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Regional Divergence in the Celtic Tiger: The Policy Dilemma

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Using a consistent data set, this paper presents evidence on the degree of living standards convergence among Irish Regional Authority Areas between 1960 and 1996. Between 1960 and 1979, a period in which Ireland as a whole failed to converge on the EU, regional living standards within Ireland converged strongly, partly due to a regional policy of dispersal that was pursued at the time. Between 1979 and 1996, regional living standards diverged. The greater emphasis on targeted industrial policy during the last two decades, which has brought national convergence with the EU, coincided with diverging Irish regional living standards. This poses a dilemma for policy makers, of achieving the twin policy objectives of maintaining the recent very strong national performance of Ireland, while simultaneously bringing about convergence of regional living standards within Ireland. However, the view that there should be a return to a regional policy of dispersal may be misplaced. The success of the 'Celtic Tiger' has been built around internationally competitive firms in key sectors. The challenge for the 2000s is to design coherent regional policy centered on clusters of firms in a limited number of urban centres.

INTRODUCTION

This paper contributes to the re-emerging debate on Irish regional policy by using a recently-compiled regional data set to evaluate Irish regional policy for the past 40 years. The question asked is as follows: has Irish regional policy delivered balanced regional development as measured by the degree of convergence in regional living standards?

After an absence of 30 years, regional policy is now on the agenda in Ireland today, due to the emergence of severe infrastructural bottlenecks in the main urban areas, especially Dublin. In addition, the Government must now address regional policy since under the latest round of EU Structural Funds Ireland is being treated, for the first time,

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as two regions.[1] Accordingly, the current Government is committed to the development of a national spatial strategy as part of its National Development Plan for 2000-2006.

The task of historically evaluating Irish regional policy has been severely constrained by the absence of data. Recently this shortfall has been addressed by O'Leary (2001) through the compilation of a consistent data set on living standards in the eight Regional Authorities areas (RAA's) for the years 1960, 1979 and 1996.[2] This facilitates, for the first time, a detailed evaluation of Irish regional policy.

This paper considers the lessons to be learnt from using this data set to evaluate Irish regional policy over the past 40 years. It begins by outlining the stance of Irish regional policy since 1960. This is followed by a discussion on the appropriate definition of Irish regions and a brief description of how the data set was constructed. An analysis of the degree of living standards convergence/divergence among RAA's over the period is then presented. Finally, the dilemma facing future regional policy is considered.

REGIONAL POLICY SINCE 1960

The objective of balanced regional development has long been pursued not just by Irish Governments, but also by the EU.[3] Balanced regional development may be said to occur when regional incomes converge or grow closer together over time. Policies targeted at enhancing the productive potential of less prosperous regions are generally preferred, rather than income transfers. Funding is intensive initially and subsequently phased out in the expectation that the productive potential of poorer regions is realised over time.

These policies are conducted largely through public programmes of investment in industrial development. In focusing policy on poorer regions, it is important that particular town centres are selected with the necessary productive potential to sustain industrial development. Towns are preferred due to the availability of human and physical infrastructure and to the presence of external economies, such as agglomeration and urbanisation economies. The success of regional policy is judged on whether

[1] The BMW region (Border, Midlands and West) qualifies for Objective 1 status, while the Dublin/Mid-East, South-East, South-West and Mid-West are Objective 1 in Transition.

[2] Definitions of the RAA's are as follows:

Border:	Cavan, Donegal, Leitrim, Louth, Monaghan and Sligo.
Dublin/Mid-East:	Dublin, Kildare, Meath and Wicklow.
Midlands:	Laois, Longford, Offaly and Westmeath.
Mid-West:	Limerick, Clare and Tipperary North Riding.
South-East	Waterford, Carlow, Kilkenny, Wexford and Tipperary South Riding.
South-West:	Cork and Kerry.
West:	Galway, Mayo and Roscommon.

[3] Fitzgerald, Kearney, Morgenroth and Smyth, 1999: 105-111.

regional living standards converge over time. However, it is clearly desirable that such convergence occurs in the context of the national economy growing satisfactorily.

The form of public investment has changed over the past number of decades to reflect changes in both the nature of economies and in thinking on regional development. Beginning in the 1960s the emphasis was on national Governments influencing the location decisions of the branch plants of multinational corporations through a variety of investment incentives. The belief was that these plants would form links with indigenous industry, thus stimulating the local economy.

Partly as a result of a variable degree of success of these policies, but also due to the changing nature and increasing intensity of international competition, the prevailing view in the 1990s was that a more holistic policy approach should be adopted. In order to build productive potential, including enabling indigenous industry to develop beneficial linkages with multinationals, emphasis shifted to improving factors such as the transport and telecommunications infrastructure, human capital, research and development and local support structures. This view has been greatly influenced by the ideas of Porter (1990), who argued that the role of Government is to support local clusters of internationally competitive industries.

These policy shifts are apparent over the period in the changing focus of Ireland's industrial policy. Beginning in the 1960s, directed industrial policy was pursued through the efforts of the IDA to attract foreign direct investment. While the Telesis report did advocate greater attention to indigenous industry, it had relatively little success.[4] This policy was pursued throughout the 1970s and 1980s. The very disappointing performance of the economy in the 1980s resulted in a subsequent policy re-appraisal. The 1990s witnessed a more holistic view, as evidenced by the Culliton report, which was also influenced by Porter (1990).

Irish regional policy has operated within the broad framework provided by industrial policy over the past 40 years. In the 1960s there was an important debate on regional industrial policy, which may prove prescient for the current policy debate. Buchanan proposed the identification of nine growth centres in which industrial policy would be focused (1969). The growth centre approach, which claimed that the spatial allocation of investment in industrial development should be concentrated at selected points rather than follow an even distribution, had gained widespread acceptance at this time.[5] Thus, in order to implement Buchanan's policy, hard political choices would have had to be made in order to identify those growth centres that could sustain industrial development.

[4] Hitchens and Birnie, 1991/2: 158.
[5] Breathnach, 1982: 35-8.

Buchanan's proposal was over-turned following strong political resistance. In effect political expediency dictated that funds had to be distributed more equitably.[6] Instead of nine growth centres, a total of 47 town clusters, comprising 177 towns, were earmarked, with specific job targets being set for town clusters. The result was that Government policy favoured wide dispersal. Accordingly, during the 1960s and 1970s, regional policy was implemented by the IDA which attracted foreign direct investment by setting job targets and by purchasing fully-serviced sites and advance factories for selected towns throughout the country.

The availability of the unique data set on Irish RAA's used here facilitates analysis of the extent to which Irish regional living standards converged during the 1960s and 1970s. Was the regional policy of dispersal, described above, successful in bringing about converging living standards? This question is considered later.

During the late 1970s and 1980s, the now widely documented poor performance of the Irish economy coincided with substantial job losses, especially in indigenous industry. Problems surfaced concerning the low degree of linkage between foreign multinationals and indigenous industry. These problems were partly attributable to the lack of embeddedness by multinationals in the local economies. However, they also stemmed from the fact that many foreign operations were basic assembly, offering limited opportunity for spill-overs to indigenous industry.[7]

The response of the IDA was to shift emphasis from an explicit regional focus to a strategic industry approach.[8] Thus, by the 1980s the policy was to attract high value added companies in high growth sectors, and to develop a sustainable number of companies in these sectors. By the 1990s concentrations of companies had emerged in the computer, electronics and pharmaceutical sectors located in and around urban centres, such as Dublin, Cork and Limerick.

In addition, during the late 1980s and 1990s, much of the policy agenda was focused on the use of the substantial funding available through the EU Structural Funds. The main objectives of these initiatives were to boost long-term growth and to reduce unemployment. Accordingly, funds were targeted at the development of indigenous industry, physical infrastructure, human capital and local development. It is not clear that coherent regional strategies were followed in the use of these funds. While funds were demarcated to regional authorities, the process by which this was accomplished

[6] Breathnach, 1982: 39-40.
[7] Bradley and Morgenroth, 1999: 166-7.
[8] Meyler and Strobl, 2000: 114.

was political rather than economic in nature, with little attention being paid to developing regional economic strategies. Moreover, the fact that for EU purposes Ireland was treated as one region meant that less attention needed to be devoted to developing a coherent regional policy among Irish regions.

The interesting question that has yet to be answered is the extent to which the policies pursued during the 1980s and 1990s by the IDA in relation to foreign industry and by other Government departments and agencies under EU Structural Funding were successful from a regional perspective. Did these polices coincide with convergence of living standards among Irish RAA's? The availability of the consistent data set on Irish regional living standards enables this question to be addressed here.

DEFINITION OF IRISH REGIONS

From a policy perspective, it is appropriate to use RAA's for analysis. The existing definitions have been in place since 1994. They replaced the old planning regions instituted in the early 1980s.[9] Prior to that the traditional administrative units were counties.

Given that the RAA's have been used to administer economic policy, it is important to consider the extent to which they form economic or functional areas. In their recent study of the spatial distribution of Irish manufacturing, Bradley and Morgenroth suggest that these regions may not form functional areas, owing to a considerable degree of manufacturing heterogeneity present within the existing boundaries (1999: 166).

From their evidence, it is clear that there are substantial differences in manufacturing enterprises within RAA's. For example, the *Border* region hosts modern high-technology, foreign-owned industry in County Louth, while the other counties in that region have a preponderance of traditional indigenous industries.[10]

From a wider perspective, the inclusion of the spatial distribution of agriculture and services, as well as manufacturing, results in a considerable degree of heterogeneity within RAA's. For example, official data again reveals substantial variation within the *Border,* with output per capita in 1995 in Louth standing at £12,000 compared to £5,200 in Leitrim.[11]

[9] The eight old planning regions were identical to the current definitions except for (i) Dublin and the Mid-East being treated as one region, (ii) Roscommon being included in the Midlands rather than the West, and (iii) the Border being divided into two regions, the North-East, consisting of Louth, Monaghan and Cavan, and the North-West, consisting of Sligo, Leitrim and Donegal.

[10] Bradley and Morgenroth, 1999: 165-6.

[11] CSO, 1999b.

However, the degree of heterogeneity is not the only criterion to be used for defining economic regions.

When other issues such as travel to work areas and the presence of an urban focal point[12] are considered, it may be argued that, with the exception of the *Border*, the existing regions better resemble functional areas. The travel time calculations presented in Fitzgerald, Kearney, Morgenroth and Smyth (1999: 118-9) suggest that the cities of Dublin, Cork, Waterford, Limerick and Galway might form the basis for defining regional boundaries. In broad terms these cities coincide with the *Dublin/Mid-East*, *South-West, South-East*, *Mid-West* and the *West* respectively. Although the *Midlands* does not contain a major city, in Athlone and Portlaoise the region contains large urban centres. In the case of the *Border*, which straddles Northern Ireland and extends from the east to the west coast, it is clear that political considerations were to the fore in its construction.[13] It is difficult to argue for this region being a functional economic area, other than perhaps through its association with Northern Ireland.

In order to evaluate Irish regional policy for the past 40 years, a standard regional definition is required. The existing RAA's are chosen, as these are most relevant to the current policy debate. The majority of these regions appear to possess urban centres with the capability of providing the focus for regional policy. A description is now provided of how the data set on Irish regional living standards was constructed for the RAA's.

THE DATA SET

In order to evaluate regional policy, an appropriate measure of living standards is the income available to residents of a region, which may be defined as regional 'GNP'. This concept differs from GVA or output compiled by the CSO, which refers to the output produced in the region. Since the mid-1980s, GVA has not been ideal for measuring Irish living standards since the output produced by multinationals – which generate through profit outflows income for the residents of foreign countries – is included in GVA.

Thus, in order to estimate regional living standards, regional GVA should be adjusted for profit outflows. Following O'Leary (1999), this adjustment is made for 1996 by distributing profit outflows to the regions using each region's share of foreign-owned manufacturing profit.[14] There is no need to adjust GVA in 1979 or 1960 for profit outflows, which were insignificant in these years.[15]

[12] These factors are identified by Bradley and Morgenroth (1999: 162).
[13] In the old planning regions used up to the mid-1980s, the region was divided into the North-East and the North-West.
[14] Or, more precisely, using the remainder of net output of foreign owned manufacturing establishments from the Census of Industrial Production (CSO, 1997a). These data were kindly provided by Elaine Lucey of the CSO.
[15] However, for consistency, adjustments are made for other outflows, like debt repayments, and inflows, like emigrant's remittances, which form part of the difference between GDP and GNP, known as the net factor flow.

The data set on Irish regional living standards has been constructed from three main sources, Attwood and Geary (1963), Guiomard and O'Connor (1984) and the Central Statistics Office (1998b). The approach taken is first to compile a consistent GVA series and then to make the adjustment to derive regional 'GNP'. The Appendix to this paper contains a brief summary of the methods used.[16]

The resulting regional income or 'GNP' estimates are ideally suited for evaluating Irish regional policy. This concept of income is based on productivity fundamentals, as the only adjustment made to GVA is to account for the uniquely large level of profit outflow from Irish regions. Thus, it can be used to measure the extent to which regional policy, through its effects on productive potential, affects the income available in Irish regions. Indeed, this measure could be used to evaluate the effect of EU Structural Funds on Irish regions.[17] Regional 'GNP' is also preferable to disposable income, which adjusts for state transfers and taxes, as these are instruments of Government welfare and taxation policies and not regional policy as defined above.

In addition, the sources used here provide a reliable measure of regional income for the period. The Household Budget Survey, which has recently been used by Boyle, McCarthy and Walsh (1998/9) as a source of regional income measures, suffers to a considerable degree from sampling error at a regional level and from non-sampling error due to the substantial under-reporting of income by respondents.[18]

REGIONAL LIVING STANDARDS CONVERGENCE: 1960-96

Table 1 presents evidence on the level of living standards convergence and the ratios of regional to national average living standards over the period.[19] In 1960 there was a high degree of dispersion present with the most prosperous *Dublin/Mid-East* RAA enjoying a level of living standards 2.3 times that of the poorest *West* region. The high degree of dispersion is evident in the coefficient of variation at 31%. By 1979, the overall level of dispersion decreased significantly to just under 16%, with *Dublin/Mid-East* dropping 37 % points relative to the average and the poorer RAA's all gaining. The

[16] A fuller description is provided in O'Leary (2001).
[17] O'Leary, 1999.
[18] O'Leary, 1998/9.
[19] It is important to place the years 1960, 1979 and 1996 in the context of cyclical movements in GNP over the whole period. The estimated average annual GNP growth rate over the full period is 3.4% per annum. Growth was strong during the 1960s and 1970s, when it averaged 3.9% and 4.2% per annum respectively. During the 1980s, growth collapsed to 1.4% per annum, mainly due to the second oil shock and the fiscal imbalances. However, the 1990s have witnessed a remarkable turnaround, with growth averaging 4.3% per annum up to 1996. It should be noted that minor differences exist between these growth rates, which were used by Bradley, Fitzgerald, Honohan and Kearney (1997) and the trend GNP growth rates used in this paper. However, these differences do not effect the degree of convergence presented. They may be explained by the emphasis here being the collection of consistent regional estimates. The main differences include (i) the compilation of regional income and output at constant factor cost, using sector specific deflators and in accordance with the ESA 79 standard; (ii) the use of historic sources from Henry (1997) and Attwood and Geary (1963); and (iii) the derivation of population data for 1960 using interpolation between 1951 and 1961 (See Appendix for details).

only region to lose ground in this period was the *Midlands*. In 1996 the level of dispersion increased to over 18%. The richer *Dublin/Mid-East* and *South-West* regions pulled away from the average, while the poorer regions all failed to continue to converge, with the *Border* actually losing nearly all of the ground it had gained in the earlier period.

TABLE 1: DEGREE OF LIVING STANDARDS CONVERGENCE AMONG 7 RAA'S: 1960, 1979 AND 1996

	1960	1979	1996
Region/Ratios[1]			
Border	81	89	82
Dublin/Mid-East	167	130	135
Midlands	88	85	85
Mid-West	94	102	101
South-East	95	103	104
South-West	102	104	107
West	74	87	86
Level of Convergence[2]	31.0	15.8	18.4

Note 1: Living standards in each RAA as a % of national unweighted averages.
2: Coefficient of variation of living standards (equal to the standard deviation as a % of the mean).

Table 2 presents the corresponding growth rates in regional living standards along with the rate of convergence registered over the period. The significant decrease in the degree of dispersion between 1960 and 1979, presented in Table 1, is evident in the rate of convergence at 3.5%. Clearly, a strong convergence process was underway, with poorer RAA's all exhibiting faster growth in living standards compared to the richer regions, especially *Dublin/Mid-East.* However, between 1979 and 1996 the picture changed with regions diverging by nearly 1% per annum. This divergence process was driven by the strong performance of *Dublin/Mid-East* and the *South-West*, with the poorer regions slowing down.

TABLE 2: RATE OF LIVING STANDARDS CONVERGENCE AMONG 7 RAA'S: 1960 – 1979 AND 1979 – 1996

	1960–1979	1979–1996
Region/Living Standards Growth[1]		
Border	+3.1	+2.7
Dublin/Mid-East	+1.3	+3.4
Midlands	+2.4	+3.2
Mid-West	+3.1	+3.1
South-East	+3.1	+3.2
South-West	+2.8	+3.3
West	+3.5	+3.1
Rate of Convergence[2]	-3.5	+0.9

Note 1: Annual average growth rate in living standards (% per annum)
2: Annual average change in the coefficient of variation of living standards (% per annum). A negative (positive) value indicates convergence (divergence).

These results are broadly consistent with those of recent Irish studies. O'Connor found that personal income per capita converged at a rate of 1.2% per annum between 1960 and 1977, with all of the convergence occurring in the 1970s (1999: 5). In addition, between 1979 and 1996, O'Connor, using similar sources as this study, found that GVA per capita diverged by 2.5% per annum. The difference between this finding and that of the current study is the use of regional 'GNP' here in order to adjust for the distorting effect of profit outflows on living standards. This adjustment was not part of the O'Connor (1999) study, with the result that a greater level of dispersion is reported for 1996. Finally, although it is difficult to make comparisons, Boyle, McCarthy and Walsh find evidence, using HBS data, that living standards converged between 1973 and 1987 and diverged between 1987 and 1994 (1998/9: 165).

Overall, the use of consistent measures leads to the result that convergence of living standards among Irish RAA's was relatively strong during the 1960s and 1970s. However, this convergence appears to have been replaced by divergence over the last two decades. It is noteworthy that this performance is in stark contrast to the convergence performance of Ireland as a whole. Compared to the EU average, Irish GNP per capita diverged during the earlier period but converged strongly in the last two decades.[20]

[20] O'Leary, 1997: 51 and 1999: 808.

THE DILEMMA FOR FUTURE REGIONAL POLICY

If the policy of the 1960s and 1970s is to be regarded as having been effective in bringing about regional convergence within Ireland, a major dilemma now arises for current policy thinking, since it would also appear that the policy of the 1980s and 1990s would also have to be regarded as effective in bringing about national convergence with the EU average. It now seems that the targeted industrial policy of the last two decades, which promoted strong concentrations of high-technology multinationals, has resulted in divergence of regional living standards. This conflicts with the policy of dispersal, which resulted in convergence among Irish regions, but a lack of national convergence with the EU in the 1960s and 1970s. Given the Irish experience of two types of regional policy, the dilemma now facing policy makers is how to achieve the twin policy objectives of maintaining the national performance within the EU, while simultaneously bringing about convergence of regional living standards within Ireland.

Although it may be tempting to argue, based on these results, for a return to a regional policy of dispersal – as followed in the 1960s and 1970s – this view may be misplaced. The success of the 'Celtic Tiger' has been built around internationally-competitive firms in the computer, electronic, pharmaceutical, food, tourism and financial services sectors.[21] The challenge ahead is to design coherent regional policies centered around local clusters of these internationally-competitive sectors. This challenge is all the more pressing, given the emergence of severe infrastructural bottlenecks in urban centres – but especially in Dublin.

In formulating future regional policy, far greater emphasis than heretofore needs to be placed on the development of deeper clusters within Irish RAA's.[22] While Ireland's internationally competitive industries have enjoyed great success in the 1990s, there is little convincing evidence to suggest the presence in Ireland of strong geographic clusters. Indeed, Michael Porter recently identified the absence of clusters as being one of the competitive disadvantages currently facing Ireland (2000)[23].

The task of formulating regional policies to develop deeper clusters will, in the first instance, involve the selection of a small number of urban centres in RAA's for special attention. Any such selection would clearly result in certain towns – such as Longford or Nenagh for example – not being selected as locations hosting clusters of internationally-

[21] Doyle, Gallagher and O'Leary, 2000.
[22] These policies would clearly focus on indigenous as well as foreign-owned industry. For example, the internationally competitive software industry, which includes many indigenous firms, could be developed in Dublin/Mid-East. Similarly, the tourist industry could be developed around Tralee/Killarney in the South-West.
[23] This formed part of a presentation given by Professor Michael Porter at University College Cork on 25th October 2000.

competitive industries. Instead, these would be developed as commuter towns for the major urban centres in their RAA's, namely, Athlone and Limerick respectively. However, if political expediency results in equity considerations holding sway in the distribution of regional funding, as they did in the 1960s, the outlook may be uncertain.

The delay by Government in initiating the national spatial strategy leads to fears for the longer term. This Government, like many of its predecessors, seems to be more interested in short-term considerations affecting its fortune in the next election, than in making the hard decisions involved in the design of long-term growth strategies for the regions. For example, when announcements are made of the imminent closure of multinational branch plants located in relatively small towns, the typical Government response, usually under political pressure from local communities, is to institute task forces to find 'replacement industries'. The challenge never seems to be faced as to whether it would be better, in the longer term, for resources to be devoted to larger neighbouring urban centres. One way of overcoming this myopia is for Government to decentralise responsibility to Regional Authorities to formulate their own development strategies. Such a radical measure would involve local communities agreeing to take initiatives as well as taking the responsibility for outcomes. It would also involve central Government ceding a certain amount of power.[24]

In any event, it seems clear that, in order for Irish regional living standards to converge in a 'Celtic Tiger' that continues to grow at anything like the rates it did in the 1990s, coherent regional policies are required that are focused on clusters of internationally-competitive firms in a small number of urban centres.

[24] Fanning, 1986: 102.

APPENDIX: CONSTRUCTION OF THE DATA SET

Since 1991, the CSO have produced regional GVA estimates for the 8 RAA's (CSO, 1998b). Due to the large numbers commuting from the *Mid-East* to *Dublin*, the standard practice is to amalgamate these regions, thus forming the 7 RAA's used in this study (CSO, 1998a). Regional estimates of GVA are also available for 1979 from Henry (1997). They are based on original estimates of regional GVA for the old planning regions contained in Guiomard and O'Connor (1984). The methodology employed is similar to that now used by the CSO. Differences in regional definitions resulted in Henry estimating sectoral and total GVA for Roscommon, for inclusion in the *West* rather than the *Midlands* (Henry, 1997: 27).

In compiling personal income estimates for Irish counties for 1960, Attwood and Geary (1963) first estimated 'income arising' using a similar methodology to the CSO and Guiomard and O'Connor (1984). 'Income arising' is equivalent to net domestic product. To derive GVA, depreciation estimates are required, which are unavailable at a regional level. Regional depreciation estimates were accordingly estimated by assuming that the regional depreciation rates are equal to the national rate of 7.1% of net domestic product. While this method is approximate, it may be defended due to the small relative magnitude of depreciation and data constraints.

In addition, Attwood and Geary's estimates relate to Tipperary as a whole and not Tipperary North Riding and Tipperary South Riding, which are in the *Mid-West* and *South-East* respectively. This problem was overcome by using the income estimates first produced for the North and South Ridings for 1973 by Ross (NESC, 1977: 61) to distribute the Attwood and Geary estimates for 1960. Thus, for the years 1996, 1979 and 1960 GVA estimates were compiled for 7 RAA's. Although the data have been taken from different sources, the similarity of methodologies employed in each suggests a high level of confidence that valid comparison and analysis can be undertaken over the period. The GVA estimates, which are valued at current factor cost in accordance with the ESA 79 standard, were converted to constant 1990 factor cost using national GDP deflators. Separate deflators were constructed for five sectors and total deflated GVA is taken as the sum of deflated sectoral GVA. The use of national rather than regional deflators may be a drawback, since it is likely that prices would vary regionally. However, Irish inflation data are unavailable at a regional level.

Estimates of regional income or 'GNP' were produced, at constant 1990 factor cost, following O'Leary (1999). For 1996, GNP is 15.6% less than GDP for the country as a whole. This is dominated by profit outflows, which were approximately 3% in excess of the total outflow and small net inflows. Profit outflows were distributed to the regions using each region's share of foreign owned manufacturing profit. The small inflows were distributed in proportion to regional GVA.

For 1979, GNP is 3.8% less than GDP mainly due to foreign debt repayments, while for 1960, GNP is 6.2% larger than GDP, due to emigrant's remittances and other inflows. Following O'Leary (1999), these gaps were distributed to the 7 RAA's based on regional GVA shares.

For 1996 and 1979, population estimates are taken from the Census of Population. Population estimates for 1960 were interpolated linearly from the Census of Population for 1951 and 1961.

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THE MANAGEMENT OF THE NATIONAL PENSIONS RESERVE FUND

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The National Pensions Reserve Fund Act, 2000, provides for the partial pre-funding of the State's hitherto unfunded public service and social welfare pension liabilities. With an initial seed capital of some €6.5 billion, the new Fund will receive annual Exchequer contributions equivalent to 1% of GNP and will not have any outflows until the year 2025. As the party mandated to achieve a commercial return on the Fund, the National Pensions Reserve Fund Commission will determine its success through its choice of long-term strategic investment benchmark, its choice of fund managers and on how the Fund's market entry is handled. Finally, it will be necessary to put in place sensible processes for reviewing the Fund's performance by reference to the Exchequer's pension liabilities, the profile of which may change materially over the Fund's lifetime.

BACKGROUND

The National Pensions Reserve Fund Act, 2000, provides for partial pre-funding arrangements to meet public service employee and social welfare pension liabilities maturing after 2025. Public pensions in Europe are almost entirely met on an unfunded pay-as-you-go basis. In Europe today an average 3.5 workers contribute to the retirement income of one pensioner. By 2020 this ratio is expected to disimprove to 2.5 workers for every pensioner. In Ireland we have currently a ratio of 1 person aged 65 or over for every 5 persons of working age. By 2025 this ratio will have fallen to around 3 workers for each pensioner and will fall further to 2 workers for each pensioner by 2046.

From the point of view of the public finances and sovereign credit ratings, how countries tackle the problems arising from the ageing of their populations, including the provision of retirement income, will be a major differentiating factor. A key question will be whether or not to fund retirement schemes. However, for many countries funding will not be a major part of the solution because of their age structure. Those countries are likely to have to resort to other measures such as increasing the retirement age or reducing benefits. Given that our median age is some ten years lower than the

European median, Ireland is uniquely positioned to address the funding question through the National Pensions Reserve Fund mechanism.

The Minster for Finance directed that three core principles should underpin the legislation establishing the Pensions Reserve Fund:

(a) the new Fund should be managed by commissioners who would be independent of Government (it was decided to use the term commissioners rather than trustees in order to avoid a lot of the 'baggage' of trustee law);

(b) the investment mandate should be strictly commercial (the objective being to secure the optimal return over the long term, subject to prudent risk management); and

(c) there should be no drawings from the fund prior to 2025 (in the meantime there is currently some €6.5 billion – largely part of the proceeds of the Telecom Eireann (now Eircom) flotation – awaiting investment in the Fund to be supplemented by an annual Exchequer contribution of 1% of GNP, about €970 million in today's values).

Accordingly, the legislation provides that the control and management of the Pensions Reserve Fund will be vested in the National Pensions Reserve Fund Commission. The Commission will perform its functions through the National Treasury Management Agency (NTMA) and may also delegate to the Agency any of its functions, as it considers appropriate. In that regard, subject to the direction of the Commission, the Agency itself may manage the assets of the Fund or outsource all or part of the management to external institutional investment managers. The Agency's view is that, apart perhaps from cash and fixed interest securities, the management of the assets should be substantially outsourced.

INVESTMENT PHILOSOPHY

With regard to investment philosophy, typically the Prudent Man/Expert Rule underpins the Anglo-Saxon approach to the responsibilities of pension fund trustees. In his book, Against the Gods – the Remarkable Story of Risk, Peter Bernstein refers to a decision by Justice Samuel Putnam of the Massachusetts Supreme Judicial Court as the most authoritative statement on the subject of risk. The decision was delivered in 1830 and was purposefully vague. In rendering his decision in the case, Justice Putnam defined what came to be immortalised as the Prudent Man Rule:

> *All that can be required of a trustee to invest is that he shall conduct himself faithfully and exercise a sound discretion. He is to observe how men of prudence, discretion and intelligence manage their own affairs, not in regard to speculation, but in regard to the permanent disposition of their funds, considering the probable income as well as the probable safety of the capital to be invested.*

The U.S. Employee Retirement Income Security Act (ERISA) of 1974 applies a revised and restated version of the Prudent Man Rule to pension and profit sharing portfolios. ERISA requires that a fiduciary should manage a portfolio 'with the care, skill, prudence, and diligence under the circumstances then prevailing, that a prudent man acting in a like capacity and familiar with such matters would use in the conduct of an enterprise of like character and with like aims.' This statement differs from the classic Prudent Man Rule in that familiarity with such matters suggests a higher standard than simple prudence; hence, the name – Prudent Expert Rule. Other provisions of U.S. law and US Department of Labour regulations suggest a portfolio approach under which a position imprudent in isolation may be acceptable in a portfolio context.

In drafting the National Pensions Reserve Fund Act, the authors had the Prudent Man/Expert Rule to the fore of their thinking. In language resonant of the ERISA legislation referred to above the Act provides (section 6.4) that the Commission shall at all times exercise due care, skill, prudence and diligence, acting in the utmost good faith, in the discharge of its functions. The Act further provides (section 6.3) that the National Pensions Reserve Fund Commission shall have all such…. powers as are necessary or expedient for the performance of its functions and that the Commission (section 6.2.e) may engage, from time to time, consultants and advisers and other service providers as are necessary or expedient for the performance of its functions. Last, but not least, as regards the investment mandate or policy of the Fund section 19.1 of the Act provides as follows:

> 19.—(1) Moneys standing to the credit of the Fund shall, from time to time, be held or invested for the benefit of the Fund by the Commission, in or outside the State, so as to secure the optimal total financial return, as to both capital and income, having regard to:
> *(a)* the purpose of the Fund as set out in *section* 18(1), and
> *(b)* the payment requirements of the Fund as provided for under *section* 20,
> provided the level of risk to the moneys held or invested is acceptable to the Commission.

The reference in section 19 to return and risk reflects the two objectives which the father

of modern portfolio theory, Nobel Laureate Harry Markowitz, identified in his classic book, Portfolio Selection: Efficient Diversification of Investments, published in 1959, as being common to all investors:

Return: Investors want return to be high. The appropriate definition of "return" may vary from investor to investor. But, in whatever sense is appropriate, they prefer more of it to less of it.

Risk: Investors want this return to be dependable, stable, not subject to uncertainty. No doubt there are security purchasers who prefer uncertainty, like betters at a horse race who pay to take chances. The techniques in this (Markowitz's) presentation are not for such speculators. The techniques are for the investor who, other things being equal, prefers certainty to uncertainty.

The National Pensions Reserve Fund Act leaves the question of risk to the discretion of the Commission and identifies it as a constraint on how the Fund's moneys may be invested. Risk, as indicated above, is best regarded as a measure of uncertainty. In portfolio theory risk is defined as the standard deviation, or the probability distribution, of possible returns about the mean; that is, the extent to which the actual outcome of an investment decision is likely to diverge from the expected value. Holding period, or time frame, is obviously of relevance. Focus on the short term, for example, places equities in a high-risk category and bonds and cash into a low-risk category whereas over longer holding periods, say 20 years, the converse is the reality. A research note published last year by Merrill Lynch on the equity risk premium – that is, the expected excess return on equities over debt – showed that, over a one-year time horizon, equities are much more volatile/risky than bonds but over a twenty-year time horizon, at least for the US, equities are slightly less volatile/risky than bonds.

TABLE 1: VOLATILITY OF US RETURNS OVER DIFFERENT TIME HORIZONS, 1802-1995

Year	Equities (%)	Bonds (%)
1 year	18.15	6.14
20 years	2.76	2.86

Source US: Siegel and Thaler (1997) and Merrill Lynch (2000)

Looking at the relative performance of equities and bonds, the Merrill Lynch note made the same point in a different way

TABLE 2(A): HOLDING PERIOD COMPARISONS: PERCENTAGE OF PERIODS WHEN US EQUITIES OUT-PERFORM US BONDS, 1802-1996

Holding Period	% of Periods Equities Outperform Bonds
1 year	60.5
5 years	70.2
10 years	79.6
20 years	91.5
30 years	99.4

Source: Siegel (1998) and Merrill Lynch (2000)

The Barclays Equity/Gilt Study shows a similar pattern using UK data.

TABLE 2(B): HOLDING PERIOD COMPARISONS: PERCENTAGE OF PERIODS WHEN UK EQUITIES OUT-PERFORM US BONDS, 1802-1996

		Equities	Equities	Gilts
Holding Period – Years	Time Period	Outperform Gilts %	Outperform T-Bills %	Outperform T-Bills %
1	1918-1998	67.50	62.50	47.50
	1958-1998	68.29	63.41	43.90
2	1918-1998	69.62	72.15	49.37
	1958-1998	68.29	73.17	46.34
5	1918-1998	82.89	82.89	57.89
	1958-1998	87.80	80.49	48.78
10	1918-1998	98.59	98.59	60.56
	1958-1998	100.00	97.56	43.90
20	1918-1998	100.00	100.00	50.82
	1958-1998	100.00	100.00	31.71
30	1918-1998	100.00	100.00	41.18
	1958-1998	100.00	100.00	26.83

Source: Barclays Capital Equity-Gilt Study 1999 & NTMA

However, the above presentation should not be taken as justifying a blind act of faith in equities for funds with a long-term time horizon in terms of their investment decisions. A cautionary note is that after the 1929 crash it took 15 years for equities (with the dividends reinvested) to regain their 1929 highs and 21 years for equities to outperform bonds!

LONG-TERM STRATEGIC ASSET ALLOCATION

Central to the successful management of the new Pensions Reserve Fund will be the strategic asset allocation process, or the process of defining a benchmark for the Fund. This involves identifying the asset classes most appropriate to the Fund and the proportions of these asset classes that would be expected to make up the Fund over the long term. In sum, the benchmark will define the Fund's investment universe and its strategic risk tolerance. Trustees are expected to take ownership of the risk inherent in the benchmark itself. Subject to being satisfied with the level of risk, the National Pensions Reserve Fund gives the Commission virtually absolute discretion as to the type and weighting of asset classes that would be included in the benchmark. Asset classes open to the Fund would include (but would not necessarily be restricted to) the following:

- Cash (and cash-like instruments)
- Sovereign Bonds (euro/non-euro)
- Corporate Bonds (euro/non-euro)
- Convertible Bonds (euro/non-euro)
- Quoted Equities (euro/non-euro; large, medium, small capitalisation)
- Emerging Markets
- Alternative Investments/Private Equity/Venture Capital (euro/non-euro)
- Property
- Currency

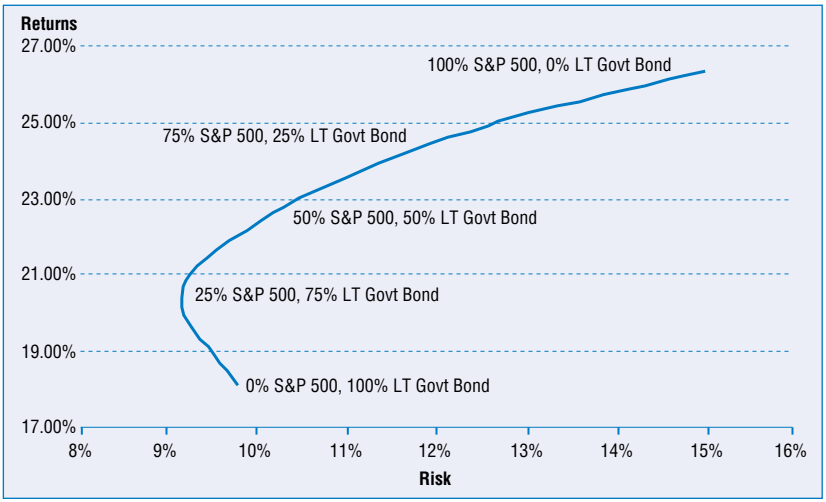
The only category of assets which the enabling legislation prohibits the Fund from investing in is Irish Government securities. The purpose of the restriction is to prevent any future Government undertaking a backdoor raid on the assets of the Fund and to avoid any possible conflict between the National Treasury Management Agency's role as debt manager and as fund manager. In any event, investment by the Fund in Irish Government securities would not represent pre-funding in the real sense to the extent that the Government would ultimately have to refinance those securities by increasing taxes, reducing expenditure or borrowing elsewhere. Another problematic area with regard to asset allocation is how much should the Fund invest in quoted Irish equities. In discussions with representatives of Irish-based plcs and with local and international investment managers the Agency has expressed the view that it would not see the Reserve Fund being significantly overweight in Ireland relevant to the mainstream international indices and in no circumstances having a weighting of more than 1%. An alternative to making a specific allocation to Irish equities would be to include Ireland as part of a wider euro-zone equity allocation, benchmarked against an appropriate euro-zone index.

In the normal course trustees' decisions on strategic asset weightings for a pension fund can be expected to be heavily influenced by their understanding of the liability profile,

their interpretation of the Fund's long-term investment objectives and any constraints (such as a minimum rate of absolute return or a maximum downside tolerance) which the trustees would wish to impose. Other influences on the asset allocation decision are obviously the performance characteristics of the different asset classes and how they interact. Trustees also tend to be influenced by what other similar funds do.

A common approach to strategic asset allocation is the mean variance portfolio optimisation process or efficient frontier analysis developed by Markowitz. Efficient frontier analysis involves the construction of a set of alternative diversified portfolios each of which has the minimum expected risk for a given expected maximum return. It is best explained, as the following example constructed by Paine-Webber illustrates, as a graph with risk on the X axis and expected return on the Y axis.

FIGURE 1: STANDARD AND POORS 500 TR vs. LT T-BOND TR
EFFICIENT FRONTIER (1982-2000)



Source: Paine Webber

The above example is based on a portfolio containing two asset classes: equities (the Standard and Poor's 500 Index) and bonds (US 30-year Treasury Bonds). All feasible combinations of these asset classes are plotted for their given level of risk and return. No one portfolio above the minimum risk portfolio (consisting of 25% equities and 75% bonds) on the frontier is 'better' than any other since higher returns are associated with greater levels of risk. Risk is the same definition as set out above; that is, the standard

deviation of possible returns about the mean. The asset allocation should flow from the risk selection, not the other way around. This approach would be consistent with the Pensions Reserve Fund Act which, as indicated above, identifies risk as the primary constraint in the asset allocation process.

Efficient frontier analysis should be seen as a process rather than some form of holy grail. It is highly sensitive to the inputs: expected returns from the different asset classes account for about 80% of the sensitivity, with standard deviation/risk and the matrix of correlations accounting for 15% and 5% respectively. As regards expected return, estimation of the equity risk premium is a key input. There is a wide range of estimates around what the equity risk premium is, starting with whether you are looking at it historically or in terms of expectations. Ex post, it was probably around 6% in the last 40/50 years, although this is not to say that investors' expectations at the time were actually targeting 6%: their ex ante estimates were probably nearer 4%-5%. Going forward, Goldman Sachs estimated some time ago that, if equity market valuations were to remain constant (i.e. stable price/earnings ratios and real bond yields), the excess return from equity investments would likely be 1% to 3%. Notwithstanding the lower expected equity risk premium, the view expressed earlier – that over longer holding periods equities should out-perform bonds – still remains valid although the probability of under-performance is likely to have increased somewhat.

As well as representing a formal statement of long-term asset allocation and risk tolerance, the benchmark is also the reference point against which the managers – both passive and active – can be judged. In that regard the return on the benchmark is usually calculated on the basis of the weighted returns on selected indices representing its individual asset class constituents. The choice of indices or asset class benchmarks is obviously important not least because it will condition the behaviour of the investment managers whose performance will be evaluated against the indices. Within asset classes there is an argument for segmenting managers by style, for example value versus growth managers or separate managers for large and small capitalisation stocks. Returning to the choice of index or asset class benchmarks, the following are the type of criteria that should make up a good benchmark:

- *Market weighting scheme* – a market capitalisation weighted index is essential.
- *Rule based* – the index should be constructed and re-balanced according to published rules, rather than rely on qualitative judgements.
- *Timely availability of capital and total return indices* – this information is obviously required for fund pricing purposes, ideally via electronic feeds.
- *Good usage by institutional investors* – this facilitates peer group comparisons.
- *Availability of derivatives* – derivatives can be used to manage the exposure of the portfolio.

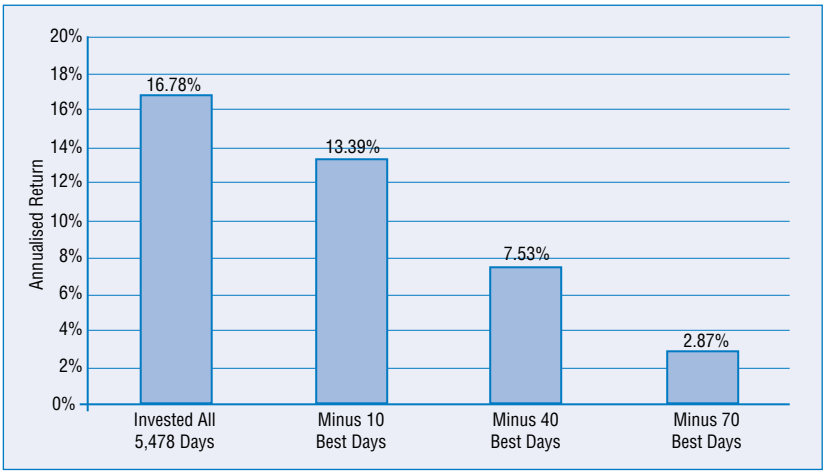
MARKET ENTRY STRATEGY

Notwithstanding the long-run superiority of equities over bonds, for pension funds the long run tends to be a series of short runs as represented by the annual performance statistics. The market entry strategy for the Fund, which on its establishment will consist solely of cash, will obviously be of vital importance. If risk is redefined as the downside risk (or statistically speaking semi-variance) the key question in looking at the efficient frontier is how big a loss can one tolerate in one year out of six (one standard deviation). In terms of entry strategy a not unreasonable concern would be that the outlier one-in-six event would occur in the first year of the Fund's existence. Possible entry strategies might be as follows:

(i) fully invest the Fund as soon as possible after its establishment;
(ii) invest the Fund on the basis of an 'averaging in' approach over say 12/18 months;
(iii) fully invest the Fund as at (i) above but insure some of the downside risk by, for example, buying put options which could be partly financed by selling call options; and
(iv) some combination of (ii) and (iii).

Fully investing the Fund on its establishment would intuitively expose it to unacceptable market risk. An averaging-in approach clearly reduces the Fund's market risk by spreading investment over time. Depending on market volatility the options approach could be expensive and indeed may not provide any more cost-effective risk reduction than the simple averaging-in approach. As Figure 2 shows, market timing can be problematic leading to the conclusion that the simple approach may well be the best.

FIGURE 2: THE IMPACT OF MISSING THE 'BEST' DAYS (1982–1996)



The conclusion to be drawn is that in trying to avoid the 'worst' days to invest, you may miss the 'best' days, which could reduce the portfolio's return.

PASSIVE/ACTIVE MANAGEMENT: MANAGER SELECTION

Passive management means holding securities in proportion to their weighting in the benchmark so that the risk and return of the portfolio very nearly match the risk and return of the benchmark. Active management seeks to out-perform the investment benchmark by active asset allocation, security selection, sector rotation and other potential sources of valued-added (or alpha); each of these decisions is likely to result in the risk and return of the actual portfolio deviating from the benchmark. There is evidence that top-quartile managers add value but that their persistence of performance – that is, their ability to continue to out-perform – is weak in certain asset classes, notably those involving more efficient markets such as US large capitalisation stocks.[1] There is considerable merit in the idea of the Fund having a core passive portfolio combined with active specialist portfolios in those asset classes where there is a reasonable degree of confidence that managers who consistently out-perform can be identified.

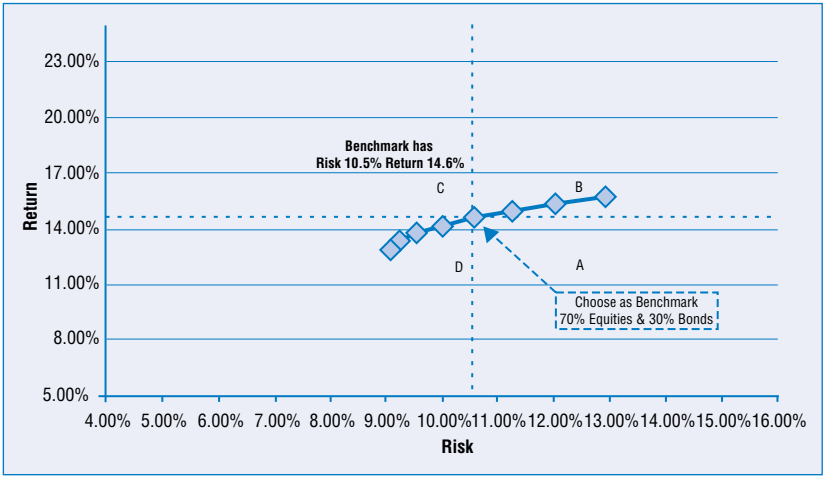
Of course the manager selection process should be subject to transparent competition. The tendering process is likely to be the restricted procedure as provided for under the Public Services Directive 92/50/EEC. In seeking to identify good active managers, the Fund should be looking for those managers with an externally-verified high Information Ratio (compliant with the Global Investment Performance Standards) indicating that they are able to generate more value-added (alpha) for each unit of active risk or tracking error (the standard deviation of a manager's return relative to the benchmark).

Managers should have a clearly articulated investment process which can be expected consistently to deliver alpha within clearly-defined performance targets and risk parameters. They should also have stable and properly incentivised investment teams, sound IT systems and databases and a clear sense of corporate governance. An active investment manager's demonstrated ability to operate within prescribed risk parameters will be essential if there is to be effective management and control of the Fund's active risk across the different asset classes and at the total Fund level through a formalised risk budgeting process, most likely operated by the NTMA on behalf of the Pensions Reserve Commission.

[1] For example, Gupta, Prajogi and Stubbs, The Journal of Portfolio Management, Autumn 1999.

Schematically, the active manager selection process can simplistically be represented as follows:

FIGURE 3: SPLIT BETWEEN PASSIVE AND ACTIVE MANAGEMENT



The example in Figure 3 assumes that the trustees have chosen a benchmark consisting of 70% equities and 30% bonds: the benchmark has an expected return of 14.6% and a risk/standard deviation of 10.5%. A passive manager would be expected to produce a return close to 14.6%. An active manager consistently in quadrant A would be rejected on the basis that the return would be lower than the benchmark/passive return while the risk would be greater. An active manager in quadrant B would be generating higher return than the benchmark but on the basis of higher risk. In quadrant C an active manager would be out-performing both the benchmark/passive portfolio and the manager in quadrant B in terms of risk and possibly return. The manager in quadrant D could best be described as conservative. He might deliver a return close to, but obviously not exceeding, the benchmark on a lower risk basis: a question arises as to whether he is really a closet indexer charging the much higher active management fees. From the point of view of awarding active mandates, managers consistently in quadrant C would clearly be the preferred choice.

ANALYSIS OF LIABILITIES

The Prudent Man/Expert should also look at the liability side. This should involve looking not just at their size and structure as currently constituted but also looking ahead

by analysing the dynamics of those liabilities. For example: Are the liabilities growing? If so, are they growing in line with inflation? So how big are the pension bills to be addressed by the National Pensions Reserve Fund? The cost of Social Welfare pensions in 1999 was 3.4% of GNP, which is projected to rise to 5.7% in 2026, 6.9% in 2036 and 10% in 2056. By contrast the Public Service pensions bill was 1.3% of GNP in 1999 and will rise to 2.4% by 2026 and stay at around that level. So the key part is the rapid growth in outlay to the government from Social Welfare pensions in the years after 2026 – hence the 25 years commitment to injecting money before it can be drawn down.

The Pensions Reserve Fund Act (section 6.1.h) includes as a function of the Pensions Commission, the commissioning from time to time of independent valuations of the assets of the Fund; and, after consultation with the Minister for Finance, assessments of the projected profile of Exchequer outlays on a public service pensions; and, after consultation with the Minister for Finance and the Minister for Social, Community and Family Affairs, assessments of the projected profile of Exchequer outlays on social welfare pensions.

Of course there are important differences between the liability streams of the Pensions Reserve Fund and those in private sector pension funds; notably, the solvency/discontinuance actuarial tests for defined benefit schemes which the latter must meet every 3.5 years and which it would not be appropriate to apply to the Pensions Reserve Fund. Nonetheless, it makes sense for changes in assets and liabilities to be considered together – as provided for in the Act – to see whether there are any policy implications arising from unexpected changes in either the Fund's assets or the pensions liability stream.

It will be important to see whether the investment performance has been sufficient to keep up with the growth in liabilities or not – and to understand the reasons for falling behind or gaining ground. This means that the assets will need to be compared with long-term liability measures as well as investment benchmarks. These analyses of assets and liabilities can feed directly into long-term government thinking. It is important that this cycle of review of performance is put in place from the outset. The impact of pension changes is seductively long term and transitions need to be planned far in advance or they run the risk of being politically unacceptable. The decision to set up the Fund in the first place should be reinforced by establishing sensible review processes, but in the short term these should not impact on the main objective of maximising investment returns.

CONCLUSIONS

The Pensions Reserve Fund is going to be a very big Fund. In the Dáil debate on the legislation the Minister for Finance said that, assuming a conservative equity risk premium of 1%, by 2025 the value of the Fund would be equivalent to some 42% of GNP, equivalent in today's money to some €41 billion. The Fund needs to be looked at from a long-term perspective. Short-term rigidities, which do not allow the Prudent Man's common sense to prevail, will undermine its successful management. A long-term perspective with a heavy equity bias, combined with proper risk management systems, clear strategic asset allocation and manager selection processes, as well as sensible monitoring and review arrangements, will ensure that the Fund will meet its statutory investment policy objective.

Investing the National Pensions Reserve Fund

Shane Whelan, Consultant Actuary *

Ireland is not unique in establishing reserves for future pension payments. However, the investment performance of such funds accumulated in over 50 countries is poor, with average returns – where available – even lower than the interest rate on local deposits. Privately managed pension assets, when unconstrained by regulation, set a better example. A survey of the asset distribution of such private pension funds around the world leads the author to advocate a strategy similar to the investment mix that would be adopted if individuals were making provision for their own pensions. A strategy that involves under-representing sectors, industries and firms that are prominent in the Irish economy is recommended, so as to avoid the perils of self-investment.

INTRODUCTION

This paper considers the investment strategy for the National Pensions Reserve Fund that can best secure the desired optimal return with an acceptable level of risk.

The significance of the investment performance of the Fund to the Irish economy will grow as its assets grow. By 2025, and assuming the Fund is then 42% of GNP, an additional 1% of return in that year would amount to a tidy IR£250 million in today's terms. Since a 1% variation in any one year is commonplace between investment managers with the same investment brief, the role of those charged with the responsibility of selecting investment managers for the Fund, the Commissioners, is financially significant.

However, the National Pensions Reserve Fund Commission has an even greater responsibility that can be expected to dwarf the performance differences posted in the selection of one investment manager in preference to another. The Commission must set the investment strategy with the aim of maximising the return with a prudent level of

* This paper is based on a report, Remarks on Investment Strategy of the National Pensions Reserve Fund, commissioned by the Irish Association of Pension Funds (IAPF). The author is grateful to the IAPF for permission to develop this paper from the report.

risk. The investment strategies consistent with that objective are very wide indeed, resulting in large and persistent differences in returns delivered – measured not in one percentage point in one year but several percentage points each year over decades. Accordingly, the key financial decision facing the Commissioners is how to interpret the general investment objective and put it into a workable format by prescribing a mix of equities (domestic and foreign), bonds, cash and other investments, deemed suitable as a long-term asset distribution. The Commissioners are not alone in facing this dilemma. Trustees of pension funds have an almost identical investment objective and the funds are targeted to meet similar long-term, real liabilities.

The investment freedom granted to the Commission is markedly different to that of other countries that have partially funded their pension liabilities. This is as it should be because the lessons to be learned from other countries are very much of the form of what to avoid. Iglesias & Palacios (2000) provide a wide ranging and, at times, amusing study of what has gone wrong. The problem common to many countries is that investment policy has been driven by political motives and often the managers of the reserves are not accountable to the public.

The average investment strategy of other States' funds tends to be skewed to government bonds (averaging 75% in their sample of 34 such funds), housing bonds (14%) and directly held property (8%). Equities account for just 3% on average (highest at 19% in Japan) and foreign assets form a similar small proportion. Their findings are that publicly-managed pension funds have been difficult to insulate from political interference and rates of return, where available, have been generally poor. In their sample of 20 such funds most delivered returns even lower than those available on bank deposit to individual savers. They conclude:

> "These findings are consistent across countries of all types, but returns are especially dismal in countries with poor governance. The experience suggests that the rationale for pre-funding has been seriously undermined by the public management of pension reserves."
>
> Iglesias & Palacios (2000)

The Commission is charged with an investment objective and given investment freedom similar to that of Irish pension funds. No doubt the use that the latter have made of their freedom has influenced the mandate of the Fund. Irish pension funds have maintained the highest equity content, the highest foreign asset content and the lowest fixed interest content of all euro-zone pension funds. The excess returns of equities over bonds and, more generally, real assets over monetary assets has consequently led Irish pension funds to persistently out-perform their peers in the euro zone in the past. This out-

performance relative to, say, their more restricted German counterparts, averaged over 3% per annum over the decade to the end of 1993.[1]

The financial significance for the Irish economy of this out-performance can be crudely estimated. Pension funds in Ireland are estimated to have accumulated assets of 46% of GDP at the end of 1996.[2] Accordingly, it seems reasonable to assume that over the decade to 1993 this proportion averaged more than 34%. This entails that the 3% performance of Irish pension funds over the period reduced pension costs by more than 1% of GDP per annum. This is a significant amount. Over the years since 1993, this relative performance would have increased as real assets delivered more emphatic superior returns over monetary assets. The unusually non-intrusive regulatory environment has allowed Irish trustees and their investment managers to capitalise on investment opportunities when and where they present themselves. Presumably, it is hoped that the Fund will find an equally profitable use for its investment freedom.

INVESTMENT PRUDENCE DEPENDENT ON TIME AND PLACE

The investment guidelines of the Fund have more than a passing similarity to pension and trust law in Ireland, the UK, the US, Australia, Canada and the Netherlands. All of these countries have adopted the 'prudent man principle' when it comes to investing pension reserves: namely, that little or no restrictions are imposed on the portfolio other than what would be imposed by a prudent person. In fact, the major restriction in each of these jurisdictions is to impose a limit on self-investment (either 5% or 10%) so that the pension promise is not too tightly tied to the fortunes of the sponsoring employer. The liabilities for which provident investment is made, being real and long term, are also similar. It seems sensible then to survey what prudent pension trustees around the world, with their considerable skill and diligence, are signalling to the Commission by their actions. Table 1 sets out the average asset allocation of pension funds over the last few decades in those countries where the prudent man principle applies.

In 1990, the equity proportion varied from 20% in the Netherlands to 63% in the UK. Property varied from 0% to 16%, giving a range for real assets from a low of 31% in the Netherlands to a high of 72% in the UK. The inverse is seen when it comes to monetary assets. There is also a marked preference for local assets in all the countries with the proportion of foreign assets varying from a low of 4% for US pension funds to Ireland's high of 29%.

[1] Supplementary Pensions in the Single Market, European Commission, 1997.
[2] National Pension Policy Initiative Consultation Document, Department of Social Welfare & The Pensions Board, February 1997, p. 31.

TABLE 1: AVERAGE ASSET ALLOCATION (%) OF PENSION FUNDS WHERE GUIDED BY PRUDENT MAN PRINCIPLE, 1970-1990.[3]

Asset Type	Year	Ireland	UK	US	Australia	Canada	Netherlands[4]
Equities	1970	n/a	49	45	15	27	11
	1980	n/a	52	41	15	26	5
	1990	53	63	46	27	33	20
Property	1970	n/a	10	0	2	1	16
	1980	n/a	18	0	13	2	14
	1990	11	9	0	16	3	11
Total Real Assets	1970	n/a	59	45	17	28	27
	1980	n/a	70	41	28	28	19
	1990	64	72	46	43	36	31
Govt. Bonds	1970	n/a	18	7	51	38	10
	1980	n/a	22	14	33	40	5
	1990	23	11	20	13	39	14
Other Bonds/Loans	1970	n/a	14	44	n/a	26	57
	1980	n/a	2	29	n/a	24	72
	1990	7	3	18	7	12	47
Cash	1970	n/a	4	1	n/a	5	3
	1980	n/a	5	8	n/a	9	2
	1990	6	7	9	23	11	3
Total Monetary Assets	1970	n/a	36	52	n/a	69	70
	1980	n/a	29	50	n/a	73	79
	1990	36	21	47	43	62	64
Other Assets	1970	n/a	5*	3	n/a	3*	3*
	1980	n/a	1*	7*	n/a	-1*	2*
	1990	0	1*	7*	14*	2*	5*
% of which Foreign	1970	n/a	2	0	n/a	n/a	7
	1980	n/a	9	1	n/a	4	4
	1990	29	18	4	13	6	15

[3] Figures abstracted from Tables 6.2, 6.6, 6.7, 6.8, 6.9, 6.10, 6.11, 6.12, and 6.13 in Davies (1995) which excludes insured assets. The average asset distribution for Irish pension funds was taken from the IAPF Investment Survey for 1990, excluding insured assets for comparability. Where the percentages do not sum to unity, the figure for 'Other assets' was adjusted and the adjusted figure is marked with an asterisk.

[4] Excludes the large Dutch public service fund, the ABP, which prior to 1996 had limits of 20% in real assets and 10% in foreign securities.

Looking over the last few decades, a considerable shift away from monetary assets towards real assets, and towards equities in particular, is evident. Over all the regions, the equity proportion increased by an average 8% between 1970 and 1990.[5] The move to equities over the last few decades is part of a much longer trend with trusts largely invested in government bonds a hundred years ago.

The signal is ambiguous. Even though the asset markets in each country are marked by very similar risk and reward trade-offs, and even though the pension liabilities that the funds are invested to meet are fundamentally of the same character, it appears that a prudent Dutch pension investor is quite different from a prudent UK pension investor. When it comes to setting an asset allocation for long-term real liabilities, only one rule is clear from a look at practice around the world. That rule can be put simply: *anything goes*. Table 1 captures the very wide range of asset distributions justified by prudence.

Phillips & Drew (2000) attempt to update the distribution of pension funds to the end of 1999, as can be seen in Table 2. They use slightly different data to that earlier so some caution must be used in inferring the extent of the trends. Nevertheless, the broad trend towards equities can be seen to have continued over the 1990s. While a much greater uniformity of asset distribution is beginning to emerge, still large variations remain.

To sum up, no consensus is found in this brief survey of how in practice the prudence principle demanded of the Commission is interpreted around the world when provision is made for similar liabilities. However, the trend is away from monetary assets towards real assets. It is straightforward to explain why prudence might alter with time; prudence is, after all, intimately linked with experience.[6] However, the geographical variation is more perplexing.

[5] Unfortunately no figures are available for the distribution of Irish pension funds back in 1970 but it is highly likely than the shift to equities was as pronounced in Ireland as it was in the UK. In fact, the underlying trend towards equities is probably more striking than is represented here. The Table ignores the structural switch in Ireland from insured assets (with high monetary backing) to unit-linked investment (with higher equity content) and the progressive liberalisation of investment restrictions placed on some large public service pension funds over this time.

[6] In fact, US pension law implicitly recognises that what appears prudent at one time may not appear so when judged at another. It requires that investments must be chosen with 'the care, skill, prudence and diligence *under the circumstances then prevailing* that a prudent man acting in like capacity and familiar with such matters would use in the conduct of an enterprise of like character with like aims" [italics added].

TABLE 2: AVERAGE ASSET ALLOCATION (%) OF PENSION FUNDS WHERE GUIDED BY PRUDENT MAN PRINCIPLE, 1999[7]

Asset Type	Ireland	UK	US	Australia	Netherlands
Equities	65	75	65	55	50
Property	5	4	3	5	6
TOTAL REAL ASSETS	70	79	68	60	56
Bonds	25	17	28	25	41
Cash	4	4	4	12	3
TOTAL MONETARY ASSETS	29	21	32	37	44
Other Assets	1	0	0	3	0
% of which Foreign	60	28	11	19	57

UNDER-REPRESENTATION OF IRISH ASSETS

One possible explanation for the range of investment strategies justified by prudence comes from placing pension fund investment in a larger context. Consider the firm sponsoring the pension fund and its competitors. If the latter are regarded as being similar industries in the same region, it follows that the appropriate peer group comparison for labour costs is across similar industries in the region. As performance of pension assets is a meaningful method of stealing a competitive advantage over one's peers, it follows that each industry will tend to compare the performance of its pension assets with the average for the industry. In a competitive environment this in turn means that it is the relative investment performance of the pension fund that matters, not its absolute return.

The above simple model explains why asset allocations of pension funds within a single industry in the same region tend to converge. It can easily be extended to all industries in the same region by considering the centripetal forces acting on the asset allocation of the local fund manager groups.[8] This model explains some stylised facts about the pension industry in many areas – the importance it places on relative performance (often its measurement is a small industry in itself) and, for our purposes, the common

[7] For Ireland, IAPF (2000) otherwise Phillips & Drew (2000).
[8] See Whelan (1998). The term 'region' is left purposely vague. It can be an area within a national boundary, a supra-national trading area, or a common currency area. The force promoting conformity in asset allocation dissipates with decreasing competition.

consensus asset allocations in one region that can differ significantly from other regions, despite similarity in the asset choice and liability profile.

The question naturally arises whether there exists a larger context in which the aims of the National Pensions Reserve Fund can be viewed? Such a broader context might narrow the range of possible prudent strategies such as to suggest a single suitable benchmark strategy.

The obvious parallel is to benchmark the total financial strength of the Irish economy against our competitor states, and by a judicious selection of industry representation in the Fund, ensure that the Irish economy plus the investments in the Fund are balanced so that the Irish nation is at no disadvantage when compared with competitor nations. The idea is to select investments so as to minimise the asymmetric effects of a shock to our economy as opposed to the economies of our competitors. Under this logic the Fund takes on the role of an insurance fund for the economy.

However appealing the logic of this proposal, the sums simply do not add up. The Fund will always be too small to act as a meaningful counterweight to the sectoral concentration of industries in Ireland – it cannot materially diversify the risk inherent in Ireland's economic structure. However, investment of the Fund can be skewed to ensure that those times that the Irish economy is weak – in the sense of lacklustre growth, high unemployment, and poor fiscal position – coincide with the times that the Fund's assets are buoyant. This means that paying for pensions in these bad years is a bit more bearable. The flipside of this orientation of the Fund – and there must be one with risky investments – is that when the Irish economy is posting above trend growth, unemployment is low, and there is a budget surplus, then the assets of the Fund will tend to perform poorly. In these happier days the burden of pension payments will weigh less heavily on the economy.

The consequences of the strategy proposed above would be to de-emphasise the Fund's weighting to those sectors already overweighted in the Irish economy (e.g. food processing) and to diversify into other industries in which the economy is deficient or under-represented (e.g. oil exploration and refining). This strategy attempts to recognise the underlying reality that future pensions will not only be paid out of the Fund but will rely on transfers from the profit and wages of Irish industries. Obviously, it is preferable to tax heavier in buoyant times and lighter in recessionary times.

If adopted, this strategy would skew the sector orientation of the Fund away from the global market average. It would also have a significant impact on the split between Irish and overseas equities. The general rule is to diversify from Irish domestic industry,

which implies that, insofar as equities listed on the Irish exchange are truly indigenous firms, they should be under-represented in the Fund. This argument is particularly acute when it applies to firms like the important domestic financial sector whose fortunes depend so much on final demand within the economy. In short, the Irish market, which forms a negligible one-quarter of one percent of the world equity markets,[9] should be under-represented in the Fund.

THE EQUITY RISK PREMIUM

In the past, equities have out-performed bonds by a significant margin and the persistence of this out-performance has merited the phenomenon a name, the 'equity risk premium'. Table 3 shows how significant this out-performance has been in real terms over the last century in Ireland, the major euro zone economies, the UK, and in the US.

TABLE 3: REAL RETURNS ON ASSET CLASSES OVER 20TH CENTURY, SELECTED COUNTRIES[10]

Country	Equity	Bonds	Cash	Inflation
	% p.a.	% p.a.	% p.a.	% p.a.
Ireland	6.7	1.0	0.7	4.5
UK	5.9	1.3	1.0	4.1
US	6.9	1.5	1.1	3.2
Netherlands	6.0	1.1	0.7	3.0
Germany	4.5	-8.5	-19.3	34.0
France	4.0	-1.0	-3.4	8.0
Italy	2.7	-2.3	-4.1	9.2

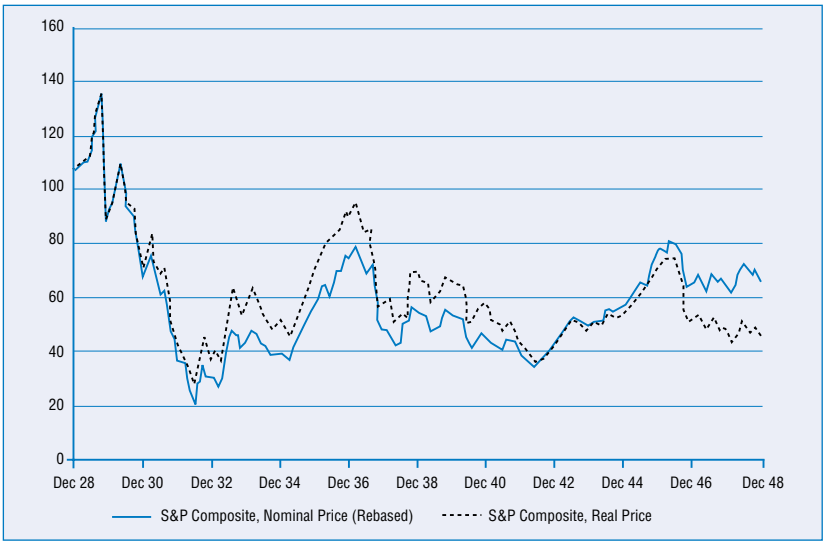
The same general picture emerges for many other economies, over shorter and longer periods of time, and for almost any terminal date chosen at random. The equity risk premium has been positive and materially so.

The equity risk premium is a puzzle. It presents an argument so overwhelmingly in favour of equities that we must wonder what is the lure of bonds that tempted past investors – investors largely intent then as now to maximise return with a prudent level of risk – to buy and hold them despite their huge opportunity cost. Probing for an

[9] In the FT S&P Actuaries World Index as at 31st October 2000.
[10] Whelan (1999) for Ireland, suitably updated, otherwise Dimson et al. (2000).

answer reveals two salient facts. First, when times are good for equities they can be very good; and when bad, they are awful. Figure 1 below graphs the US equity market from 1928 to 1948. The early 1930s were the time of the Great Depression when firms closed and unemployment soared – in short, a time when pension funds would tend to call on their assets. The assets fell in the 1930s to half the value they attained at their high and, at one stage, amounted to just one-sixth of their peak value. There is not much good in having assets that will fall when they are most needed. Indeed, the clock need not be turned back seventy years to see bad times for equities. Japan, the largest stock market in the world at the start of 1990, halved in value over the subsequent decade as the economy flirted with recession. Bonds did well through both of these historic episodes.

FIGURE 1: US STOCK MARKET CAPITAL INDEX, REAL AND NOMINAL TERMS, 1928 – 1948[11]



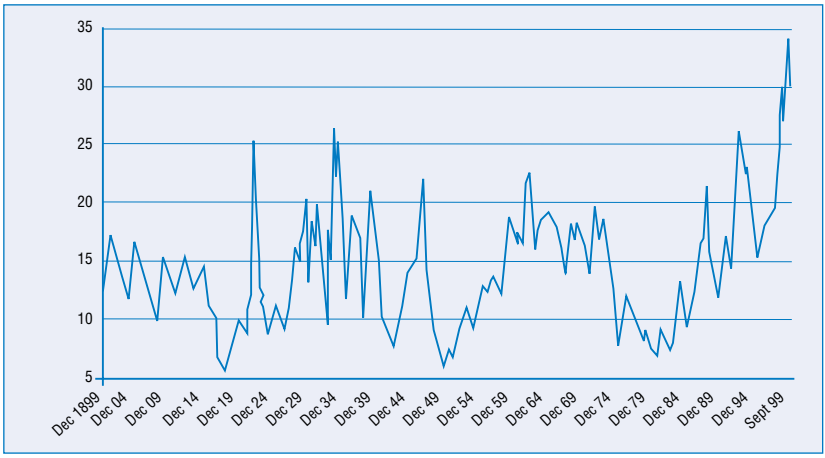
Holding international equities diversifies the pension promise from a reliance on the Irish economy. There remains the systemic risk that equities everywhere perform poorly reflecting global economic weakness but this risk is thought to be sufficiently modest when set against the temptation of the positive risk premium. Indeed, the idea behind

[11] Data on the US market for over a century are readily available see, for instance, Shiller (2000) or, for longer series including cash and bonds, see Siegel (1992). Data used was from Shiller (2000) which is available to download at www.econ.yale.edu/~shiller.

the Fund itself is that the reasonable risk it undertakes will be more than fairly rewarded and, with their form over the last century, equities look like they are worth the risk. The ultimate benchmark against which the Fund performance is to be judged is the alternative uses of the money, the obvious one being to redeem part of the national debt.

The second lesson from financial history is that equities, on the straightforward measure of price per unit of profit stream purchased, are more expensive now than they have been at any time in the past (see Figure 2). This has one obvious consequence: the more paid, the less the excess return in the future. However, there is a less obvious consequence. The equity risk premium observed from the current perspective in 2001 is inflated by the inflated price now paid for equities. The re-rating of equities in many economies – that is, paying a higher price for the same earnings stream – observable over the last decade or two cannot be reasonably projected into the distant future. The equity risk premium observed in the past is thus an exaggeration of what can be projected into the future.

FIGURE 2: PRICE-TO-(REPORTED) EARNINGS RATIO OF THE US EQUITY MARKET, DEC. 1899 – SEPT. 1999[12]



How much of an exaggeration? This is anybody's guess. A particularly informed guess has been made recently by Campbell and Shiller.[13] Under the compelling logic that the more paid for the same asset the less the future return, they estimate that real returns

[12] Calculated from figures in Shiller (2000).
[13] See Campbell & Shiller (1998). This paper was developed out of joint testimony before the Board of Governments of the Federal Reserve System in early December 1996.

could be close to zero in the US equity market (which represents more than half of the global equity market) over the next decade. The analysis came up with the same bearish prognosis for equities in 1996, in 1998 and, with market rises continuing to outstrip profit growth, remained true in 2000. Their argument is flawless but it clearly ignores an important short-term driver of the market. Herein lies a difficult lesson, although not the one intended by the authors: exceptional returns from the market are not the unfailing reward for the best argument or for the most insightful analysis. Most fund managers will admit (outside of new business presentations) that the link between the original motivation for the position and its success is so tenuous that, even when the hoped-for excess return materialises, the doubt remains that it was the right result for all the wrong reasons.

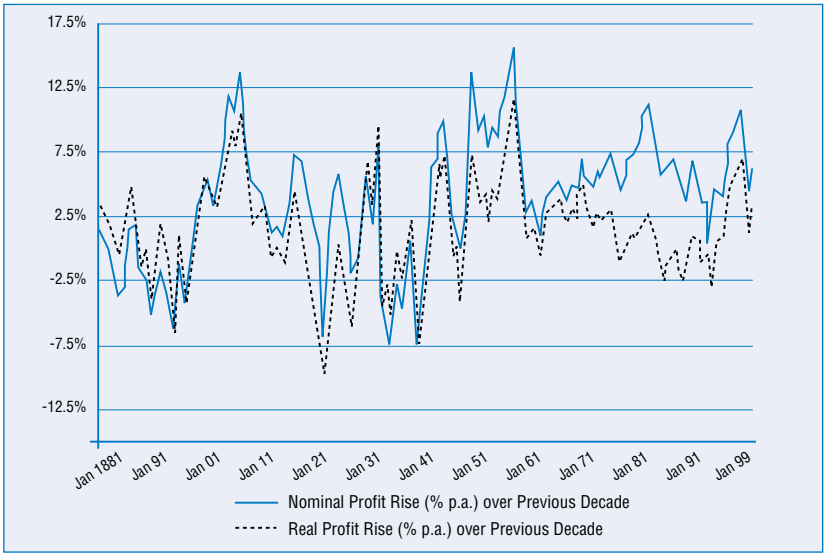
The positive and persistent equity risk premium is a simple fact and, subject to the two important caveats above, demands that the Fund should commit the majority of its money to this category of asset, on average, and over the long term. Should another asset class, or section of an asset class, demonstrate such a robust performance and hold out such reasonable promise for the future, the obvious approach is probably the best: invest as much as possible in that asset class or subsection of that asset class subject to the limit of prudent diversification.

While the Fund can be expected to have a high equity weighting on average over the long term, this is consistent with large swings in the proportion of equities and bonds held from time to time. Equities are good in general but good in particular when they are cheap. Figure 3 shows how the (smoothed) profits of US quoted companies moved in cycles over the last one hundred and thirty years or so. Being able to anticipate such profit cycles would require the Fund to alter its asset distribution over such long cycles. Indeed, there is reason to believe that markets are efficient in the micro sense insofar as the shares in one company are likely to be anchored at least loosely to the industry average by quasi-arbitrage opportunities. However, it is difficult to envisage the forces ensuring macro efficiency between, say, the bond market and the equity market. This means that equities as a whole can stay persistently over- or under-valued for a period of time measured in years.

Whether such cycles, even if they exist, are predictable without significant error and opportunity cost remains open. The ‘told-you-so’s’ after every stock market crash tell us very little for, as the saying goes, at least ten out of the last two crashes have been confidently predicted. There are many indicators from Tobin’s *q* ratio to dividend yields and price-to profit ratios that suggest that equities are unusually expensive now and have been so over the last few years. These arguments can be reflected in the Commission’s setting a benchmark proportion to equities somewhat lower than they

would when such valuation measures are not recording extreme values. Thus, the Commission could adopt a long-term target range of 65% in equities and adjust it to, say, 50%, when equities are so highly valued.

FIGURE 3: PROFIT CYCLES IN US MARKET, 1871-1999



The Fund will be a saver in the markets over the next few decades and clearly wants to acquire its assets as cheaply as possible. In this context, a fall in values during the investing period is not necessarily bad. Despite the losses it will show, it will be acquiring assets cheaper.

An immediate question facing the Commission concerns the entry strategy of the Fund into the market. Suppose that the Commission has decided on an asset allocation strategy or benchmark for the Fund. Should it invest immediately in the markets, average the money in over a period of a year or so, or use some other method to keep the rewards but mitigate the risk? This problem is capable of a mathematical formulation and resolution. There is only one correct answer: close your eyes and take the plunge. The solution is put in a typically forceful manner by the Nobel Prize Laureate, Samuelson, in an amusing round up of common misconceptions in general investment practice:

> "Sleeping well for irrational reasons, you may say, is as good as sleeping well for rational reasons. I do not pronounce on that. Dollar averaging gives many folk the comfort to get into stocks. Bully for them. This denies not the truth that dollar-averaging cannot improve risk-corrected expected performance. There are dozens of other rules and maxims whose attractions have naught to do with their genuine merits to optimize mean-variance results. For a fiduciary trustee of a large endowment to act on them is a blunder if not a crime…"
>
> Paul A. Samuelson (1994)

SELLING LIQUIDITY IN BOND MARKETS

This section takes a brief look at bond and currency markets to find some anomaly that can be profitably exploited. As with investment in equities, certain profit is unobtainable but perhaps a fertile subsection of these markets can be identified that might tend, on average and over the long term, to yield returns higher than the market average. Ideally the risk associated with concentrating the investments in a subsection of the market will be modest and not correlated with other risks in the portfolio.

Keynes remarked more than half a century ago that:

> "Of the maxims of orthodox finance none, surely, is more anti-social than the fetish of liquidity, the doctrine that it is a positive virtue on the part of the investment institutions to concentrate their resources upon the holding of liquid resources..."
>
> John Maynard Keynes (1936)

Markets continue to place a high value on liquidity, that is, the ability to buy or sell quickly at little cost and without moving the price against oneself. Yet, marketability is not required by the Fund over the next few decades as it will be a net investor. What deal can the Fund get in selling liquidity?

It is possible to make a good assessment of the price paid for liquidity in bond markets. If bonds have a similar coupon payment, similar maturity and identical credit rating in all respects save liquidity, they are the same. It follows that a good assessment of the price paid by the market for liquidity can be made by comparing the enhanced yield on offer by investing in the less liquid bond. Table 4 takes three very small issues of the European Investment Bank listed on the Irish Stock Exchange. They are small, as testified by the issue size, but they have a triple A credit rating (comparable with Irish Governments bonds). Such stocks give an enhanced yield ranging from 0.25% for the

shortest dated maturity to 0.5% or more for the longest date one when compared with the yield on similar dated Government stock. (A range for the yield spread is given as it is often difficult to get a reliable price for such illiquid issues.) This small sample illustrates that Keynes's observation still holds true and that the Fund might do well to build up patiently an exposure to such high-rated unmarketable issues. There are many such euro-denominated bonds.

TABLE 4: YIELD SPREAD OF SELECTED AAA-RATED BONDS OVER IRISH GOVERNMENT BONDS, NOVEMBER 2000[14]

Stock	Issue Size € m	Duration	Yield to Redemption (Annual)	Yield Spread (at issue)
7-7/8% EIB 2003	63	2.26	5.65	c.25-45 (28)
8% EIB 2006	13	4.73	5.69	c.40-50 (40)
9% EIB 2015	32	9.07	6.08	c.50-75 (55)

Looking through the balance sheet of the State, the Irish government can be pictured as a manufacturer of liquidity on the euro-denominated bond market. Under the proposal above, the government, through the Fund, buys illiquid stocks at a discount and issues or maintains in issue liquid ones through the National Treasury Management Agency's management of the national debt. The result is that the Government pockets the very worthwhile discount for illiquidity. In short, the Fund exploits the market's fetish for liquidity.

This prescription will no doubt strike some as being simplistic. One apparently promising line of argument against it is to state that there are considerable differences in credit worthiness within the AAA category and the above analysis is mistaking a credit discount for an illiquidity discount. This objection does not stand up to closer scrutiny. Based on a study of Moody's database over the years 1970-1991, the probability of a triple A rated bond so much as delaying or skipping an interest payment over a ten-year period is less than 1% (Diaz & Young, 1993). It is difficult to ascribe such a yield spread to small differences in credit worthiness when there is such a small probability of default.

In any event, it is evident from the foregoing that the ban on the Fund investing in Irish Government securities is not that restrictive. There are many other assets in all respects similar, with a similar negligible probability of default, so that this restriction cannot have a detrimental impact on performance.

[14] Source: ABN-AMRO Stockbrokers, Ireland, 06.11.2000 which give a point estimate of the yield spread within the range above.

CONCLUSIONS

The National Pensions Reserve Fund Commission should look to the example of private pension investors, guided by the prudent man principle, to help set the investment strategy for the Fund. A survey of the asset mix of such funds around the world does not provide a clear signal to the Commissioners but suggests an equity exposure somewhere between 50% and 75% of the total Fund value. The merit or otherwise of the high equity weightings is considered directly in the section dealing with the equity risk premium. Historically, this has been high and persistent and observed in most of the world's economies. While leading to a more realistic appraisal of the risks and making a more sober view of the equity risk premium in the future, historical considerations do not alter the key signal that Irish and international pension trustees are giving to the Commissioners.

Future pensions will not solely be paid out of the Fund but will rely on future transfers from the profit and wages of Irish industries. Based on the observation that it is preferable to tax heavier in buoyant times and lighter in recessionary ones, an investment strategy that tends to de-emphasise the Fund's weighting to those sectors already overweighted in the Irish economy and to diversify into other industries in which the economy is deficient or under-represented should be pursued. A corollary to this general rule is that, insofar as equities listed on the Irish Stock Exchange are truly indigenous firms, they should be under-represented in the Fund.

A brief analysis of profit opportunities in the bond market highlights the long-observed fetish that this marketplace has for liquidity. This fetish can be profitably exploited. The government balance sheet can be seen as essentially manufacturing and selling liquidity in the fixed interest markets. The result is enhanced returns which, though modest, are achieved with a negligible risk exposure.

Other markets, such as currency markets, have been shown to exhibit exploitable anomalies (see, for instance, Levich & Thomas (1993 a and b), Whelan (2001)). However exploiting such small profit opportunities is best delegated to the fund managers charged with the daily investment decisions of the Fund.

The Commissioners face a challenge common to many provident savers for retirement. It would stand to the Commission if its expert deliberations were made open. Perhaps this would even disarm some of the more cynical commentators. The Commission has, of course, an ultimate accountability to current contributors and future pensioners. It is to be hoped that the onus of this responsibility does not give way to the worldly wisdom of John Maynard Keynes when he remarked that "…it is better for reputation to fail conventionally than to succeed unconventionally".

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Lessons from the French Experience in Public and Private Partnership

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Attention should be given to contract incentives and incentives within contracts, if lessons are to be taken from the French experience in Public and Private Partnership (PPP). This is because in economic terms PPP contracts are characterised by the granting of a temporary monopoly to a firm with long-term and specific investments, asymmetries of information between the firm and the public body, cost and quality requirements that cannot be monitored and pre-and post-contracting opportunism. Such contracts have the potential to contribute significantly to the efficiency and timing of infrastructure and other public service developments in Ireland. However, a rigorous evaluation of the economic, legal and technical aspects is essential if the public sector is to get a fair deal.

INTRODUCTION

France has a long tradition of PPP dating from the 16th Century. Its present form was developed at the end of the last century for the purpose of building and operating the French railway system. PPP is currently used for infrastructure (such as highways, stadiums) and local public services, such as refuse collection, water provision or urban transport. This long experience permits a great awareness of the advantages and disadvantages of this type of organisation and above all its potential pitfalls in terms of pre- and post-contracting opportunism.

In one of his public addresses in relation to PPP, the Minister for Finance, Charlie McCreevy, stated that Public Private Partnership "could provide real opportunity – for the public sector to deliver key public services more efficiently, effectively and economically – for the private sector to share the risks and rewards for providing such services". To gain a better understanding of the key issues, it is useful first to examine the rationale for PPP and to analyse PPP contracts in economic terms. Later, examples of pre-and

* The author wishes to thank colleagues at Indecon for their comments, in particular Paddy McNutt, William Holmes-Batt, Gregory Swinand and Alan W. Gray. The usual disclaimer applies.

post-contracting opportunistic behaviour within the French experience are provided in order to highlight a number of lessons for the Irish situation.

ECONOMIC RATIONALE BEHIND PPP

The rationale behind PPP is much the same all over the world. A wide range of factors as follows underlie its development. In the first instance, there is an increasing need for infrastructure due to increased wealth, urbanisation and environmental constraints. Secondly, public funds may be scarce and their opportunity cost can be expensive, whereas the PPP approach allows private investment to either crowd-in or crowd-out public funds. In fact, government financial and non-financial contributions can provide private contractors with a return on their investment when the project would have never taken place in in the absence of government intervention. Thirdly, governments can be risk-averse in relation to project delays, cost overruns, quality failures, or simply, price increases. Fourthly, all government levels may not have the technical expertise to deal with project management and operation. Finally, there is a general perception that private firms may be more efficient than public bodies, even though this perception has recently been challenged in France. [1]

THE FRENCH EXPERIENCE

In France, PPP contracts are performed under *Délégation de gestion* contracts, that is to say, the public body's duties are transfered to a third party under two types of contract: C*oncession* and *Affermage* contracts. *Concession* contracts can be compared to BOT (Buy-Operate-and-Transfer) or DBOT (Design-Build-Operate-and-Transfer) contracts. The contractor chosen at the end of the tender process finances, builds and delivers the project for a specified number of years as agreed. The contractor also has to bear the cost of maintaining the project. At the end of the contract, the project is transferred to the public body. *Affermage* contracts, by contrast, can cover design and building, or even operations only, but do not cover project financing. The investment is publicly financed and publicly owned so that maintenance has to be provided by the public body (it is often contracted-out to the operating firm). Such contracts are awarded through a public tendering process. For small projects, the bids are price-based; for larger projects, tendering is based on the project design and price.

Concession contracts first appeared in France in the 1870s when the railway network was developed. They were later used in the development of water provision networks

[1] Cours des Comptes, 1997

and street lighting facilities. In the 1930s, local authorities could not afford the high cost of construction or extension of local gas, electricity and water networks so they were financed by private operators who charged service fees to end-users. As infrastructure was further developed in the 1950s and 1960s, PPP contracts became increasingly common. The majority of French highways were built under such schemes, for instance. In the 1980s, decentralisation made contracting-out easier, but it was the lack of public funds and the increasing need for investment in relation to EU environmental regulations that underpinned the last phase of PPP expansion.

However, a critical attitude progressively developed in the 1990s. The assumption that PPP was necessarily cheaper than public-only provision diminished as prices increased during the period of the contracts. Now, contracts are more carefully negotiated and enforced; and renegotiations take place when they are thought to be unfair.

At present, PPP covers a wide range of service provision at a national or local level in France. Highways, tunnels, bridges (often associated with tolling) are the most well known forms of PPP, but almost all local public services can be subject to PPP. In fact, sewage disposal, refuse collection and treatment (in landfill or incinerators), cable, urban transport (such as bus network or metro), sport facilities, school canteens, funeral services (as they have to be publicly provided) and water provision can be organised under *Delegation de Gestion* contracts. Water provision is the local public service with the greatest PPP element. In 1995, 75% of the population was provided with water under PPP contracts, as shown in Table 1.

TABLE 1 POPULATION WITH PRIVATELY PROVIDED WATER IN FRANCE

Year	% of total population
1938	25
1956	37
1970	48
1983	57
1995	75

Source: Defeuilley (1996)

The number of PPP private operators is limited, however. In 1995, two firms, Lyonnaise des Eaux and Generale des Eaux (now Vivendi), controlled 62% of the water distribution market and 36 % of the sewage disposal market (an area where PPP is still relatively limited but is expected to expand as strict EU regulations have to be applied). Both

TABLE 2: PPP ASSESSMENT IN FRANCE OF RELEVANCE TO IRELAND

	FINANCE	KNOW-HOW	POLITICS	COST AND PRICE
Advantages	Private finance allows more flexibility No opportunity cost of public funds (not an issue in the French context)	Management provides incentive to make productivity gains, R&D, economies of scale and/or scope Fewer technical risks when the operator designs and builds the facility (if concession contract)	Private finance of public investment in case of concession contracts Revenues if public facilities are sold to a private investor The government does not bear the political risk of project delays, quality failures, price increase	Supposed or real cost efficiency Supposed or real experience in project evaluation and cost monitoring
Disadvantages	The direct cost of public finance is cheaper because governments can have a higher credit rating Possible bankruptcy of the private firm	Personnel employment status may be modified Lack of control over investment decision Possible lack of incentive to control costs when subject to price escalating mechanism	Possible political costs in implementing a PPP contract (privatisation fears and change of employment status for employees) Possible collusion or corruption in relation to the allocation of the contract	Not necessarily the cheapest form of production organisation Low level of competition in the market and vertical integration Higher taxes

firms also control 75% of the urban central heating market, 60% of refuse treatment, 55% of cable operation, and 36% of the refuse collection market. They are known as *multi-utilities* as they are horizontally diversified. As a result of vertical integration and a high degree of concentration in the market, it is argued that competition is limited if not infringed in some cases. Some commentators believe that, in the case of the water supply industry, firms have tacitly divided the market on a geographical basis.

EVALUATION OF THE FRENCH EXPERIENCE

To evaluate the alternatives of public or private production of public services, four criteria are used as presented in Table 2. The first concerns access to funds and the cost of funds. The second criterion relates to technical and managerial know-how, that is to say, the ability to deliver the service efficiently in terms of quality and cost. The third evaluation criteria are the price and the cost of the provision of the public service. The last criterion concerns the political implications of contracting-out. More precisely, it is connected to two issues: the perception of the change of the public service organisation in terms of acceptance of the 'privatisation' process by the public/electorate; and the impact of the decision on the public budget, (local authorities' debt level is used to evaluate the quality of municipal management). PPP can also influence local authority balance sheets, as they can sell the project to the private firm.

A recent study by Kern and Vienne (1998) provides further information on the pros and cons of PPP. The authors surveyed 200 French local authority managers and local councillors. The former were asked why they chose not to contract-out local public services and to rank them on a scale from 1 to 5 (5 being the highest ranking). The results are summarised in Table 3 below.

TABLE 3 EVALUATION OF PPP CONTRACTS FOR LOCAL PUBLIC SERVICES IN FRANCE

Technically, the local public service does not require any specific know-how	50%
The monopoly position of the private operator would make things difficult	49%
The public operation of the service is satisfying in terms of quality	45%
One cannot really control the private operator	43%
Contract length is too long	41%
The decision is irreversible	38%
Contracting-out is a form of privatisation	36%
Public finance of the investment is cheaper	34%
Users are reluctant or opposed to contracting out	23%

The PPP assessment indicates that local authorities have begun to recognise that there are some disadvantages inherent in contracting-out for infrastructure and public services. Some disadvantages are related to institutional features, such as taxation; others are connected to the nature of the contract relationship specified between the principal awarding the contract and the agent. The contractual relationship is analysed in economic terms in the following section.

ECONOMIC ANALYSIS OF PPP CONTRACTS

The majority of PPP contracts award a monopoly franchise to a private firm following a public tender based on contract requirements and length. The economic analysis of PPP focuses on three areas, namely the competition issues arising from the awarding of such contracts, contract incompleteness and specific investment.

COMPETITION PROCUREMENT AND COMPETITION LAW

In 1859, the English hygienist Chadwick advocated that "in absence of competition in the field … competition for the field" would permit lower production costs. He suggested that services characterised by natural or institutional monopoly should be awarded to the lowest price firm believed to be able to provide the service throughout the contract life time. This argument constitutes the foundation of Demsetz's franchise theory (1968). According to this, the right to produce should be franchised and auctioned regularly so that the "rivalry of the market place disciplines more effectively than the regulatory processes of the commission". It is also stressed that the level of rent dissipation is inversely determined by the degree of collusion. This point was recently emphasised by the Irish Competition Authority in its Guidelines on the Detection and Prevention of Collusive Tendering on Public Sector Contracts when it stated: "Collusion will always result in higher prices. The cost of these higher prices must be borne by taxpayers and those who are affected because such behaviour diverts funds which could be used to provide other worthwhile services to the public".

INCOMPLETE PRINCIPAL AGENTS CONTRACTS

PPP contracts typically involve long time-spans. It is noteworthy that the contract period may vary significantly from one project to another and from one country to another. Notably, in France, there is a perception that PPP contracts are shorter than in the UK. In relation to water provision and sewage, for example, the French government limits PPP to *affermage* contracts (there is no private financing) on the ground that such investments require over 30 years to recover the total cost involved. The local public service contract lengths recommended by the French Ministry of Internal Affairs are presented in Table 4.

PPP contracts are incomplete because contracting partners are not in a position to foresee all possible contingencies affecting the contracts; and even if they were able to do so, the cost of writing, negotiating, and enforcing such contracts would be too high in comparison to the potential benefits. Consequently, such contracts only take into account the likely contingencies needed to allocate the rights of the parties involved.

TABLE 4 RECOMMENDED LOCAL PUBLIC SERVICES LENGTH IN FRANCE

Industry	Type of Contract	Contract Length
Water provision	Affermage	12 years
Sewage	Affermage	12 years
Refuse collection and treatment	Affermage	5 years
	Concession	10 years
Parking	Affermage	6-15 yrs depending on specifications
	Concession	6-24 yrs depending on specifications

Long contract length and wide contract scope exacerbate information asymmetries. The private firm is responsible for project design, implementation and operation of the infrastructure or the service; the public body is able to monitor effectively the cost and quality requirements at each point of the production process. Information asymmetries distort contract enforcement procedures and the negotiating power of the parties allowing for contract opportunism.

SPECIFIC INVESTMENT

Under PPP, the material or immaterial investment supporting the service is tailored towards government needs over a number of years. These are also long-life investments and are difficult to relocate. Under such a contractual relationship, there is scope for opportunism once the parties have agreed to whatever contingencies they want to take into account and once they have decided upon the pay-off to each party. In fact, one party may try to take advantage of its contractual position to force the other to accept new contract terms (written or unwritten). Such hold-up situations may occur before the final contract is signed or even after.

PRE- AND POST-CONTRACTING OPPORTUNISM

As stated, information asymmetries favour opportunism before and after the contract negotiation. Prior to the contract, they allow one party not to reveal its entire information set and to use its bargaining power to obtain an outcome in its favour. It also allows one party to exploit any loopholes to gain advantage over the other. In such situations, the other party may be forced to accept a worse situation in comparison to the terms agreed upon.[2] In other words, pre-contracting opportunism occurs when the contract is allocated and when the terms of the contract are negotiated. Post-contracting

[2] Milgrom and Roberts, 1992

opportunism takes place when the contract is performed and, finally, at the end of the contract.

CONTRACT ALLOCATION

At the tendering stage, public officials' investment decisions can be captured or even, in exceptional cases, driven by corruption. A number of examples of such behaviour are presented below.

- Investment capture takes various forms: from commercial advice, subsidiary involvement in preliminary evaluations and involvement of contract parties in decision processes. For example, a French utility gives its employees half a day off per week if they are members of a Municipal Council. Within this context, it has been suggested that some local authorities have de-nitrification water treatment plants when the level of nitrates in their water is far from being alarming.

- Bribery could also in selected cases influence local authorities in their choice of contracting firms. In France, some high-profile court cases in relation to PPP have resulted in prison sentences and civil penalties. However, such behaviour is now exceptional as tendering processes and political party funding are now carefully monitored.

CONTRACT DESIGN

Insufficient experience, lack of expertise and/or awareness of the potential pitfalls of PPP contracts weaken public bodies' bargaining position during negotiation. This phenomenon is not limited to small local authorities, as one might think. It also applies to major local authorities, national bodies and consortia financing projects. The financial troubles of the Channel Tunnel provide a good example of how poor evaluation and allocation of risks can result in huge cost overruns. The developer had no incentive to limit cost increases as they were borne by the operator.

The provision of an exhaustive list of opportunistic behaviour at the contract design stage is beyond the scope of this paper. However, four aspects of contract design can be highlighted: namely, choice of contract length, design of incentive and risk sharing schemes, definition of contingencies and contract enforcement.

Choice of Contract Length The choice of contract length can be affected by a government's political agenda. Political considerations may affect the discount rate used in the evaluation, the decision horizon and the objective function – minimising public expenditures, risks, price, construction delays, or maximising quality. Contract length specification is a challenging area, as several factors should be taken into account, including the following:

- The contract must be sufficiently attractive so that firms are competing for the project: a 'fair rate of return on investment' has to be expected otherwise firms will not participate in the tender.

- Potential costs, revenues and associated risks over the contract length need to be accounted for.

- The potential benefits from contract renewal need to be assessed, since new firms may enter the market, technical progress and/or cost-reducing investments may occur.

The majority of local authorities in France leave contract length decision to the final stage when contract terms are negotiated. However, contract length should be specified at the point of tender, on the grounds that private operators are likely to have a good idea of what is in their favour. Typically, two situations can arise. First, the private firm reduces the contract length to avoid increasing operating costs at the end of the investment life span. Secondly, at the opposite at the end of the scale, the operator may want to extend the contract length to increase profits or because of fears of competition.

Incentive and Risk Sharing Agreements In brief, the main issues in relation to incentives and risk sharing schemes are as follows. The public body awarding the contract must ensue that the contract provides an incentive to reduce price and cost over the contract life time and that the risks are shared without inducing high prices. In fact, the tendering process only allows the selection of the most effective firm on the basis of the tendering documents at a particular point in time. In designing the contract, a trade-off has to be made between the incentive to reduce cost and rent extraction in favour of consumers. For example, a contract with a price cap provides for participating firms to reduce costs as it allows a profit, but the cost reduction does not provide any benefit to the consumers or the public body. At the opposite end of the spectrum, cost-plus contracts do not provide the incentive to reduce costs as contracts specify that cost increases are supported by a third party. This phenomenon is exacerbated when the private firm is vertically integrated. In fact, cost increases supported by the third party can benefit a parent company in terms of profit. In brief, the contract must make sure that monopoly surplus is transferred to consumers over the contract length.

Adaptation to Contingencies Contingency adaptation mechanisms leave considerable scope for opportunism on the part of contract parties. Two aspects of such mechanisms are worth pointing out: namely, the definition of the price escalator scale to increase prices when production factor prices increase; and the definition of profit under

a profit sharing scheme. Typically the escalator scale between date *0* and *t* has the following form:

$$\frac{P_t}{P_0} = a\frac{w_1}{w_0} + b\frac{f_1}{f_0} + c\frac{l_1}{l_0}$$

with p = price of the service, w = wage, f = fuel index, l = price of commodity and with $a + b + c = 1$. The choice of the price reference and its weight (respectively, w and a, above) influence the outcome of the price escalating mechanism and therefore the profit of the firm operating the project. Two examples illustrate this point:

- In a six million euro leisure swimming pool project organised as a 22.5-year *concession* contract, the wage element of the price escalator was the wage index of technicians in the heat and freeze industry. This feature was not questioned by the local authority signing the contract, although it should have been. In fact, wage inflation is more likely to happen in that industry than in the leisure/sport industry.

- The weight of the indices should be re-evaluated over time. If a major operating cost such as labour is reduced over night, the local authority may wish to ensure that the wage share in the price index is reduced accordingly or partially to keep the incentive to reduce costs. This is of importance in inflationary periods as the price of the service would increase more than the real costs.

With a profit-sharing contract, a clear definition of the scope of the activities covered by the scheme is highly advisable: for example, failure to take into account retail space rents and retail outlet profits could alter the picture dramatically. In the swimming pool example, a bar may be opened! Designing a contract where all the major contingencies have been carefully evaluated is one consideration; another is contract enforcement.

Contract Enforcement Contract enforcement is very often loose. Several factors explain this: lack of expertise in detecting breaches of contract, lack of political will, high litigation costs and, finally, possible reluctance on the part of public bodies to admit their errors. These phenomena are more likely to occur at the end of the contract, especially when a contract will not be renewed or when the incumbent's chances of winning the new tender are limited. Another form of opportunism can arise at the contract renewal stage, whereby the incumbent firm may disguise or not release information in order to maximise its advantage.

CONCLUSIONS

The scope for possible opportunistic behaviour in PPP contracting is impressive. One may wonder why such behaviour is so common when it is so obvious. The answer is simple: too little attention is given to evaluating incentives in contracts and incentives within the contracts by the authorities awarding them.

The Irish government took the decision to set up a small agency to deal with PPP contracting. This agency should not limit its expertise to investment decisions and contract negotiation, and it should ensure that there is no collusion at the tendering stage and that the contract is properly enforced. It should also carry risk profile assessments beyond the explicit risks in the contracts. This would allow contract negotiations on a more equal footing.

In addition, the Government should make sure that, where feasible, it has the expertise to take over the work of the private firms involved in PPP. This would increase its negotiation power and reduce the long-term, hold-up situation. Potential competition is essential to improve public service efficiency. The costs and advantages of projects managed by Government departments compared to PPP should be reviewed. Encouragement of maximum participation in PPP by Irish and international firms should also be vigorously pursued.

Furthermore, a comparison of public versus private operation would have two benefits: first, it would provide diversified information for yardstick comparison; secondly, it would limit the possible long-term effects of concentration in the utility market. PPPs have the potential to contribute significantly to efficiency and timing of infrastructural and other public service developments in Ireland. However, a rigorous evaluation of the economic, legal and technical aspects is essential if the public service is to get a fair deal.

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