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"The Macroeconomics of Long-Term Economic Value"

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The Macroeconomics of Long-Term Economic Value

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1 Introduction

In line with the European Commission framework, the NAMA draft legislation proposes to incorporate "long-term economic value" in the method employed to determine the appropriate transfer value for loans to be acquired by NAMA from the banks that participate in the scheme. In principle, long-term economic value may be interpreted as corresponding to the expected "hold to maturity" value of a loan.

Its use can be defended on several grounds. First, where a loan is to be acquired from a bank on a voluntary basis, the transfer value should correspond to the internal shadow valuation that a bank may reasonably apply to a loan on its books.

Second, in the banking and finance literature, a key role for banks is to fund long-term investment projects, where the full value of the underlying asset is only realised over time. If funding for such projects is interrupted, the disposal value of a loan that is backed by an incompletely-developed asset lies below its potential long-term value were the project to be completed. (Clearly, this point only applies to a fraction of the loans held by Irish banks, since it does not apply with the same force to loans that are backed by mature assets.)

Indeed, this characteristic helps to explain why banks exist and why bank loans rather than "marked to market" securities play a dominant role in funding long-term projects. It also helps to explain why banking crises are so costly and how there are self-reinforcing amplifying dynamics between credit conditions and collateral values. During periods of easy

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credit, asset values rise which in turn may tempt some investors to exploit rising collateral values to over borrow and invest in marginal-quality projects. In the other direction, a credit crunch leads to a decline in asset values and the non-completion of otherwise-viable projects. While the ideal solution is for the financial regulator to engage in counter-cyclical measures and avoid the occurrence of a crisis, these amplification dynamics also provide an explanation why market values can fall below long-term economic value if regulation in inadequate and a crisis does indeed occur. (For a classic model of banking, see Doug Diamond and Philip Dybvig: "Bank runs, deposit insurance, and liquidity," *Journal of Political Economy* 91(3), 401–419. On the interplay between liquidity and collateral values, see Nobu Kiyotaki and John Moore, "Credit Cycles," *Journal of Political Economy*105, 211-248).

In addition, the nature of financial markets mean that persistent gaps may emerge between the the fundamental value of an asset and its current market price. The "limits to arbitrage" literature explains why a persistent gap may emerge, since arbitrageurs may not have access to sufficient liquidity to quickly close the gap between the fundamental value and the current market price. (The classic paper is by Andrei Shleifer and Robert Vishny: "The Limits of Arbitrage," *Journal of Finance* 52(1), 35-55.) This mechanism explains both why bubbles may not be quickly punctured and why post-bubble market crashes may "overshoot" in the downwards direction.

For these reasons, there is a *prima facie* case to employ long-term economic value in determining the price for loans that will be transferred from troubled banks to NAMA. However, a major implementation challenge facing NAMA is to develop a high-quality model of long-term economic value. Here, I focus on the long-term economic value of the underlying property assets. (Other factors also matter in valuing loans, such as the cost of capital.)

Such a model should have both macroeconomic and microeconomic dimensions. Macroeconomics is required in order to establish the likely economy-wide evolution of average property values, while microeconomics is required to model the cross-sectional dispersion of individual properties around the average value. (Since the NAMA valuation method will be applied on a loan-by-loan basis, the individual characteristics of each loan and property asset must be modelled.) The microeconomic task can be fulfilled by those with expertise in property valuation.

In this note, I consider some methodological issues in the macroeconomics of estimating

long-term economic value. In addition, I make some points about the implementation of such methods in relation to the current Irish situation.

2 Estimating Long-Term Economic Value

We can write (in logs) the period-t assessment of the long-term nominal economic value of some property i

$$NV_{it} = NV_t^* + NVDEV_{it} \tag{1}$$

where NV_t^* is the long-term nominal economic value of the aggregate property holdings in a country (as might be captured by the composition of an overall property index) and $NVDEV_{it}$ is the deviation in the nominal value of property i from the aggregate value. This deviation term will reflect the site-specific characteristics of property i. Macroeconomics is concerned with the modelling of V_t^*, while microeconomics (in particular, applied property valuation techniques) is primarily concerned with the estimation of $VDEV_{it}$. In what follows, I focus on the macroeconomic dimension.

An empirical macroeconomic model of NV_t^* will typically have the following elements. First, nominal economic value (in logs) of property is the sum of the nominal consumer price level and the real (that is, inflation-adjusted) economic value of property. We can write (in logs)

$$NV_t^* = P_t^C + V_t^* \tag{2}$$

such that we need to determine the evolution of the consumer price level and the dynamics of the real economic value of property.

Regarding the latter term, long-term real economic value may be linked to a set of macroeconomic characteristics. Such a model may be represented as

$$V_t^* = f(X_t^*) \tag{3}$$

where the X vector may include real disposable income per capita, the level of long-term real interest rates, the size of the population and the demographic structure of the population.[1] Importantly, the long-term economic value of property is linked to the long-term value of

[1] Long-term macroeconomic models are typically separable between the determination of the "real" (that is, inflation-corrected) value of variables and the determination of long-run inflation. I return to this point in Section 3.

each of these driving factors, such that long-term projections for each of these variables are required.

In addition, the nature of the functional form $f()$ must also be modelled. A log linear form is typically assumed (where, in some cases, some nonlinearity can be incorporated by including the squared and higher-order values of some driving variables)

$$V_t^* = \beta' X_t^* \tag{4}$$

where the vector of β coefficients determine the sensitivity of long-term property values to shifts in the long-term value of the various X variables. Accordingly, the values of the β coefficients are critically important in determining the long-term economic value of property.

One approach is to impose the values of the β coefficients from an underlying theoretical model of the economy, in which the β coefficients are derived from the "deep" parameters of utility functions and production functions. However, the limitations of theoretical models mean that such an exercise must be subject to great uncertainty.

Another approach is to use data to estimate the β coefficients. This can be done if we assume that market prices closely correspond to fundamental economic value over the long run, such that

$$RPP_t = V_t^* + \varepsilon_t \tag{5}$$

where RPP_t is the real (inflation-adjusted) property index and the residual term ε_t reflects the deviation in period t of the period-t market price from long-term economic value. Over a long sample period, the average value of ε_t will be zero. Accordingly, we can back out V_t^* from a "cointegration" estimation approach that infers the long-term β coefficients from the joint modelling of $(RPP_t, X_t, \varepsilon_t)$.

While it is certainly important to implement such an approach in order to establish a baseline estimate of long-term economic value, it is also vital that such estimates are interpreted with care. First, the estimates of the β coefficients will be subject to imprecision, such that the estimation process is better viewed as establishing a plausible range for these coefficients rather than unique values. Second, the β coefficients relate V_t^* to the long-term value of the X variables - it is still necessary to take a view on the long-term evolution of the X variables. Third, it is possible that the β coefficients are subject to structural change: the estimated values over an historical time period may not provide a perfect guide to the future. Fourth, the speed by which actual property prices converge

on long-term economic value is subject to uncertainty. Although "cointegration" models typically do provide ancillary estimates of average convergence speeds, these may not apply in relation to recovery from severe crises.

A key issue is the selection of the appropriate sample to estimate the model. While it is possible to run such a model just on Irish data, there may be considerable gains to also examining the data for other countries that share a similar economic structure to Ireland, since a larger panel data sample may enable more precise estimation. The concern is whether the relation between property prices and the X factors in other countries is sufficiently similar to the Irish case for the extra data to be useful.

Similar considerations apply to estimating the speed of convergence to long-term economic value. Again, panel estimates of the "error correction mechanism" may be helpful. In addition, it is possible to investigate non-linearities in the adjustment process by examining the recovery process from crisis episodes in other countries. In relation to the latter, it is important that due account is taken of the factors that explain variation in recovery speeds across the various crisis episodes, in order to identify the case studies that would have the most predictive power for the current Irish situation.

3 Some Implementation Issues

As is clear from equation (1), a key issue in projecting long-term property values in Ireland is the likely future evolution of the aggregate consumer price level. Even if there were a well-performing model linking inflation-adjusted property values to real disposable incomes per capita, real interest rates and other inflation-adjusted variables, it is necessary to take a position on the evolution of the Irish price level.

This is especially important, since the historical inflation data will not provide a good guide to the future for two reasons. First, the high inflation of the 1970s and early 1980s was *sui generis* for well-known reasons and central banks across the advanced economies have successfully subsequently established improved methods to keep inflation at a relatively low level.

Second, as a member of EMU, the Irish price level (in logs) is best interpreted as the sum of two components: the EMU-wide price level and the deviation of the Irish price level

from the EMU average level

$$P_t^{IRE} = P_t^{EMU} + PDEV_t^{IRE} \tag{6}$$

where the evolution of P_t^{EMU} is determined by the performance of the ECB in controlling area-wide inflation and the dynamics of $PDEV_t^{IRE}$ reflects shifts in the price level in Ireland relative to other member countries. Regarding the former, the ECB has a target inflation rate of 'close to but below' 2 percent. While there is a lively debate about whether the exit from the current international crisis may entail a transition period of above-target inflation, a 2 percent annual trend is a reasonable project for area-wide inflation.

Regarding the latter, the $PDEV_t^{IRE}$ term is just the Irish real exchange rate (vis-a-vis the other EMU member countries)

$$RER_t^{IRE} = PDEV_t^{IRE} = P_t^{IRE} - P_t^{EMU} \tag{7}$$

There is a considerable domestic and international literature on the behaviour of the long-run real exchange rate. For instance, at the international level, the most comprehensive applied modelling effort is conducted by the International Monetary Fund via its Consultative Group on Exchange Rate (CGER) assessments.

In relation to the current Irish situation, the research literature indicates that a sustained period of real exchange rate depreciation may be expected for Ireland. This theme is reflected in the ongoing domestic debate on competitiveness, with many analysts suggesting that the Irish price level needs to decline by a substantial amount relative to the price levels in our trading partners if the export sector is to expand to take up the slack from the collapse in the construction sector and other domestically-orientated activities. To a large extent, the factors driving real exchange rate depreciation just mirror the forces that led to significant real appreciation against other EMU member countries during the boom: between end-1998 and end-2008, the Irish price level grew by a cumulative 13.3 percent relative to the EMU average price level. Accordingly, the prospect of significant real exchange rate depreciation over the coming years may be an important drag on the evolution of nominal property prices in Ireland.

In regard to the other long-run factors driving long-run property values, the NAMA valuers can incorporate the projections for growth in GDP per capita, real interest rates and population size by agencies such as the ESRI and the European Commission. By relying on independent forecasts, there will be greater confidence in the objectivity of the

NAMA valuation method. However, it is abundantly clear that these projections are bound to be quite imprecise for a small, flexible economy such as Ireland, given the influence of international capital flows, international migration flows and international productivity trends in determining Irish economic performance, in addition to the impact of domestic factors such as the participation rate in the labour force and the influence of policy variables such as taxation policy and the level and quality of public investment.

In addition to providing estimates of the evolution of long-term economic value over the coming years, it is also necessary for NAMA to take a stand on the nature of the convergence process towards the long-run equilibrium. While the current credit crunch represents an important mechanism that acts to push current asset values below long-run equilibrium values, it is also true that current market prices may still be influenced by expectations that formed during the peak of the bubble period, with this 'backward-looking' influence on asset prices pushing in the opposite direction.

Accordingly, it is important that the NAMA process recognises the inevitability of such uncertainty in determining long-term economic values and the nature of the convergence process. For this reason, as has been suggested by Patrick Honohan, a two-part pricing mechanism is optimal by which the initial payment for a loan reflects a discount on the 'best current estimate' for long-term economic value, with a deferred second payment that will reflect the ultimately-realised loan value.