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Ireland: Selected Issues

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IRELAND

Selected Issues

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Approved by European Department

July 12, 2005

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I. FAVORABLE FISCAL OUTTURNS: IS IT JUST THE LUCK OF THE IRISH?[1]

A. Introduction

1.   **Since the early 1990s, Ireland's fiscal position has improved significantly.** Fiscal consolidation resulted in a tremendous reduction in public debt from nearly 100 percent of GDP in 1991 to about 30 percent in 2004. This has reflected a combination of policy decisions and economic circumstances. Excluding 2001 when the economy was affected by the global economic slowdown, Ireland has in general consistently enjoyed favorable surprises in its public finances. Indeed, during this period, the actual fiscal outturns have exceeded budget forecasts on average by 0.3 percent of GDP a year. Has this been a reflection of prudence in budget forecasts or is it just luck?

Forecast Error: Fiscal Balance

(Actual minus Forecast, in percent of GDP)
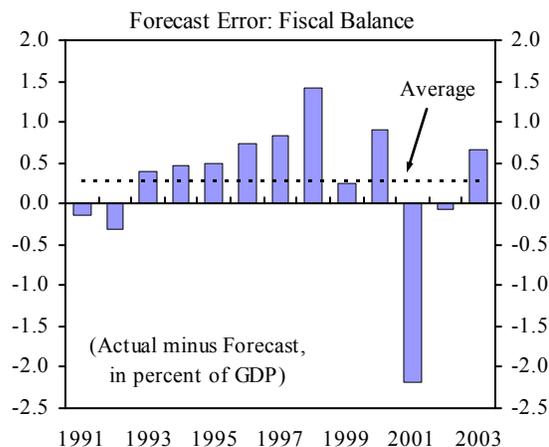
2.   **The objective of this paper is threefold.** First, it compares Ireland's budget forecasting record with that of other industrialized countries. This comparison makes it possible to assess to what extent the favorable fiscal outturn was Ireland-specific. Second, the paper gauges the main factors affecting the Irish budget forecasts taking into account the institutional environment governing fiscal policy. Third, it discusses some implications for public finances going forward in the context of possibly lower potential growth and significant pressure to raise public spending in Ireland.

3.   **The analysis presented here suggests that a sustained sequence of stronger-than expected growth and buoyant asset price developments were key contributing factors to the favorable budget surprises in Ireland.** Budget macroeconomic projections did not differ much from outside forecasts, including the ESRI, a non-governmental think-tank in Ireland, and World Economic Outlook (WEO). Prudence in preparing budget estimates also played some role. Budget estimates have been based on cautious assumptions regarding tax elasticities. Thus, a combination of stronger growth and a prudent approach employed by the budget in forecasting revenues produced consistent revenue overperformance during this period. However, revenue overperformance was in large part offset by increases in expenditure. As a result, despite the larger upside surprises on growth experienced by Ireland compared to other industrialized countries, the forecast error for the fiscal balance was not significantly large in Ireland's case.

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[1] Prepared by Keiko Honjo.

B. Methodology

4.   **The paper uses the methodology employed by Muhleisen et al. (2005) to assess Ireland's budget forecasts**. The benchmark group used for comparison purposes consists of 11 countries: the United States, Germany, United Kingdom, France, Italy, Canada, Australia, New Zealand, the Netherlands, Sweden, and Switzerland. Following Muhleisen et al. (2005), the paper compares budget forecasts against the actual outturns reported in the budget two years later to allow for revisions.[2] For example, when budgets for Ireland are published in December, the actual outturn for the previous year is still preliminary and subject to considerable changes. The advantage of using the reported data in the subsequent budget over actuals is that it allows a more unbiased assessment of the budget forecast errors based on available information at the time of the preparation of the budget.

5.   **There are serious data limitations in conducting cross-country comparisons of fiscal forecasts.** A relatively short and uneven sample period across the benchmark group makes it difficult to draw statistically significant conclusions. In addition, the forecast errors do not take into account any policy decisions that were not envisaged at the time of the budget, but were implemented during the course of a particular year.

6.   **Forecast errors are defined as the difference between the reported actuals and budget projections.** A positive (negative) value implies the outcome has exceeded (underperformed) budget expectations. The extent of forecast accuracy is assessed on the basis of a simple average of forecast errors (the mean error—ME) and root mean squared error (RMSE), which indicates the magnitude and variance of the errors independent of the direction of forecast errors. A standard set of statistical tests is applied to assess the presence of forecast bias and efficiency; the latter to assess whether forecasts were based on all information available at the time of budget preparation.

C. International Comparison of Forecast Accuracy

Fiscal projections

7.   **During 1995–2003, Ireland's fiscal balance was on average 0.4 percent of GNP better than projected.**[3] While there was substantial overperformance, Ireland was not the only country that enjoyed such stronger fiscal outturns. Indeed, a number of countries in the benchmark group experienced similar levels of overperformance on their budget balance.

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[2] Appendix I provides an explanation of the data and statistical tools used in this study.

[3] There is a substantial contribution of multinationals to Irish output, and associated profit flows (including the effects of transfer pricing) creates significant differences between measures of GDP and GNP. Hence, the paper uses GNP for Ireland as it reflects a better measure of Ireland's tax base.

Compared to the benchmark group, Ireland's mean error was slightly above the group average; and its forecast accuracy, measured by the RMSE, was slightly weaker than the average.

Fiscal Balance: Mean Error

Fiscal Balance: RMSEs
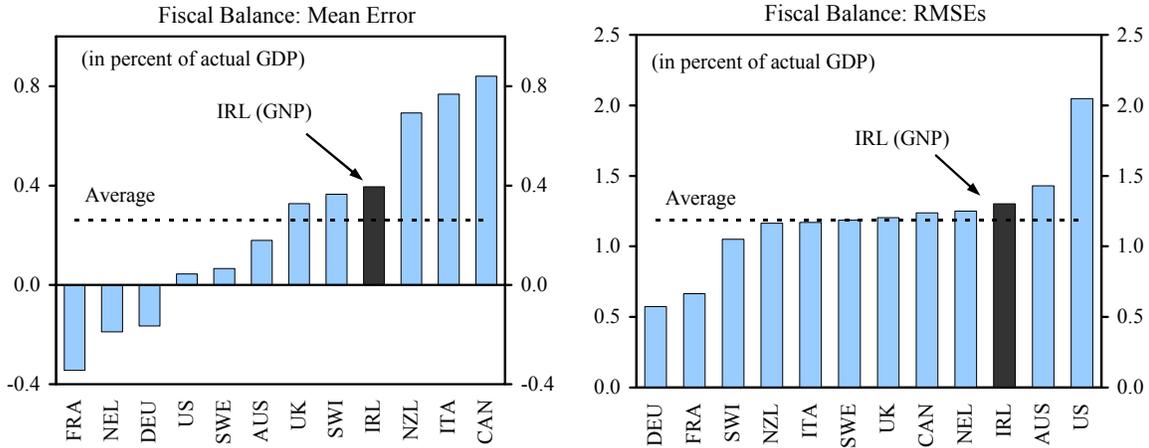
8.   **Overperformance on fiscal balance was mainly driven by higher-than-expected revenue.** The large majority of the benchmark group benefited from revenue overperformance. The revenue forecast error was particularly large for Ireland, followed by Canada and New Zealand. Excluding the economic downturn in 2001 –02, revenues were consistently higher than budgeted in Ireland, by about 0.8 percentage point of GNP. The forecast accuracy of Ireland's revenue projections was relatively weak, reflecting larger standard deviation compared to other countries.

Revenue Forecast Error

Expenditure Forecast Error
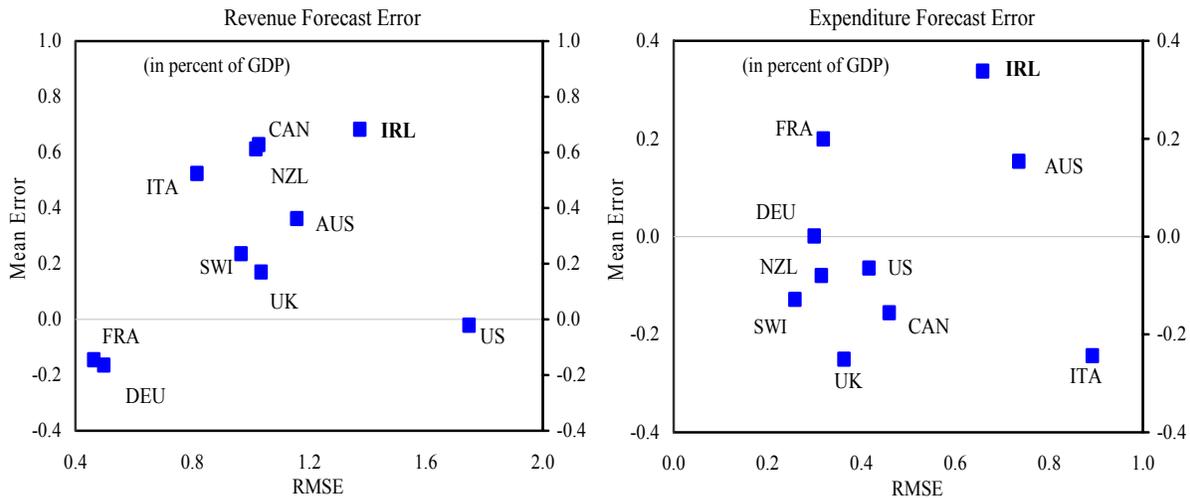
9.   **In contrast, expenditure in Ireland has consistently exceeded budget estimates despite smaller-than-expected interest payments.** Interest on government debt in Ireland was on average over 0.1 percent of GNP lower than projected, by far the largest deviation among the benchmark countries. This notwithstanding, expenditure tended to overshoot the budget projections by an average of 0.3 percentage point of GNP. In general, forecast accuracy was higher in expenditure than revenue.

10.   **A striking feature of Ireland's fiscal forecast errors was a high correlation between revenue and expenditure errors.** A
decomposition of the forecast errors for the
fiscal balance indicates that, in most of the
benchmark countries, higher-than-expected
revenue was accompanied by lower-than-
expected expenditure. This can be explained
in part by lower-than-budgeted welfare
payments such as unemployment benefits on
the back of stronger economic activity. Two
exceptions were Ireland and Australia where
revenue and expenditure surprises tended to be
positively correlated.

Decomposition of Fiscal Forecast Errors

(Mean error, in percent of GDP)

[Scatter plot with x-axis labeled "Revenue" (ranging from -0.4 to 1.0) and y-axis labeled "Expenditure" (ranging from -0.4 to 0.6). Data points: IRL (~0.67, 0.34), FR (~-0.15, 0.20), AU (~0.35, 0.15), DEU (~-0.15, 0.0), US (~-0.05, -0.07), NZL (~0.6, -0.07), SWI (~0.25, -0.13), CA (~0.65, -0.13), UK (~0.15, -0.25), ITA (~0.5, -0.25).]
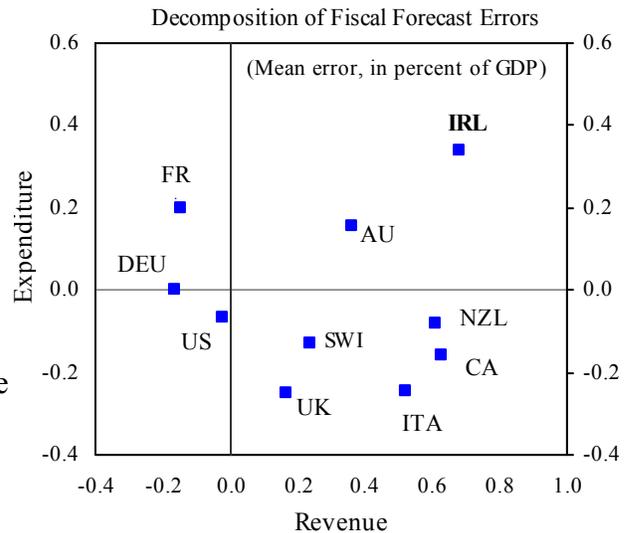
Macroeconomic assumptions

11.   **The accuracy of macroeconomic projections underpinning budgetary forecasts plays a key role in explaining fiscal forecast errors.** Based on budget forecasts and actuals
in the United States over the 1980s and 1990s, Auerbach (1994) shows that macroeconomic
forecast errors can account for a large part of the deterioration in fiscal position during that
period. More recently, evaluating the performance of budget and growth forecasts in
convergence and stability programs across euro-zone countries, Strauch (2004) concludes
that the cyclical position and the form of fiscal governance have been key determinants of
forecast biases. Jonung and Larch (2004) show that the presence of overly optimistic forecast
bias in macroeconomic projections in several euro-area countries have affected fiscal
forecasts.

12.   **A comparison of forecast errors among the benchmark group shows that there
were significant errors in macroeconomic projections but with notable differences
across countries.** Within the benchmark group, forecast errors for growth in Ireland were
consistently one-sided, with large upward surprises during the sample period. The only
exception was lower-than-expected growth in 2001; however, most countries in the
benchmark group failed to predict the effects of the 2001 global economic downturn. Canada
and the United States experienced a similar pattern of more favorable outturns for growth,
but only in the second half of the 1990s. Most of the other countries experienced forecast
errors in both directions.

13.   **During 1995–2003, output growth (GNP) in Ireland was on average nearly
1 percentage point higher than budget projections.** At the other end of the spectrum,
Germany recorded lower-than-expected growth on average of 1 percentage point. Another
salient feature of the Irish forecast errors was the high RMSE, reflecting not only a large

mean error but also a higher standard deviation than the other countries in the benchmark group.[4]

Real GDP Growth: Mean Error

Real GDP Growth: Forecast Accuracy
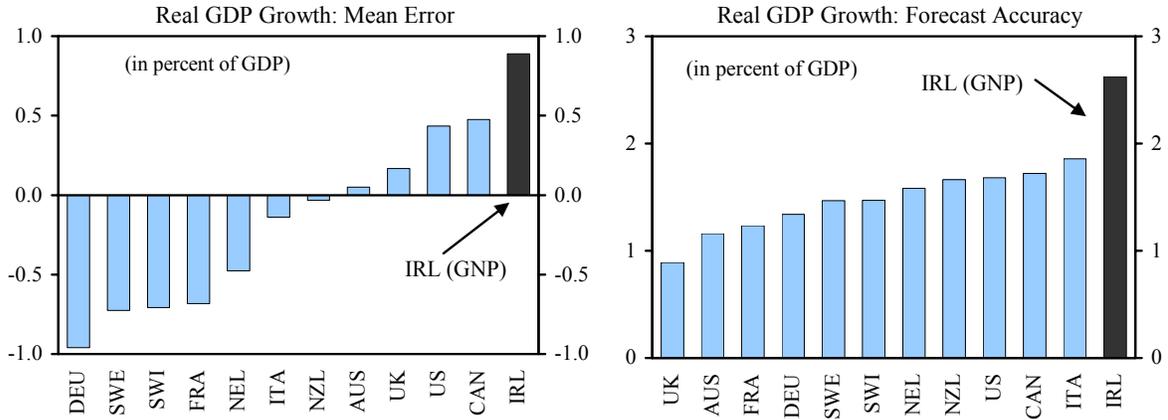
14. **An important part of revenue overperformance can be explained by higher-than expected growth.** A simple pooled regression of the forecast errors for revenue projections on the errors for the output projections suggests that generally one percentage point higher output growth than budgeted would lead to higher revenues by about 1½–2 percentage points. However, the size of the estimated elasticity may be biased upward because systematic biases other than those in the macroeconomic variables may be embedded in the revenue projections.

15. **Consistent with the favorable outturns in growth, labor market conditions in Ireland turned out stronger than envisaged, and inflation (as measured by either GDP or GNP deflator) was higher.** Actual unemployment rates in Ireland were on average

Deflator

Unemployment

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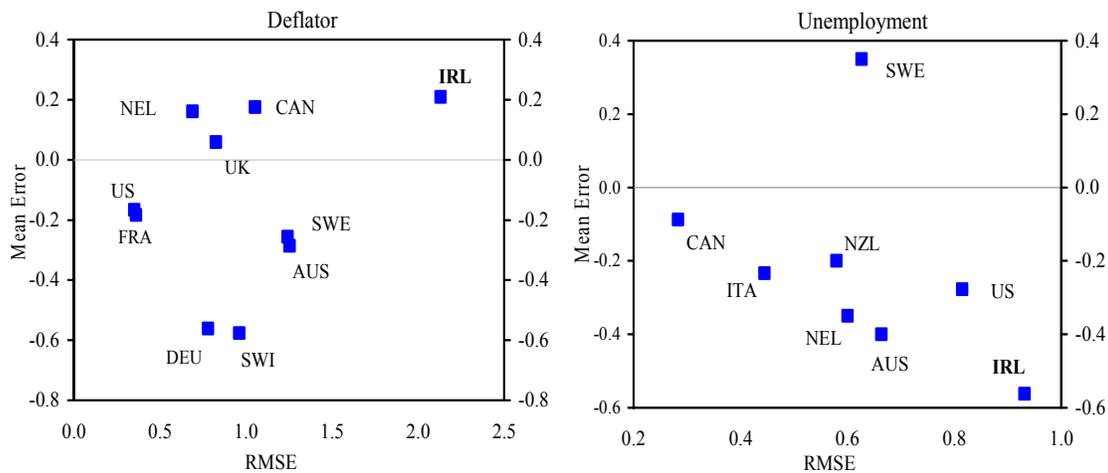
[4] The relatively weak forecast accuracy in Ireland may be in part related to Ireland's higher average growth rate than other countries during this period.

0.4 percentage points lower than projected, and inflation 0.6 percentage points higher. Forecast errors for both variables show similar characteristics to the growth forecast error, with large mean errors and standard deviations. The result may reflect in part high volatility in these key Irish macroeconomic variables due to the large role played by external demand as a source of growth. Commodity-exporting countries, such as Australia and New Zealand, also have relatively higher standard deviations in their forecast errors; however, these countries have relatively small mean errors on average in comparison to Ireland.

D. Characteristics of the Forecast Errors in Ireland

16. **Ireland's large and consistently one-sided forecast error for output growth was primarily driven by upward surprises in external demand.** Indeed, the forecast errors for domestic demand, both for private consumption and fixed capital formation, were two-sided and their mean errors were relatively small, especially for private consumption (Table 1 and Figure 1). On the other hand, export growth (goods and services) recorded mostly large, one-sided forecast errors. During 1991–2003, export growth was on average 3½ percentage points higher than budget projections. The Irish economy was also subject to strong fluctuations, as indicated by the large RMSEs in the forecast errors for investment, imports, and exports. Standard statistical tests confirm forecasting biases in Ireland's macroeconomic projections (Table 2). As expected, the forecasts for output growth and the unemployment rate suggest the presence of a statistically significant bias. Among the components of output, forecast errors for exports exhibit bias in both median and mean tests.

Table 1. Ireland: Descriptive Statistics of Macroeconomic Forecast Errors, 1991-2003 1/

	ME	MAE	SD	RMSE
	(Difference between the actuals and forecasts, in percentage points)			
Macroeconomic Variables				
Real GNP growth	1.3	2.2	2.1	2.5
Private Consumption growth	-0.2	1.7	2.1	2.1
Investment growth	0.4	4.7	6.2	6.2
Export growth	3.4	5.1	5.1	6.1
Import growth	1.4	4.7	5.9	6.1
Real GDP growth	1.8	2.3	2.0	2.7
Nominal GNP 2/	3.1	3.6	3.6	4.8
Nominal GDP 2/	3.1	3.5	3.2	4.4
GNP deflator	-0.2	1.5	1.9	1.9
GDP deflator	0.1	1.3	1.6	1.6
Unemployment rate 3/	-0.6	0.5	0.8	1.0

Sources: Fund staff calculations. See Appendix for a description of descriptive statistics.
1/ For each variable, columns lis mean error (ME), mean absolute error (MAE), standard deviation (SD), and root mean squared error (RMSE).
2/ Percent deviation in level.
3/ Average for 1997-2003.

Figure 1. Ireland: Forecast Errors for Macroeconomic Projections
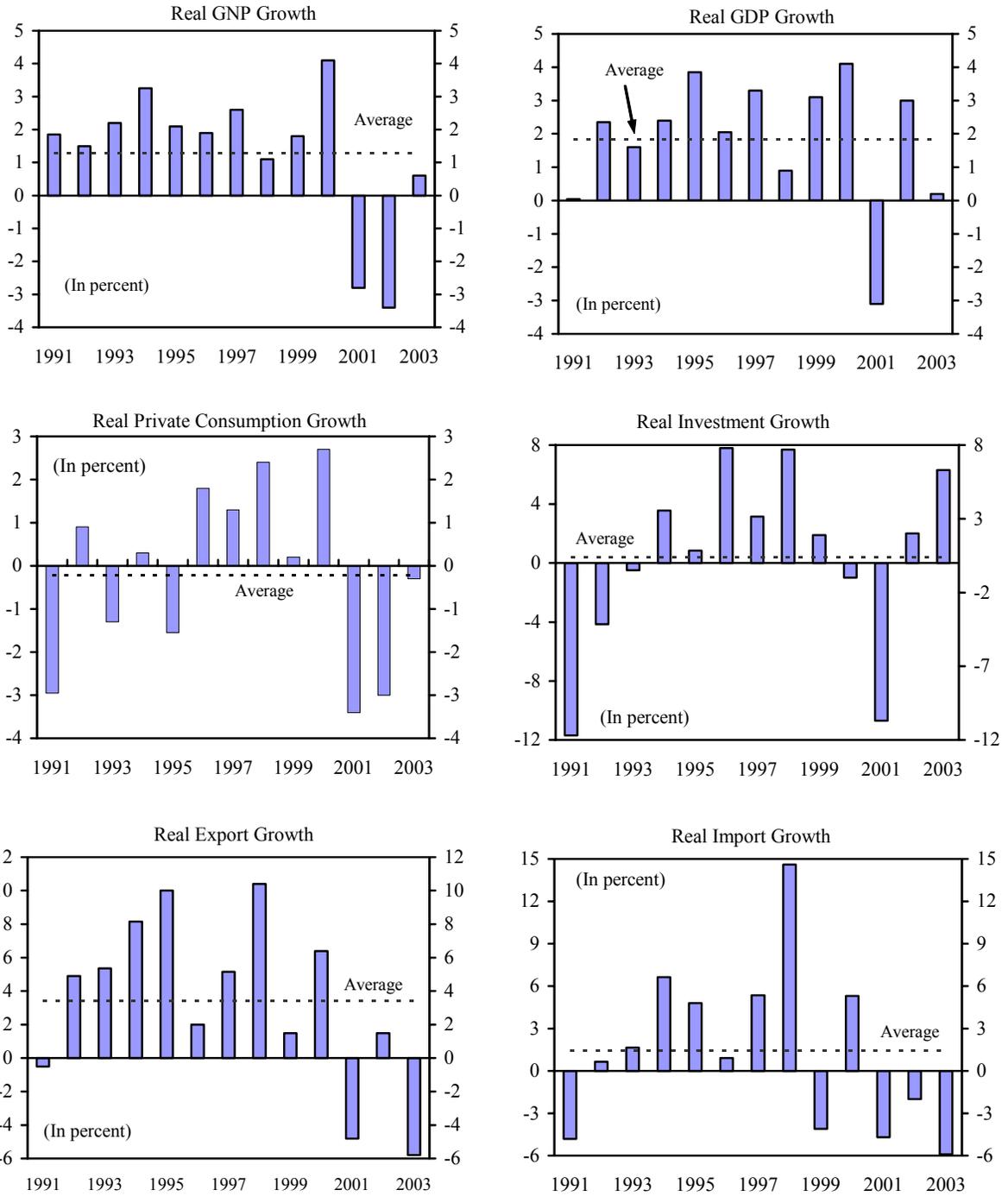
Sources: Fund staff calculations.

Table 2. Ireland: Macroeconomic Projections: Results of Bias and Efficienty Tests 1/

| | Bias tests | | | | | Efficiency tests | |
| | Median tests | | | Mean tests | | | |
	Sign	Wilcoxon	van der Waerden	C	C and AR(1)	Chi-Square	F-test
Real GNPgrowth	X	X	X	X	...	...	...
Private Consumption	...	...	...	...	...	...	...
Investment	...	...	...	...	...	...	...
Exports	X	X	X	X	...	X	...
Imports	...	...	...	...	...	...	...
Real GDPgrowth	X	X	X	X	X	X	X
Nominal GNP	X	X	X	X	...	...	...
Nominal GDP	X	X	X	X	X	X	X
GNP inflation	...	...	...	...	...	...	...
GDP inflation	...	...	...	...	...	...	...
Unemployment		X	X	X	...	X	X

Sources: Fund staff calculations. See Appendix for a description of the methods.
1/ Marks indicate tests that reject a zero median or mean at the 10 percent level.

17.   Given the large uncertainties in predicting the strength of external demand, the Irish record of under predicting export growth may indicate that the budgets have relied on prudent macroeconomic assumptions, but other macroeconomic forecasts for Ireland show similar results. A comparison of budget macroeconomic forecasts against those by outside forecasters (ESRI and the WEO), available around the same time that budgets were released, show that errors in these forecasts were equally large with similar biases and large RMSEs (Table 3).[5] They also under predicted output growth (GDP) by about 2¼ percentage points; in fact, their deviation was slightly larger than that of the budget forecasts. Similarly, while their forecast errors for private consumption growth were small, they consistently under predicted export growth. Overall, budget forecasts are in line with the other forecasts. A more formal test to examine the presence of statistical dominance of the budget forecasts over the others confirms that there is no clear evidence of such dominance. Regressions of the actual values of macroeconomic variables on both budget and outside forecasts, following the technique employed by Fair and Shiller (1990), show that neither set of forecasts statistically encompass the other.

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[5] The Economic and Social Research Institute (ESRI) is a private think tank in Ireland. For the WEO projections, this study uses projections published in April or May each year reflecting the time lag between when the projections are made and when they are released.

Table 3. Ireland: Forecast Errors:1992-2003 1/
(Actual minus forecast, in percentage points)

	ME	MAE	SD	RMSE
Real GDP				
Budget	2.0	2.5	2.0	2.8
ESRI	2.3	2.6	1.8	3.0
WEO	2.3	2.7	2.1	3.1
Private Consumption (1995-2003)				
Budget	0.0	1.9	2.3	2.3
ESRI	0.6	1.9	2.2	2.3
WEO	0.1	1.2	1.6	1.6
Investment				
Budget	1.4	4.1	5.2	5.4
ESRI	0.6	4.2	5.3	5.3
WEO	1.5	5.9	6.6	6.7
Exports				
Budget	3.8	5.4	4.9	6.3
ESRI	3.1	4.8	4.7	5.6
WEO	3.4	5.0	4.6	5.7
Imports				
Budget	2.2	4.4	5.5	5.9
ESRI	0.9	4.5	5.7	5.8
WEO	1.0	4.1	5.4	5.5

Sources: Department of Finance, ESRI and the WEO.

1/ For each variable, columns lis mean error (ME), mean absolute error (MAE), standard
deviation (SD), and root mean squared error (RMSE).

18.   **Consistent with the presence of forecast biases in macroeconomic projections, a series of statistical tests finds broad evidence of biases in Ireland's fiscal forecasts between 1991 and 2003** (Tables 4–5 and Figure 2). While the tests do not find biases in total revenue or expenditure, almost all of the major subcomponents of tax revenue and current expenditure have forecast biases, as indicated by means and medians of the forecast errors that were significantly different from zero.

19.   **On the revenue side, a significant part of the forecast error came from deviations in the projections of taxes on income and wealth.**[6] In contrast, in line with small errors for private consumption growth, the mean forecast errors for both VAT and excise taxes were remarkably small. The RMSEs were particularly large for corporate taxes, capital taxes, and stamp duties. High RMSE for corporate tax revenue may reflect the impact of large export volatility, but also difficulties in projecting the tax base given sustained inflows of FDI to

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[6] Excluding social security contributions, taxes on income and wealth (income tax and corporation tax) account for about 45 percent of total tax revenue; VAT and excise taxes about 40 percent; and capital tax and stamp duty about 6 percent.

Table 4. Ireland: Descriptive Statistics of One-Year Budget Forecast Errors: 1991-2003 1/

	ME	MAE	SD	RMSE
	(Forecast error in nominal terms in percent of actual GNP)			
Overall balance (1995-2003)	0.4	1.0	1.2	1.3
Revenue	0.8	1.4	1.4	1.6
Of which: Tax revenue	0.7	1.5	1.6	1.8
Expenditure	0.4	0.6	0.6	0.7
Overall balance	0.3	0.8	1.0	1.1
Revenue	0.5	1.0	1.2	1.3
Of which: Tax revenue	0.7	1.2	1.4	1.5
Expenditure	0.2	0.5	0.6	0.6
	(Forecast error in percent of actuals)			
Revenue	1.4	2.9	3.5	3.8
Tax revenue	2.1	4.0	4.5	4.9
Of which:				
Personal income tax	2.3	4.0	4.3	4.9
Corporate tax	4.8	9.3	9.6	10.7
VAT	0.3	3.3	4.6	4.6
Excise tax	-0.2	3.7	5.7	5.7
Stamp duties	6.9	9.7	10.1	12.2
Capital tax	25.0	23.6	24.0	34.7
Other revenue				
Expenditure	0.6	1.3	1.6	1.8
Of which:				
Current expenditure	1.0	1.5	1.7	2.0
Interest payments	-6.0	7.4	12.3	13.7
Non-interest spending	1.8	1.8	1.3	2.3
Overall balance	0.7	2.3	3.2	3.3

Sources: Fund staff calculations.

1/ For each variable, columns lis mean error (ME), mean absolute error (MAE), standard deviation (SD), and root mean squared error (RMSE).

Table 5. Ireland: Fiscal Forecasts: Results of Bias and Efficiency Tests 1/

| | Bias tests | | | | | Mean tests | | | | Efficiency tests | |
| | Median tests | | | Mean tests | | | | | | | |
	Sign	Wilcoxon	van der Waerden	C	C and AR(1)	C and GNP growth	C and GDP growth	C, GNP	C, GDP	Chi-Square	F-test
Revenue											
Tax revenue	X	X	…	…	…	…	…	…	…	…	…
Direct tax	X	X	X	X	…	…	…	…	…	X	X
Income tax	X	…	X	X	…	…	…	…	…	X	…
Corporate tax	…	…	…	X	…	…	…	…	…	X	X
Capital tax	…	X	X	X	…	X	X	…	X	X	X
Indirect tax	…	…	…	…	…	…	X	X	…	…	…
VAT	…	…	…	…	…	…	X	X	…	…	…
Stamp duties	…	X	X	…	X	X	…	X	X	X	…
Excise	…	…	…	…	…	…	X	X	…	…	…
Other revenue	…	X	X	X	…	X	X	X	X	X	…
Expenditure											
Current expenditure	X	X	X	…	…	…	…	…	…	…	…
Non-interest	X	X	X	X	…	…	…	…	…	X	X
Interest payments	X	X	X	X	…	X	X	X	X	X	X
Capital expenditure	…	…	…	X	…	…	…	…	…	…	…
Fiscal balance	…	X	…	…	…	…	…	…	…	…	…

Sources: Fund staff calculations. See Appendix for a description of the methods.
1/ Marks indicate tests that reject a zero median or mean at the 10 percent level. Tests are conducted on forecast errors as a percentage of actuals.

Figure 2. Ireland: Revenue Forecast Errors

Expenditure taxes

VAT

(Actual minus forecast in percent of actual)

Excise Tax

(Actual minus forecast in percent of actual)

Income taxes

Personal Income tax

(Actual minus forecast in percent of actual)

Corporate tax

(Forecast error in percent of actual)

Asset-related taxes

Capital tax

(Actual minus forecast in percent of actual)

Stamp duties

(Actual minus forecast in percent of actual)
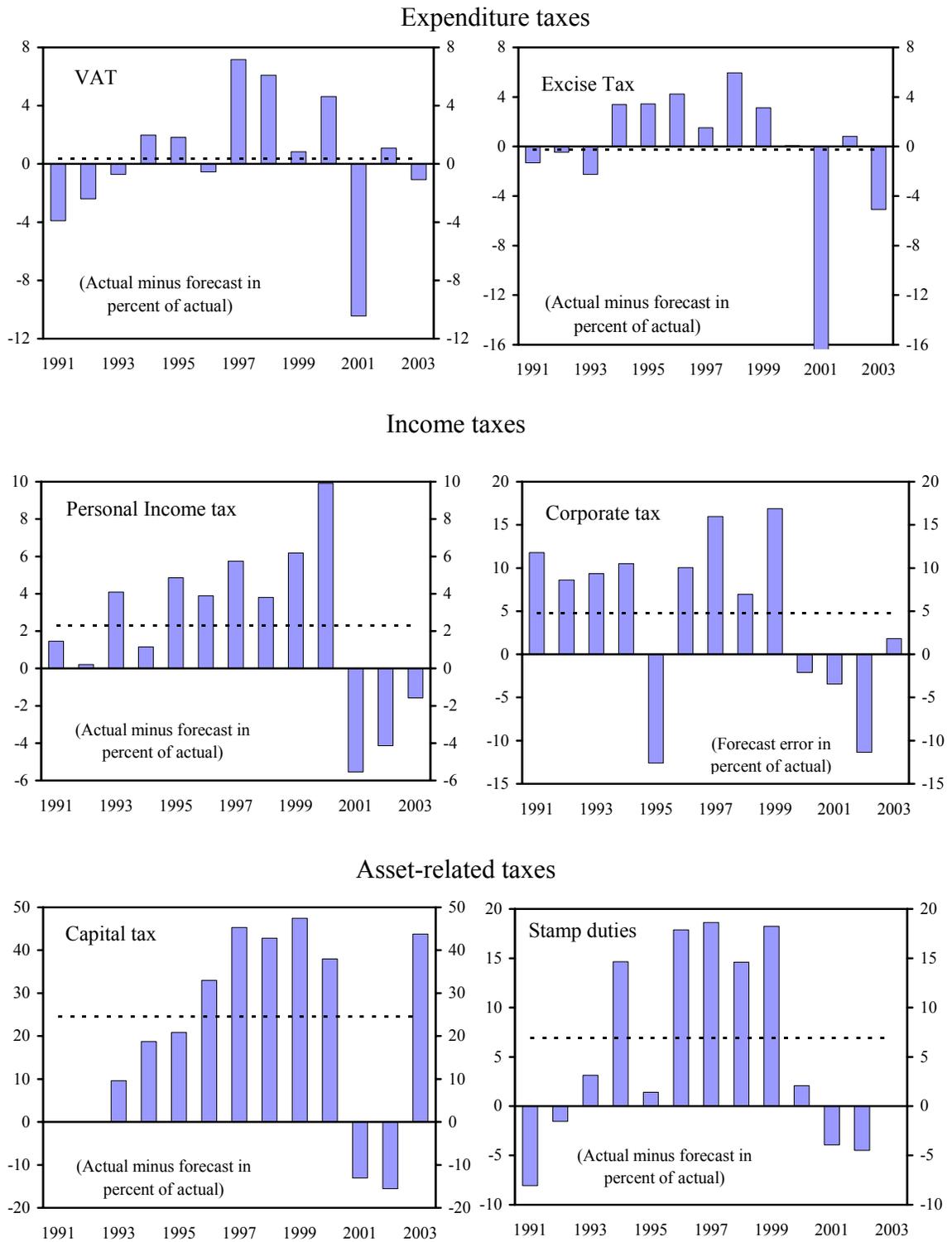
Sources: Fund staff calculations.

Ireland during the 1990s. Rapidly rising property markets and strong equity markets also contributed to significant upside surprises in stamp duty collections and capital taxes. Indeed, while they account for only about 6 percent of total tax revenues, their overperformance has averaged roughly a third of the forecast errors for tax revenue. As expected, statistical tests confirm forecasting biases in most of the subcomponents of revenue, with the notable exceptions of VAT and excise taxes.

Tax Revenue Forecast Errors 1995-2003

(In percent)

Other
Capital tax
Stamp duties
VAT
Excise
Income and Corporation taxes

Tax Revenue   Forecast Errors
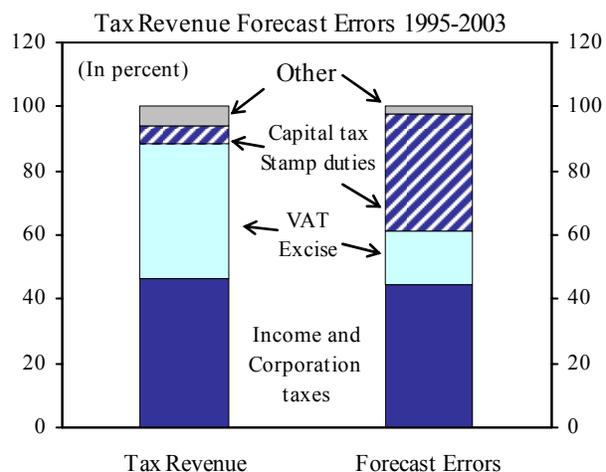
20.   **Revenue forecast errors can be largely explained by errors in the outlook for growth.** Adding the forecast errors for output growth in the mean tests, the null hypothesis of unbiased forecasts can no longer be rejected for the tax revenue projections. Two exceptions are stamp duties and capital taxes, which, as described above, may have been affected by factors beyond the economic cycle in Ireland. Between GNP and GDP growth, GNP appears to be a better proxy for Ireland's tax base, especially with regard to the base for indirect taxes. Forecast errors for inflation and unemployment do not explain revenue forecast errors well.[7]

21.   **The evidence suggests that revenue forecast errors were primarily driven by stronger-than-expected economic activity, but the budget's cautious approach in projecting revenue also played a role.** A calculation of implicit tax elasticity over the period 1991–2003 suggests that budget forecasts relied on a prudent assumption. While the long-term tax elasticity in Ireland is about one, budget estimates appear based on a slightly smaller value of 0.9.

Non-Interest Current Expenditure

(Actual minus forecast in percent of actual)

Average

1991   1993   1995   1997   1999   2001   2003

22.   **On the expenditure side, tests show clear evidence of forecasting bias in current expenditure and interest payments.** What makes Ireland rather unique among the benchmark group of countries is a positive statistical relationship between forecast errors in revenue and expenditure. The procyclicality of

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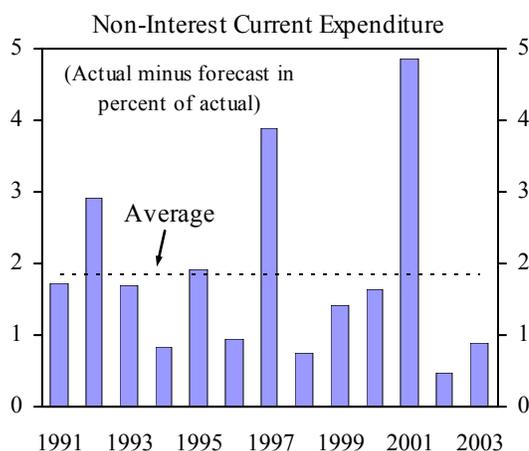
[7] Forecast errors for either nominal GDP or GNP are also strong candidates for explaining errors in revenue projections. However, a shift from the European System of Accounts (ESA) 79 to ESA95 during this period hampers accurate analysis.

Irish errors in expenditure forecasts can be illustrated by adding errors in the output projections to the right-hand side of the regression testing for bias in the mean forecast error. When growth errors are included, the null hypothesis of unbiased forecasts for expenditure can no longer be rejected.

E. Institutional Environment

23.   **The institutional framework for fiscal policy and budget forecasting practices in Ireland are relatively strong compared with other countries (Box 1).** The Department of Finance is solely responsible for budget forecasts and prepares its own macroeconomic projections. Over the past decade, economic growth turned out to be generally stronger than

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Box 1. Key Elements of the Institutional Framework

Fiscal forecasting

- Department of Finance is solely responsible for macroeconomic and budget projections. There is no involvement of non-government agencies.

- Three-year forecasting horizon, including the budget year.

Budget system: the executive branch has strong budgetary powers in Ireland's parliamentary system.

- Budget is submitted to the legislature 4 weeks before the fiscal year begins. There is no pre-budget parliamentary discussion. The Cabinet's proposed budget cannot be amended.

- Mid-year taxation changes require either full supplementary budget or an additional Finance Act. Increases in spending require approval of supplementary estimates (augmentation of programs already included in the budget) or additional estimates (new programs).

Fiscal rules

- Ireland is subject to the Stability and Growth Pact (SGP), which sets a medium-term fiscal objective of close-to-balance or surplus, with a limit of 3 percent of GDP deficit and 60 percent of GDP debt ceiling.

- There are Ireland-specific rules and guidelines about expenditure. For example, capital spending (by all sectors of government) is currently capped at 5 percent of GNP, and local government borrowing is capped at €140 million. However, there is no formal mechanism to enforce these rules.

Fiscal relations with sub-national levels of governments

- The central government enjoys relatively strong control over the sub-national governments. There is no cost sharing arrangement between the central and the sub-national level.

- There is limited fiscal autonomy at the sub-national level: borrowing by the sub-national governments is governed by the Local Government Act, which requires the approval of the central government to any borrowing proposal. A local authority which fails to agree on an appropriate budget is suspended, and replaced by a commissioner appointed by the central government.

projected by the Department of Finance, but the comparison with other forecasters suggests that the latter were not any more accurate. Given the strong powers of the executive branch in Ireland's parliamentary system, there is little risk of the budget being amended by the legislature, which could potentially undermine the consistency of the budget forecasts.

24.   **However, when government revenue was higher than projected, there was a tendency to increase spending**. Ireland's budget framework allows for supplementary or additional spending during the course of the fiscal year. On the whole, the increases in spending were prudent, as they amounted to less than the revenue overperformance. However, there is the risk that spending increases could be procyclical, adding to demand pressures at times when there is limited slack in the economy.

25.   **Spending increases were in fact procyclical during 1997–2002.** A precise estimate of spare capacity in Ireland is difficult to derive given the effects on the level of potential output of many of the factors accounting for the boom in the 1990s, such as the increased employment and productivity catch up. However, the IMF staff's estimate indicates that the resource constraint was starting to bind in the period after 1997. Assuming a fiscal multiplier of one, the contribution to growth from expenditures above budgeted levels averaged about 0.6 percentage point of GNP a year during this period.

F.   Concluding Remarks

26.   **The analysis presented in this paper suggests that fiscal overperformance in Ireland was largely due to stronger–than-expected output growth.** During 1995–2003, GNP growth in Ireland exceeded the budget forecast by about 1 percentage point on average—highest among the countries sampled—contributing to better fiscal outturns by 0.4 percentage point of GNP. In addition, buoyant asset price developments contributed to the favorable budget surprises. Prudence also played some role. Budget estimates have followed a cautious approach based on prudent assumptions for tax elasticities. A combination of stronger-than-expected growth and the cautious approach employed in forecasting revenues produced consistent revenue overperformance during the period. While revenue overperformance was in part offset by increases in expenditures, spending increases did not exceed revenue overperformance, another aspect of fiscal prudence in Ireland.

27.   **Looking ahead, growth surprises are less likely to be consistently on the upside.** Ireland's growth prospect remains strong, but there are several important downside risks. These include lower potential growth; upward wage pressures resulting from the next national wage agreement and public sector benchmarking exercise which could have an impact on the public sector bill and the overall fiscal position; and deterioration in Ireland's competitiveness that can undermine the base for corporate taxes. Moreover, asset developments may not continue to contribute significantly to large upside surprises. Given these risks, a continuation of the authorities' prudent approach to budget forecasts would prove useful.

28. **At the same time, the risk of procyclical spending increases in response to revenue performance needs to be addressed.** Discretion to increase spending during the course of a year has been used prudently in the past, such that additional expenditures have not exceeded revenue overperformance. Expenditure over budgeted levels on average has been limited to about half of revenue overperformance. This behavior was prudent from a budgetary perspective, but spending increases at times added stimulus to aggregate demand when the economy was already showing signs of limited slack. This tendency appears to have weakened over the recent few years on the back of tighter expenditure management in place. However, large and long-standing pressures to increase public spending in Ireland are likely to contribute to a continuing potential for procyclical stimulus in the event of upside surprises to growth. The risk of such procyclical stimulus could be mitigated by requiring an assessment of cyclical conditions in the economy before additional spending is approved.

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DATA SOURCES AND DEFINITIONS

- Budgets in Ireland are published in early December, with the new fiscal year starting on January 1. Budgets do not consistently provide detailed information about the outturn for other than the previous year (*t-1)*. Missing information, especially on the macroeconomic variables, was supplemented by using *Economic Review and Outlook* published by Department of Finance around the same time as the budget each year. *Finance accounts* were also used to obtain the fiscal outturns.

- Data used in this analysis are on a cash basis, focusing on the exchequer borrowing requirement.

- Ireland implemented a change from the European System of Accounts (ESA) 79 to ESA95 starting in 1995. Following a partial transition between 1995-97, the ESA95 was fully implemented in 1998. There are data issues related to the transition to ESA95 as budget macroeconomic forecasts were still based on ESA79, particularly GDP and GNP levels, while budget outturns were reported based on the ESA95.

- The study focuses on non-interest current spending because the Irish budget does not provide estimates for discretionary and mandatory spending.

- Data for the benchmark group was obtained from Mühleisen et al. (2005). It was updated for the United Kingdom with the most recent March 2005 budget figures.

DESCRIPTIVE STATISTICS

Forecast errors

Forecast errors for variables projected in budgets are defined as the difference between the actual outturns reported in the budget two years later (t+2) and forecasts in the budget year (t). Thus, forecast error for variables x, $E_t(x)$, in *percentage points*, such as real GNP growth, is defined as:

$$E_t(x) = x_{t+2} - x_t$$

Forecast errors for variables in *levels*, for example revenue or expenditure, are calculated as:

$$E_t(x) = \ln(x_{t+2}) - \ln(x_t)$$

Forecast errors in *percent of GDP*, such as fiscal balance, are calculated as forecast errors in nominal terms in percent of actual GDP (or GNP):

$$E_t(x) = (x_{t+2} - x_t)/GDP_{t+2}$$

Mean error and root mean squared error

Mean error (ME) and root mean squared error (RMSE) are defined as:

$$ME_t = 1/T \sum_{t=1}^{T} E_t \qquad RMSE_t = \left(1/T \sum_{t=1}^{T} E_t^2\right)^{1/2}$$

where the following relation holds:

$$RMSE_t = \left(ME_t^2 + \sigma_t^2\right)^{1/2}$$

Bias tests

The study uses three rank-based, nonparametric *median tests* for forecast bias:

- Binomial sign test, which tests whether the sample is drawn randomly from a binomial distribution such that the sample proportion above and below the true median should be one-half;

- Wilcoxon signed ranks test, which is based on the idea that the sum of the ranks for the samples above and below the median should be similar; and

- Van der Waerden test, which is similar to the Wilcoxon test but is based on smoothed ranks. The signed ranks are smoothed by converting them to quantiles of the normal distribution.

Mean tests are conducted by regressing forecast errors on a constant and testing whether or not it is significantly different from zero.

Efficiency tests

Tests of forecast efficiency check whether forecasts were based on all of the information available at the time they were made. They are based on a test of whether forecast errors are independently, if not normally distributed. More formally, following a regression of the actual outturn on its forecast,

$$y_{t+2} = \beta_1 + \beta_2 y_t + \varepsilon_t$$

it tests the joint hypothesis of $\beta_1 = 0$ and $\beta_2 = 1$.

II. THE EVOLUTION OF UNEMPLOYMENT IN IRELAND: THE ROLE OF LABOR MARKET POLICIES[8]

A. Introduction

29.   **The unemployment rate in Ireland increased dramatically in the early 1980s and remained one of the highest in Europe until the mid-1990s.** Since then it has fallen to one of the lowest levels in Europe (Figure 1). The improvement has been broad based. Long-term unemployment, which stood above 10 percent at the end of the 1980s, dropped to 1.5 percent in the 2000s. The rate of unemployment declined for all age groups and education levels. These favorable developments are typically attributed to the upturn of the business cycle, driven by large FDI flows, favorable exchange rate developments, and low interest rates. This paper evaluates whether good labor market policies have also contributed to the sharp fall in unemployment.

Long-Term and Short-Term Unemployment Rate

Source: CSO, Household Quarterly Survey and Labor Force Survey. Long-term unemployed are defined as people out of a job for more than a year.
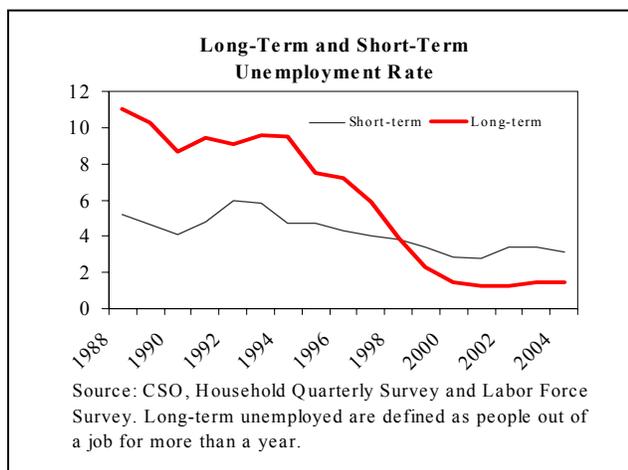
30.   **The structure of the paper is the following. First, changes in unemployment are decomposed into a cyclical and a structural component.** Then follows a discussion of major developments in Irish labor market policies that can induce variations in the structural unemployment rate over time. Finally, the contribution of changes in the tax and benefit system and in labor market institutions to the evolution of structural unemployment is estimated.

B. Cyclical Versus Structural Unemployment

31.   **Ireland's economic fortunes changed significantly over the last two decades.** The 1980s were characterized by relatively slow growth attributed to negative external shocks and poor macroeconomic policies. In contrast, the second half of the 1990s saw a virtuous cycle of positive shocks, supportive macroeconomic policies, and strong economic growth. That has led some observers to attribute the decline in unemployment mainly to changing cyclical conditions.[9]

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[8] Prepared by Dora Iakova, ext. 35365.

[9] See Honohan and Walsh (2002).

Figure 1. Ireland: Changes in the Unemployment Rate in Ireland

Unemployment Rate By Age

Source: CSO, Quarterly National Household Survey.

Unemployment Rate By Education

Source: ILO.
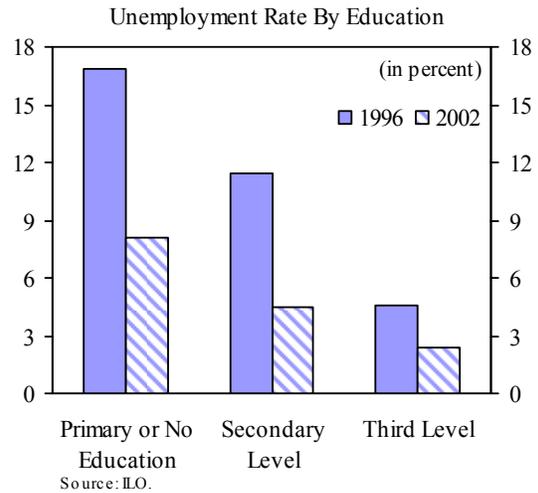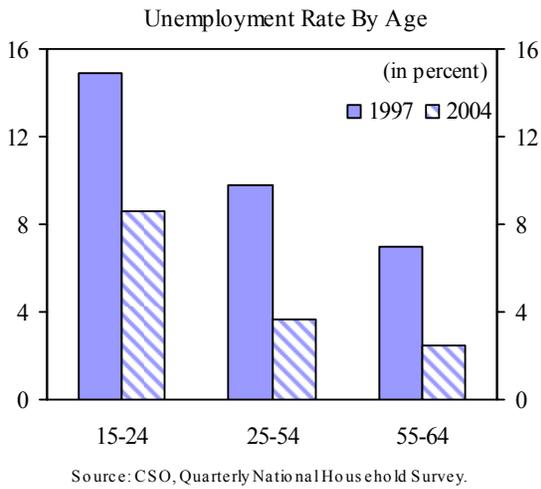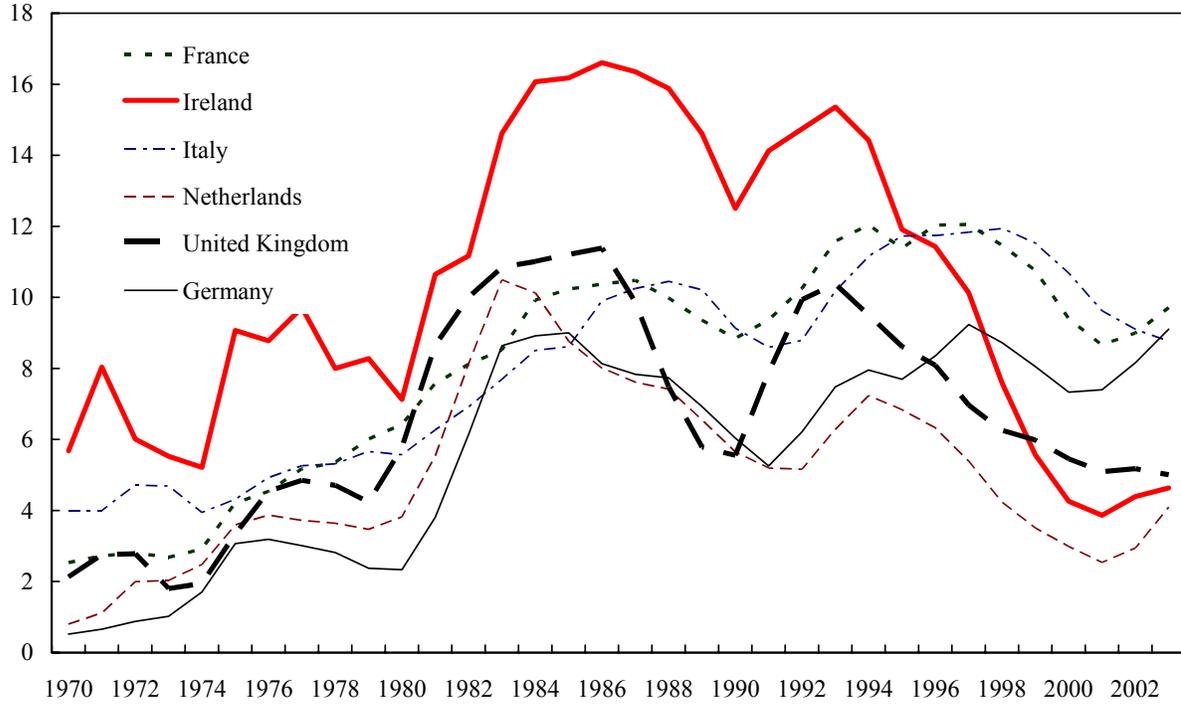
32.   **In order to isolate the effect of the cycle on unemployment, a time-varying NAIRU has been estimated.** NAIRU ("the non-accelerating inflation rate of unemployment") is the unemployment rate at which there is no tendency for the rate of inflation to change due to wage pressures. The intuition behind the concept is that demand shocks cause cyclical variations in unemployment, but do not have a long-lasting effect on the rate of structural unemployment. Negative demand shocks increase unemployment on impact. That eventually eases wage pressures, bringing about wage moderation compatible with a return of unemployment to its equilibrium level. The estimated gap between the actual unemployment and the NAIRU captures the effect of demand shocks and can be thought of as the cyclical component of unemployment.

33.   **The estimation follows the methodology of Boone et al.** (2002). The model incorporates a two-way causality between unemployment and inflation. The gap between the NAIRU and the actual unemployment rate is assumed to affect the future path of inflation, and policy-induced changes in the inflation rate affect the unemployment gap. Using reasonable parameters for the variance of the unemployment gap relative to the variance of changes in the NAIRU, we find that improving cyclical conditions can explain about 40 percent of the decrease in total unemployment since the second half of the 1980s.[10]
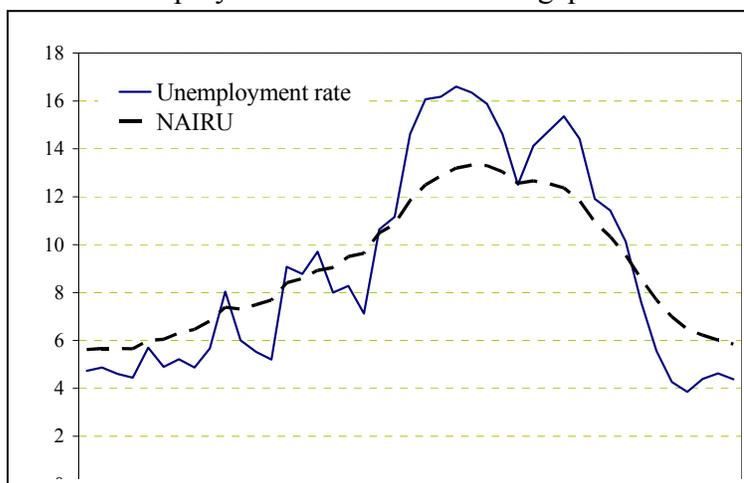
34.   **Therefore, at least half of the decline in unemployment can be attributed to changes in the structural unemployment rate.** Movements in the structural rate over time are driven by changes in policies and institutions that affect the responsiveness of wages to fluctuations in unemployment, influence the incentives to search for a job, or improve the

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[10] The ratio of the variance of the gap to the variance of changes in the NAIRU is set at five in the estimation shown. Varying this parameter within the limits suggested by Boone et al. gives a range of 35 to 50 percent of the decline in unemployment explained by cyclical conditions. Given the uncertainty in choosing the appropriate degree of smoothness of the estimated NAIRU, an alternative estimation of the cyclical part of the decline in unemployment is presented later as a robustness check. I am grateful to Papa N'Diaye for providing the computer code for the NAIRU estimation.

job-matching process. Empirical and theoretical studies of the driving forces of unemployment have identified the following institutions as important:[11]

- *The system of wage determination* Generally, higher unionization rate is expected to increase the negotiated wage between employers and employees, reducing the equilibrium employment. However, this effect could be offset (or reinforced) by the degree of bargaining coordination. When bargaining is highly coordinated, the aggregate employment implications of wage determination are taken into account, and the wage and employment outcomes would be similar to the social planner's solution.[12]

- *The generosity of the unemployment benefit system* affects the incentives of unemployed individuals to search for a job. Measures of generosity include the benefit replacement rates and the duration of benefits.

- Changes in the *strictness of enforcement* of eligibility for benefits would also affect the equilibrium level of unemployment.

- *The structure of labor taxation and its interaction with the benefit system* An increase in labor taxes increases labor costs and/or decreases the net take-home wage. Unless changes in taxes are passed on completely to the workers, equilibrium employment would decline.[13] In addition, if benefits are indexed to the gross wage and are not taxed, an increase in taxes would lead to an increase of the effective net replacement rate and a rise of equilibrium unemployment (the reverse would happen if labor taxes are reduced).

- The introduction (or expansion) of *active labor market programs* could facilitate job-matching and improve the employability of the long-term unemployed through training and counseling.

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[11] Debrun (2003), Nickell et al. (2002), Nickell and van Ours (2000), OECD Jobs Study (1994).

[12] An inverted-U relationship between the degree of bargaining coordination and the level of unemployment is expected to hold. See Calmfors (1993) for an exposition of this theory and relevant empirical evidence.

[13] Arpaia and Carone (2004) show that both perfect and imperfect competition models generally predict a negative impact of labor taxation on employment.

C. The Evolution of Labor Market Institutions in Ireland

35.   **After an unsuccessful experiment with centralized wage bargaining in the 1970s, wage negotiations were effectively decentralized in the early 1980s.** In 1987, Ireland introduced an economy-wide system of wage bargaining in an environment of poor economic growth, soaring unemployment, high public debt and a heavy tax burden. Against the background, all social partners agreed that the overriding common objective was to restore sound macroeconomic fundamentals.[14] The partners established that this would require improving competitiveness through wage moderation and strengthening the fiscal position to allow future tax reductions. Indeed, a period of relative wage moderation followed, resulting in significant job creation (see Blanchard, 2002). Unions density was very high in the 1970s, but membership declined significantly over the last two decades. Nonetheless, the union's role in the economy has strengthened after the return of coordinated wage agreements.
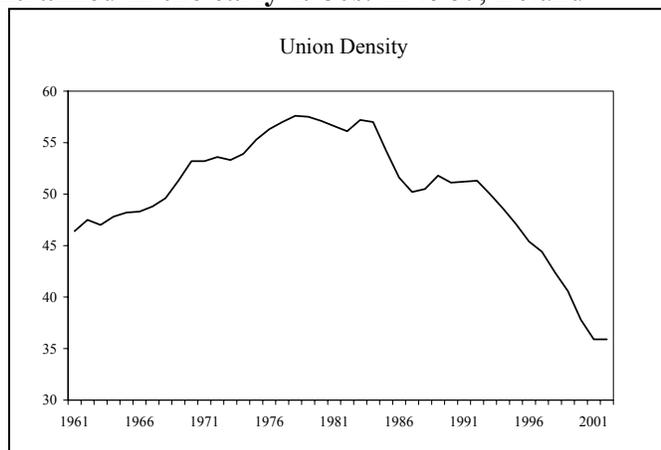
Union Density

36.   **After rising sharply in the 1980s, *taxes on labor* declined steadily in the 1990s.** Both marginal and average tax rates on labor income have been reduced. The structure of taxation also changed. Rising personal exemptions have increased the share of employees that do not have to pay income tax at all, benefiting low-income people. A gradual move towards individualization of income taxation has reduced the tax burden of the second earner in married couples. All these measures have improved the incentives for the economically inactive to join the labor force and for the unemployed to look for a job.

Tax Wedge
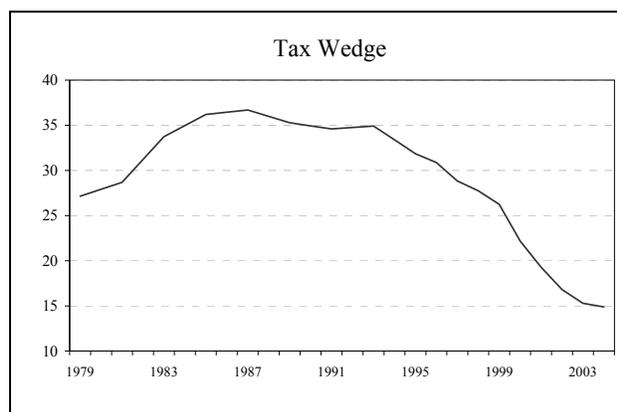
37.   **The *generosity of unemployment benefits* measured by the gross replacement rate increased in the 1970s and 1980s.** At the same time, marginal taxes rates on income were raised and reached very high levels even for low-income earners. The lack of

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[14] See Chapter IV in IMF Country Report No. 04/349 for a detailed discussion of the role of social partnership agreements.

coordination between tax and welfare policies reduced the gap between benefits and the net expected income from work. Based on OECD estimates, the unemployment assistance for married couples without children increased by 56 percent in real terms between 1979 and 1994, although the net income of a worker earning the average manufacturing wage remained constant over the same period. This process has been partially reversed in the 1990s. Although the average gross replacement rate has remained broadly unchanged, the steady reduction of marginal tax rates has resulted in declining net replacement rates, especially for the low-paid. The net replacement rate averaged over three family types earning the average production wage has declined from about 52 percent in 1995 to 46 percent in 2002.

38.   **In the past, the loss of supplementary benefits—housing subsidies, child benefits, and free medical care—also influenced the incentives to search for employment.** The combination of various benefits led to net replacement rates exceeding 100 percent for some low-skilled workers in the 1980s. This problem has been partially addressed through a series of policy measures. A "back-to-work" allowance, introduced in 1993, allowed the long-term unemployed to continue receiving 75 percent of their social welfare payments in the first year of employment, 50 percent in the second, and 25 percent in the third year. Additional measures have been introduced more recently—the rent supplement is no longer withdrawn on taking up employment,[15] and child benefits have been increased and uncoupled from unemployment benefits.

39.   **The enforcement of eligibility for unemployment benefits has been tightened since 1998.** Unemployment benefits have effectively unlimited duration in Ireland, so strict enforcement of eligibility is important to keep long-term unemployment in check.[16] As part of the National Employment Action Plan, interviews were introduced for those unemployed for six months or more to assess whether they can be matched to existing vacancies or need any specific training. The interviews were progressively phased in for different age groups between 1998 and 2000 and were judged to be very successful in reducing the number of registered unemployed (OECD, 1999).

40.   **However, in a number of countries that have adopted similar proactive polices to enforcing eligibility for unemployment benefits (Canada, U.S., and New Zealand, for example), an increase in claims for other social benefits has been observed.**[17] A casual

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[15] The continuation of the rent supplement applies only to those taking up part time work or entering approved employment schemes, and to long-term unemployed accepting employment. These rules could create incentives for the short-term unemployed to keep their working hours low once they enter employment.

[16] The unemployed receive benefits for 15 months and then continue to receive unemployment assistance (means-tested) indefinitely.

[17] See Autor and Duggan (2003) for analysis of the U.S., and Gruber (2000) for analysis of Canada.

look at changes in the number of social welfare recipients by category suggests that this could be a potential problem for Ireland as well. The decline in unemployment claims between 1998 and 2003 has been more than offset by a rise in claims for other types of social welfare payments. Of course, there may be other reasons for the observed changes, but some analysis of the channels of exit from unemployment may be warranted, and the eligibility for all types of social welfare support should be strictly enforced.

Social Welfare Recipients by Payment Category, 1998-2003

	1998	2003	Change	% Change
Unemployment Support	182,087	145,339	-36,748	-20
Disability Allowance	47,126	67,720	20,594	44
Supplementary Welfare	16,300	31,217	14,917	92
One-Parent Family	65,548	79,296	13,748	21
Population (aged 15-64)	2,447,000	2,710,000	263,000	11

Source: The Irish Labor Market Review, 2004, FAS

41.   **Spending on *active labor market policies* in Ireland is relatively high.** Active labor market policies include training, public employment services and administration, and subsidized employment (including direct job creation). Evaluations done by the OECD

Expenditure on Active Labor Market Policies, 2001

Source: OECD, Labor Market Statistics

Active Labor Market Policies Expenditure in Ireland

Source: OECD
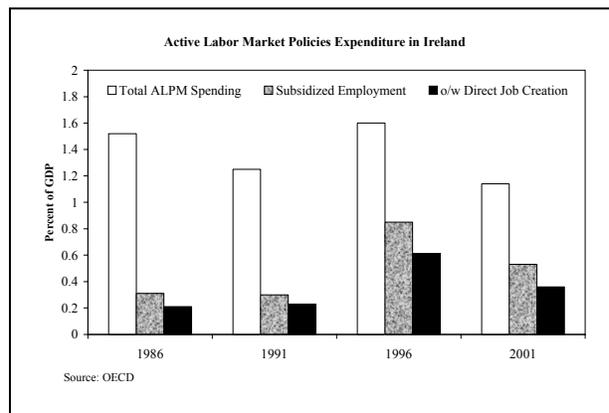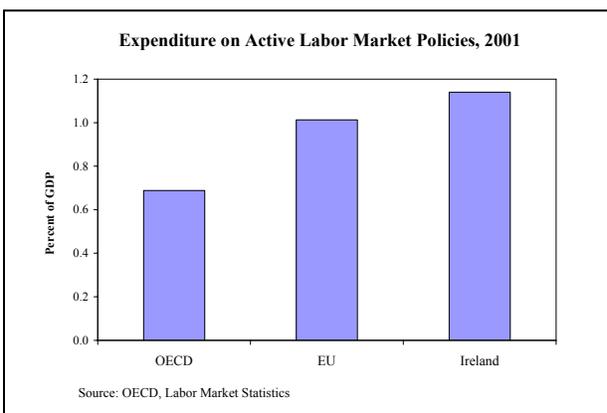
suggest that the different types of active labor market programs vary in their effectiveness. Job-matching services and specific training, for example, are judged to be successful in reducing unemployment; while direct job creation may have limited influence on unemployment in the long run (see Martin, 2000). An increasing share of overall spending in Ireland has gone to public jobs creation. The community employment scheme is the largest program for direct job creation and accounted for about 1.2 percent of employment in 2004 (down from about 3 percent in the mid-1990s). The effectiveness of such spending could be reviewed, especially given the recent tightness of the labor market in Ireland.

42.   **Not all labor market policies have changed in the direction of greater labor market flexibility.** A statutory minimum wage was introduced in 2000 (at about 55 percent of average industrial earnings). However, recent analysis suggests that the effects of the

minimum wage of the economy has been marginal since it is binding only for a small share of the work force (Nolan et al., 2003). Progress in product market deregulation has also been uneven.[18] In addition, there are two social programs that may serve as a route from unemployment to early retirement and discourage the labor force participation of elderly workers—the pre-retirement allowance and the retirement pension. People over 55 that are unemployed and satisfy means-tested criteria are eligible for a pre-retirement allowance. To be eligible for a retirement pension, a person has to stop working at (or before) age 65, while the regular old-age pension can be received from age 66, independent of employment status.

D. Empirical Evaluation of the Role of Institutions

43.   **The empirical study of the effect of institutions on structural unemployment is based on a model of the labor market described in Blanchard and Katz (1999).**[19] In that model, the wage is determined in negotiation between the unions and employers, and firms choose employment at the given wage. Structural unemployment is affected by factors that shift the "wage setting" curve or affect the responsiveness of wages to changes in unemployment—such as changes in labor market polices and institutions. The effect of institutions is typically modeled in a linear form:

$$U_t^* = \alpha + \sum_{j=1}^{J} \beta_j X_{j,t} + \varepsilon_t$$

where U_t^* is the structural rate of unemployment at time t and X_j is a vector of institutional variables. The time varying NAIRU described previously is used as a proxy for the structural rate of unemployment. The independent variables are the gross unemployment benefit replacement rate, the labor tax wedge, union density, an index of bargaining coordination, and a dummy variable for the strictness of benefit eligibility enforcement (takes a value of 1 starting in 1998). For definitions and sources of the data see Annex 1. For ease of interpretation, all variables are in percentage points (except for the index of bargaining coordination and the enforcement dummy). Lack of sufficiently long series prevents the inclusion of active labor market expenditure among the repressors. The equation is estimated by OLS and the results are in the text table.[20]

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[18] See Walsh (2003) for a discussion. Highly competitive product markets are expected to increase employment.

[19] The theoretical structure was originally developed by Layard et al. (1991). See Nickell et al. (2002) for a summary of the extensive empirical work based on it.

[20] Unit root tests confirm that most variables are stationary. Two variables – the structural unemployment rate and the benefit replacement rate – fail the test for stationary at the usual significant levels, but since these variables are always between zero and one, they are included in levels.

44.   **The results show that changes in labor market policies explain well the changes in the structural rate of unemployment over time.** All variables are significant and enter with the expected signs (except for union density). Specifically, ten percentage points reduction in the benefit replacement rate is expected reduce unemployment by about 3.6 percentage points. The elasticity of unemployment with respect to the tax wedge is similar.[21] The degree of bargaining coordination has a significant negative effect on unemployment, confirming the general belief that the partnership agreements have contributed to the successful performance of the labor market in the 1990s. The increase in enforcement efforts starting in 1998 seems to have been very effective in reducing unemployment (subject to possible caveats discussed previously).

Dependent Variable: NAIRU	
Sample Period: 1961-2002	
Constant	-2.01
Benefit Replacement Rate	0.36 **
Tax Wedge (t-1)	0.31 **
Bargaining Coordination	-0.93 **
Union Density	-0.08
Enforcement	-2.05 **
Adjusted R-sq	0.94
F-Statistic	131.6

Note: Asterisks indicate that the estimated coefficient is significantly different from zero at the 1 percent level.

45.   **Given the uncertainty surrounding estimates of the structural rate of unemployment, a second specification of the model is estimated as a check of the robustness of the results.** In that specification, the actual unemployment rate is used as the dependent variable and various demand shocks are added to the set of explanatory variables (see Nickell et al. for a similar approach). The augmented equation is as follows:

$$U_t = \alpha + \sum_{j=1}^{J} \beta_j X_{j,t} + \sum_{k=1}^{K} \gamma_k Z_{k,t} + U_{t,U.K.} + \varepsilon_t \ ,$$

where Z is a vector of demand shocks (the real interest rate and labor productivity growth). Changes in labor productivity growth would affect labor demand and respectively unemployment in the short run. On impact, an increase in the real rate of interest raises the required return on investment and reduces labor demand for a given wage level. Over time, high real interest rates raise the cost of capital and reduce capital accumulation. At a fixed ratio of employment to capital, labor demand would fall. Since the Irish and U.K. labor markets are highly integrated, changes in economic conditions in the U.K. can be expected to influence the domestic labor market. Indeed, net migration has been an important channel of adjustment in Ireland. The U.K. unemployment rate is included in the regression to capture the effect of shifts in labor demand in the U.K. on Irish unemployment.

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[21] Since the benefit replacement rate is measured as percent of gross wage, changes in the tax wedge would determine the net replacement rate, which could explain the relatively high elasticity of unemployment with respect to the tax wedge.

46.   **The results confirm that demand shocks—interpreted as changes in the interest rate, labor productivity growth, and U.K. unemployment—can explain about a third of the decline in actual unemployment since the second half of the 1980s.** Changes in U.K. labor market conditions prove to be a highly significant determinant of the Irish rate of unemployment (although in recent years the link has weakened somewhat as domestic demand conditions have become more important). The coefficients of the labor market institutions remain significant and with the correct sign (with the exception of the coefficient of bargaining coordination which becomes insignificant).

Dependent Variable: Unemployment Rate Sample Period: 1961-2002	
Constant	-7.25
Benefit Replacement Rate	0.20 **
Tax Wedge (t-1)	0.33 **
Bargaining Coordination	-0.71
Union Density	0.06
Enforcement	-2.34 *
Real Interest Rate (t-1)	0.24 **
Labor Productivity Growth	-0.41 *
UK Unemployment Rate (t-1)	0.35 *
Adjusted R-sq	0.95
F-Statistic	88.3

Note: Asterisks indicate that the estimated coefficient is significantly different from zero at the 5 percent (**) or 10 percent (*) level.

E. Concluding Remarks

47.   **In summary, improved cyclical conditions can explain between a third and a half of the reduction in unemployment in the 1990s, with the rest accounted for by changes in the structural rate of unemployment.** The greater flexibility of the labor force has been induced by favorable changes in labor market institutions and policies. Significant reduction in labor taxes, a decline in the effective benefit replacement ratios, stricter enforcement of eligibility for benefits, and the system of coordinated wage negotiations have all contributed to the activation of the unemployed and can explain well the decline in the structural unemployment rate.

48.   **Going forward, continued flexibility of the labor market would be necessary to sustain rapid growth.** The ability to use tax reductions to stimulate labor supply may be nearing its limit. However, further refinements in labor market policies could help facilitate adjustments to economic shocks in the future. The effectiveness of certain active labor market policies, such as the community employment scheme and other job-creation schemes could be reviewed, especially against the background of emerging labor shortages in various areas in the private sector. The rational for the pre-retirement allowance and retirement pension programs may need to be re-examined as these programs discourage labor participation by elderly workers. Limiting the duration of unemployment assistance could improve the incentives of the unemployed to search actively for jobs. Emphasis on enforcement of eligibility for various social support schemes may allow for better targeting of social spending. Finally, the system of social partnership and flexible immigration policies would continue to play an important role in ensuring wage growth consistent with maintaining competitiveness.

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DATA SOURCES AND DEFINITIONS

Unemployment Rate is the standardized unemployment rate (OECD Analytical Database).

Benefit Replacement Rate. The data refers to the first year of unemployment benefits as a percentage of average earnings before tax. The rate is averaged over two earnings levels, three family situations and three durations of unemployment. For further details, see the OECD Jobs Study (1994). The OECD publishes this measure once every two years. The intermediate years are interpolated.

Bargaining Coordination. This is an index between 1 and 3, increasing in the degree of coordination in the wage bargaining process on the employers' as well as on the unions' side. Constructed by Nickell and Nunziata and available in their labor market institutions database at http://cep.lse.ac.uk/pubs.

Union Density. The ratio of union members to the labor force. The data from 1960 to 1995 is taken from the Nickell and Nunziata database. The data after 1995 is from the OECD and can be found at http://www1.oecd.org/scripts/cde/members/lfsindicatorsauthenticate.asp.

Tax Wedge. For 1979–2002 the tax wedge is estimated by the OECD as the sum of income taxes plus employee social security contributions less cash benefits as percentage of labor costs for the average production worker. This data is available once every two years and the remaining years are interpolated. The data for the tax wedge prior to 1979 is from Nickell and Nunziata (2001).

Enforcement is a dummy variable which takes a value of 1 starting in 1998 (when interviews for the unemployed were conducted for the first time).

Real Interest Rate. The long-term rate on government bonds deflated by the GDP deflator (OECD Analytical Database).

Labor Productivity Growth is calculated at the growth of real GDP per hour worked. Source of average hours worked per person: OECD.

III. WHO SAVES IN IRELAND? THE MICRO EVIDENCE[22]

A. Introduction

49. **Over the next half-century, Ireland is set to experience a significant aging of its population, raising the question of whether households are saving enough for retirement.** Past falls in fertility rates and increasing life expectancy will raise considerably the elderly dependency ratio and the share of age-related expenditure in GDP, in particular for public pensions and health care. In order to adjust to these developments, the government is already partly prefunding future pension liabilities by setting aside 1 percent of GNP in the National Pensions Reserve Fund every year. Although Ireland's effective retirement age is among the highest in industrial countries, higher labor force participation, particularly among the elderly, could also be further encouraged to help reduce the burden of population aging.[23] In this context, it is also important to ensure that households are forward looking and able to save to maintain current living standards in old age.

Elderly Dependency Ratio, 2000 and 2050 | Household Saving Rate, 1970-2002
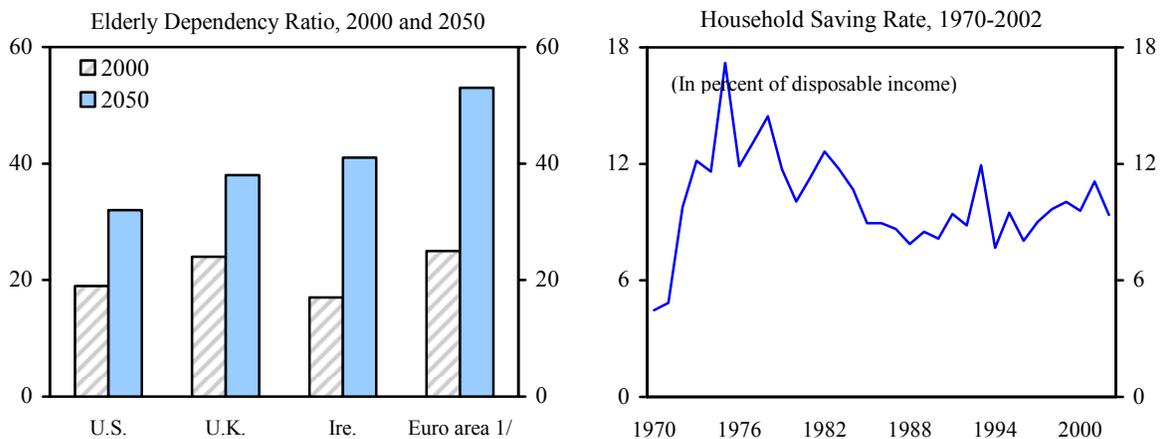
1/ Average of France, Germany, and Italy.

50. **Ireland's household saving rate has remained roughly stable since the mid-1980s.** Household saving rates fell sharply during the 1970s and 1980s from about 17 percent of disposable income in 1975 to 8 percent in the late 1980s. Since then, household saving rates have been stable, except for a spike in 1993.[24] Since the mid–1990s, strong growth in

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[22] Prepared by Marialuz Moreno Badia. I thank Jim Dalton and Paddy McDonald of the Central Statistics Office (CSO) for the data and valuable clarifications on the Household Budget Surveys 1994/95 and 1999/2000.

[23] The government is currently considering the introduction of an old-pension bonus for those who work beyond age 65.

[24] The CSO data on savings are calculated as residuals. As a result, the national accounts statistical discrepancy is implicitly included in the personal saving figure.

personal credit has led to high levels of household debt—above 100 percent of disposable income. Several factors may explain these trends:

- The s*trong economic performance* during the 1990s improved consumer confidence and reduced the risk of unemployment and, therefore, may have lead to lower precautionary savings.

- *Fiscal consolidation* has eased fears of a future increase in the level of taxation, decreasing "Ricardian" consumers' need to save.

- The *decline in real interest rates*, in the run-up to membership in the European Economic Monetary Union (EMU), may have also created a disincentive to save by decreasing the cost of current consumption relative to future consumption.[25]

- *Financial liberalization* and the development of mortgage markets may have also driven down the need for large down payments and, hence, lowered savings. In addition, more developed credit markets have most likely helped in reducing liquidity constraints and allowed constrained consumers to implement their saving decisions with a consequent reduction in "accidental savings."

51.   **Moreover, Ireland's household saving rate is not low by international standards** (Figure 1). During the 1990s, household saving rates in a number of industrial countries fell more sharply than in Ireland, particularly Australia, Finland, Canada, the United States, Japan and the United Kingdom. As a result, the Irish household saving rate is above the historical low levels of these countries, but still somewhat lower than in the euro area.

52.   **Nonetheless, there are some reasons for concern about the prospects for the living standards of future retirees**. First, Ireland's state pension replacement rates are among the lowest in industrial countries, and, therefore, Irish households may need higher levels of savings than those in other countries in order to prepare for retirement.[26] Second, private pension coverage is low, particularly for those close to retirement.[27] Third, Irish assets in tax-favored private pension schemes are lower than in most countries where the

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[25] However, the negative impact of lower real interest rates could be offset by substituting deposits with higher-yielding investment instruments, such as equities or real estate.

[26] People are entitled to a basic flat rate pension through the social welfare system. The additional cover is provided through occupational pension schemes and personal pension arrangements.

[27] According to Hughes and Watson (2005) occupational and personal pensions provided an income for only one third of pensioners in 2000 and the average amount paid was less than a quarter of the income received during retirement. At the request of the government, the Pensions Board started the National Pensions Awareness Campaign in 2003 to address pension undercoverage.

Figure 1. Ireland: International Comparison: Household Saving Rates 1/
(In percent)

Saving Rates in 2003

Change in Saving Rates, 1993-2003
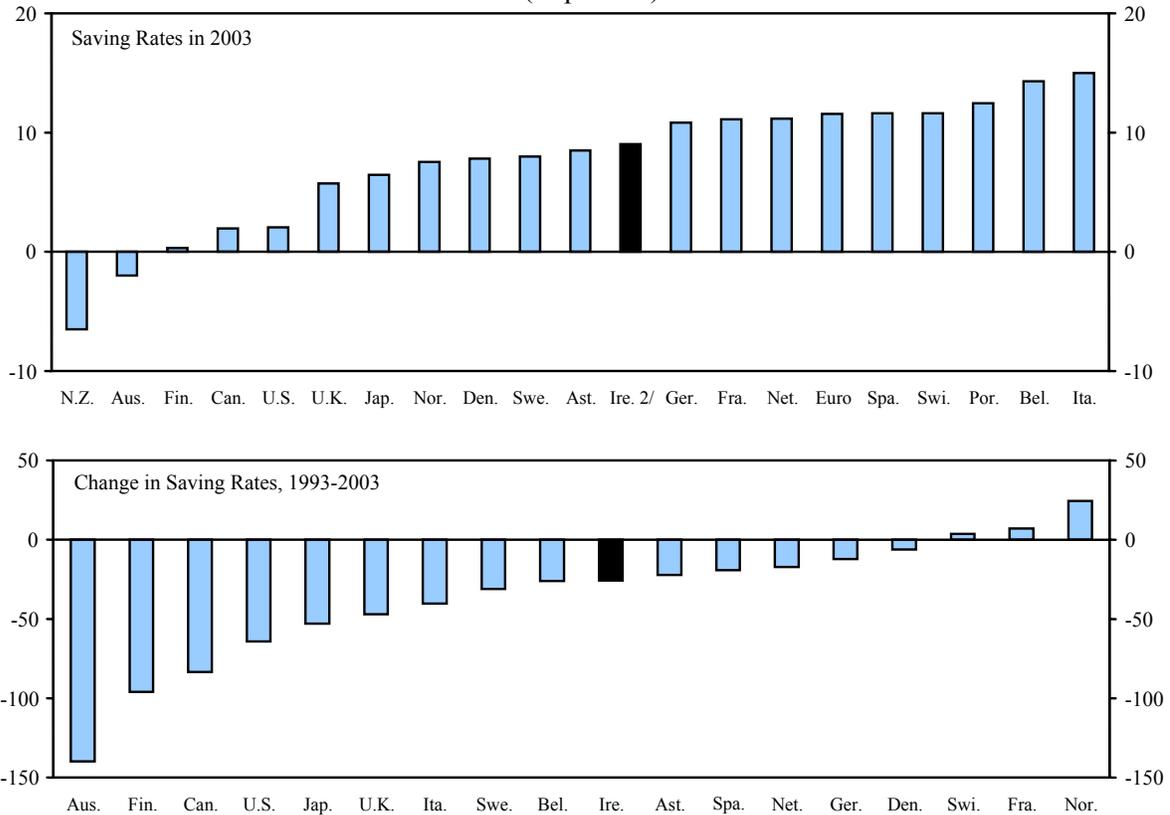
Sources: OECD *Economic Outlook*, and Economic and Social Research Institute.
1/ Ast. denotes Austria.
2/ Estimate from ESRI *Quarterly Economic Commentary* Winter 2004.

pension income provided by the public system is low in proportion to earned income (OECD, 2005). In order to understand whether low household savings may leave some population groups vulnerable to a loss of income in old age, we need to analyze the micro data evidence.

Gross Replacement Rates

Percentage of Persons in Employment without Pension Coverage, Q1, 2004
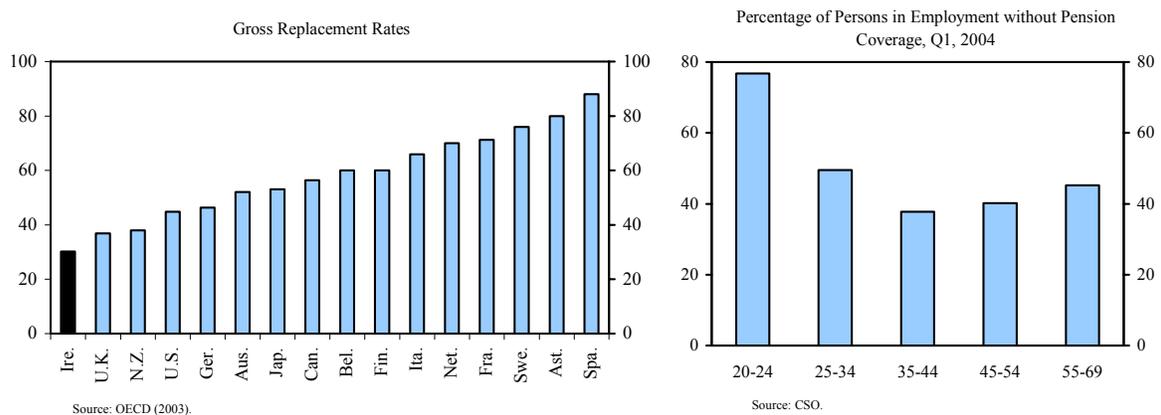
Source: OECD (2003).

Source: CSO.

53.   **This paper attempts to inform the public debate on the adequacy of household savings in Ireland.** It is organized as follows. Section B characterizes the life cycle profile of savings in Ireland and examines which groups of households have relatively low saving rates. Section C analyzes empirically the response of household saving to house prices to shed some light on whether households are relying excessively on property for retirement purposes. Section D discusses whether the Special Savings Incentive Accounts have helped boost saving. Section E concludes.

B. Who Saves in Ireland?

Data and statistical methods

54.   The data used in this paper are from the two latest Household Budget Surveys (HBSs), 1994/95 and 1999/2000.[28] The HBSs do not contain information on households' wealth, and, therefore, we can only construct a residual measure of saving. In particular, saving is determined by subtracting household total consumption, which includes expenditure on durable and non-durable goods and other services, from total disposable income, which is computed by subtracting the total amount of personal taxes and social security contributions from household total gross income.

55.   The level of saving rates in the data is remarkably low, compared with aggregate savings (Table 1).[29] It is clear that such a low level is indicative of measurement and data problems. In particular, while both consumption and income are likely to be under-reported in the HBSs, the problem seems to be more serious for income. However, we have no reason to believe that measurement problems vary systematically with age and cohorts, and, therefore, the figures presented in this paper are still informative about the evolution of saving over the life cycle. In addition, the time pattern of the saving rate in the HBSs is similar to that of the national accounts. Both measures show an increase between 1994 and 1999. Nevertheless, the saving figures, and in particular their level, must be taken with caution.

Table 1. Household Saving Rates, 1994/95 and 1999/2000
(In percent)

	National Accounts Data 1/	Median HBS
1994/95	8.6	1.3
1999/00	9.8	3.0

1/ Macro data are the average of the savings rate for the years 1994/95 and for 1999/2000.

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[28] For a more detailed description of the data see Appendix I.

[29] Throughout this analysis the measure used is the median rather than the mean, because the latter is very sensitive to outliers associated with temporarily low incomes or expenditure. This also avoids the problem of dealing with top-coded observations. All the figures are in constant euros.

56.   To analyze a dynamic phenomenon such as saving, one would like to follow the same individuals over time. In order to deal with the lack of longitudinal dimension in the HBSs we construct a synthetic panel using the available time series of cross sections.[30] The idea behind a synthetic panel is to divide up households of each survey into as many homogenous household types ("cells") as possible and identify these cells across time. Such a panel consist of household types as survey units. To analyze the life-cycle profile of saving in Ireland, we define cohorts by five-year bands. All households whose head was born before 1919 or after 1974 were eliminated from the sample. The definition of the cohorts together with the average cell size in HBSs 1994/95 and 1999/2000 are reported in Table 2. Unfortunately, one important limitation of the data is the lack of long time series.

Table 2. Cohort Definitions and Cell Size

Cohort	Year of Birth	Cell Size	
		1994/95	1999/2000
1	1919	421	248
2	1924	612	417
3	1929	571	495
4	1934	522	608
5	1939	560	577
6	1944	673	654
7	1949	816	768
8	1954	925	854
9	1959	966	904
10	1964	766	880
11	1969	409	624
12	1974	243	345

What does the theory of saving behavior predict?

57.   **The originating theory of saving behavior was the life-cycle model of Modigliani and Brumberg (1954) and Friedman (1957).** In its simplest version, households save to smooth consumption due to a declining marginal utility of consumption and lower income after retirement. The resulting life-cycle profile of saving displays a typical hump shape (Figure 2). With relatively low earnings at the beginning of their careers, households smooth consumption by borrowing. As earnings increase, they are able to save, running down their accumulated wealth after retirement. The basic life-cycle model assumes constant utility function, no uncertainty, no changes in the interest rate, and perfect capital markets. Most recently, the literature (for example, Engen, Gale, and Uccello, 1999; and Scholz, Seshadri, and Khitatrakun, 2004) has focused on a stochastic life-cycle model that includes precautionary savings and buffer stock behavior and considers explicitly the role of housing wealth. These models do not generate a single, optimal wealth-earnings ratio, but a distribution of optimal wealth-earnings ratios for a given set of household's characteristics. In addition, they are consistent with a hump-shaped consumption profile.[31]

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[30] This technique has been used extensively in the literature analyzing household savings behavior (see, for example, Browning, Deaton, and Irish (1985), Deaton (1985), and Attanasio, (1998)).

[31] Consumption is low for young households because they want to build their precautionary savings. As households age, income and wealth rise, some income uncertainty is resolved, and the precautionary motive for saving tapers off, leading to rising consumption. Finally,

(continued)

Figure 2. Ireland: Income, Consumption and Life-Cycle Saving
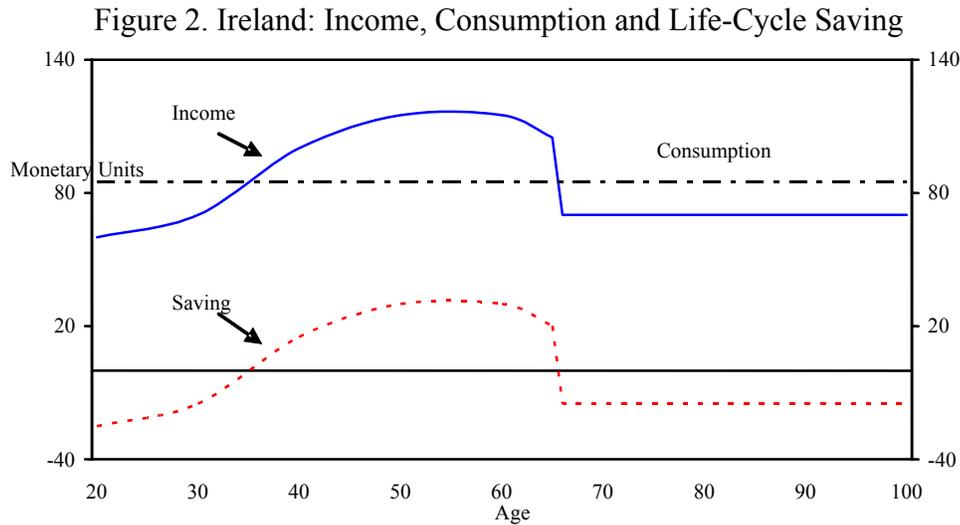
The life-cycle profile of household savings in Ireland

58.   **Income and consumption profiles in Ireland are similar in most respects**
(Figures 3 and 4). In particular, both profiles present the characteristic hump shape and peak
at around the same age of 45 to 50. Income profiles seem to exhibit a cohort effect as later
cohorts have higher levels of lifetime incomes, presumably due to productivity growth and
higher female participation. As with income, expenditure seems to display strong cohort
effects.[32]

59.   **However, household saving profiles in Ireland display features inconsistent with
the simple life-cycle model** (Figures 5 and 6). Although income and consumption display
the familiar hump-shape, their profiles are not exactly similar. In particular, expenditure
increases at a slower pace than income earlier in life, and decline faster at the end of the life-
cycle. As a result the cohort profiles of savings are not hump-shaped:

- After adjusting median saving rates to match aggregate rates at the corresponding
  year, saving rates of households aged 45 to 60 are relatively flat, when savings should
  be at their peak according to the life-cycle model. There is no evidence that the
  relatively flat pattern of savings during the prime years of households' working life is

consumption declines in old age as an increasing mortality probability effectively makes
households less willing to defer consumption to an uncertain future.

[32] However, because of data limitations and Ireland's strong economic performance during
the mid-1990s, we cannot conclusively reject the hypothesis that these patterns are explained
by time effects rather than demographics.

Figure 3. Ireland: Median Weekly Household Income by Cohort and Age
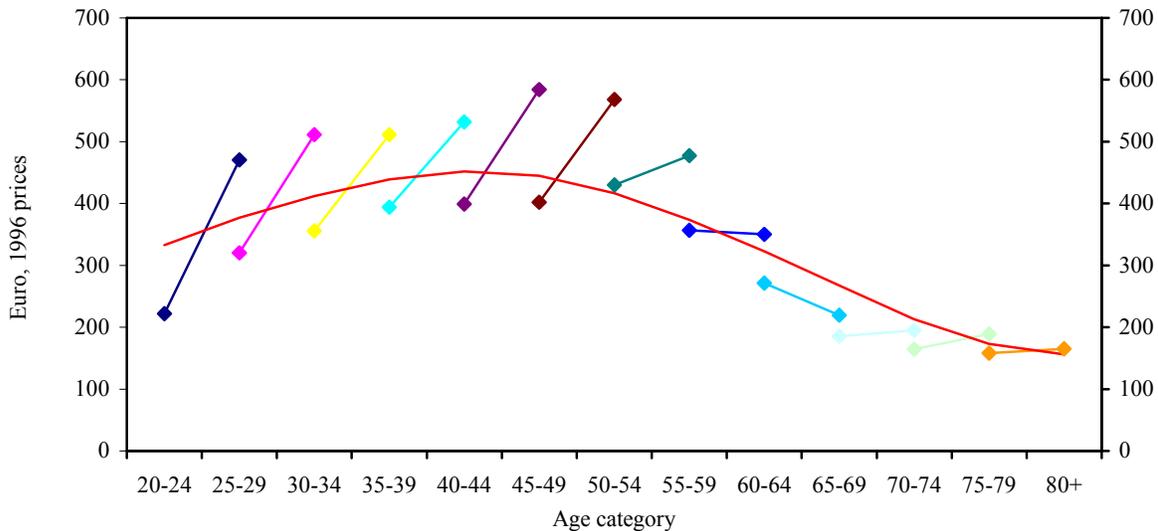
Figure 4. Ireland: Median Weekly Household Expenditure by Cohort and Age
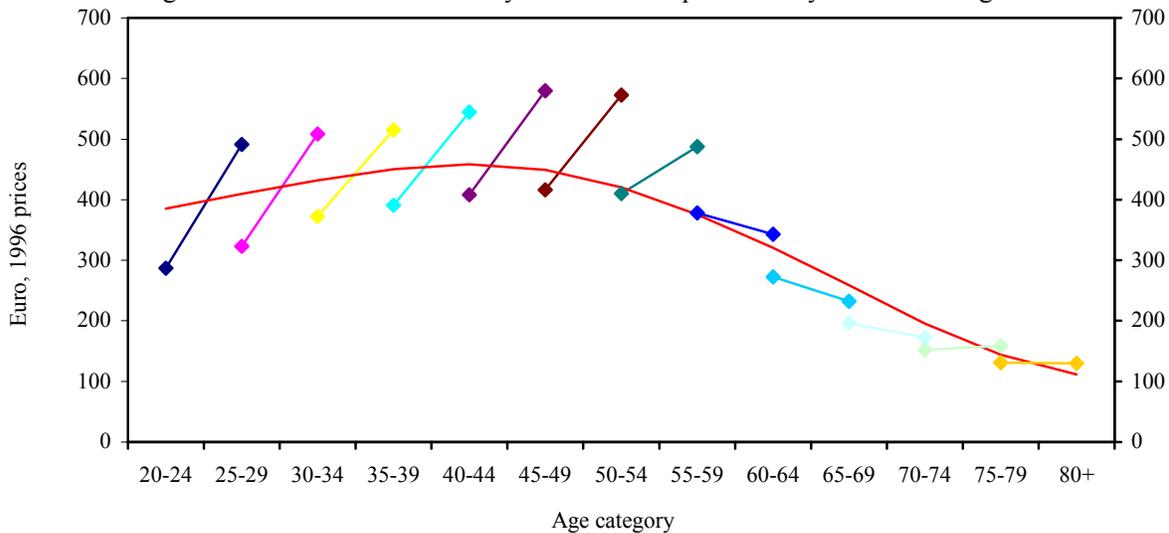
Figure 5. Ireland: Median Weekly Household Savings by Cohort and Age
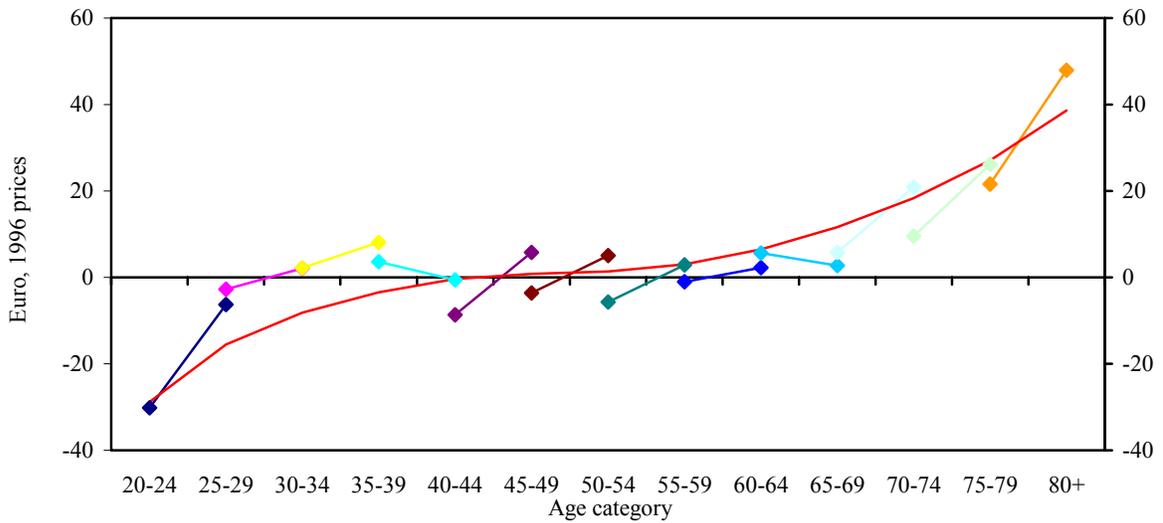
Figure 6. Ireland: Median Household Saving Ratio by Cohort and Age
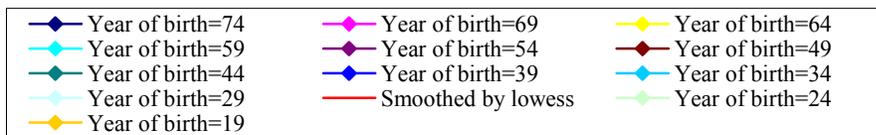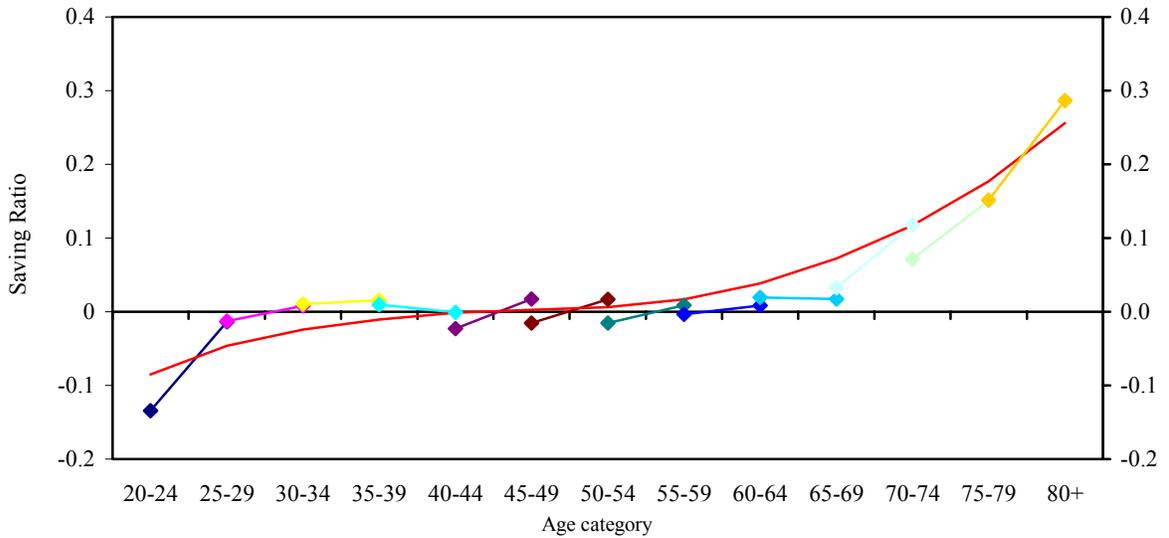
driven by data problems since this would require that households in those age groups systematically underreported income. One possible explanation might be that households are myopic and, therefore, underestimate the need to finance consumption in old age or overestimate available income after retirement.
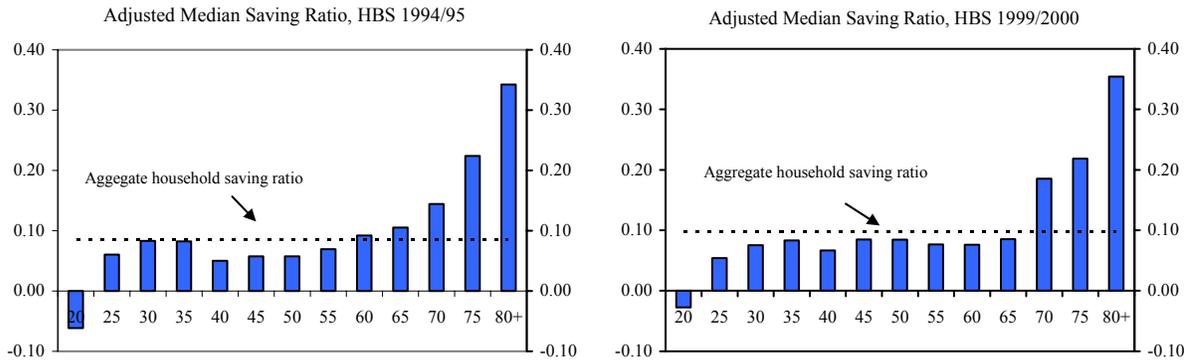
Source: Staff estimates.

- Savings do not turn negative beyond retirement age. Quite the opposite, savings for older (retired) groups continuously increase throughout. This is obviously linked to the fact that consumption profiles fall much faster than income after retirement. The figure on median savings rates shows a similar picture. There may be a variety of reasons explaining this "retirement savings puzzle." First, bequest motives could become more important in old age. Second, if pension wealth expectations are not met or the marginal utility of consumption falls in an unexpected way (because of aging), savings could further increase after retirement.

60.   **Moreover, Ireland's saving profile is remarkably different from other industrial countries.** Notwithstanding the difficulties involved in comparing life-cycle profiles of savings across countries, the literature broadly confirms that, similar to Ireland, many industrial countries have positive discretionary savings after retirement.[33] However, unlike in Ireland, we observe a pronounced hump-shaped profile in the Netherlands, and less pronounced ones in Germany and in the United States (Börsch-Supan and Lusardi, 2002).[34] Furthermore, saving rates increase throughout the entire life course in those countries that display increasing saving rates during old age (Japan and the United Kingdom).[35] This is in

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[33] See, for example, Poterba (1994) for studies on Canada, Germany, Italy, Japan, the United Kingdom, and United States.

[34] For a detailed analysis, look at Alessie and Kapteyn (2001) on the Netherlands; Börsch-Supan and others (2001) on Germany; and Attanasio and Paiella (2001) on the United States.

[35] The statistical evidence on Japan is somewhat mixed. While Börsch-Supan and Lusardi (2002) find increasing positive cohort-corrected median saving rates in old age in Japan, other studies (for example, Kitamura, Takayama, and Arita, 2001) find some evidence of

(continued)

contrast to Ireland, where households' saving rates are flat during most of their working lives. Finally, although Italy has essentially a flat saving profile, its saving rates are much higher throughout the entire life cycle than in Ireland. These differences do not seem to be explained by Ireland's pension system, since its relatively low replacement rates should be reflected in increasing saving rates among the young households (to accumulate retirement savings) and decreasing rates among the elderly (as they run down their retirement savings), like in the Dutch case.

61.   **These findings prompt the natural question of whether there is a generational savings gap in Ireland.** If this is the case, we would expect current young cohorts to maintain their relatively low saving rates in old age, which, in turn, would result in declining aggregate saving rates in the future. In fact, cohort effects would seem to be a natural candidate to explain the decline of saving rates in Ireland during the 1980s as aging thrifty cohorts may have been replaced by less frugal ones.

62.   **In order to test this hypothesis we compare median saving rates for each pair of adjacent cohorts, averaged over the same age.** For example, we compare the cohort born in 1969 (age 25 in HBS 1994/95) with the cohort born in 1974 (age 25 in HBS 1999/2000). Figure 7 indicates that the median saving rates of most cohorts are higher than those of the next older cohort. However, we cannot reject the idea of a generational savings gap since this simple analysis neglects the fact that we are comparing data observed in two different years (1994/95 and 1999/2000). To further

Figure 7. Ireland: Median Saving Ratio by Cohort and Age
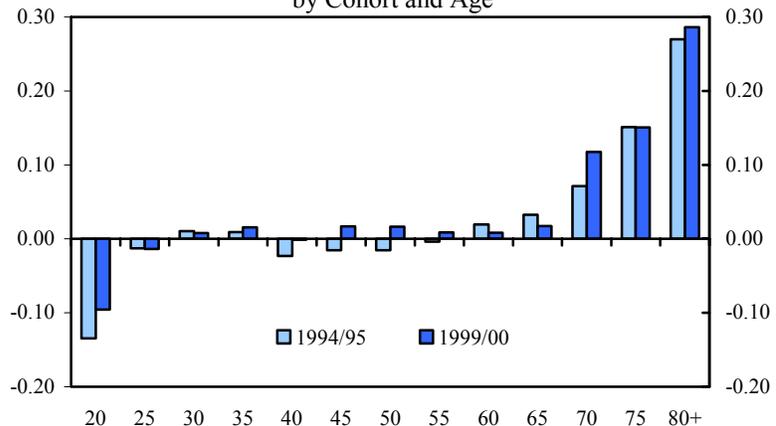
test whether there are cohort effects, we regress the saving rates on a fifth-degree polynomial in age and cohort dummies. A year dummy is also included to capture time effects. The results (reported in Appendix II) indicate that there are no systematic differences between younger and older cohorts. Surprisingly, there seems to be no time effect either. Nevertheless, one big drawback of this analysis is the lack of long time series and limited overlap across cohorts.

63.   **These results suggest that, although households at the peak of their working lives have relatively flat saving rates, those rates are not different from those of their**

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wealth decumulation in Japan among the elderly. For evidence on the United Kingdom see Banks and Rohwedder (2001).

parents. Therefore, we cannot conclusively establish whether saving rates may decline in the future. Moreover, the lack of a detailed survey on household wealth severely limits our assessment of the adequacy of savings in Ireland.

Which households save less?

64. **Despite the lack of data to assess the adequacy of savings in Ireland, several additional pieces of evidence can help us understand which households have relatively low savings.** In particular, the cross-sectional age profiles of savings provide suggestive information about which groups of households are saving less than others. The results from the analysis of HBS 1999/2000 can be summarized as follows:[36]

- *Saving rates are particularly low for households in the bottom two quartiles of income* (Table 3). As one might expect, saving rates vary with income.[37] In particular, median saving rates are negative for the bottom two quartiles of income but rise to a rate of 14 percent for the top quartile. When broken down by age, the main feature of this cross-sectional data is the relatively flat saving rates up to age 60, confirming our finding from the previous section. A large segment of the population saves nothing. Many of these households have low lifetime earnings, but there are also a number of households with higher lifetime earnings that save small amounts as well.

Table 3. Median Saving Ratio by Income Quartile, HBS 1999/2000

Age	I	II	III	IV	Total
20-24	-0.45	-0.09	-0.16	0.00	-0.10
25-29	-0.38	-0.12	0.01	0.16	-0.01
30-34	-0.17	-0.08	0.00	0.16	0.01
35-39	-0.23	-0.12	0.03	0.14	0.02
40-44	-0.33	-0.17	0.01	0.11	0.00
45-49	-0.21	-0.11	-0.01	0.12	0.02
50-54	-0.07	-0.14	0.01	0.09	0.02
55-59	-0.20	-0.19	0.03	0.18	0.01
60-64	-0.09	0.06	-0.03	0.13	0.01
65-69	-0.08	0.05	0.03	0.35	0.02
70-74	0.04	0.15	0.15	0.34	0.12
75-79	0.11	0.20	0.24	0.43	0.15
80+	0.27	0.30	0.33	0.26	0.29
Total	-0.02	-0.06	0.01	0.14	0.03

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[36] We focus on the last available HBS (1999/2000), but the results are similar for the 1994/95 HBS.

[37] This result is consistent with the findings for the United States (see, for example, Browning and Lusardi, (1996)). According to Dynan, Skinner, and Zeldes (2000), the positive relationship between income and saving is consistent with a model that includes a precautionary saving motive, tempered by the presence of a safety net, coupled with a bequest motive.

- *As expected, the employment status of households' members matter.* Single earners save less than double-income households, while households whose head is not working save little, if any. Finally, self-employed's saving rates are low for most income levels. The reason behind this is that income flows of self-employed households are not guaranteed and, therefore, fluctuate a great deal. As a result, saving rates of self-employed vary from negative for the first quartile to significantly positive for the fourth quartile. In fact, the fourth quartile of self-employed households seems to be the highest savers, probably with the highest incomes in society.

Median Saving Ratio by Spouse's Employment Status, 1999/200

Median Saving Ratio by Head of Household's Employment Status, 1999/2000

Median Saving Ratio of Self-Employed by Income Quartile, 1999/2000

Median Saving Ratio of Employee by Income Quartile, 1999/2000
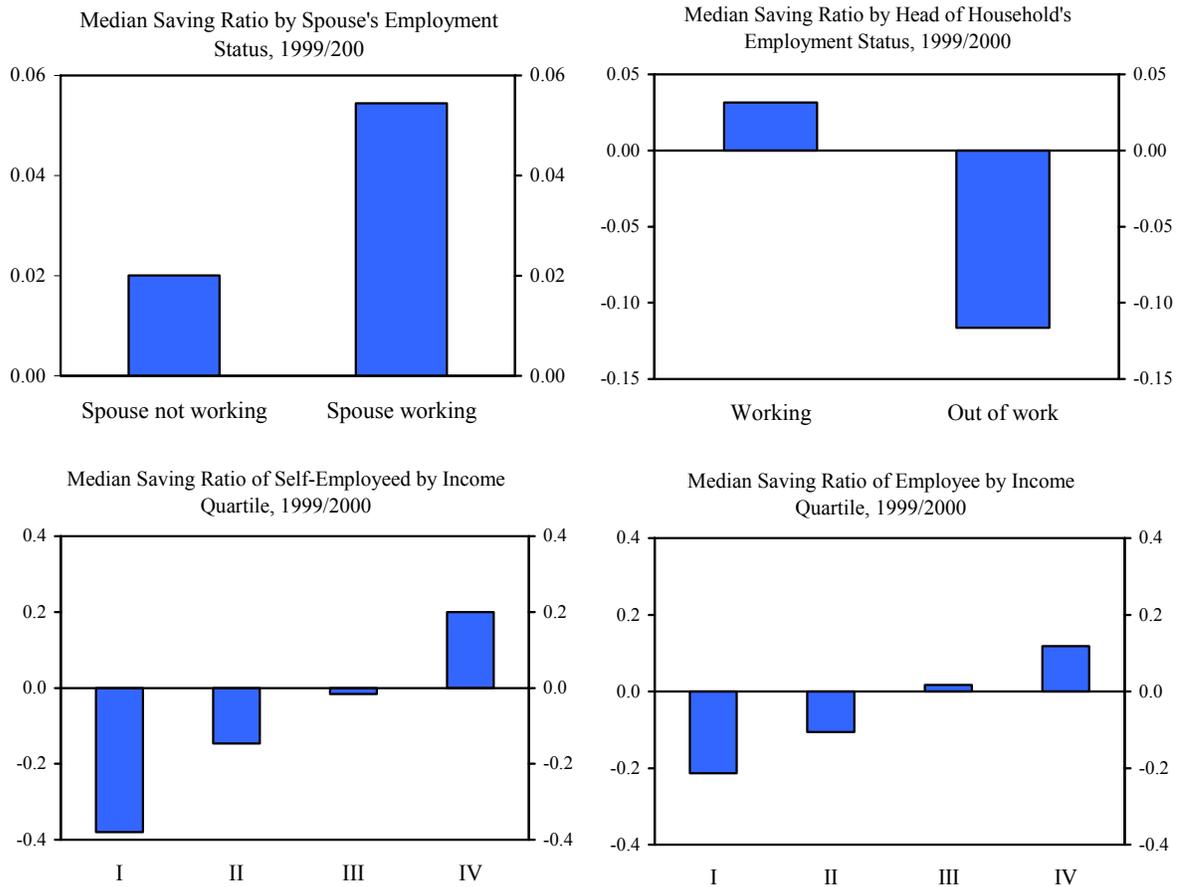
- *Education does not seem to explain households' saving behavior.* Surprisingly, our results indicate that households with higher levels of education save less even after we have controlled for income (Table 4).

Table 4. Median Saving Ratio by Education and Income Quartiles, HBS 1999/2000

	I	II	III	IV	Total
Primary	0.07	0.05	0.05	0.17	0.08
Secondary	-0.20	-0.08	0.02	0.13	0.00
Third	-0.36	-0.14	-0.01	0.14	0.05

- *Households with low savings rates have little financial wealth and do not generally make contributions to private pension plans* (Table 5). [38] Therefore, these households cannot be expected to compensate for their lack of savings with increases in wealth stemming from capital gains.

Table 5. Median Savings Rate by Assets Ownership

	Doesn't Own Investment Assets	Own Investment Assets	No Pension Contributions	Pension Contributions
20-24	-0.15	-0.04	-0.09	-0.19
25-29	-0.02	-0.01	-0.04	0.03
30-34	-0.01	0.06	-0.03	0.10
35-39	0.01	0.02	-0.03	0.07
40-44	-0.03	0.03	-0.04	0.05
45-49	0.03	-0.01	-0.02	0.05
50-54	-0.01	0.05	-0.04	0.07
55-59	0.01	0.03	-0.06	0.12
60-64	0.01	0.00	-0.02	0.16
65-69	0.03	-0.01	0.02	0.08
70-74	0.10	0.15	0.12	0.17
75-79	0.13	0.17	0.14	0.26
80+	0.30	0.26	0.29	0.28
Total	0.02	0.05	0.01	0.08

- *Indebted households save less.* Despite low interest rates, Irish households' debt-service payments have risen since the end of the 1990s because of the increasing levels of indebtedness. This seems to have a negative impact on the ability of households to save.

Median Saving Ratio by Indebtedness, HBS 1999/2000
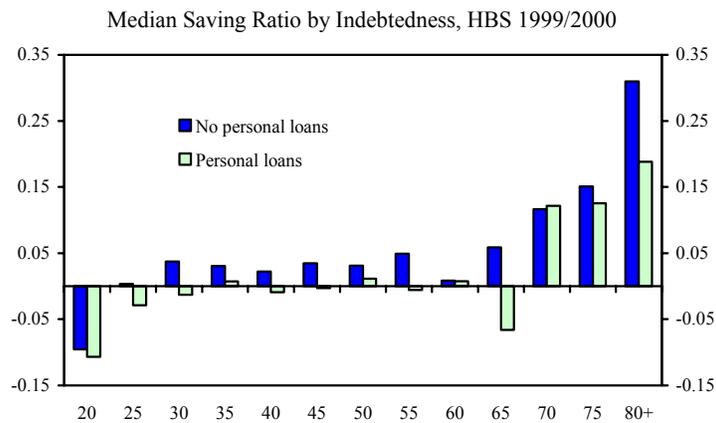
[38] The HBS contains information on whether a household member holds any stocks, government bonds, deposit and saving accounts, or other form of investment.

- *Saving rates of tenant households are, in general, lower than those of homeowning households* (Table 6). There are several reasons behind this finding. First, a substantial part of the savings among the young cohorts can be counted as repayments of housing loans. Second, savings for home reconstruction every 15 to 20 years might also be non-negligible. Finally, homeowning households earn relatively high incomes.

Median Mortgage Principal Payment as Percentage of Disposable Income, HBS 1999/2000
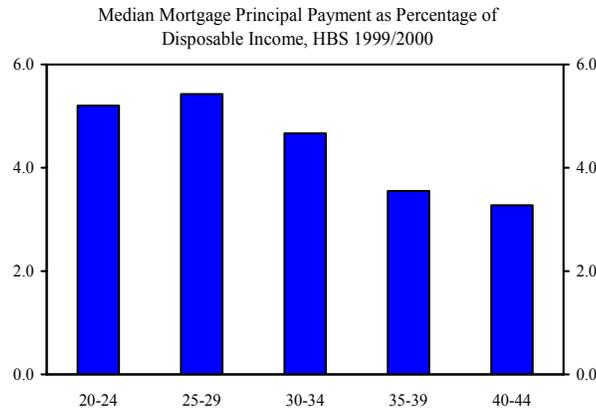
Table 6. Median Savings Ratio by Tenure and Income Quartiles, HBS 1999/2000

	I	II	III	IV
Homeowners	-0.01	-0.05	0.01	0.14
Renters	-0.03	-0.06	0.00	0.13

C. Are Household Savings Affected by Capital Gains in Housing?

65. **Housing is a major component of wealth in Ireland**. Roughly, 80 percent of Irish households own homes, and housing is the single largest asset homeowners hold.[39] In fact, while 82 percent of households in the 1999/2000 HBS are homeowners, only 36 percent of them hold some form of wealth other than housing. Moreover, 70 percent of households are homeowners by age 30!

Share of Homeowners by Age, HBS 1999/2000

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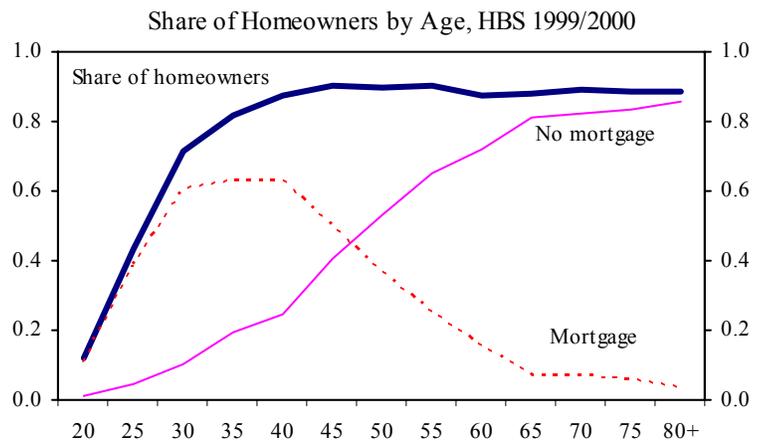
[39] According to Goodbody Stockbrokers, Irish households hold 556 percent of disposable income in nonfinancial assets.

66.   **The dramatic increase in Ireland's housing prices since the mid-1990s raises the question of whether savings may have declined as a result.** From 1993 to 2003, the price of new houses posted a cumulative increase of about 140 percent in real terms, while the corresponding price increase of second houses was 200 percent. In a simple life-cycle model, real housing capital gains would lower nonhousing savings and cause a substitution of nonhousing for housing wealth in the financing of retirement.

Real House Price Inflation
(In percent)
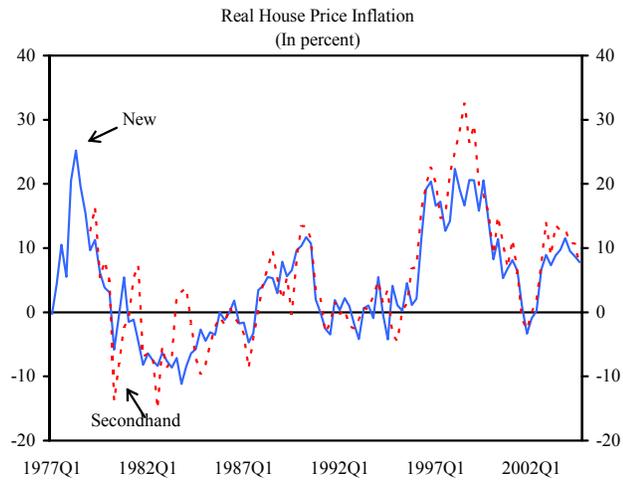
Sources: The Department of Environment, Heritage and Local Government, and staff calculations.

67.   **To get a sense of the importance of wealth effects in Ireland, we estimate a simple econometric model of savings using household-level data.** To exploit the variation in housing prices across regions, we use HBS 1994/95 and HBS 1999/2000 to construct a synthetic panel based on the year of birth and sex of the head of household and the region where the household lives.[40] We consider the eight regions as defined in the HBS: Border, Dublin, Mid-East, Midland, Mid-West, South-East, South-West, and West. We measure capital gains as the change in the housing price in the region in which the household resides between 1994/95 and 1999/2000. Housing prices data are from the Department of Environment, Heritage and Local Government. The model specification is

$$\Delta S_i = \alpha\, \Delta Y_i + \beta r + \gamma \Delta H_i + \lambda\, x_{i99} + \ldots + u_i$$

where ΔS_i is the change in saving of household i during 1994/95–1999/2000, ΔY_i is the change in disposable income during the same period, r are the real mortgage rates prevailing in 1999, ΔH are the real housing capital gains, and x_{i99} is a vector of demographic variables (household size, head of household's age, age squared, dummy for employment status of head of household and of the spouse, education, and cohort dummies). For this exercise, we focus on homeowning households.[41]

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[40] By doing so, we are implicitly assuming that households did not migrate to other regions between HBS 1994/95 and HBS 1999/2000. This assumption seems reasonable, given that less than 2 percent of the population migrates across regions according to Census 1996 and Census 2002.

[41] The inclusion of renters in the sample could greatly affect the estimated saving offset. For example, house price increases may lead renters who wish to own to increase their savings because of the increase in the required down payment. This response could offset any negative response by homeowners.

68.   **Real housing capital gains seem to have a barely significant negative effect on savings** (Table 7). Although the coefficient of the house price variable is negative, it is statistically significant at 10 percent for only two of our model specifications (regressions 4 and 5). [42] The lack of robustness of these results suggests that there is no strong wealth effect in Ireland. This is consistent with the work of O'Sullivan and Hogan (2003) who find that the marginal propensity to consume out of housing wealth in Ireland is zero. As expected, real disposable income is positive and statistically significant for all specifications. The coefficients of the education dummies are also significant and confirm the puzzling finding of our cross-sectional analysis, namely, that households with higher levels of education save less.

69.   **What can explain the absence of strong wealth effects?** One potential explanation is that housing capital gains are either anticipated or perceived as transitory by homeowners. Transitory gains do not have an impact on saving decisions, while expected capital gains have been smoothed into consumption and have no effect on savings at the time the gains occur. A second explanation is that housing wealth is not fungible in people's minds with other forms of wealth, for example, retirement wealth (see, for example, Thaler (1990)). A third reason may be the limited availability of equity withdrawal in Ireland, which makes it difficult to spend real housing capital gains without selling one's home. Finally, anecdotal evidence seems to suggest that bequest motives are very important in Ireland, and, therefore, households may prefer to pass housing capital gains to their offspring, who now face higher lifetime housing costs.

70.   **Notwithstanding the absence of strong wealth effects, households need to be aware of the risks associated with unbalanced portfolios.** According to the Gunne Research Group (2004), over 75 percent of residential property investors specified pension saving (for themselves or their partners) as their main investment objective. Excessive reliance on real estate for saving purposes could leave households close to retirement particularly vulnerable to a downturn in the housing market. Moreover, by failing to diversify their portfolios, households may amplify the fluctuations in housing prices. Therefore, the government may have an important role to play in educating households about optimal financial planning.

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[42] As a robustness test, we also estimate a model of changes in consumption and find that the coefficient of house prices is not statistically significant either. Estimating a model with saving rates yields similar results.

Table 7. Median Regression Results

	(1)	(2)	(3)	(4)	(5)
ΔReal disposable income	101.2	172.2	163.5	139.7	133.2
	(2.90)**	(3.89)**	(3.53)**	(2.79)**	(2.64)**
Real interest rate		-252.8	-133.7	-175.2	-191.7
		(0.53)	(0.29)	(0.36)	(0.38)
ΔHouse prices	-33.5	-91.1	-231.3	-308.0	-332.9
	(0.21)	(0.55)	(1.49)	(1.82)+	(1.87)+
Household size		-446.4	-520.7	-715.1	-895.4
		(0.84)	(1.03)	(1.32)	(1.28)
Age		-235.8	-408.3	-404.7	-342.3
		(1.08)	(1.98)*	(1.78)+	(1.02)
Age squared		2.8	3.7	3.9	3.5
		(1.50)	(2.09)*	(1.91)+	(1.20)
Complete medium school			-2,795.9	-2,881.5	-3,075.1
			(2.28)*	(2.32)*	(2.19)*
Complete tertiary education			-31,704.3	-32,570.3	-32,479.0
			(6.70)**	(6.77)**	(6.95)**
Employment head of household				1,629.8	2,917.6
				(0.95)	(1.24)
Employment of spouse				441.4	409.5
				(0.40)	(0.34)
Birth year=1924					536.2
					(0.42)
Birth year=1929					954.1
					(0.49)
Birth year=1934					1,014.3
					(0.55)
Birth year=1939					930.3
					(0.44)
Birth year=1944					-1,256.2
					(0.65)
Birth year=1949					0.000
					(.)
Birth year=1954					1,116.4
					(0.52)
Birth year=1959					540.948
					(0.26)
Birth year=1964					914.0
					(0.45)
Birth year=1969					1,162.7
					(0.39)
Birth year=1974					0.000
					(.)
Constant	-50.3	5617.5	14547.5	13883.7	11310.3
	(0.04)	(0.80)	(2.12)*	(1.98)*	(1.18)
Observations	187	187	187	171	171
R-squared	0.05	0.09	0.18	0.17	0.18

Notes: Dependent variable is changes in saving levels.
Robust t statistics in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%

D. The Special Savings Incentive Accounts

71.   **Prompted by what was perceived to be relatively low saving rates, the government introduced the Special Savings Incentive Accounts (SSIAs) in 2001.**[43] These accounts were launched at a time of high inflation in an attempt to reduce demand pressures while promoting savings.[44] In order to achieve these objectives the accounts offer a very generous incentive: participants in this scheme are allowed to invest up to a monthly limit of €254, with the government providing a tax credit of 25 percent at the end of each month.[45] The scheme offers both deposit and equity market products and has a one-year entry window between May 1, 2001 and April 30, 2002.[46] In order to benefit from the tax credit and avoid a 23 percent exit tax, accounts must be held for five years.

72.   **The SSIAs have well exceeded expectations in terms of participation.** Not surprisingly, the accounts have proved to be very popular, with a total of 1.17 million accounts opened as of the date of entry closure (representing about 30 percent of the total population); monthly subscriptions averaged €175 in December 2004, and aggregate inflows

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[43] There are significant lags (of up to two years) in the release of official data of savings. As a result, the estimates of saving rates at the time were much lower than what the actual saving rates turned out to be. See, for example, Lane (2001).

[44] The importance of these two factors was highlighted by Finance Minister McCreevy in his speech introducing the SSIAs in 2001:

> "There has been a lot of focus in recent press coverage on my proposal for a savings incentive as a means of taking demand out of the economy. This is, of course, an important aspect. I have, however, another goal, which is to encourage individuals to provide for the future by a regular pattern of savings. This is consistent with my approach in earlier Finance Bills of encouraging pension provision by tax reform. I consider it essential that the savings scheme be as broadly focused as possible. It is for this reason that I propose a straightforward scheme, involving a tax credit mechanism. The proposed scheme has attracted a lot of interest and positive comments. I made it clear in the Budget that I would be taking an initiative in the savings area and the scheme has been carefully developed. It is consistent with the approach I set out in the Budget of countering inflation through a series of measures including the promotion of savings."

[45] The minimum monthly contribution is set at €12.70.

[46] It is estimated that 75 percent of all SSIA accounts are deposit-based and 25 percent are equities

and tax credits were increasing (Table 8).[47] Ownership of SSIAs is very broadly based with holders low- and medium-income earners making up the largest proportion of account holders (28 percent of SSIAs' participants in 2004 had incomes below €20,000, and 77 percent below €50,000).

Table 8. SSIA Aggregate Subscriptions and Tax Credits (€ million)

Period	Subscriptions	Tax credits
May - Dec. 2001	356.6	71.0
Jan - Dec. 2002	1,859.3	433.0
Jan - Dec. 2003	2,187.3	532.0
Jan – Dec. 2004	2,264.8	548.0
Jan – Mar. 2005 1/	591.8	192.0

Source: Department of Finance.
1/ Tax credit refer to the period Jan.-Apr. 2005.

73.   **However, it is not clear whether the SSIAs have been effective in raising saving rates**. Economic theory is ambiguous on the effect of tax subsidies on the volume of private savings because the substitution effect (higher after-tax returns make savings more attractive than consumption) offsets the income effect (the subsidy increases total income, which increases consumption in all periods). However, we do know that subsidies strongly increase savings in the specific form that is being subsidized, possibly to the detriment of other saving forms, for example Personal Retirement Savings Accounts (PRSAs).[48] From this perspective, the evidence is somewhat mixed:

- According to the latest ESRI estimates, saving rates may have increased from 9.4 percent in 2002 to 10.3 percent in 2003 but declined slightly to 10.1 percent in 2004. In any event, it is hard to establish a causal link between the SSIAs and savings, in light of the uncertain economic prospects faced by households in 2002–03.

Household Saving Rates, 2000-04

Sources: CSO and ESRI estimates.

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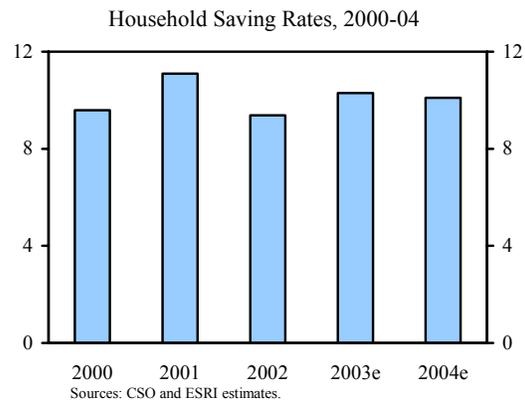
[47] The increase in monthly subscriptions is expected to accelerate as the maturity deadlines approach (the first one being May 2006).

[48] PRSAs are personal pension contracts introduced with the Pensions Amendment Act, 2002. The purpose is to promote pension coverage, particularly among employees without access to a company pension plan.

- A recent survey conducted by Bank of Ireland reveals, however, that its SSIA customer base comprises 76 percent of "novice savers" who didn't contribute regularly to any other savings scheme (other than pensions).[49]

- Nonetheless, many of these households may spend the funds accumulated in these accounts once they mature. A survey conducted by the Irish Mortgage Corporation indicates that only 23 percent of SSIA holders will reinvest the funds once they have matured.[50] Of those who have clear plans about their funds, only 10 percent will invest in pensions.

74.   **Furthermore, the SSIAs do not appear to have changed the behavior of those households with lower saving rates.** If households save little because of their failure to perceive the need to save, this scheme has probably not changed their habits. In fact, Table 9 shows that the percentage of households aged 40 to 69 holding SSIAs is roughly the same or lower than the percentage of households of the same age with positive savings in HBS 1999/2000. So, even if the scheme was successful in increasing aggregate savings, it is uncertain whether it would have encouraged vulnerable households to save more. Unfortunately, because of the limited information available about the participants in this scheme, it is difficult to draw any definite conclusions.

Table 9. Distribution of Savings Across Age Groups

	2004	HBS 1999/2000		
Age	Percent of SSIAs	Percent Owning Financial Assets	Percent with Pension Coverage	Percent with Positive Savings
20-29	17.9	6.5	6.7	6.5
30-39	24.9	20.2	27.0	18.4
40-49	22.9	24.2	33.8	22.0
50-59	18.1	20.2	23.4	19.0
60-69	10.7	15.3	7.1	15.4
70-79	4.4	10.6	1.6	13.9

Sources: Department of Finance; Household Budget Survey 1999/2000; and Fund staff estimates.

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[49] It would be interesting to know the distribution across households, since many low-income earners may be members of households financing contributions through joint accounts or intra family transfers.

[50] An additional 30 percent intend to spend and reinvest.

E. Concluding Remarks

75.   **The bulk of the evidence presented in this paper suggests that, despite respectable aggregate saving rates in Ireland, there is a significant group of households with little saving.** Households at the peak of their working lives have relatively low savings but we do not find evidence of a generational savings gap. In addition, there remains a core of households, specifically the young and the poor, that, according to both household surveys, save very little. However, in order to establish whether there are in fact problems with the distribution of savings across households, we need data on households' balance sheets.[51] It would be useful if future HBSs included questions about balance sheets.

76.   **The appropriate policy approach depends crucially on why saving is low.** If households save little because of high time preference rates, then there is little role for government policy. If, however, households save little because of failure to perceive the need to save, inability to plan, financial illiteracy, or lack of discipline, there might be an argument for government intervention.

77.   **From this perspective, any scheme to promote savings should consider targeting those who are preparing poorly for retirement.** In particular:

- If there were to be a follow-up scheme to the SSIAs or tax incentives to encourage pension take-up, it could target those who do not have pensions or have inadequate pension coverage.

- *Automatic enrollment in PRSAs* may also increase savings among households without access to company pension plans, given the voluntary nature of the enrollment in these accounts. Recent research has shown that "opt-out" choices for enrollment in pension plans (i.e., enrolling employees unless they actively opt out) lead to much higher participation rates than "opt-in" choices (Madrian and Shea, 2001; and Thales and Benartzi, 2004).

- Finally, *communication and financial education* could largely raise awareness of the need for long-term planning of retirement savings and equip households with tools to understand their financial decisions, including the risks of unbalanced portfolios. Surveys of households frequently show that large numbers of individuals do not take a comprehensive approach to financial planning and underestimate the level of

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[51] Some evidence regarding saving adequacy has been provided, however, by the consulting company Life Strategies. In particular, they have estimated that the annual retirement savings shortfall in Ireland is about 5 percent of GNP (or 11 percent of disposable income), assuming a required replacement rate of 65 percent and retirement age of 65. The saving shortfall is more pronounced in the middle three quintiles of the income distribution.

savings necessary to achieved their desired living standards after retirement. Even though financial information may be plentiful and accessible, households often make limited use of such information, perhaps because of its complexity.[52] In fact, the results of this paper suggest that households with higher levels of education save less. Therefore, the strategy should be to reach different population groups with different levels of sophistication.[53] The government should coordinate with the private sector in promoting such financial education.[54] Although the National Pension Awareness Campaign is a step in the right direction, the ongoing National Pensions Review could also be used to intensify the debate on retirement and pensions in Ireland.

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[52] According to a recent survey conducted by TNS mrbi, 59 percent of individuals in Ireland find consumer understanding of pensions to be a significant barrier to increasing pension coverage.

[53] For instance, the latest Global Financial Stability Report (International Monetary Fund, 2005) suggests the following:

> "Basic financial information may be provided in schools to children and young adults to create financial awareness from an early age. The need for long-term planning of retirement savings and related strategies may be particularly important for those at the beginning of their careers and for persons approaching middle age. As individuals reach the latter half of their working lives, the focus may need to change, with a greater consideration of payout strategies (including health care and intergenerational issues)".

[54] For example, employers could provide information and advice in the workplace and include details of employer pension contributions in pay slips.

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DATA SOURCES AND DEFINITIONS

This appendix describes data sources and definitions used in this paper.

Household Budget Survey (HBS). The HBS is a survey of a representative random sample of all private households in Ireland. The main purpose of the HBS is "to determine in detail the current pattern of household expenditure in order to update the weighting basis of the Consumer Price Index."[55] To achieve this, the questionnaire contains a detailed diary of household expenditure over a two-week period. Detailed information is also collected of all sources of household income and on a range of household characteristics and contributions, such as pension contributions. For the purpose of this paper, we use HBS 1994/95 and HBS 1999/2000. A total of 7,877 and 7,644 households participated in the 1994/95 and 1999/2000 HBSs respectively.

Monetary units. All variables in levels are reported in euros. The variables in HBS 1994/95 were converted into euros using the fixed conversion rate between the euro and the Irish pound of 0.727564.

Deflating. All income and expenditure variables were deflated using the harmonized consumer price index, base year 1996.

Weights. All calculations were weighted with the weights reported in HBS 1994/95 and HBS 1999/2000, unless otherwise indicated. The weights are used to correct any biases in the final sample of cooperating households due to sample design and differential response. For more details of the weighting of results, see the HBS documentation.

Definitions.

- Disposable income is computed by subtracting the total amount of personal taxes and social security contributions from household total gross income. Source: HBS.

- Consumption includes expenditure on durable, nondurable, and other services. In order to make the data comparable to the national accounts data as much as possible, we exclude mortgage principal payments, pensions, insurance. and charity contributions. Source: HBS.

- Saving is defined as the difference between disposable income and consumption.

- Age. The age variable refers to the age of the "head" of household in the corresponding HBS.

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[55] Central Statistics Office, *Household Budget Survey 1994-95, Volume 1: Detailed Results for All Households* (Dublin, July 1997), p.5.

- The real house price is the weighted average of new and secondhand house prices deflated by the harmonized index of consumer prices. We consider the eight regions defined in the HBS: Border, Dublin, Mid-East, Midland, Mid-West, South-East, South-West and West. Table A.1 indicates which prices were used for each region. Source: Department of Environment, Heritage, and Local Government.

Table A1. Correspondence between region and house prices

Region	House Price
South-West	Cork
Dublin	Dublin
West	Galway
Mid-West	Limerick
South-East	Waterford
Border, Mid-East, Midland	Other areas

- The real interest rate is the building societies' mortgage loan representative rate deflated by the consumer price index. Source: CSO.

MEDIAN COHORT REGRESSION

The median cohort regression (estimated without weights) is reported in Table A.2. The cohorts are defined by the year of birth of the household head. An attempt was made to estimate a regression with cohorts defined by year of birth, sex of household, and region where the household lives, but many variables were dropped probably because of collinearity.

Table A2. Cohort regression	
Year of birth=1924	-0.009
	(0.85)
Year of birth=1929	0.003
	(0.09)
Year of birth =1934	-0.026
	(0.59)
Year of birth =1939	-0.021
	(0.43)
Year of birth =1944	-0.009
	(0.18)
Year of birth =1949	0.008
	(0.18)
Year of birth =1954	0.009
	(0.23)
Year of birth =1959	0.012
	(0.42)
Year of birth =1964	0.014
	(0.73)
Year of birth =1969	0.009
	(0.56)
Year of birth =1974	0.000
	(.)
Age	0.342
	(3.70)**
Age^2	-0.015
	(3.20)*
Age^3	0.000
	(2.81)*
Age^4	-0.000
	(2.53)*
Age^5	0.000
	(2.36)+
Year=1999-00	0.011
	(1.29)
Constant	-3.082
	(4.33)**
Observations	24
R-squared	0.98

Robust t statistics in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%