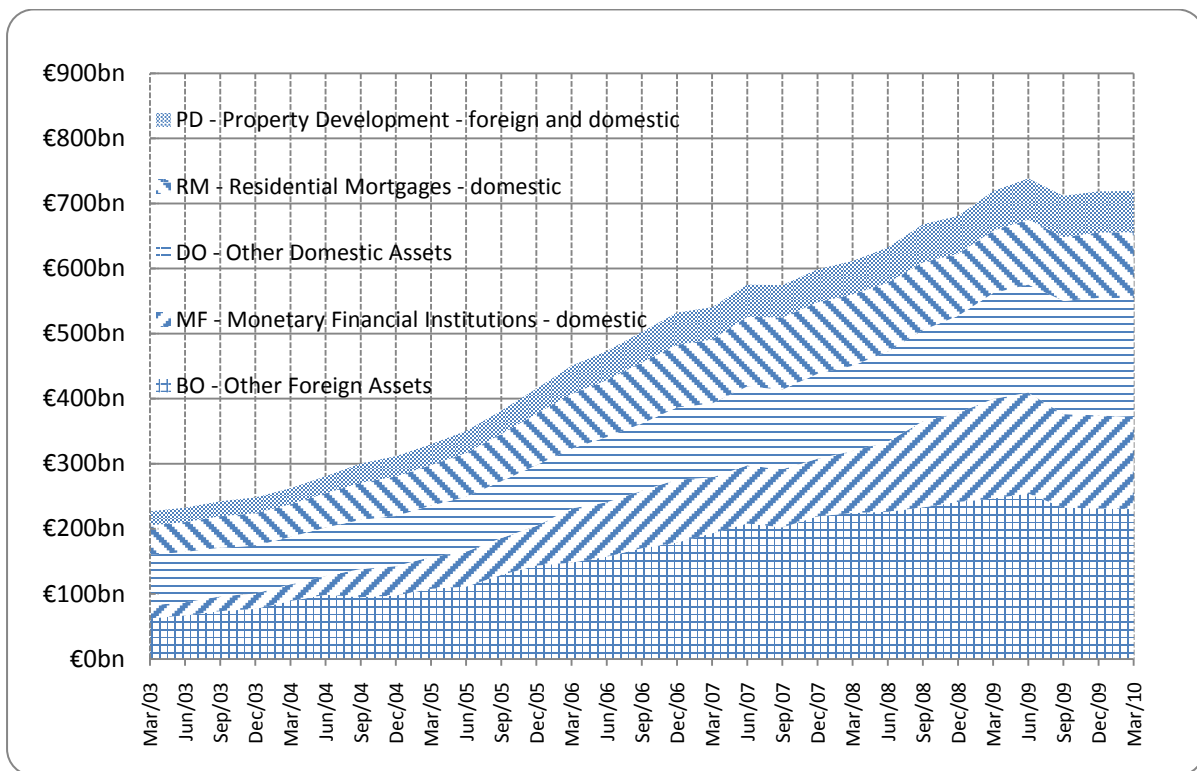
Chart 5: Actual Domestic Banking Sector Aggregate Balance Sheet, Liabilities
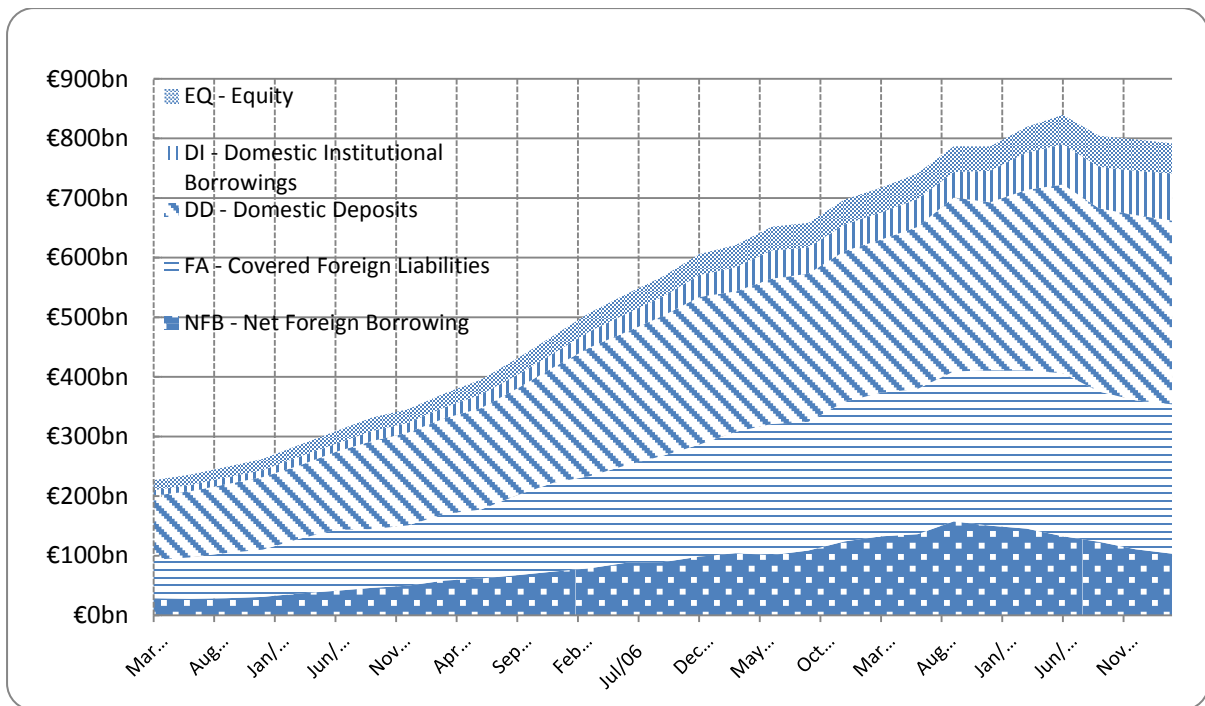
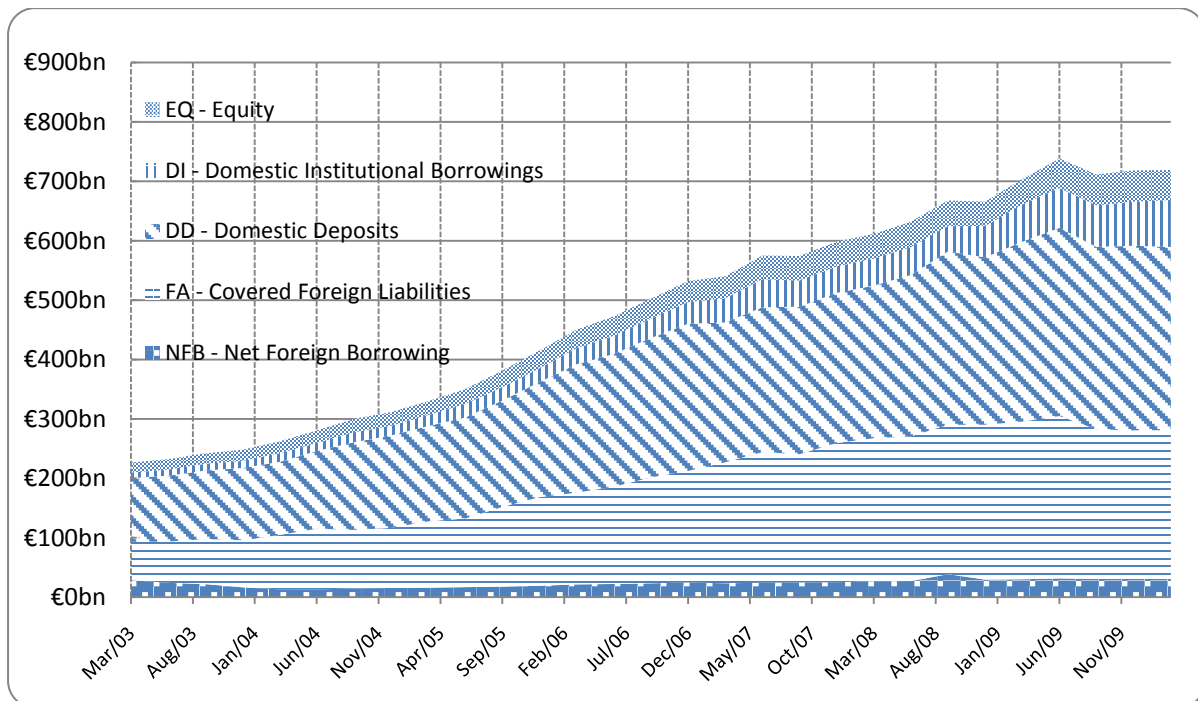Chart 6: Simulated Domestic Banking Sector Aggregate Balance Sheet, Liabilities

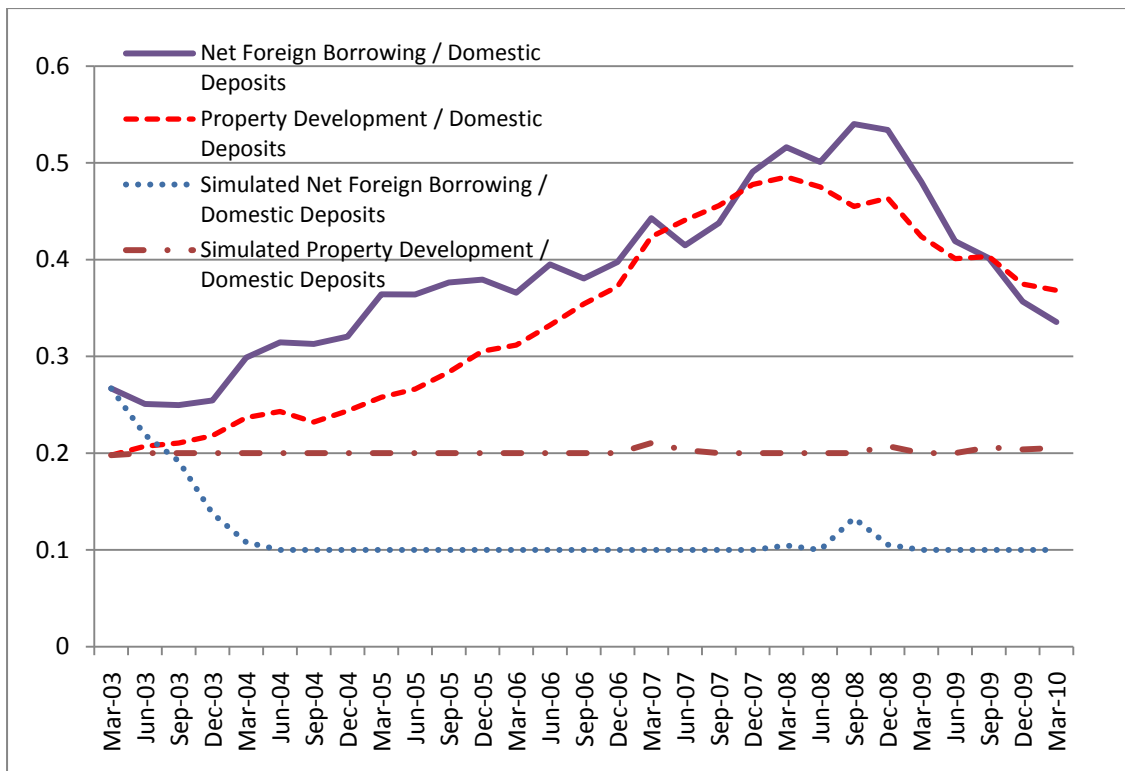Chart 7: Actual and Simulated Paths of Restricted Ratios

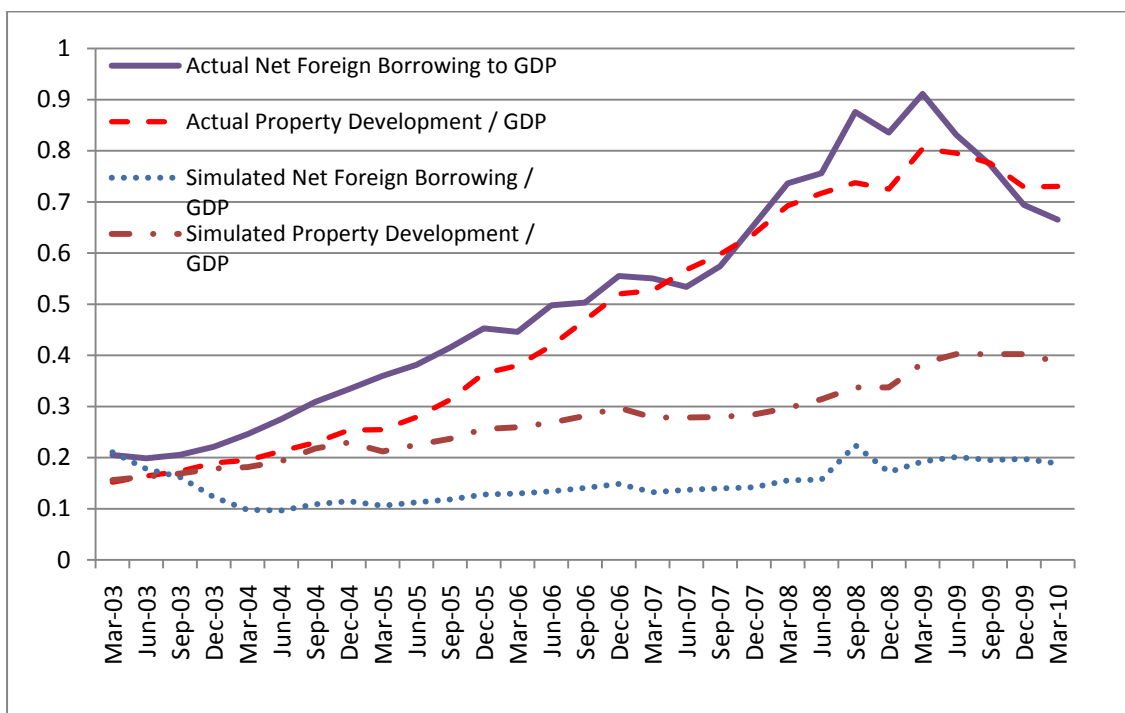Chart 8: Actual and Simulated Paths of Risk Factors

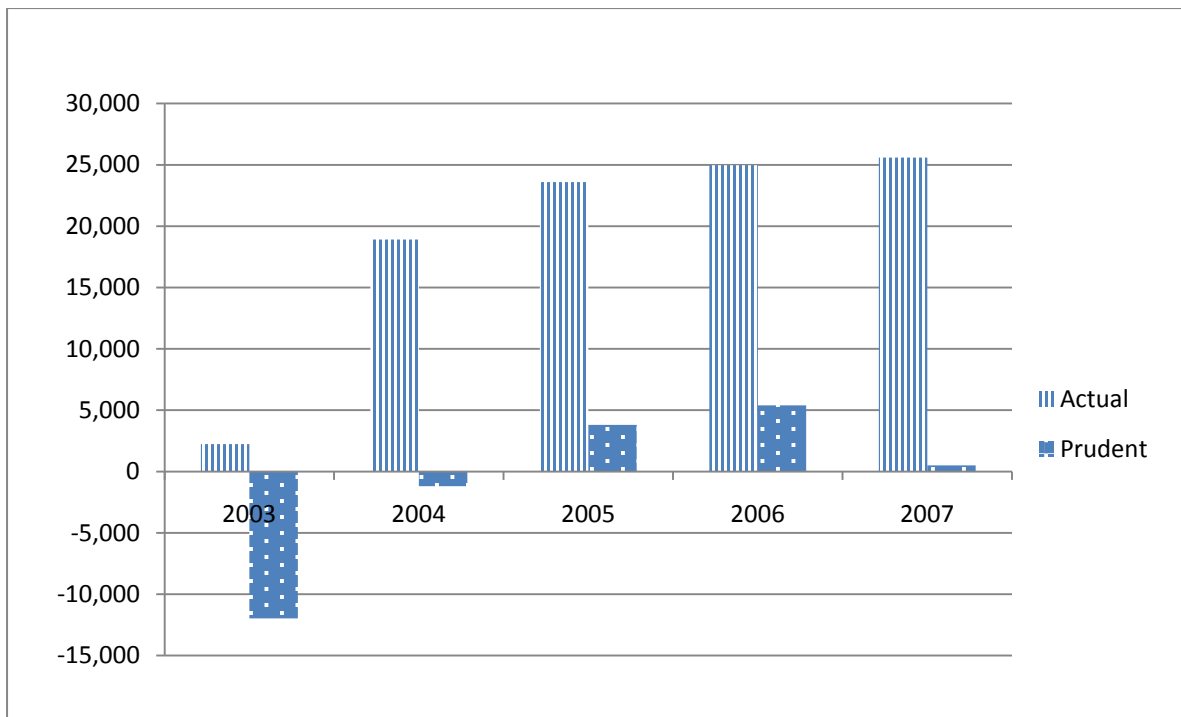Chart 9: Annual Increase in Net Foreign Borrowing (millions of Euros)

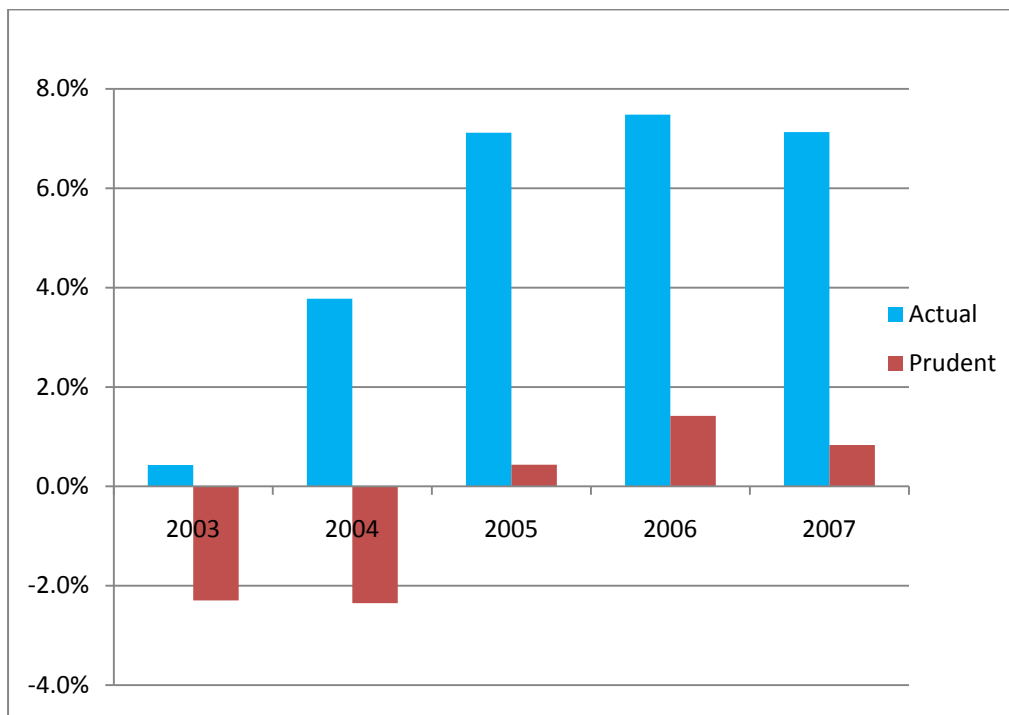Chart 10: GDP Stimulus Associated with Annual Increase in Net Foreign Borrowing

Chart11: Aggregate Real GDP under Actual and Simulated Histories, Relative to their Values in 2002
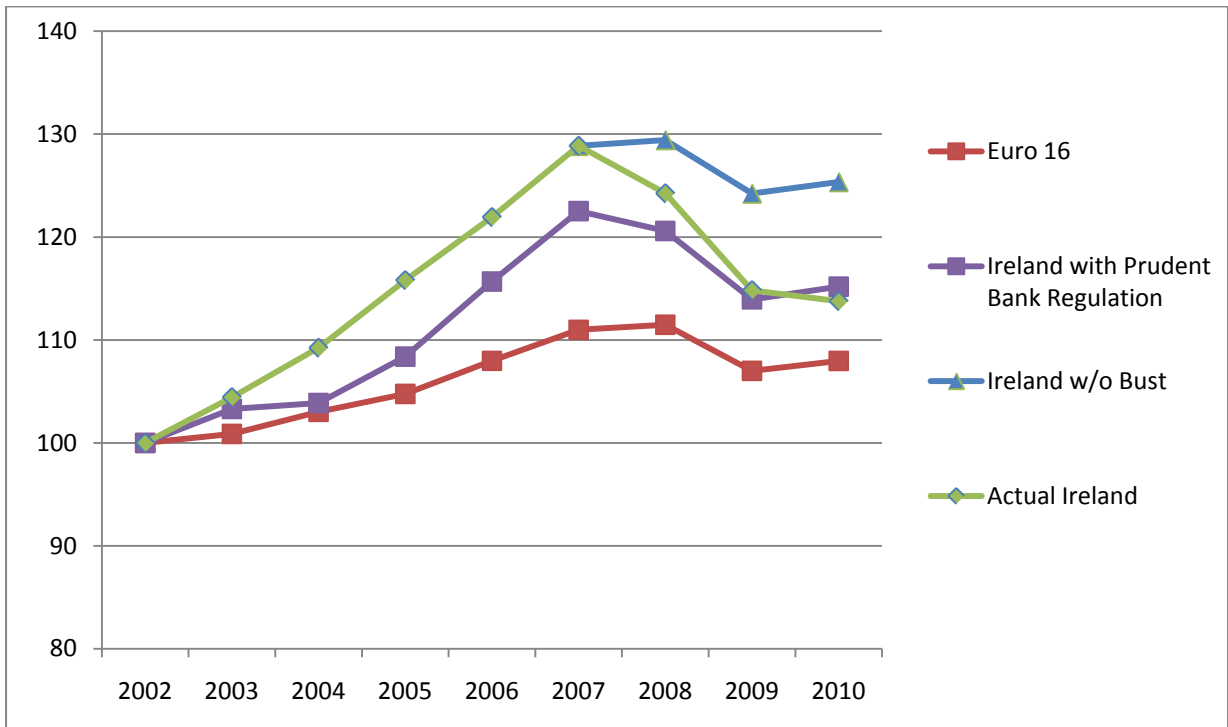

Chart12: Total Real GDP, Per Capita Real GDP and Population, Relative to their Values in 2002
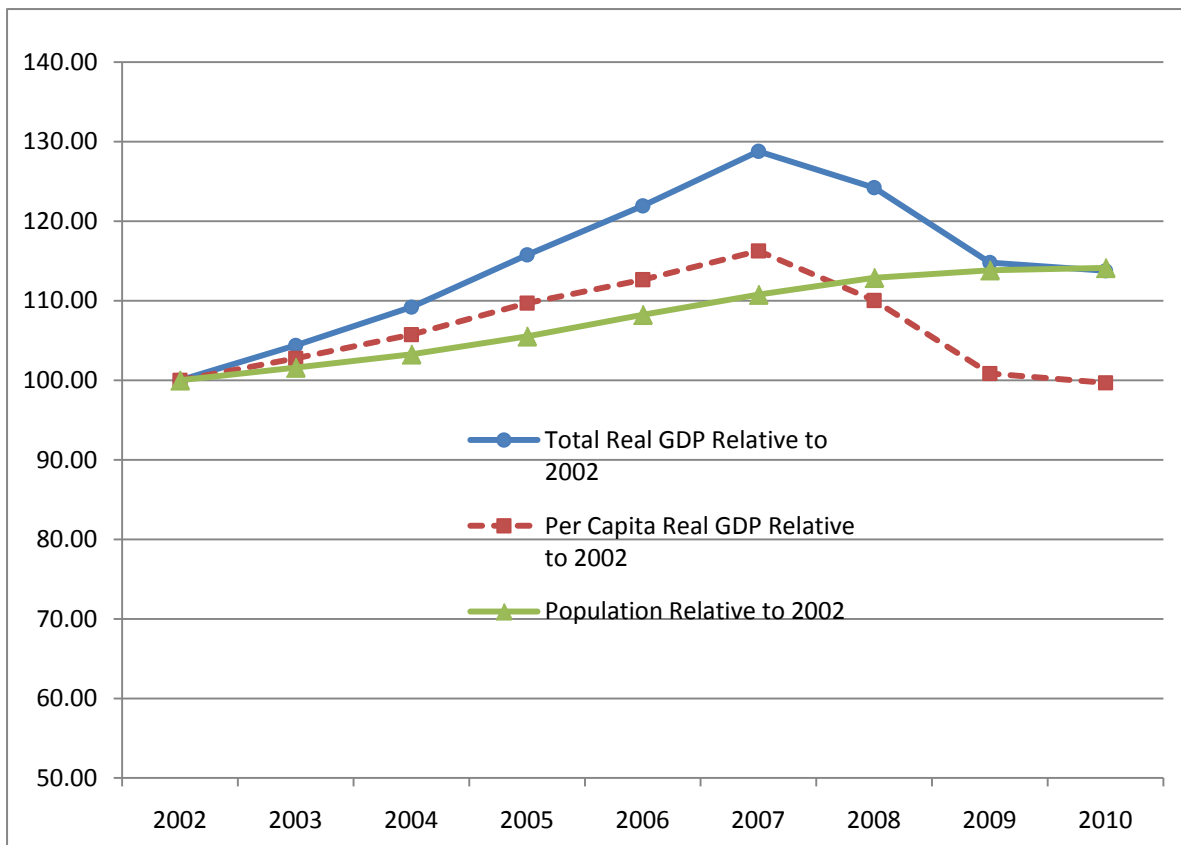
Table 1: Key Risk Features of the Irish Domestic Banking Sector in 2008:Q1 under the Actual and Prudent Regulatory Regimes

	Actual	With Prudent Bank Regulation
Property Development Assets	€124.7bn	€51.4bn
% Total Assets	17.4	7.2
% GDP	69.3	28.5
Net Foreign Borrowing	€132.6bn	€26.9bn
% Total Assets	18.5	3.8
% GDP	73.6	14.9
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 (billions of Euros)

Year	Nominal GDP (Actual)	Nominal GDP (With Prudent Regulation)	Real GDP (Actual, 2002 Price Basis)	Real GDP (With Prudent Regulation)
2003	€140.0	€138.5	€136.3	€134.7
2004	€149.3	€142.0	€142.5	€135.5
2005	€162.3	€151.9	€151.1	€141.4
2006	€177.3	€168.2	€159.1	€150.9
2007	€189.4	€180.0	€168.1	€159.8
2008	€180.0	€174.7	€162.1	€157.3
2009	€159.6	€158.4	€149.8	€148.7
2010	€155.5	€157.4	€148.4	€150.3

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

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
0.58	-€57,500	€50,000	€7,500	€0
0.5	-€46,065	€50,000	€7,500	€11,435
0.25	-€11,632	€50,000	€7,500	€45,868
0.17	€0	€50,000	€7,500	€57,500
----------	----------	----------	----------	----------
0.75	-€80,000	€50,000	€30,000	€0
0.5	-€46,065	€50,000	€30,000	€33,935
0.25	-€11,632	€50,000	€30,000	€68,368
0.17	€0	€50,000	€30,000	€80,000