

# MODELING MOMENTS OF CRISIS: THE CASE OF IRELAND

S. Kinsella<sup>1</sup> and G. Tiou-Tagba Aliti

## *Abstract.*

Ireland has experienced a series of interlocking banking, fiscal, unemployment and political crises since 2007. We detail the challenges involved in modeling individual moments of the crisis through the lens of the balance sheets and transactions matrices between sectors of the Irish society. A series of recommendations for models of small open economies concludes.

## *What exactly happened to Ireland?*

The goal of this paper is to extract useful lessons for economic modelers from the Irish crisis and its aftermath. In 2007, Ireland's Department of Finance released its annual *Economic Outlook* (page 12) with the following prediction:

The economic and fiscal outlook over the period 2008 - 2010 is as follows: GDP is forecast to expand at an average rate of 3.5% per annum (GNP by just under 3.5%). The average annual increase in employment is projected to be just under 11.5%, with unemployment assumed to average about 5.5%.

In that 2-year period, output as measured by real gross domestic product fell by almost 11%, unemployment rose from just under 4% to over 9%.

How did the authorities get it so wrong?

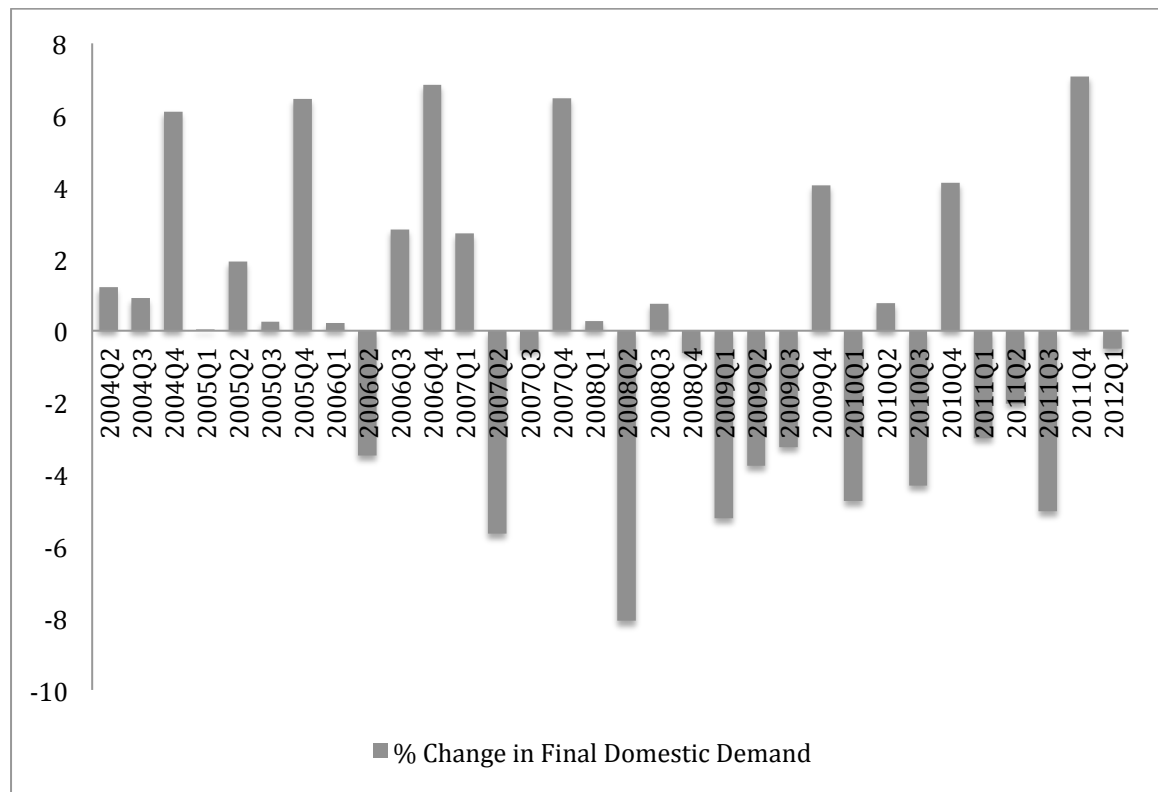
Ireland experienced an old-fashioned asset bubble in the form of a construction boom fueled by cheap credit from 2002 to 2007. During this boom period,

---

<sup>1</sup> Department of Economics, Kemmy Business School, University of Limerick, Ireland. Corresponding author: [stephen.kinsella@ul.ie](mailto:stephen.kinsella@ul.ie). Paper presented at Facultad de Ciencias Económicas y Empresariales, Universidad del País Vasco UPV/EHU, Bilbao, on 14 December 2012 and at the AFEE and ASSA meetings in San Diego, USA, January 4-6 2013, to appear in the *Journal of Economic Issues*. We sincerely thank, but obviously do not implicate, Philip Arestis and Jesús Ferreiro. Financial support from the Institute for New Economic Thinking (INET) is gratefully acknowledged.

unemployment averaged 4% a year; real gross domestic product grew by an average of 4% a year. The ratio of household debt to disposable income increased from 100% to 210%, the highest in the developed world, even as saving as a percentage of disposable income has risen due to precautionary savings, and then fallen as disposable income has dropped.

Figure 1 shows the change in Irish domestic demand, as measured by percentage changes from the previous quarter. Clearly, by 2006, as the Department of Finance's *Economic Outlook* was being written, domestic demand was beginning to slump badly.

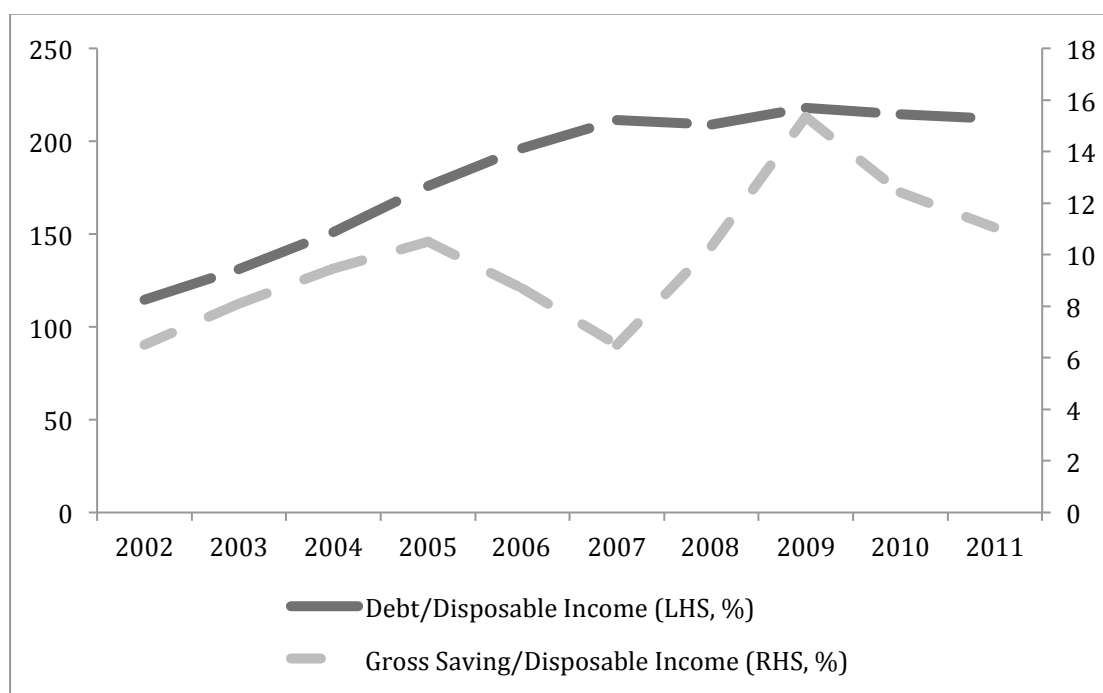


**Figure 1. Percentage change in domestic demand, quarterly. Source: Irish Central Statistics Office.**

The credit crunch of late 2007 brought Ireland's rapid debt accumulation to a sudden stop. Output and employment slumped, and, as we have seen, domestic demand dropped. The State's reliance on highly pro- cyclical tax revenues, especially from capital gains and property sales taxes, combined with an expansion in social protection expenditure, caused a large budget deficit to develop.

The current account swung from highly negative in 2007 to mildly positive in a few years, and government indebtedness as a percentage of gross

domestic product increased over the 2007 to 2011 period from 32% to 108% as a result of borrowing to finance current expenditure and costly bank bailouts, beginning with a blanket guarantee of several banks' assets and liabilities in September 2008. Figure 2 shows the development of this household debt buildup on the left hand axis, and the associated household gross saving to disposable ratio on the right hand side.



A sharp decline in sovereign creditworthiness resulted in Ireland needing a package of loans supplied by the IMF, the European Central Bank, and the European Commission as well as bilateral loans from the United Kingdom, Denmark and Sweden in 2010. This programme of financial assistance coupled with structural reforms, bank deleveraging, and fiscal austerity, is scheduled to end in 2014.

The IMF banking crisis database recently built by Laeven and Valencia (2012) identifies 84 crises resulting in fiscal costs that range from the low single digits (when measured as a percentage of gross domestic product) to over 50% of gross domestic product. Ireland's fiscal cost of its banking crisis will be close to the largest ever.

Ireland issued bonds again after a two-year hiatus in July 2012. A programme of expenditure cuts and tax increases, restructuring of the banking and other sectors, and attempts to deal with the problems of commercial and

residential debt are underway. The unemployment rate has remained above 14% since 2010 and is currently 14.6%.

Ireland in 2012 is faced with a government budget deficit of 8% of gross domestic product, an unemployment rate above 14%, a seriously indebted private sector, banks with damaged balance sheets, and the workout of a series of unsustainable mortgages.

A series of reports into the Irish crisis highlighted the rather obvious fact that very few economists and, more importantly for our purposes, no official model, was able to predict its occurrence (Honohan, 2010; Regling and Watson, 2010; Nyberg 2010). What, therefore, can the Irish crisis teach us about modeling macro-economies?

### *Modeling the Irish crisis*

The Irish crisis has exposed five fundamental difficulties modelers of small open economies in currency unions will always face.

First, in the case of Ireland, the lack of an independent monetary policy simultaneously fueled the credit boom and exacerbated the duration of the bust, as the economy adjusts downwards, essentially through the wage channel (Shin (2008), Lane (2012), McCarthy and O'Callaghan (2012)). Unit labour costs in Ireland have fallen 16% since 2008, and there was a deflation from 2008 to 2009, with unemployment, underemployment, and emigration at record levels in 2012.

In a currency union, it is imperative for small states to remain flexible and to *attempt* to set the policy mix to allow the country to run current account surpluses. This is obviously not possible all of the time for everyone, but close attention by policy makers to current and capital accounts (and, of course, international investment positions) within small open economy models is key.

Second, the existence of an implicit guarantee for bank bailouts can place the solvency of the sovereign into question, thus modelers need to ensure that a realistic channel exists through which banks of sufficient size can impact the sovereign's borrowing rates (Kinsella and Khalil, 2011), and vice versa. Indeed, it is imperative to entertain both monetary and real issues within a single model of

various kinds, as the modeling problem dictates. These can then be estimated using real world data.

Third, the 3 balances approach developed by Wynne Godley (1999) and others should form the heart of any serious model of the open economy. The three balances of government expenditure minus taxation revenue, investment minus savings, and exports minus imports provides the foundation for much of the stock-flow modeling developed since the late 1990s.

Fourth, speaking mathematically (as opposed to, say, in prose!), agents should be modeled as reacting to disequilibria on the basis of partial adjustment functions. There should be no need for rational expectations-type assumptions. Agents can display procedural rationality in the Simonian sense (Simon, 1986, pgs. 210-211 especially) in that they react to new information, have norms, and revise those norms through time without recourse to rational expectations.

Fifth, and closely connected to the modeling of rationality, is the crucial role of expectation formation and in-period behaviour modification based on new information. Households, say, should be able to react to changes in the taxes they face, but also react in future periods based on the (perhaps local) expectations they might have about their future states. Recent work by Lavoie and Daigle (2011) has pointed the way towards integrating Simonian behavioural insights into accounting-based stock flow consistent models.

An open economy model should incorporate all of these features. We have developed a stock flow consistent model of the Irish economy in order to extract lessons for the current crisis, and beyond (Kinsella and Tiou-Tagba Aliti, 2012).

The key lesson from Ireland is that connections between sectors—households, firms, private banks, central banks, and the government—must be modeled explicitly. In addition to addressing the serious theoretical lacunae outlined in points 1—8 above, a suite of macroeconomic models capable of informing policy debates in Ireland should possess the following characteristics, echoing Tobin (1982):

1. Precision regarding time;
2. Model interactions between real and financial sectors;
3. Tracking of stocks and flows;

4. Several assets and rates of return;
5. Modeling of financial and monetary policy operations;
6. Walras' Law and adding-up constraints.

Stock flow consistent models allow these features to be modeled realistically, and tractably. This is a flexible, general, and coherent modeling tool that explicitly models the various interdependencies that link income flows to changes in financial assets, a key failing of modern Dynamic Stochastic General Equilibrium models as identified in the Honohan, Regling and Watson, and Nyberg reports on Ireland's collapse.

In some sense, the balance sheet is the fundamental object in economics. As Minsky (1975, p. 118) has written, "an ultimate reality in a capitalist economy is the set of interrelated balance sheets among the various units, so that one way every economic unit can be characterized is by its portfolio: the set of tangible and financial assets it owns and the financial liabilities on which it owes".

Building on these insights will

*Where next?*

Macroeconomic models which uncritically rely on assumptions like the representative agent to drive their predictions will fail, and fail again, to understand the role of debt and default in shaping the growth trajectories of developed economies. The key insights developed above around debt buildups, interbank and inter-sectoral flows, and sectoral reactions to changes within their environments, could most usefully be simulated using an agent-based or network approach, and then estimated using a stock flow consistent or sectoral balance approach

Policy makers do not rely on mainstream models' predictions for their policies. That should tell us something about the models' efficacies as tools to guide action.

Building a range, or menu, of models to understand specific aspects of the economy—from flows of funds to agent based models of portfolio allocation to stock flow and network models—embraces a plurality of approaches that accepts, at its heart, that there is no one true model to rule them all, only more or less convenient stories to understand recurrent patterns in the data.

The Irish case should be used by modelers as a test—does your model, back tested on Irish data, forecast the probability of a crisis coming from debt buildups in the private sector as rising from 2004 to 2007? If not, why not? Does your model allow for a sectoral explanation of unsustainable processes? If not, why not? What Procrustean assumptions does your model make that denies this obvious reality, and why?

The importance of the Irish case is that it is not unique. There is nothing special about Ireland's construction boom and bust. It was a very old-fashioned one. The core lessons are transferrable to other times and other countries. For that reason modeling moments of crisis using the Irish case makes sense.

### *References*

- Honohan, P. "The Irish Banking Crisis, Regulatory and Financial Stability Policy 2003-2008." available at <http://www.bankinginquiry.gov.ie/>, 2010.
- Kinsella, S. and Khalil, S. "Debt-deflation Traps Within Small Open Economies: A Stock-flow Consistent Perspective" in *Contributions in Stock-flow Consistent Modeling: Essays in Honor of Wynne Godley*, edited by Papadimitriou, D. B. and Zezza, G., Palgrave Macmillan, 235–265, 2011.
- Lane, Philip R. The European Sovereign Debt Crisis, *Journal of Economic Perspectives*, 26(3): 49-68, 2012.
- Lavoie, M., and Daigle G. "A behavioural finance model of exchange rate expectations within a stock-flow consistent framework." *Metroeconomica*, 62(3), 434–458, 2011.
- McCarthy, C. and O'Callaghan G. EMU 2.0: Building a Durable Monetary Union in the Eurozone, available at <http://www.hnb.hr/dub-konf/18-konferencija/mccarthy-ocallaghan.pdf>, 2012
- Nyberg, P., "Report of the Commission of Investigation into the banking sector, Misjudging risk: Causes of the systemic banking crisis in Ireland." available at <http://www.bankinginquiry.gov.ie/>, 2011.
- Regling, K. and Watson, M. "Preliminary report on the sources of Ireland's banking crisis." available at <http://www.bankinginquiry.gov.ie/>, 2010.
- Shin, H. S. Risk and Liquidity in a Systemic Context, *Journal of Financial*

*Intermediation*, 17(3), 315-329, 2008.