The World Economy

The World Economy (2012)
doi: 10.1111/j.1467-9701.2012.01482.x

Sliding Doors Cost Measurement: The Net Economic Cost of Lax Regulation of the Irish Banking Sector

Gregory Connor[1] *and Brian O'Kelly*[2]

[1]*National University of Ireland, Maynooth, Ireland and* [2]*Dublin City University, Dublin, Ireland*

1. INTRODUCTION

THE financial and economic turmoil of the years 2007–10 has led to considerable regret among financial and economic policymakers about bad policy decisions at earlier dates. A worthwhile exercise in economic analysis is a careful delineation of the net economic cost of an earlier bad policy decision. Such an analysis is conceptually difficult because it requires a baseline case against which to compare observed economic outcomes. Comparing the actual outcome to that from the *ex post* best possible policy decisions at every juncture gives an unrealistically high benchmark, because 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 be included. It is incorrect to evaluate an earlier past decision based on present and future impacts, since 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 analysing the *ex post* economic cost of an isolated policy decision. We suggest

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 Colm Kearney, Philip Lane, Martin O'Brien and participants in the NUI Maynooth research workshop, the Dublin Economics Workshop, the Lehigh University Conference on the Irish Economy and the Central Bank of Ireland Financial Stability Seminar for helpful comments. We wish to acknowledge support from the Science Foundation of Ireland under grant 08/SRC/FM1389.

the comparison of actual economic outcomes with those that would have emanated from a counterfactual but real-world feasible alternative decision. 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 counterfactual 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. Although we do not follow their particular methodology, we invoke Leeper and Zha's (2003) 'modest policy intervention' theory, in which small variations in policy do not alter agents' rational expectations, thereby circumventing the Lucas (1976) critique of counterfactual policy analysis. We argue that this restrictive evaluation procedure can be illuminating within certain narrow circumstances.

We apply the procedure to the difficult problem of analysing the economic costs of the excessively lax regulation of the domestic banking industry in Ireland during the period 2003–08. The view that the lax regulatory approach of 2003–08 was a policy error is widely accepted; some analysts made this point contemporaneous with this policy period, for example Honohan (2004), Kelly (2007) and many others after the subsequent Irish banking crisis, for example Honohan (2009), Elderfield (2010) and O'Sullivan and Kennedy (2010). It is also established that this lax financial regulatory approach in Ireland contributed fundamentally to the magnitude of the 2008–10 economic crash in Ireland (see Kelly 2009; Honohan et al. 2010; Regling and Watson 2010). We take it as given that this lax regulatory approach was a mistake and analyse the economic costs associated with this policy mistake. Our sliding doors alternative choice is that the strict and prudent financial regulatory approach adopted by the Central Bank and Financial Services Authority of Ireland (CBFSAI) in 2009 was adopted six years earlier.

Our modelling method is related to the microsimulation policy analysis literature, for example Mitton et al. (2000), in which individual household or business balance sheets are reconstructed under a counterfactual policy change, and the impact on broader economic outcomes extrapolated. In our application, we assume that the Irish Central Bank imposed reasonable, prudent controls on the domestic banking industry during the 2002–07 period. Given this counterfactual, we simulate the impact of these controls on the aggregate net balance sheet of the domestic banking sector each quarter and extrapolate the macro-implications.

[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 (Conefrey and Fitzgerald 2010; Regling and Watson 2010) and planning and regional development policy (Kitchin et al. 2010). We attempt to analyse in isolation the effects of the lax controls on bank risk-taking, 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 2008–10 and the deep Irish recession of 2009–10. A few simple, reasonable but prudent regulatory 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 2008–09 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 this policy error in terms of cumulative lost Irish national income over the period 2003–10 are actually negative, as least in total (as opposed to *per capita*) units. The moderated-boom and moderated-bust in national income which would have come with a more prudent regulatory policy have offsetting effects. On the one hand, the policy error contributed substantially to the 11.7 per cent decline in real GDP between 2008 and 2010 (inclusive, with 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 per cent increase in real GDP between 2003 and 2007 (inclusive). It is only the post-2010 impact (because of bank bailout costs and future deadweight costs of fiscal readjustment) that accounts for a negative total effect on cumulative national income of the policy error.

An additional impact of the too lax banking controls on GDP during the 2003–10 period is in the volatility of the annual real growth rate, which is 5.13 per cent per annum in the actual history, falling to 4.08 per cent under prudent banking controls. Large social welfare costs of this policy error, including the 2009–10 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.

There are many limitations in our exercise, as is always true with counterfactual policy analysis, but we try to be open and unprejudicial in acknowledging them and addressing them to the extent possible. The usual critique of counterfactual policy analysis – that not all endogeneity can be accounted for when altering policy inputs – is relevant to our analysis and limits the strength of our conclusions. For example, although *per capita* income might provide a more appropriate metric, we instead use total national income. We do this because net migration flows could be endogenously affected by the counterfactual policy change that we simulate, and modelling this endogeneity would be very difficult. Using a *per capita*

metric, and properly accounting for endogenous population flows, might give a substantially different measure. We also must make heroic assumptions about the link between credit growth and credit balances and macroeconomic outcomes. We state clearly the assumptions made and their impact on our conclusions.

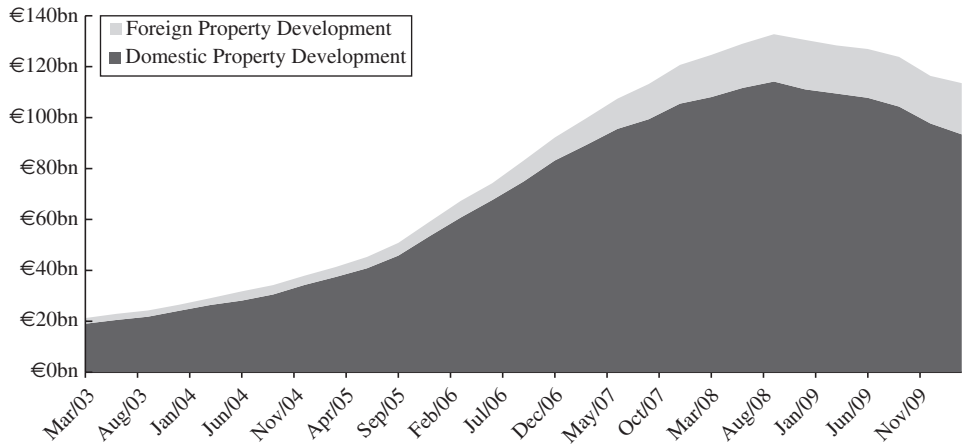
2. A SIMULATED HISTORY OF THE IRISH BANKING SECTOR UNDER STRICT AND PRUDENT REGULATORY CONTROL

In the early years of this century, Ireland had one of the most under-regulated financial regulatory systems 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 banking regulation in Ireland. Rather, it represented the continuation of the extremely lax regulatory system firmly in place at that time. After the credit crisis of 2008, and in particular the Lehman Brothers bankruptcy and the freezing of the interbank lending market, the Irish banking 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 in detail here). Our sliding doors alternative is that strict and prudent regulation of the domestic banking sector was imposed in January 2003 and maintained throughout the 2003–10 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 sector's 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).

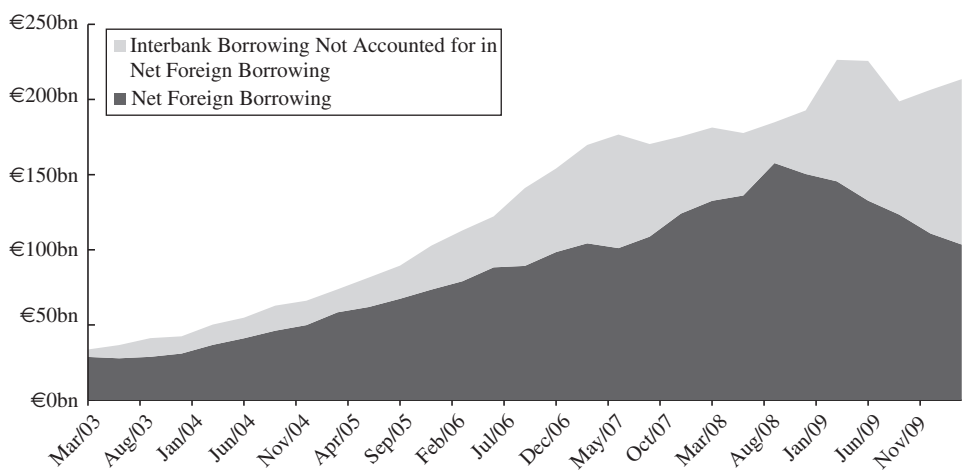
Domestic institutional borrowing (DIB) is a small component of the balance sheet; as interbank borrowing between domestic banks is netted out, DIB consists of a relatively small amount of borrowing from Irish domestic nonbank financial institutions (such as insurance companies) that are not included 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 Figure 1). Property development assets are mostly for domestic projects; only a small proportion is for overseas projects (see Figure 2). It is

FIGURE 1
Foreign and Domestic Property Development Assets of the Domestic Banking Sector



Source: Central Bank of Ireland.

FIGURE 2
Interbank Lending and Net Foreign Borrowing



Source: Central Bank of Ireland.

noted that this domestic-only bank balance sheet does not cover the foreign-regulated subsidiaries of Irish banks such as AIB-GB 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 that strict and prudential regulation by the Central Bank and Financial Service

Authority of Ireland (CBFSAI) led to the following features for Irish domestic bank balance sheets:

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

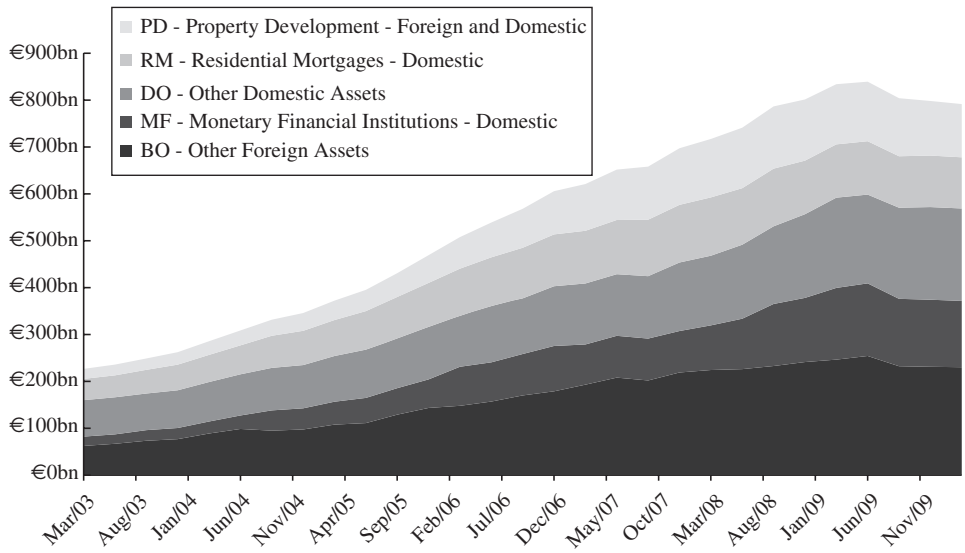
Neither of these conditions is particularly strict. We view them as observable sectorwide features of a reasonably prudent bank regulation system; we do not view them as directly imposed criteria mandated on individual banks. We do not attempt to model in detail how these sensible risk features of the 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 is more than 20 per cent, then we shrink PD and NFB equally until $PD/TA = 20$ per cent. 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, because 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 per cent, then we shrink NFB until $NFB/DD = 10$ per cent. 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 that 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 practise, 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) is greater than 0.20 in a given quarter, then the next quarter we set $PD^*_{t+1} = PD^*_t$ or $0.20 \times DD_{t+1}$, whichever is larger. In step 2, if (NFB_t/DD_t) is more than 0.10 in a given quarter, then for the next quarter we set $AA^*_{t+1} = AA^*_t$ or the value of AA^*_{t+1}that sets $(NFB^*_{t+1}/DD^*_{t+1}) = 0.10$, whichever is larger.

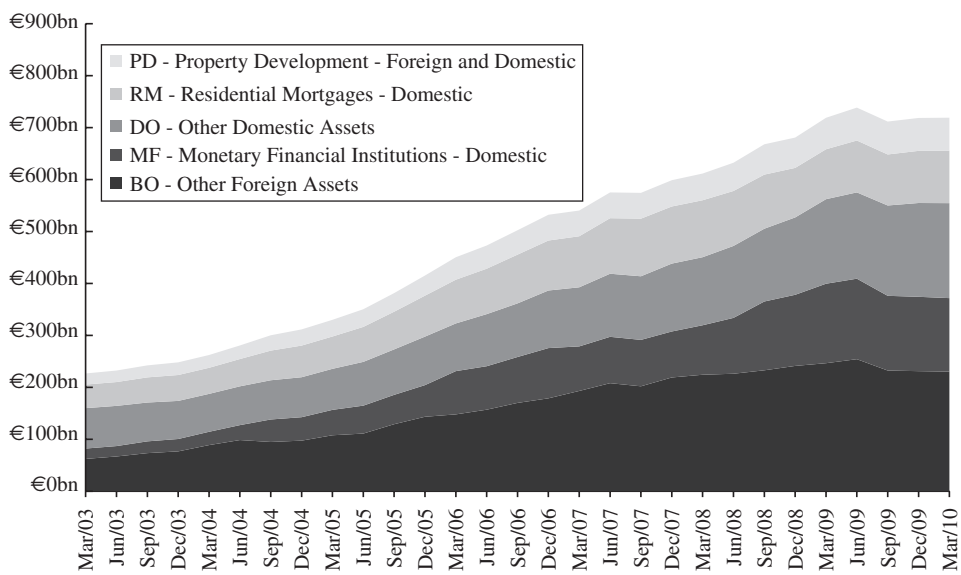
Figures 3–6 show actual and simulated assets and liabilities. Figures 7 and 8 compare the risk features of the actual and simulated balance sheets. Table 1

FIGURE 3
Actual Domestic Banking Sector Aggregate Balance Sheet, Assets



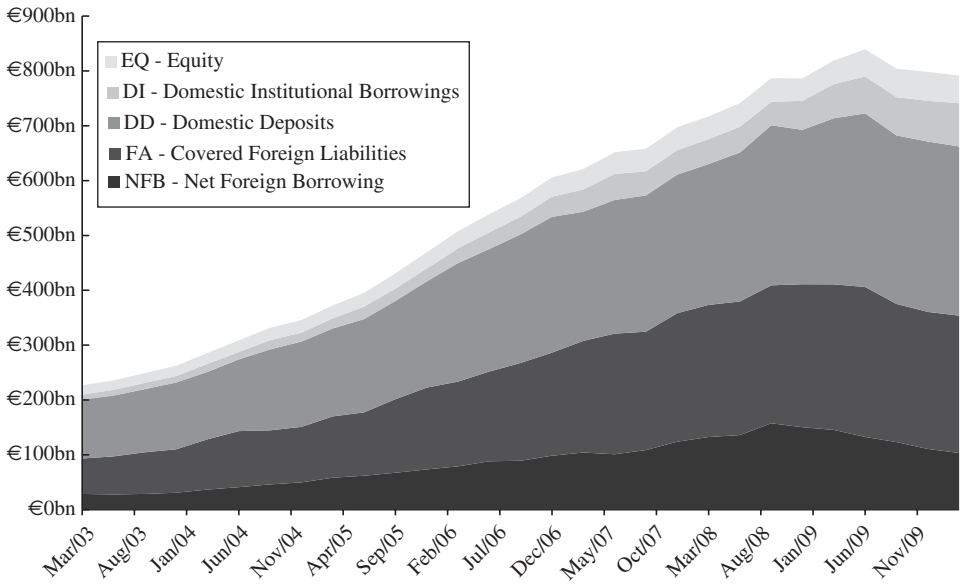
Source: Central Bank of Ireland.

FIGURE 4
Simulated Domestic Banking Sector Aggregate Balance Sheet, Assets



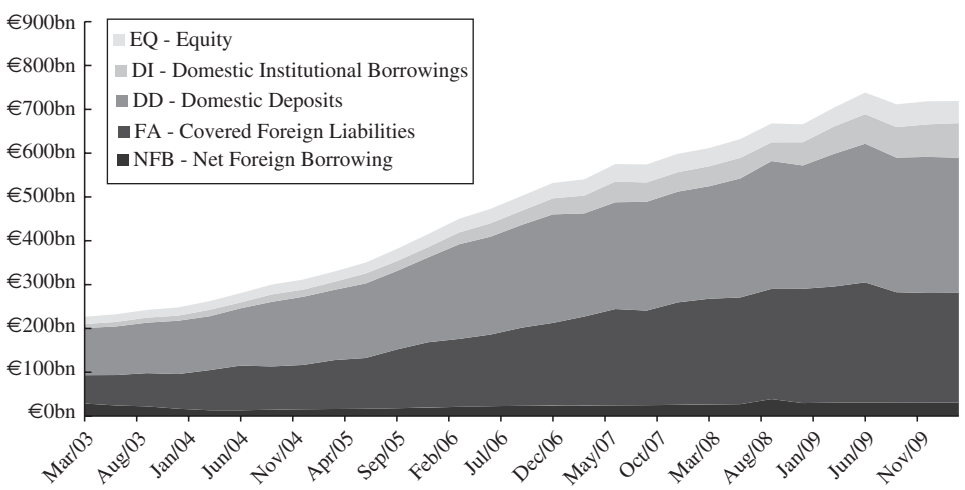
Source: Central Bank of Ireland.

FIGURE 5
Actual Domestic Banking Sector Aggregate Balance Sheet, Liabilities



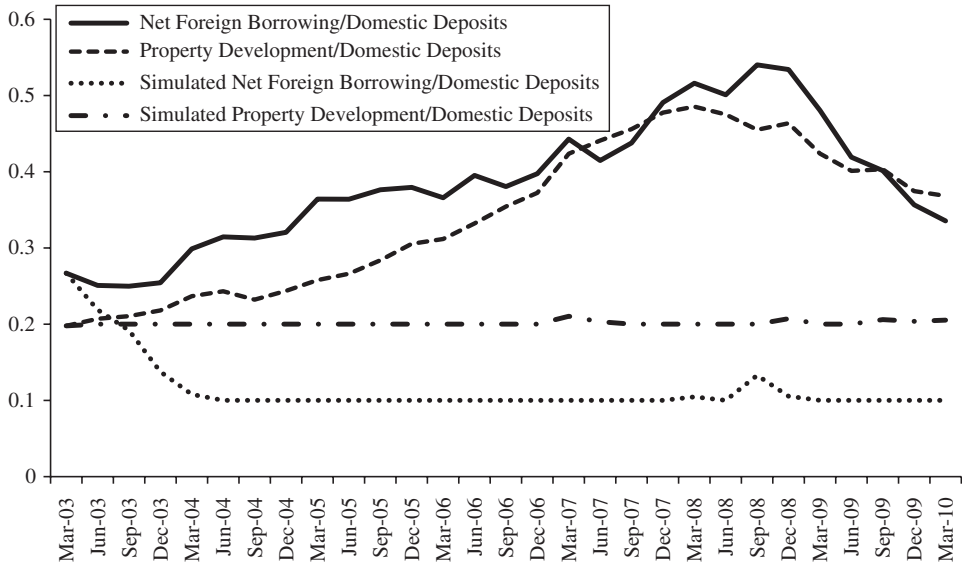
Source: Central Bank of Ireland.

FIGURE 6
Simulated Domestic Banking Sector Aggregate Balance Sheet, Liabilities



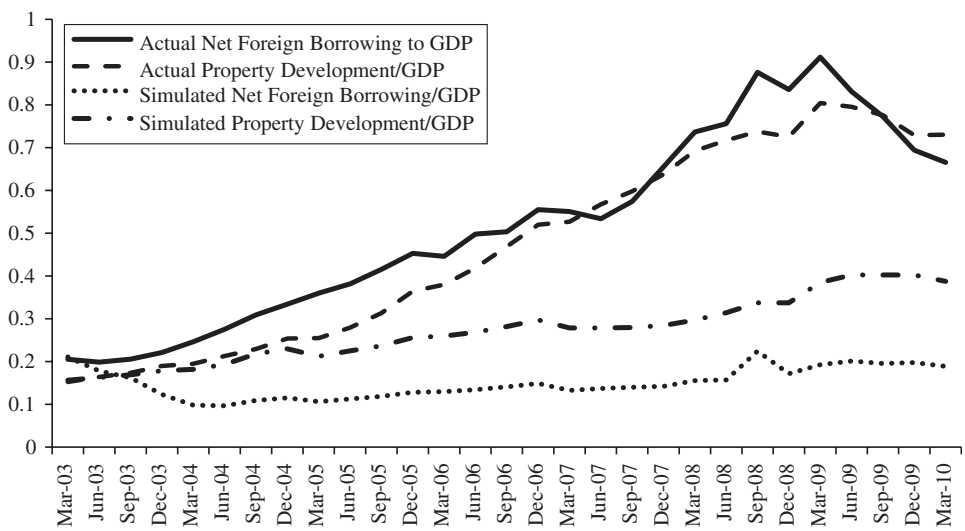
Source: Central Bank of Ireland.

FIGURE 7
Actual and Simulated Paths of Restricted Ratios



Source: Central Bank of Ireland.

FIGURE 8
Actual and Simulated Paths of Risk Factors



Source: Eurostat and Central Bank of Ireland.

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	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

Source: Eurostat and Central Bank of Ireland.

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 cent per annum over this five-year period and total assets also by 19 per cent 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 et al. 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 PRUDENT BANKING SECTOR CONTROLS ON THE GROWTH PATH OF NATIONAL INCOME

This section simulates the impact of the alternative, prudent banking sector controls 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.

a. A Macroeconomic Model with Regime Shift

Following Lane and Milesi-Ferretti (2011), 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; Schularick and Taylor 2009 for related analyses). We call the period 2003:Q1–2007:Q4 the boom period and 2008:Q1–2010:Q4 the bust period.

b. 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 and 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:

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

Assume for simplicity that taxes are fixed. Let B denote government borrowing, we have $\Delta B = \Delta G$, and hence:

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

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

[2] 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 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!

on this macroeconomic impact of foreign capital inflows (see, e.g., Calvo et al. 1996; Fernandez-Ariaz and Montiel 1996; Cardarelli et al. 2010). 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 destabilising 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 destabilising foreign capital inflow intermediated by the banking sector (see Kelly 2009 for related analysis).

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

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

or equivalently

$$\Delta GDP = m\Delta NFB. \tag{4}$$

We use equation (4) because the exogenous increase in net 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.[2] The multiplicative coefficient m is typically called the fiscal multiplier, but in our application, it is better termed the exogenous expenditure multiplier, because the spending shock comes from foreign-borrowing-based property development expenditures rather than government-debt-based government expenditures.

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:

$$FFE_t = \frac{1}{2}\left[(NFB_t - NFB_{t-1}) + (NFB_{t-1} - NFB_{t-2})\right] = \frac{1}{2}(NFB_t - NFB_{t-2}). \tag{5}$$

We use the two-year average increase because 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:

$$GDP_t = A_t + mFFE_t. \tag{6}$$

$$GDP_t^* = A_t + mFFE_t^*, \tag{7}$$

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:

$$GDP_t^* = GDP_t - m(FFE_t - FFE_t^*). \tag{8}$$

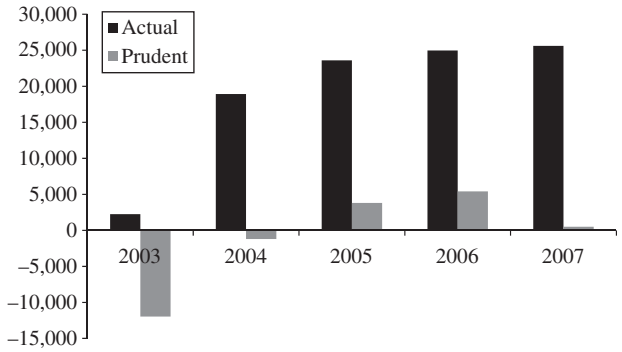
The value of the expenditure multiplier m in equation (8) is crucial to our analysis. There is considerable uncertainty in the literature about its value and how its value varies with circumstances (see Freedman et al., 2009). Barro and Redlick (2011) use annual data on military expenditures by the US government to estimate the fiscal multiplier, getting an estimate of 0.6 to 0.7, but argue that the multiplier for nonmilitary expenditures is likely to be somewhat lower. Auerbach and Gorodnichenko (2010), 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 US. 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. Figure 9 shows the annual increase in net foreign borrowing each year, and Figure 10 converts this into percentage GDP stimulus using equations (5)–(7) with the baseline value of $m = 0.5$.

c. The Credit Crisis Regime

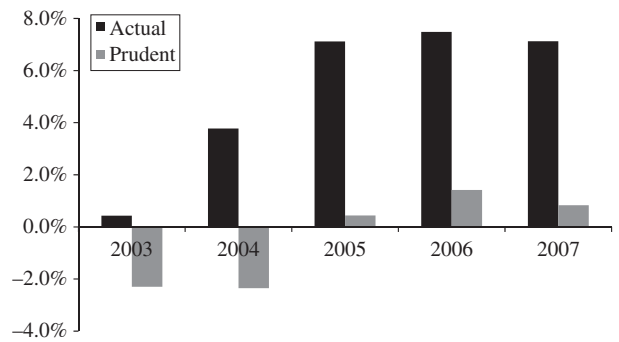
After 2007, the Irish economic regime changes. After this date, a Ricardian-type correction occurs. Economic agents become aware of the dangerous overhang of private indebtedness and adjust their behaviour, leading to an economic contraction. In the 2008–10 bust regime, we rely on the estimates of Lane and Milesi-Ferretti (2011) who find that in developed markets, the increase in the

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



Source: Eurostat and Central Bank of Ireland.

FIGURE 10
GDP Stimulus Associated with Annual Increase in Net Foreign Borrowing



Source: Eurostat and Central Bank of Ireland.

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 *GDP*, $PSCR_t = PSC_t/GDP_t$, 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 (2011) 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:

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

with $h = 0.0733$ from Lane and Milesi-Ferretti (2011, table 6, column 4) and B_t denoting all explanatory variables not differing between the sliding doors simulation and actual history. It is noted that equation (9) applies to real rather than nominal GDP growth rates. Let 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 Harmonised Index of Consumer Prices for Ireland as the source of the annual inflation rate. Applying equation (9) to both the actual and simulated economies and rearranging gives:

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

The PSCR 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 and Milesi-Ferretti (2011) 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 and 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 that recovered more quickly.

Table 2 shows actual and simulated nominal and real GDP based on the model described above. Figure 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 2008–10 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. It is noted 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 per cent 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 1.3 per cent higher under the prudent regime. Furthermore, this difference does not take account of the much higher levels of real GDP in the years 2003–07 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

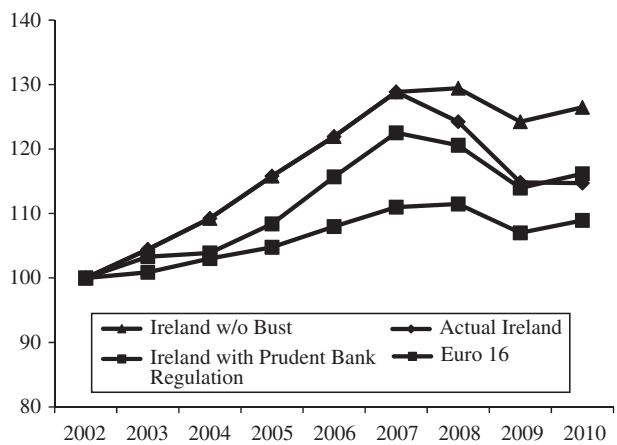
[3] Using 2 per cent to compound/discount cash flows across years.

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	134.8
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	153.9	155.9	149.7	151.6

Source: Eurostat and Central Bank of Ireland.

FIGURE 11
Aggregate Real GDP under Actual and Simulated Histories, Relative to their Values in 2002



Source: Eurostat and Central Bank of Ireland.

of the boom-bust cycle. Other policy errors (in fiscal policy, tax policy and land-use policy) likely played a significant role in exacerbating the cycle.

4. MEASURING THE ECONOMIC LOSSES BECAUSE OF THE LAX REGIME

a. Impact on Cumulative GDP

As shown in Figure 11, lax bank regulation and the associated foreign capital inflow first increased and then sharply decreased, Irish GDP. The investment

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*
0.75	−80,443	70,000	7,500	−2,943
0.5	−46,053	70,000	7,500	31,447
0.25	−11,663	70,000	7,500	65,837
0.1	8,971	70,000	7,500	86,471
–	–	–	–	–
0.75	−80,443	70,000	30,000	19,557
0.5	−46,053	70,000	30,000	53,947
0.25	−11,663	70,000	30,000	88,337
0.1	8,971	70,000	30,000	108,971

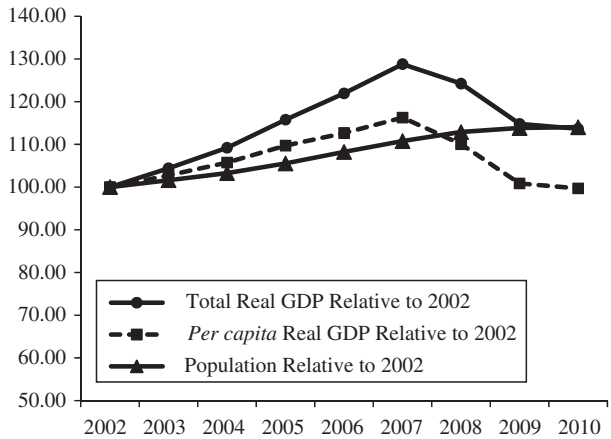
Source: Eurostat and Central Bank of Ireland.

of this capital inflow into negative-return property development assets also left a large overhang of domestic bank losses, which have been substantially 'socialised' by the Irish government's bank bailout policies. Using a risk-neutral present discounted value metric with a risk-free nominal rate of 2 per cent, and comparing the conditional realised GDP paths for the simulated and actual histories, gives a cumulative GDP measure of the cost of the lax regulatory policy (assuming risk neutrality towards income volatility). For the actual GDP history, we also add in the (approximately) €70 billion cost of the bank bailout, which is not yet paid as of 2010 but which will come out of future income as an uncompensated expense. We also include a €7.5 billion deadweight cost, reflecting the future income costs of fiscal and economic re-adjustment that must take place because of the boom-bust cycle.

Table 3 shows the cumulative GDP costs for a range of values of the fiscal multiplier m, because there is considerable uncertainty about the correct value to use in this context. All the costs are stated in nominal 2010 euros, for convenience.[3] In the base case, with $m = 0.5$, the net economic cost in terms of lost GDP is €31.4 billion. A higher value for the multiplier, $m = 0.73$, 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

[4] We treat the €70 billion government expenditure on bank bailouts as entirely 'wasted' expenditure with no utility value to Irish taxpayers. It replaces 'useful' government expenditures or increases taxes, or a combination. The €7.5 billion reflects growth-diminishing shocks associated with the bank crisis, including decreased future income growth associated with higher taxes to pay for the bank bailout.

FIGURE 12
Total Real GDP, *per capita* Real GDP and Population, Relative to their Values in 2002



Source: Eurostat and Central Bank of Ireland.

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 also show an alternative case with deadweight costs of €30 billion in the table.

The aforementioned analysis relies on total rather than *per capita* GDP. Figure 12 compares the growth rates of total and *per capita* Irish GDP over the period. As there was substantial population 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 2008–10 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 per cent. Figure 12 takes no account of the estimated €77.5 billion bank bailout, and readjustment costs, which although not an immediate drain on income, are a substantial downward shock to *per capita* wealth.[4]

What would have happened to Irish *per capita* GDP with prudent bank regulation? 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

[5] Volatility is measured by the time-series standard deviation of annual real GDP growth rates; see Table 2.

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.

b. 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 2003–10 (inclusive), the volatility[5] of actual per annum real GDP growth rate was 5.13 per cent; under the base-case prudent regime, this falls substantially to 4.08 per cent. At a deeper level, the social costs associated with the boom-bust cycle (gyrating unemployment, business distress and 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 an extremely dangerous fiscal imbalance (see, e.g. Regling and Watson, 2010). Cardarelli et al. (2010) conduct an extensive empirical survey of episodes of large capital inflows and their macroeconomic impact. They find that such inflows commonly leave damaging fiscal imbalances in their aftermath, particularly if the national fiscal authorities do not offset the expansionary impact or become reliant on capital-inflow-related taxes. In the Irish case, not all of the painful and dangerous fiscal imbalance consequent to the bank crisis can be directly ascribed to lax bank regulation; it also reflects serious errors in fiscal management during the period. It is arguable that if bank regulation had been more prudent, the Irish fiscal authorities would have found other methods to overstimulate the economy during the period, replacing the capital-inflow-caused boom-bust cycle with a tax-and-expenditure-caused boom bust. There is no way to entirely separate the fiscal policy errors from the lax regulation policy errors; this reflects the limits to knowledge using counterfactual-based policy analysis.

5. SUMMARY

This paper describes a restrictive approach to the analysis of policy errors, an approach that we call sliding doors cost measurement. The procedure relies

on identifying a specific past policy error and counterfactually replacing it with a feasible alternative policy that 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 analysed, by simulating the impact of this alternative decision on economic outcomes and comparing them to the actual outcomes that 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 2003–07 and get useful results.

First, we demonstrate that the extremely lax controls on the Irish domestic banking sector were the pivotal domestic policy error leading to the 2008–10 Irish banking crisis. If Irish bank regulators had acted reasonably prudently over the 2003–07 period, then Irish domestic markets would have been shaken but not stirred by the US-centred credit–liquidity crisis of 2008–09.

Second, the macroeconomic effects of the excessively lax Irish bank regulatory policy were 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, dangerous fiscal imbalance, business distress and labour force dislocation. The impact on cumulative national income, however, is dampened considerably when both the initial income 'boom' and subsequent income 'bust' associated with the policy error are accounted for in the analysis.

REFERENCES

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

Barro, R. J. and C. J. Redlick (2011), 'Macroeconomic Effects from Government Purchases and Taxes', *The Quarterly Journal of Economics*, **126**, 1, 51–102.

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.

Cardarelli, R., S. Elekdag and M. A. Kose (2010), 'Capital Inflows: Macroeconomic Implications and Policy Responses', *Economic Systems*, **34**, 4, 333–56.

Conefrey, T. and J. Fitzgerald (2010), 'Managing Housing Bubbles in Regional Economies under EMU: Ireland and Spain', *National Institute Economic Review*, **211**, 1, 91–108.

Connor, G., T. Flavin and B. O'Kelly (2010), 'The US and Irish Credit Crises: Their Distinctive Differences and Common Features', Irish Economy Note No. 10 (Dublin: Trinity College).

Eichengreen, B. and K. J. Mitchener (2003), 'The Great Depression as a Credit Boom Gone Wrong', Working Paper No. 137 (The Hague: Bank for International Settlements).

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 No. SPN/09/03, March.
Honohan, P. (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**, 1, 180–2.
Honohan, P. (2009), 'Resolving Ireland's Banking Crisis', *Economic and Social Review*, **40**, 2, 207–31.
Honohan, P., D. Donovan, P. Goreckiand 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.
Kelly, M. (2007), 'Banking on Very Shaky Foundations', *The Irish Times*, 7 September.
Kelly, M. (2009), 'The Irish Credit Bubble', Working Paper No. 09/32 (Dublin: University College Dublin School of Economics).
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 (Maynooth: National Institute for Regional and Spatial Analysis).
Lane, P. and G. M. Milesi-Ferretti (2011), 'The Cross-Country Incidence of the Global Crisis', *IMF Economic Review*, **59**, 1, 77–110.
Lavery, B. and T. L. O'Brien (2005), 'Insurers' Trails Lead to Dublin', *New York Times*, 1 April.
Leeper, E. M. and T. Zha (2003), 'Modest Policy Interventions', *Journal of Monetary Economics*, **50**, 8, 1673–700.
Lucas, R. E. (1976), 'Econometric Policy Evaluation: A Critique', *Carnegie-Rochester Conference Series on Public Policy*, 7–33.
Mitton, L., H. Sutherland and M. Weeks (2000), 'Introduction', in L. Mitton, H. Sutherland and M. Weeks (eds.), *Microsimulation Modelling for Policy Analysis: Challenges and Innovations* (Cambridge: Cambridge University Press), 1–10.
O'Sullivan, K. P. V. and T. Kennedy (2010), 'What Caused the Irish Banking Crisis?'. *Journal of Financial Regulation and Compliance*, **18**, 3, 224–42.
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.
Schularick, M. and A. M. Taylor (2009), 'Credit Booms Gone Bust: Monetary Policy, Leverage Cycles, and Financial Crises, 1870-2008', Working Paper No. 15512 (National Bureau of Economic Research: Washington, DC).
Sliding Doors (1998), Written and directed by Peter Howitt, Miramax Films.