

POLICY PAPER

Lifting the Lid: the Private Financing of Motorway PPPs in Ireland

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Abstract: This paper addresses the complete absence of detailed information on, and analysis of, the financial aspects of Ireland's road public-private partnership (PPP) programme to date. We focus on the eight hard toll roads in operation by 2010 and provide a financial analysis of their performance. Although privately financed we find that projects also received considerable public money. Whereas four projects are profitable, the other four have accumulated significant losses. The risk premia paid to profitable projects and the potential renegotiations that may be necessary for loss-making projects raise questions as to whether value for money can be achieved. We conclude with a number of policy recommendations.

I INTRODUCTION

Increased private sector participation in the financing and delivery of public infrastructure services is by no means a recent phenomenon, but it has expanded phenomenally over the last twenty years in Europe following the pioneering private finance initiative (PFI) in the UK. European Investment Bank (EIB) data show that

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1,765 public–private partnership (PPP) contracts were signed in the EU from 1990 to 2016, representing a capital value of almost €356 billion. While the global financial crisis had a significant negative impact on the PPP market, the volume of deals closed resumed growth relative quickly and over 520 contracts were signed between 2009 and 2016. Fixed capital formation through PPP projects has become big enough to have macroeconomic and systemic significance in a number of countries such as Portugal and Spain, in addition to the UK (Blanc-Brude *et al.*, 2009).

Ireland also ranks among the small group of countries where PPP has made an appreciable contribution to overall public infrastructure investment. Comparative international data indicate that the extent of PPP procurement in Ireland is relatively high. Burger and Hawkesworth (2011) surveyed PPP activity in OECD countries and reported that in Ireland, PPP accounts for between 5 and 10 per cent of overall investment in infrastructure. Macário *et al.* (2015) surveyed PPP activity in Europe and found that Ireland's total cumulative PPP investment (up to 2009) accounted for over 7 per cent of GDP (measured in 2013). Ireland exceeded the average level of investment in the EU (5 per cent) and ranked third amongst the countries included in their analysis.

Road infrastructure accounted for a significant majority of the value of contracted PPP projects in Ireland prior to the slowdown in PPP activity precipitated by the global financial crisis. Moreover, since the revival of the Irish PPP market circa 2012–2013, five incremental PPP contracts for new road infrastructure have been signed (see Reeves and Palcic, 2017). Despite the ongoing contribution of PPP to the much needed development of road infrastructure in Ireland, there has been a distinct scarcity of government-led and independent analysis of whether road PPPs have achieved key policy objectives such as accelerated delivery of assets, achievement of value for money (VFM) and efficient allocation of risks and improved project-cycle management of important public infrastructure.

This paper seeks to address the complete absence of detailed information on, and analysis of, the financial aspects of Ireland's road PPP programme. Following a review of relevant literature on the history of PPP procurement in the European context, the paper describes the extent of road infrastructure procured as PPPs in Ireland to date. It proceeds to conduct a financial analysis of the road PPPs that became operational by 2010. This analysis provides details of the financial structure of the deals completed and the payments made by government to support these projects. We then use financial ratios that focus on the companies' income, costs and the returns to the providers of finance. The paper concludes with a discussion of results and a set of policy recommendations.

II BACKGROUND: INCREASED FINANCING AND FUNDING OF ROAD INFRASTRUCTURE IN EUROPE

Meeting the demand for improved transport infrastructure is a major problem faced by governments around the world. Although private participation in various aspects of road infrastructure has a long history (Bel and Fageda, 2005; Grimsey and Lewis, 2007), there has been a surge in private involvement in recent years. Albalade (2014) identified three major trends in the new wave of private involvement in the motorway industry in Europe:

- (1) *The privatisation of motorways managed by government through publicly owned concessionaires:* Over the period 1998-2006, there have been significant sales of stakes in publicly owned motorway concessions in Portugal, Italy, Spain and France. Since the global financial crisis, Greece has also put public concessions up for sale.
- (2) *Concession awards (of different kinds) that have underpinned the extension of the motorway network:* For example, in the form of design, build, operate, finance and manage (DBFOM) projects based on hard tolls, shadow tolls related to traffic volumes, or availability payments, which have been signed in a number of countries such as Hungary, Ireland, Poland and the UK.
- (3) *The privatisation of the existing motorway network by the introduction of tolls on existing networks:* This has taken place in Germany since the decision to introduce user payments in 2005 (originally introduced for heavy goods vehicles). Similar approaches have been adopted in Austria, the Czech Republic (since 2006), Slovakia (since 1996), Serbia (since 2005), as well as Slovenia and Croatia.

It is clear that the significant expansion of private sector participation in the European road network since the early 2000s has encompassed a variety of arrangements based on different approaches to constructing, operating, managing, financing and funding projects. The label PPP is commonly applied to these different arrangements and it is evident that different PPP types are now used within and across European countries. The mix of PPP arrangements makes it difficult to gauge the precise amount of PPP activity in terms of value or number of road projects.

Blanc-Brude *et al.* (2007) reviewed PPP activity in Europe before the collapse of PPP markets in the wake of the global financial crisis. They concentrated on PPP projects that are long term, risk sharing contracts between public and private parties and include the bundling of design, construction, operation and/or maintenance, together with a major component of private finance. In the UK, which had the most mature PPP market, the transportation sector – including airports, bridges, rail, road,

and urban railways – only accounted for 6 per cent of the number of PPP contracts to reach financial close. In value terms, however, the transportation sector accounted for 36 per cent of the total largely due to the London Underground PPP contracts (which subsequently collapsed). In the rest of Europe the transportation sector accounted for 60 per cent of projects signed and over 84 per cent of value. Within the transport sector, road PPPs dominated, accounting for 60 per cent of the number of projects and 67 per cent of value.

It is evident that before the economic crisis the PPP market in mainland Europe was dominated by very large motorway and fixed link projects. This feature of PPP activity also applies to the case of Ireland. Reeves (2015) reported that nine road PPP projects accounted for 80 per cent of the aggregate contracted capital value of the entire PPP programme that was operational in Ireland as of 2013, which also spanned other sectors including water and wastewater treatment, schools and court buildings. The following section provides details on the procurement of road infrastructure (mainly motorway) in Ireland since Ireland's first PPP programme was announced in 1999.

III THE USE OF PPPS FOR THE PROCUREMENT OF ROAD INFRASTRUCTURE IN IRELAND TO DATE

Information provided by the Department of Public Expenditure and Reform shows that as of April 2018, there were 24 privately financed PPP contracts in operation with a further eight projects in construction or procurement across sectors including: transport (motorways and services areas); justice (court buildings); education (schools and a new third-level campus); environment (incineration); tourism (a national convention centre); health (primary care centres) and social housing. The capital value of these projects amounts to over €5.7 billion with road transport projects accounting for over 60 per cent (€3.4 billion) of this total.

The origins of Ireland's road PPP programme can be traced back to the recognition of the comparatively poor quality of the Irish roads network at the turn of the millennium. At that time, the Irish Department of Finance (2000) published an appraisal of the nature of the country's infrastructural deficiencies. With respect to roads infrastructure, the appraisal highlighted the underdeveloped state of the motorway network. In 1996 the network had reached just 13 per cent of an EU index weighted for population and land area, which was by far the lowest figure for any EU Member State. The *National Roads Programme 2000-2006*, which set out plans to increase the proportion of the network accounted for by motorways, identified PPP as the model of procurement for a number of individual road projects.

Table 1: Road PPP Projects in Operation by 2010

<i>Project</i>	<i>Contract type</i>	<i>Contract award</i>	<i>Date of operation</i>	<i>Contract end</i>	<i>Contract Values (€m)</i>
N1/M1 Dundalk Western Bypass	Concession	Feb. 2004	Sept. 2005	2034	112.6
M4 Kilcock-Kinnegad	Concession	Mar. 2003	Dec. 2005	2033	301.8
M8 Rathcormac Fermoy Bypass	Concession	Jun. 2004	Oct. 2006	2034	182.7
N25 Waterford Bypass	Concession	Apr. 2006	Oct. 2009	2036	262.3
N6 Ballinasloe East/Oranmore PPP	Concession	Apr. 2007	Dec. 2009	2037	297.8
M7/M8 Portlaoise	Concession	Jun. 2007	May 2010	2037	300.1
M3 Clonee Kells	Concession	Apr. 2007	Jun. 2010	2052	521.2
N7 Limerick Tunnel	Concession	Aug. 2006	Jul. 2010	2041	382.5
M50 Upgrade	DBFOM	Feb. 2006	Sep. 2010	2042	219.1

Source: National Roads Authority/Transport Infrastructure Ireland; Department of Public Expenditure and Reform.

Table 1 shows that between 2003-2007 procurement for nine road projects was finalised. Approximately 300 kilometres of motorway on major inter-urban routes have been constructed using the PPP model, and PPP projects accounted for almost one-third of Ireland's motorway network in 2015. Eight of the nine PPPs in operation by 2010 were procured as concession DBFOM contracts with one procured as an availability payment-based DBFOM contract.¹ The National Roads Authority (NRA, now Transport Infrastructure Ireland (TII)) conducted the procurement process for all PPP projects and acted as the contracting party in contrast to conventional contracts, which are signed by the local authorities. The eight concession contracts secured the majority of payment via a combination of construction grants and operational payments from the NRA and direct tolls. Concessionaires assumed demand risk in all but two cases where the NRA have agreed traffic guarantees whereby it compensates the private concessionaire if traffic falls below fixed thresholds.

¹ DBFOM = Design, Build, Finance, Operate and Maintain. In a concession contract the concessionaire is reimbursed either partially or fully through user fees (tolls). In an availability payment-based contract there are no user fees and the private partner is instead remunerated through regular payments by the public partner.

To date, there has been no comprehensive government-sponsored appraisal of the PPP experience in Ireland, with the minor exception of a VFM report by the Comptroller and Auditor General (C&AG) on the first PPP Schools project procured in Ireland (C&AG, 2004). Most of the analysis to date has been published by independent researchers and has concentrated on PPPs in sectors such as: social housing (Hearne, 2011); water infrastructure (Reeves, 2011); roads (Burke and Demirag, 2015) and schools (Reeves, 2008). This paper seeks to address the scarcity of analysis of PPP usage in Ireland. It focuses entirely on the roads sector and analyses the structure of PPP deals in Ireland in terms of the composition of PPP companies and the financial structure of PPP deals, focusing in particular on the precise mix of public and private finance. It examines the nature and extent of payments by the NRA to the PPP companies and the income, costs, profits and return to shareholders. The following section reviews previous studies in the international literature that have conducted financial analyses of PPPs and roads PPP in particular.

IV PREVIOUS FINANCIAL ANALYSES OF PPPS

The prevalence of PPP usage over the last 25 years has been the focus of a growing body of research covering financial and economic aspects, as well as relevant issues around politics, governance and project management. Financial analysis of PPP projects has covered the appraisal methodologies used to establish whether or not PPP delivers VFM compared to traditional procurement methods. Some authors have provided general discussions of issues relevant to VFM appraisal (e.g. Grimsey and Lewis, 2005; Morralos and Amekudzi, 2008), whereas others have provided more critical perspectives on the topic (e.g. Ball *et al.*, 2007; Heald, 2003).

With respect to roads and motorways, there is a sizable body of literature concentrating on PPP and the private financing of such infrastructure. The majority of these studies cover aspects such as the rationale for PPP, the details of procurement and descriptions of various projects (e.g. Glaister, 1999; Debande, 2002). It is noteworthy that these studies tend to view private finance and PPP in a positive (although sometimes cautious) light. However, only a small number of studies provide empirical evidence based on rigorous economic and financial analysis to support the use of PPP and private finance.

Examples of evidence-based studies include Blanc-Brude *et al.* (2009) who use data on 227 road projects (including 65 PPPs) financed by the EIB to compare the ex-ante construction costs of projects procured by traditional and PPP approaches. Using ordinary least squares regression analysis the authors found the ex-ante unit construction cost of a road to the public sector is estimated to be 24 per cent higher in a PPP than in traditional public procurement. As this magnitude is similar to the cost overruns that are typically observed in traditional public procurement in the

European road sector, the authors find that this difference is largely attributable to the premium paid to transfer construction risks.

Shaoul *et al.* (2006) used a case-study approach to conduct an aggregate financial analysis of the first eight design, build, finance and operate (DBFO) roads procured by the UK Government Highways Agency. They analysed accounting information mainly sourced from the Highways Agency and the accounts of the special purpose vehicle (SPV) companies created for each DBFO contract for the first six years of the relevant 30-year contracts. The authors found that within three years the Highways Agency had paid more than the aggregate construction cost of the projects and that in four of the six years analysed the effective cost of capital was higher than the cost of public finance. A further key contribution of this study was the demonstration of the limited nature and opacity of the information in the public domain. The authors emphasised that the complex web of sub-contracting and hidden nature of intra-company transactions makes it difficult to account for all profit accrued by parent companies and establish the total cost of using private finance.

A similar analysis was conducted for road PPPs in Spain by Acerete *et al.* (2009) who conducted a financial analysis of fifteen concession companies operating 24 private toll roads. The authors found that despite the Spanish government making generous loans to private contracts (known as participative loans) the cost of private finance was estimated as more than twice that of public finance. Cheaper finance as a result of government subventions contributed to higher profits and returns to investors. The return on shareholder funds increased from 8 per cent in 1995 to 11 per cent in 2003. The cost of capital was estimated at 9 per cent in the same year. The authors also noted the absence of important information from the public domain and that there was less availability of information in Spain compared to the UK.

The tenor of these findings raises suspicions about the financial cost of PPP contracts in the roads sector and the scope for achieving objectives such as better VFM compared to conventional procurement methods. Moreover, they suggest the need for further investigation into these issues. The remainder of this paper aims to provide new evidence on issues including the financial cost of PPP contracts and the relative cost of public versus private finance for public infrastructure. The paper adopts the approach used by Shaoul *et al.* (2006) and Acerete *et al.* (2009) to provide a financial analysis of road PPPs in Ireland. We concentrate on the eight concession projects in operation at the end of 2010 and ignore the availability payment based M50 PPP project for the purpose of this analysis.² Our principal data sources are the annual reports published by the NRA that contain information on expenditure on PPP projects and the annual financial statements for each PPP company that we sourced from the Companies Registration Office.

² A comparative analysis of financial performance that included the M50 PPP project was not possible due to the significant differences in the availability payment based structure of this contract.

V FINANCIAL ANALYSIS OF ROAD PPPS IN IRELAND

It is widely acknowledged that the financial analysis of PPP contracts can be obstructed by the absence of reliable data made available by public bodies and private companies alike. In the case of Ireland the full business case for PPP, including the expected costs and revenues, traffic flows (in the case of transport projects), VFM assessments and public sector comparators are not placed in the public domain for reasons such as commercial confidentiality and the risk that such information may undermine competition for future contracts. Independent financial analysis is also obstructed by the complex structure of PPP companies and their reporting methods. Whilst private companies are regulated by national and international accounting regulators they maintain significant discretion and choice over matters such as the aggregation of information and how it is disclosed and presented. In addition, SPVs “in particular take advantage of reporting rules to present the minimum information permissible” (Stafford and Stapleton, 2017, p. 383).

In this study a number of issues relating to the disclosure and presentation stand out. First, establishing basic data such as capital value is difficult, with the CSO, DPER and the PPP company financial statements all providing conflicting figures over the years. Second, the web of subcontracting means that there are many related party transactions, which are unlikely to take place at arm’s length and therefore create opportunities for hidden profits. Third, in most projects the public sector has provided significant funds towards the construction and operation of the assets. Finally, in four of the eight projects included in our analysis, significant losses have been incurred to date with one company in negotiations with its lenders in relation to restructuring its debt. The following sections outline the level of expenditure committed by the NRA to each project, the financial structure of the PPP companies, how each project has been financed and, finally, the financial performance of each project.

VI EXPENDITURES BY THE NRA

Table 2 shows that payments to each of the road projects by the NRA to date amount to over €2.7 billion and it is estimated that future commitments total €422 million. Despite the investment of private finance, the public sector has made expenditures on elements of roads projects such as the purchase of land, preliminary studies and design necessary to identify the route, ground investigations and preparation of statutory documents. Expenditures on these items are incurred irrespective of the procurement method but it is worth noting that the extent of public expenditure before contracting amounted to €1.17 billion (36.7 per cent of total payments by the NRA). In addition, the NRA incurred ancillary costs (covering costs related to activities such as project planning, financial, legal and technical advisory services, etc.) which amounted to over €128 million up until 2010 (see notes to Table 2).

Table 2: NRA Expenditure on Projects to End 2016 Plus Forward Commitments as of Jan. 2017 (€million)

<i>Project</i>	<i>Land acquisition (1)</i>	<i>Construction Payments (2)</i>	<i>Operational payments (3)</i>	<i>Traffic guarantee payments(4)</i>	<i>Total to date (1+2+3+4)</i>	<i>Forward commitments (5)</i>	<i>Overall total (1+2+3+4+5)</i>
M4 Killock-Kinnegad	64.00	161.705	7.606	–	233.311	5.375	238.686
N1/M1 Dundalk Western Bypass	40.00	2.190	1.785	–	43.975	3.133	47.108
M8 Rathcormac-Fermoy Bypass	40.00	87.377	48.668	–	176.045	15.667	191.712
N25 Waterford Bypass	160.00	107.277	50.297	–	317.574	39.279	356.853
M7 Limerick Tunnel	150.00	182.528	34.876	30.321	397.724	32.839	430.563
M3 Clonee-Kells	303.00	275.993	148.733	12.000	739.725	266.736	1,006.461
N6 Galway-Ballinasloe	270.00	180.765	140.332	–	591.098	51.594	642.692
M7/M8 Portlaoise	144.00	46.635	31.366	–	222.001	7.653	229.654
Total	1,171.00	1,044.470	463.663	42.321	2,721.454	422.276	3,143.730

Source: Authors' calculations based on information in NRA/TII annual reports, NRA/TII website and PPP company accounts.

Notes: (1) the above expenditure figures do not include ancillary costs incurred by the NRA in relation to scheme planning, scheme supervision, financial, legal and technical advisory services plus various other expenses. No breakdown was provided of these costs by project, however by the end of 2010 when the above projects were all operational, ancillary costs totalled €128.3 million (although this total includes costs incurred in relation to the M50 upgrade scheme which is not included in our analysis).

(2) the forward commitments included above are nominal undiscounted values assuming 2 per cent inflation per annum and exclude variable operational payments;

(3) The land acquisition, etc. cost included above for M3 Clonee-Kells is an estimate based on information in a government information note from 2007 (available at: <http://www.ahtg.gov.ie/en/Publications/HeritagePublications/NationalMonumentsPublications/Part%204%20The%20M3%20road%20development.pdf>).

The degree of information provided in the annual accounts of the National Roads Authority appears to exceed that which is available in the UK as it provides a breakdown by company which allows tracking of different projects. Also, the structure of payments (other than construction payments) on hard-tolled schemes in Ireland are less complicated than those that apply in the case of shadow-toll schemes in the UK where payments cover items such as interest on DBFO finance, shadow tolls and other costs such as capital charges payable on DBFO assets (Shaoul *et al.*, 2006). Moreover, NRA payments to PPP companies comprise construction payments (essentially capital grants), operational payments and traffic guarantee payments (in the case of two contracts). The data provided by the NRA also include amounts of future commitments over the lives of contracts. Construction payments of €1.05 billion account for 33 per cent of total NRA payments (including projected future payments). The PPP companies have also received operational payments of €463 million to date (17 per cent of total payments to date). In addition, payments under traffic guarantee schemes have accounted for 7.6 and 1.6 per cent of payments to date on the relevant schemes (M7 Limerick Tunnel and M3 Clonee-Kells respectively).

It should be noted that the timing and magnitude of future payments is open to negotiation and may vary significantly across projects. As PPP companies have assumed demand risk (in six of the contracts covered) they may seek to alter the profile of operational payments in the event of traffic falling below initial projected levels. This has been a pertinent issue over the last number of years as falling traffic volumes have increased incentives for PPP companies to seek a front-loading of operational payments. If lower than expected traffic volumes persist there is also a possibility that PPP companies will seek to renegotiate the levels of payments made by the NRA. In that eventuality forward commitments will increase to levels above those presented in Table 2 which will have implications for any VFM expected as a result of using the PPP approach to procurement.

VII FINANCIAL STRUCTURE OF PPP COMPANIES

As in other countries, the corporate structures underpinning the road PPP projects we examine are complex and make any analysis of the activities and financial performance of each road scheme burdensome. In each of the road projects that we analyse, the PPP company that operates the asset is an SPV³ with most of the operating and administrative functions subcontracted out to related group companies, many of which are subsidiaries of the equity shareholders. The construction of the asset is either subcontracted out to a subsidiary company of the construction company equity sponsors, or to a related group company specifically

³ The SPV company created for each project is a shell company whose only activities relate to the PPP contract, with only a small number of employees in four cases and no employees in the other four cases.

created for the construction phase of the scheme (owned by the construction companies that make up the equity owner consortium). The financing of the project is also generally channelled through a specific finance company created to source funds on behalf of the PPP company, or through the existing finance companies of the equity shareholders involved in the consortium.

Figure 1 provides a brief illustration of the corporate structure of the M7 Limerick tunnel scheme and lists the related companies where intercompany transactions are recorded in 2015. An examination of the accounts for the related holdings, finance and construction companies reveals further subcontracting out of services and financing to other related subsidiaries of the equity shareholders that further complicates a detailed financial analysis of the scheme. Although some of the PPP companies that we examine do not have as complex a structure as the one outlined in Figure 1, they all subcontract out the construction of the asset and much of their administration/operation, as well as source their finances from a related finance company or finance companies.

Figure 1: Corporate Structure of M7 Limerick PPP Scheme

Related party name	Relationship
DirectRoute (Limerick) Holdings Ltd.	Ultimate parent undertaking
DirectRoute (Limerick) Finance Ltd.	Parent undertaking
DirectRoute (Limerick) Ltd.	PPP operating company
DirectRoute (Limerick) Construction Ltd.	Joint venture of construction shareholders
Allied Irish Banks	Shareholder of DirectRoute (Limerick) Holdings Ltd
Lagan Projects Investments Ltd.	Shareholder of DirectRoute (Limerick) Holdings Ltd
Meridiam Infrastructure (SCA)	Shareholder of DirectRoute (Limerick) Holdings Ltd
PPP Roadholdings Ltd.	Shareholder of DirectRoute (Limerick) Holdings Ltd
Spandor Limited	Shareholder of DirectRoute (Limerick) Holdings Ltd
Strabag AG	Shareholder of DirectRoute (Limerick) Holdings Ltd
John Sisk & Son Ltd.	Related to PPP Roadholdings Ltd
Lagan Operations & Maintenance Ltd.	Related to Lagan Project Investments Ltd
Roadbridge	Related to Spandor Ltd
The Intolligent	Related to Strabag AG
Efkon	Related to Strabag AG

Source: DirectRoute (Limerick) Ltd. financial statements for the year ended 31 December 2015.

Shaoul *et al.* (2006, p. 266) observe similar corporate structures in the eight UK road DBFO projects that they examine and point out how such structures create the possibility for transfer pricing and the recording of profits in related companies rather than the PPP operating company. They highlight how this structure allows

equity owners to profit from the PPP contract in multiple ways: (1) from profits earned by the PPP company; (2) from profits earned by related subsidiary companies that carry out work on behalf of PPP company; and (3) from interest on shareholder loans to the PPP company (examined in more detail in the next section). Accurately estimating these profits and the returns to shareholders' funds is difficult due to the fact that most of the companies they examined were exempt from disclosing the magnitude of payments made to related parties.

We encountered similar issues in our analysis of the eight road concession projects in operation by 2010. For most of the PPP company accounts that we examined, only minimal information on transactions between related companies are provided in the notes to the financial statements and it is generally not possible to accurately track the exact nature of inter-company payments. Despite these information difficulties it is still possible to conduct a detailed examination of the financing and activities of the PPP companies in our sample from the available PPP company financial statements and NRA annual reports. The following section examines the financing of each scheme before we conduct an analysis of some key financial performance indicators for each company.

VIII FINANCING PPP CONCESSIONS: THE MIX OF PUBLIC AND PRIVATE

One of the principal objectives ascribed to PPP is that it enables the provision of public infrastructure using private finance. It is argued that this confers obvious advantages at times of severe constraints on public finance. Moreover, the participation of private finance ensures that projects are rigorously appraised by providers who take on project risks and therefore have incentives to ensure the infrastructure is constructed and operated efficiently. In reality, PPP deals do not necessarily rely fully on private finance as governments often provide an element of public finance for PPP investments.

Table 3 shows the sources of finance for the construction of the eight PPPs analysed. As noted earlier, the NRA provided over €1 billion in construction grants to the PPP projects, accounting for over 36 per cent of the aggregate €2.88 billion in financing required. The amounts contributed by the NRA to each project varied from as little as 1.6 per cent in the case of the Dundalk Western Bypass to over 46 per cent in the cases of the M4 Kilcock-Kinnegad and M3 Clonee-Kells schemes. The effective contribution of public finance to these projects is even greater if loans from the EIB are taken into account. Table 3 shows that the EIB contributed finance to seven of the eight projects examined, providing 50 per cent of the senior debt raised in each case.

One of the notable features of the financing of road PPP projects in Ireland has been the extremely small amount of ordinary share capital injected into the PPP

Table 3: Financing of Projects (€million)

Project	NRA construction payments (1)	EIB financing (2)	PPP company private finance (3)	PPP company shareholder loans (4)	PPP company share capital (5)	Total financing (1+2+3+4+5)
M4 Kilcock-Kinnegad	161.705	103.000	43.000	38.250	4.250	350.205
N1/M1 Dundalk	2.190	65.000	31.353	37.979	0.090	136.612
M8 Rathcormac-Fermoy	87.377	64.500	33.247	13.813	0.050	198.987
N25 Waterford Bypass	107.277	75.000	91.000	67.000	0.090	340.367
M7 Limerick Tunnel	182.528	97.600	113.461	44.718	0.050	438.357
M3 Clonee-Kells	275.993	0.000	279.846	42.886	6.067	604.792
N6 Galway-Ballinasloe	180.765	70.000	180.361	30.088	0.050	461.264
M7/M8 Portlaoise	46.635	115.566	117.061	69.698	0.090	349.050
Total	1,044.470	590.666	889.329	344.432	10.737	2,879.634
% of total financing	36.27%	20.51%	30.88%	11.96%	0.37%	100%

Source: Authors' calculation based on information in NRA annual reports and PPP company accounts.

Notes: (1) Figures used in Column 3 show the total private (non-EIB) debt for each PPP company in the year that borrowings reached their peak level (generally the year that each project became operational).

(2) Figures used in Column 4 show total shareholder debt in the year that projects became operational. In some companies, shareholder debt has since increased as shareholders have rolled up interest payments due and added it to the outstanding principal.

(3) Information on EIB funding for each project was sourced from the EIB website.

companies by equity shareholders; the so-called ‘pinpoint’ equity model. For six of the eight companies in our sample, paid up share capital does not exceed €90,000. For the two projects where share capital is higher (M3 and M4 motorways), it still only accounts for just over 1 per cent of total financing in both cases. Instead of direct share capital injections, shareholders in all cases have issued shareholder loans to the PPP company, generally in the form of subordinated debt with relatively high interest rates.⁴ These loans are usually made around the time that projects become operational, and are generally the refinancing of short-term equity bridge loans that fall due once the construction phase of each project has been completed. There are obvious benefits to shareholders in pursuing this model of financing, given that shareholder loans can start earning interest once operations commence, whereas dividend payments are dependent on the company reaching ‘steady state’ profitability and servicing its debt regularly. In addition, the interest payments on shareholder loans also have the benefit of reducing corporate tax liabilities.

Interestingly, the pinpoint equity model used in the projects we examine appears to differ from what is generally recommended for hard toll schemes. According to the OECD/ITF (2013: 28), tolled PPPs require a relatively larger share of equity in order to reduce insolvency risk compared to what would be required in less risky availability payment based contracts. Having more ‘skin in the game’ should, in theory, increase the incentive of equity owners to ensure traffic/revenue forecasts are more realistic and reduce the scope for strategic misrepresentation when bidding for PPP contracts. The incentive for equity sponsors to underprice demand risk by being overly optimistic in their traffic forecasts is an issue that is dealt with in detail by Burke and Demirag (2015) in their analysis of demand risk in three road PPP schemes in Ireland. They found that demand risk was aggressively priced by equity sponsors in the three projects they examined in order to win the PPP contracts.

While Burke and Demirag (2015) do not examine the issue of pinpoint equity and incentives to price risk more accurately in their study, it is worth examining in future research whether it is one of the factors that might have led to what appears to be overly optimistic traffic forecasts in most of the eight hard toll PPP projects that we examine. Although it can be argued that, in reality, equity owners have more ‘skin in the game’ through the subordinated loans that they provide to the PPP projects, in our paper the fact that shareholders can immediately begin receiving payments on the interest owed on these loans whether the company is profitable or not arguably weakens the incentive to more accurately forecast revenues when bidding for the contract. The high interest rate that is generally charged on shareholder loans also has the effect of reducing PPP company tax liabilities and is an easier way for shareholders to make a return on their investment. The high interest payable on shareholder loans also has the effect of raising the overall cost

⁴ Except in the case of the three Celtic Roads Group projects – Dundalk, Waterford and Portlaoise – where shareholder loans are non-interest bearing.

of capital for each project and makes it more difficult to accurately estimate the returns to shareholders' funds (examined later).

Tracking where shareholder loans come from is difficult due to the structure of each of the projects and the fact that loans are usually channelled through a finance company related to the PPP company. It is, however, possible to obtain the accounts of some of the Irish registered finance companies in order to examine the interest rates charged on loans made to PPP companies and the source of the funds used to make the loan. An interesting insight into the added benefits for shareholders of using pinpoint equity contributions along with shareholder loans is provided by the two Eurolink consortium controlled projects (M4 Kilcock-Kinnegad and M3 Clonee-Kells). An examination of the accounts of Financinfrastructures Ltd., a finance company owned by Cintra Infraestructuras S.A. (the main shareholder in each Eurolink project), along with the accounts for the M3 and M4 PPP companies, reveals that in 2009, Financinfrastructures Ltd. borrowed just over €13 million from the then operational M4 PPP company at an interest rate of 0.5 per cent below the average monthly Euribor, and then loaned the same sum of money at an interest rate of 8 per cent to the M3 PPP company.

The financial engineering evident here allowed the shareholders to extract cash at a low interest rate from one company without paying tax and to lend that money to their other company at a high interest rate, thereby lowering its tax liabilities. While this type of transaction may be common practice within large multinational infrastructure companies, it raises obvious questions in relation to VFM in a PPP context and raises the overall cost of capital for the projects in question. Although beyond the scope of this paper, future research into the activities of all of the related finance companies involved in the PPP projects examined in this paper would provide a more accurate picture of how equity owners inject equity into and extract money from the PPP companies that they control.

IX FINANCIAL PERFORMANCE OF ROAD PPP COMPANIES

Table 4 presents some basic financial indicators for the eight PPP companies for the three most recent years where accounts are available (2014-2016). Four of the projects are clearly in financial difficulty having incurred net losses in each year. While losses are to be expected in the early years of operation for such projects, each of the loss-making companies in Table 4 has yet to record a profit since operations commenced in 2009/2010. The N25 Waterford Bypass project appears to be in considerable difficulty having recorded a fixed asset impairment charge of €36.5 million in 2014 and a further charge of €61.6 million in 2015 after the company revised cashflow forecasts incorporating anticipated traffic volumes. The company is currently engaging with lenders on a restructuring plan for the project debt and it remains to be seen what type of a deal will be made.

Table 4: Aggregate Financial Indicators for PPP Companies (€million)

PPP Project	Turnover		Operating Profit		Interest Paid		Tax paid		Profit after Tax						
	2014	2015	2014	2015	2014	2015	2014	2015	2014	2015					
M4/M6 Kilcock-Kinnegad	23.12	23.25	23.67	10.36	10.86	11.16	9.25	9.41	8.89	0.15	0.09	0.63	0.96	1.36	1.64
N1/M1 Dundalk Bypass	22.07	23.28	25.40	10.52	13.20	14.57	5.95	5.84	5.71	0.58	0.92	1.11	4.01	6.45	7.75
M8 Rathcormac-Fermy	16.39	16.75	16.41	7.48	7.53	7.58	5.53	5.28	5.08	0.00	0.77	0.47	(4.31)	5.34	3.10
N25 Waterford Bypass ¹	12.18	12.42	12.85	(37.78)	(61.54)	4.72	8.41	7.74	7.97	0.00	7.18	0.00	(44.98)	(76.47)	(3.25)
M7 Limerick Tunnel	21.38	21.41	23.70	7.07	6.82	9.41	15.09	15.32	15.89	0.00	0.00	0.00	(7.65)	(8.35)	(6.43)
M3 Clonee-Kells	21.23	23.22	22.02	15.66	17.40	16.43	11.09	10.10	9.26	0.58	0.93	0.90	3.99	6.37	6.27
N6 Galway-Ballinasloe ²	7.07			(2.54)			11.31			0.00	0.00	0.00	(6.70)	(8.20)	(8.31)
M7/M8 Portlaoise	19.09	19.49	20.14	2.46	8.63	9.40	12.91	12.54	12.13	0.00	0.00	0.00	(9.10)	(3.39)	(2.38)
Total	142.52	139.81	144.18	13.22	2.89	73.26	79.52	66.23	64.93	1.30	9.89	3.11	(63.78)	(76.89)	(1.61)

Source: Authors' calculations based on information in PPP company accounts (losses are shown in parentheses).

Notes: (1) The large losses in 2014 and 2015 on the N25 Waterford project are due to impairment provisions of €36.6 million and €61.6 million respectively charged in those years based on revised cash flow forecasts for the remaining life of the project. The tax paid by Waterford in 2015 relates to the derecognition of deferred tax asset as a result of the impairment provisions.

(2) Turnover and operating profit figures were not available for the N6 project in 2015 and 2016 as the company stopped providing a profit and loss account and cashflow statement in its annual financial accounts.

In aggregate, over €1.2 billion in turnover has been generated by the eight projects included in our analysis as of December 2016, although as highlighted in Table 2 earlier, this figure includes over €463 million in operational payments from the NRA plus almost €42 million in traffic guarantee payments to the Limerick Tunnel and M3 Clonee-Kells projects. Interest payments account for over half of the turnover generated across all projects which is to be expected given the high level of debt financing involved in each project. Since most projects are in the early years of operation the total amount of corporate tax paid out has been low and just three companies have paid out dividends to date (totalling €19.1 million to date for N1/M1 Dundalk, €17 million for M3 Clonee-Kells and €1.5 million in the case of M4/M6 Kilcock-Kinnegad).

The scale of the accumulated losses experienced by the four loss-making projects highlighted in Table 4 is considerable. Although losses are to be expected in the early years of operation for such projects they are nonetheless relatively high compared to those incurred by earlier projects such as the M4/M6 and N1/M1 in their first years of operation. Although most PPP companies don't provide a breakdown of their turnover into toll income and operational payments from the NRA, it is still possible to estimate this breakdown by comparing turnover in a given year to the total operational payments paid out in the same year available from the NRA annual reports. On this basis, it is clear that four of the five projects that became operational from 2010 onwards are hugely reliant on operational payments from the NRA as their main source of income. We estimate that approximately 62 per cent of the aggregate turnover earned to the end of 2016 on the M3 Clonee-Kells scheme came from NRA operational payments (67.4 per cent when traffic guarantee payments are included). This figure stands at 24.9 per cent (46.5 per cent when traffic guarantee payments are included) for the M7 Limerick Tunnel project and 25.6 per cent on the M7/M8 Portlaoise project. On the N6 Galway-Ballinasloe project we estimate that NRA operational payments to date have accounted for approximately 75 per cent of aggregate turnover by the end of 2016.⁵

Given that operational payments on, for example, the N6 scheme are due to end before 2020, this raises obvious concerns over the viability of some of these projects and the possibility that, in the absence of significant traffic growth, either shareholders or debt financiers will have to restructure some of their debts, or contracts will have to be renegotiated with the NRA. In this context it is worth noting Burke and Demirag's (2015) finding that some of the SPV members that they interviewed as part of their analysis of demand risk in three Irish road PPP projects believed that the Government would intervene in the event that traffic levels were below forecast and PPPs were in financial difficulty. They argue that such behaviour raises questions about

⁵ Annual accounts for the N6 project stopped providing a profit and loss account from 2015 onwards so this estimate is based on a conservative estimate of toll revenue recorded in the 2014 accounts that assumed a 3 per cent growth in toll revenues in 2015 and in 2016.

how risk is initially allocated in PPP and, consequently, it is also important to consider how it affects the accountability, VFM and transparency of the PPP process (Burke and Demirag, 2015: 203).

Turning to the financial ratios presented in Table 5, we focus here only on the four profitable projects as of the end of 2016. On the three projects that opened prior to the economic crisis in 2008, each company very quickly began earning significant operating profit margins and generating considerable returns on shareholders' funds which have raised the overall effective cost of capital in each case. The M3 project which commenced operations in 2010 also immediately began recording substantial after tax profits, however approximately €160 million of the €240 million in aggregate turnover earned by the company between 2010 and 2016 came from operational and traffic guarantee payments from the NRA.

The effective cost of capital (debt and equity) is calculated (as an average) for the four profitable companies in Table 6. It rose from 3.9 per cent in 2006 to 11.5 per cent in 2016 and averaged 7.9 per cent over the eleven-year period covered. Given that the ten-year yield on Irish government bonds averaged 4 per cent over the period in which the eight projects reached financial close, we estimate a premium on private finance of approximately four per cent. This premium which is essentially the price paid for risk transfer is within the range of 1.6 - 4 per cent observed by Bain (2008) who reviewed a sample of studies of the premium on PFI projects in the UK. It is worth noting that the actual cost of capital differential between the public and private sectors is a contested issue in the PPP literature. Whereas Shaoul *et al.* (2006) found that the risk premium on PFI road projects in the UK rose from 3 per cent in 1997 to 11 per cent in 2002 resulting in a risk premium of 6 per cent in the latter year, other writers such as Bain (2008) have argued that the effective cost of capital gap is more modest than this study suggests. Our analysis of road PPPs in Ireland suggests a risk premium of 4 per cent, but a number of caveats should be highlighted. First, this estimate is based on four PPP projects that have maintained profitability since commencing operations. Second, these estimates were recorded over a period of severe economic recession and subsequently lower levels of traffic flows. It remains to be seen how the effective cost of capital changes on these hard-toll schemes in the coming years.

While the four loss-making companies to date are not included in our financial analysis given they are only 7-8 years into the life of their contracts and it is too early to say anything definitive about their performance, the scale of their losses to date is nonetheless surprising. By the end of 2016 accumulated losses were over €166.5 million on the N25 Waterford Bypass project, €56.7 million on the M7/M8 Portlaoise project, €55.9 million on the N6 Galway-Ballinasloe project and €45.6 million on the M7 Limerick Tunnel project. The Waterford PPP project is currently in negotiations with lenders in relation to a restructuring of its debt. While the scale of accumulated losses on the other three projects in financial difficulty is relatively

Table 5: Key Financial Ratios for Profitable PPP Companies (Average) from Start of Operations

Year (# roads)	Key ratios: profitable roads – Kilcock and Dundalk (2006+), Fermoy (2008+), Clonee (2010+)															
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016					
	(2)	(2)	(3)	(3)	(4)	(4)	(4)	(4)	(4)	(4)	(4)					
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
PBIT/Turnover	34.5	47.0	46.7	47.6	56.7	52.1	48.1	53.1	53.3	56.5	57.7					
Interest rate on bank debt	6.0	6.7	6.6	6.3	5.9	5.8	5.5	5.7	5.7	5.9	6.0					
Effective total cost of capital	3.9	7.1	7.4	7.6	8.3	7.3	6.3	7.7	9.3	10.5	11.5					
Gearing ratio	82.3	81.5	84.0	85.3	83.1	84.2	84.9	86.1	90.4	88.0	86.4					
Return on shareholders' funds	-4.5	10.4	9.4	14.4	21.4	15.4	14.4	59.7	141.7	67.0	70.4					

Source: Authors' calculations based on information in PPP company accounts.

Notes: (1) ratios in table above are calculated as average ratios across each company with each company only included in the calculation from the year where the first full year set of accounts are available.

(2) Interest rate on bank debt is calculated as: [interest payable (excluding interest on shareholder loans)] / total bank debt.

(3) Effective total cost of capital is calculated as: (interest payable + profit after tax) / (long-term debt + shareholders' funds).

(4) Gearing ratio is calculated as: total bank debt / (total bank debt + shareholders' funds);

(5) Return on shareholders' funds is calculated as: (profit after tax + interest payable on shareholder loans) / shareholders' funds.

lower, the loss on shareholders' funds for these projects over the 2010-2016 period is still significant and it is likely that some form of debt restructuring may need to take place in each of the projects if current trends continue.

X DISCUSSION AND CONCLUSIONS

PPP schemes account for approximately one-third of Ireland's motorway network and approximately 60 per cent of the capital value of Ireland's relatively extensive PPP programme. To date, however, the experience with the use of PPP in the Irish roads sector has not been subjected to any form of in-depth review or analysis by government bodies or independent researchers. This paper seeks to address this deficit of knowledge by conducting a review of road PPP activity to date and a financial analysis of PPP projects in operation by 2010.

A striking feature of our analysis is the revelation that road PPP projects are mainly financed by the public sector. Our analysis has established that the public sector has contributed €1.01 billion in construction payments, in addition to €1.17 billion spent on land acquisition costs. Although private finance contributed over €1.8 billion of investment in the projects analysed, of this over €590 million was borrowed from the EIB which is a major lender of public funds to the private PPP companies.

Furthermore, our financial analysis shows that just four of the eight projects in our study were profitable at the end of 2016, with this group including the three longest running projects and the M3 Clonee-Kells project which is heavily reliant on large operational payments from the NRA. The other four loss-makers all became operational in 2009/2010 and have accumulated large after tax losses to date. While all of these projects opened during a major economic downturn, it would still appear that these companies significantly overestimated traffic levels when submitting their bids prior to the financial close of contracts in 2007, and it remains to be seen whether they seek to re-negotiate terms with the NRA.

A key rationale for PPPs is to optimise risk allocation thereby incentivising private operators to deliver infrastructure efficiently and achieve VFM. One way of examining this is to address the differential between the cost of public and private capital. Our analysis showed that the effective cost of capital for the four profitable PPP companies averaged just under eight per cent suggesting a risk premium of four per cent. While this risk premium is broadly in line with that previously found for road projects in the UK, the case of Ireland differs significantly given the substantial sums of money contributed by the public sector to most projects. Lenders benefit from getting a sizeable risk premium even though the public sector has contributed large construction and operational payments. This raises a legitimate question as to whether significant risk has actually been transferred to the private sector. When coupled with the issue of renegotiations with lenders on the loss-

making projects, the ability for these projects to achieve VFM is called into question.

In conclusion, the evidence produced in this paper points to a number of policy recommendations. First, a government sponsored review of all PPP projects (including those in the roads sector) is long overdue. Given that PPP has been an important part of public investment policy in Ireland since 2000, there is a clear need for a review of how the PPP model has performed. The state of play in the Irish case stands in sharp contrast to that in the UK where Stafford and Stapleton (2017) note that the National Audit Office (NAO) alone has published over 80 reports on PPP projects and policy. In this context, the history of PPP procurement in the Irish context exhibits signs of a form of de-politicisation whereby government, corporations, media and interest groups shift issues off the agenda of political or policy debate (Willems and Van Dooren, 2016).

Second, there is both justification and scope for providing much better public access to financial information about PPP. Options in this regard include bringing PPP companies within the remit of the Freedom of Information Act which is currently confined to public authorities. One justification for such a measure is provided by Stafford and Stapleton (2017) who argue that PPP companies receive substantial hidden subventions and can therefore reasonably be considered as parastatal companies that are *de facto* public authorities.

Third, given the competing calls for greater transparency on the one hand versus the demands of interested parties for the protection of commercial confidentiality on the other, Vining and Boardman (2008) and Siemiatycki (2007) recommend the deposit and public availability of all contracts with the proviso that legitimate trade secrets “should be protected through the sealing of specific contract provisions with a neutral third party adjudicating the legitimacy of particular claims to secrecy” (Vining and Boardman, 2008, p. 156).

Fourth, PPP companies should be contractually obliged to disclose information that ensures the public can access clear and transparent data on the financial performance of PPP companies that provide vital public services. Shaoul *et al.* (2010, p. 238) suggest that such information should include “a breakdown of its costs, the location of and the amount retained within a sinking fund and thus the viability of the project and the company”. Public agencies should also disclose full information on the breakdown of annual costs, including its monitoring costs, performance deductions and any changes to contractual arrangements.

The financial analysis conducted in this paper provides new insights into the financial performance of PPPs in the Irish roads sector. It is, however, important to be mindful of the limitations to this analysis. As four of the PPPs examined came into operation in 2010 they are only beginning to reach a ‘steady state’ in their operations. It is hoped that future research will extend the period of analysis. As time elapses there will also be scope for in-depth case-based analysis of individual projects. This type of financial analysis is critical for ensuring that decisions on

how public money is allocated are viewed as legitimate by the public. However, the challenges to financial analysis of future PPP projects will persist unless policymakers make determined efforts to implement changes along the lines recommended here.

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