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Is the regulatory control of utilities' capital structures always justified?

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Abstract

This work analyses whether there are reasons for regulators to control the capital structures of utilities firms. That control is commonly seen as a suitable ex-ante form of prevention of financial distress. The case of UK utilities is used as case study. It is shown that various concerns related to high levels of debt are unfounded, mainly because the specificities of the regulatory regime have not been taken into account. Contrary to what underlies some concerns, the economic benefits of price-cap regulation are not necessarily undermined with the change in the capital structures of the firms. Also, incentive-based regulation is not necessarily incompatible with high levels of debt. Finally, it is shown that there is still a need for regulators to control the capital structure of regulated utilities. The capital structure affects the distribution of risk between firms and consumers and ultimately the prices paid by the latter. Therefore, the need for a more open link between risk and the regulatory outcome is needed. The challenge is to adapt without losing the incentives-based characteristics of the regime.

Keywords

Capital Structure, Utilities, Risk, Regulation, UK

1. Introduction

Part of the literature considers the regulatory control of the capital structure as a suitable policy response to avoid bailing out private infrastructure firms.¹ Preventing companies to increase debt over certain threshold would help governments to *ex ante* prevent financial distress and thus avoid unplanned *ex post* cash-injections. Contrary to this belief, in this work I argue that controlling the capital structure might in itself be an ineffective method to prevent financial distress. I also cast doubt on other general negative effects on the regulatory framework normally attributed to highly geared capital structures. Those effects, I will show, are largely unrelated with firms' capital structures, but mostly caused by the special features of the regulatory system.

Nonetheless, I also argue that there still are compelling reasons for regulators to control capital structures of infrastructure firms. These reasons are associated with the specific impact on the cost of capital and (crucially) with the price paid by consumers. Somewhat surprisingly, consumers have not been at the centre of the debate. The main objective of the literature has been to improve regulatory designs and tools in order to boost private investment – i.e. the analysis has mainly carried out considering one side of the regulatory relation: the one existing between governments and private firms. In contrast, the impact on consumers has been set aside and not further analysed. Explanations on risk distribution are normally stated, but mainly as guidance to governments on how to prevent extensive residual risk bearing that may undermine the benefits of private investment on infrastructure.² Such a focus is not wrong, but has led to overstated concerns erroneously linked to firms' capital structures. Also, it may lead to departures from the main regulatory duty to protect consumers.

This work presents the main regulatory responses to the changes in capital structures of utilities firms and the criticisms that have arisen. The aim is to advance the understanding of the interactions between the capital structure, the cost of capital and economic incentives within highly regulated environments. To explain the argument, I use the case of British utilities. The election is sustained in several reasons. First, the UK has accumulated vast amount of experience with private investment on infrastructure sectors. As it is widely well-known, it was one of the first countries to privatise and liberalise most of its infrastructure sectors. Secondly, the regulatory environment is largely isolated of political risk and other type of regulatory risks normally present in less developed economies.³ Thus, it provides a good ground to analyse problems allegedly associated with financial risks (particularly insolvency risk) – e.g. changes in capital structures.⁴ Thirdly, there has been a noticeable trend amongst

¹ For instance, ERHARDT & IRWIN (2004: 49) indicate that 'If there is a risk that government will treat debtholders more favourably than equityholders in the event of bankruptcy of the private infrastructure provider, then effective risk transfer to the private sector may require stipulations that equity exceed certain levels'. In this work control means any form of intervention that affect the decision of the firm to freely adopt its decision over the capital structure.

² E.g. IRWIN *et al.* (1997) (analysing how to manage government exposure to private infrastructure projects).

³ See *infra* note 94 and accompanying text.

⁴ Generally speaking, there are two categories of risk. On the one hand, business risk is associated with the unique circumstances of a particular firm and the overall economic environment. It arises from the operating characteristics of an investment in real assets. Therefore, it basically represents the possibility that the firm will not have the cash flow necessary to meet its operating expenses. Some

British infrastructure firms to replace equity with debt.⁵ Regulators, concerned about the possible negative effects thereof, have attempted to exert some control the capital structure of the firms.⁶ This control has given rise to a debate where a wide variety of arguments have been stated, either to justify or criticise the regulatory approach.⁷ The trend witnessed in the UK coincides with a worldwide increase in financial gearing across privatised utilities in many developing countries and Europe.⁸ Therefore, in principle many of the arguments and policy responses might be of general application – indeed, introducing the necessary and adequate modifications according to country-specific characteristic.⁹

Apart from the introduction, this work has other four parts. Section II provides evidence on the trend towards debt in British utilities firms and explains how UK regulators have exerted some form of ‘soft’ control over the capital structures of all regulated firms within their respective sector – i.e. they have signalled their preference for certain structures by using ‘notional’ rather ‘actual’ level of gearing in their calculations of the cost of capital. Such a policy seems to be driven by two effects of high gearing, explained in the next two sections. Section III assesses the impact of the gearing assumption on the financial strength of the firms. Allegedly, firms might be seen their access to financial resources limited, affecting the outcomes require by the regulator and hence the whole regulatory regime. I will argue that these concerns are not related to firms’ capital structures, but mainly to features of price-cap regulation

elements that are included in the business risk are revenue uncertainty, labour costs uncertainty, regulatory and political uncertainty, and risk of technological obsolescence, amongst others. The distinctive feature of all these elements is that they are independent of the means by which the assets are financed. On the other hand, financial risk arises from the means by which the assets of the firm are financed. It represents the possibility that the firm will not have the cash flow necessary to pay its equity holders when the assets are partially funded by borrowing. Amongst the elements included in the financial risk are the risk of bankruptcy, the risk of restructuring in event of default, and the risk of suboptimal operating and inefficient investment decisions when the firm is in condition of financial distress. The risk of financial distress is also known as ‘insolvency risk’. In this work I use both expressions interchangeably.

⁵ That is, gearing increased. Although gearing is normally defined as ‘debt to debt plus equity’ ($D:D+E$), UK regulators commonly use the ratio ‘debt to Regulatory Asset Base’ (*debt:RAB*) as primary measure. The RAB is a regulatory concept, not a financial one. Generally speaking, it is a proxy value of the firm’s regulated operating assets, upon which investors earn a return. It is formed by investors’ stake at privatisation plus completed capital expenditures not paid out by customers. In monetary terms, it is also known as Regulatory Asset Value (RAV) or Regulatory Capital Value (RCV). Arguably, its determination is the most contentious part of the tariff-setting process (for an account, see BREYER [1982]; and NEWBERY [1997]). The ratio ‘debt to RAB’ is known as ‘regulatory gearing’, and in general gearing measured on this basis is slightly lower than that using ‘debt to debt plus equity’.

⁶ The regulatory approach is explained *infra* in section II(B).

⁷ See e.g. NAO (2002: 18): ‘There are concerns that the standard form of price control regulation may no longer be appropriate for UK regulation’; and OFGEM (2009b). Changes in utilities capital structures have even given rise to calls to reform the current regulatory approach (e.g. BARNARD & COOPER, 2008). To some extent, there seems to be a general feeling that regulators have not completely understood or internalised the sort of ‘paradigm shift’ occurring in financing networks.

⁸ See, CORREIA DA SILVA *et al.* (2004) (analysing the increase in the use of debt in developing countries and its implications) and BORTOLLOTTI *et al.* (2007) (given evidence of a similar tendency in Europe). See also ALEXANDER & CHIA (2003), on evidence of the increased role of international bond-financing in utility and infrastructure companies.

⁹ Undoubtedly, the concerns arising from high levels of debt vary depending on the economic stage of development. In developing countries, for instance, access to debt finance may be somewhat restricted for many privatised companies. Also, depending on the countries’ risk profile, debt finance might be even more expensive than equity.

(PCR). Section IV assesses the impact of high gearing on the cost of capital. This effect can be approached from the firms' perspective or the consumers' perspective. However, only the latter provides strong grounds to adopt control over the firms' capital structures. Finally, conclusions follow (section V).

2. The increase in gearing levels and the regulatory control of the capital structure

2.1 The 'trend towards debt' in the UK utilities

Liberalisation and regulation in the UK were part of a major privatisation process that led to change in the ownership-pattern of the former state-owned monopolies and placed them in private hands. Although the process had no comprehensive list of goals, one of its principal underlying aims was the encouragement of wider employee share ownership (VICKERS & YARROW, 1988; VELJANOVSKI, 1987) as a means to alter the balance of political power: more shareholders would offset the power of trade unions.¹⁰ Privatisation was complemented by a system of economic regulation of former monopolies based on PCR. However, the latter was underpinned by different concerns and may hence be clearly differentiated from the former.¹¹ Therefore, mainly for political reasons – not economic reasons – an 'equity financial' model of firms was implemented and boosted by the government.¹²

To expand rapid share ownership, the government implemented concrete actions. First and foremost, shares were underpriced and additional bonuses were given to small shareholders. Also, companies were privatised with very low levels of debt.¹³ For instance, when water companies were privatised, in 1989, virtually all the existing debts were written off deliberately, so firms' balance sheets would appear ungeared before being sold to private investors.¹⁴ Likewise, gearing levels of electricity

¹⁰ In addition, it would lead to a bigger base of supporters of capitalism sensitive to the then conservative government. Overall, the model aimed to change 'people's attitudes to business and trade' (VELJANOVSKI, 1987: 9) and make them more akin to the conservative government beliefs.

¹¹ The new regulatory regime was instrumental to privatisation (*see e.g.* BEESLEY & LITTLECHILD, 1989: 457: 'The initial level of X is set by the government at the time of privatization, *as part of the privatization process* ... the initial level of X is set as part of a whole package of measures...' [emphasis in the original]; NEWBERY, 1999: 50: 'Price regulation was *designed*...to enable publicly owned utilities to be transferred to private ownership' [emphasis in the original]). Along with allowing regulated firms to earn only 'normal' profits and hence protect consumers against the exploitation of monopoly power (until competition fully arrived), the regulatory regime would provide protection to the firms' profits. In turn, this would incentivise new shareholders to continuously inject cash into the firms, facilitating private investment expenditure to modernise infrastructure. In contrast, according to VICKERS & YARROW (1988), before privatisation the regulatory regime was not object of concern, because the industries were reasonably competitive.

¹² Indeed, during the first phase of privatisation (1979-84) there was an economic objective: the 'pursuit of quick cash' to improve the public finances (PARKER, 2009: 88). From 1981 onwards, privatisation became more a matter of principle and 'entrenched as a central component of the Government's economic strategy' (*Ibid*, at 188).

¹³ The only exception to the low-debt trend amongst utilities was the National Air Traffic Services. It was sold to a consortium that financed the purchase with 94% of debt (with a ratio of debt to regulatory capital value of 118% – *see supra* note 5 for an explanation of this concept).

¹⁴ There were even cash injections. The so-called 'green dowry' (equivalent to £1 billion cash) was given to water and sewerage (but not water only) companies to fulfil the new enhanced environmental requirements promulgated by the European Commission.

distribution companies were brought down to around 25%. In addition, the allowed rate of return was generally high and investment programmes involving large sums were readily approved in order to facilitate the process and improve the level of services. Overall, the policy was successful.¹⁵ The result was the creation of a wide base of shareholders in the formerly state-owned utilities. The early days of privatisation were widely considered as an ‘easy-money’ period where equity finance flourished.

However, during the mid-nineties the trend reversed. Increasingly, infrastructure companies introduced major changes in their ownership and capital structures. A distinctive common characteristic of those changes has been the trend to replace equity with debt.¹⁶ In sharp contrast with the situation that followed privatisation, a number of companies currently have gearing levels in the range of 50-70%. With variations, the trend is present across different sectors.¹⁷ For instance, since the last price control review, in 2004, the yearly overall industry weighted average gearing of electricity distribution companies has been 50% (2004-05), 51% (2005-06), 45% (2006-07) and 44% (2007-08).¹⁸ Recently, gas distribution companies have also achieved very highly geared capital structures – in the range of 60% as an industry average.¹⁹ The situation in water is summarised in Figure 1. By sectors, overall, only airports still present relatively low levels of gearing.²⁰

¹⁵ Underpriced shares resulted in over subscriptions and immediate profits for shareholders. For that reason, as VICKERS & YARROW (1988: 160) point out, ‘Politically, privatization was a winner, at least in the short term’.

¹⁶ The period from mid-90s has been labelled the ‘dash for debt’. The trend towards debt seems to have started in electricity distribution. Low levels of debt remained relatively stable until 1994 when, as a part of its defence against a hostile takeover bid from Trafalgar House, a British conglomerate, Northern Electric borrowed a substantial sum from banks and handed it out as cash to shareholders in exchange for their rejection of the bid (an account of this is provided by HELM, 2003: chapters 11 & 12).

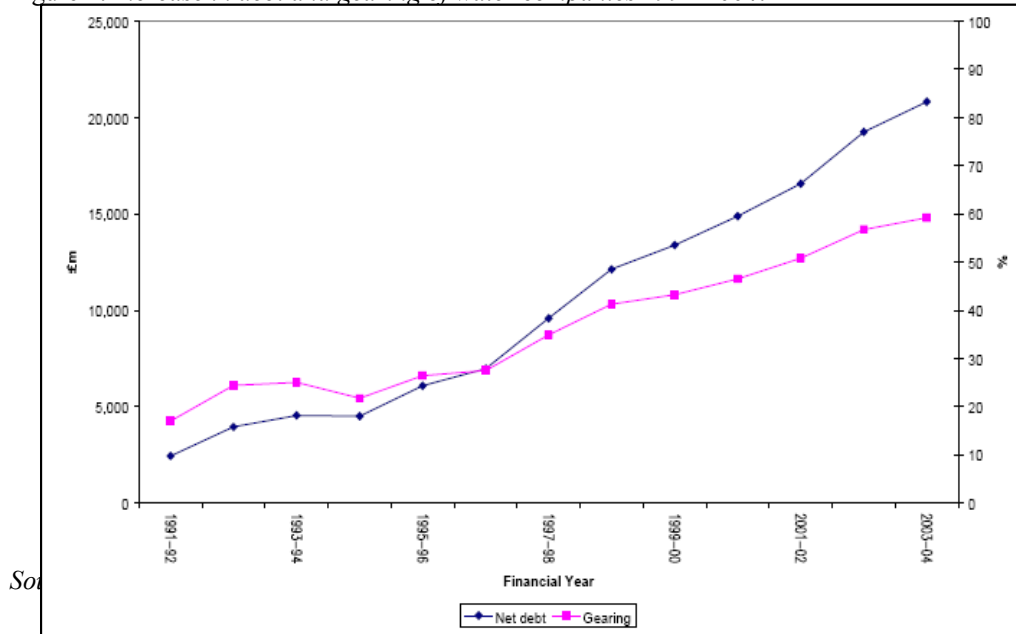
¹⁷ For instance, the optimal gearing ratio is likely to be higher in the water sector than in telecommunications – i.e. whilst the latter shows rapid technology change, changing market definition and -so far- growing demand, the former has both stable technology and demand. In fact, the trend towards debt has affected mainly the electricity, water (including both water and water and sewerage firms), gas and railways sectors.

¹⁸ Debt fell £280 million in 2006-07. In 2008, overall net debt augmented by £218 million in real terms. See OFGEM (2008b).

¹⁹ See Ofgem (2009a)

²⁰ WRIGHT *et al.* (2006) show ratios of debt to the market value of capital of nine utilities in different sectors for the period 1995-2005. In most cases, but not all, there was considerable rise in gearing over the period.

Figure 1: Increase in debt and gearing of water companies 1991-2004.



However, there are considerable variations amongst firms within the same industry. As an example, whilst the most geared electricity distribution firm in 2008 had 61% of gearing (decreasing from 75% in 2005-06 and 68% in 2006-07), during the same year the least geared firm had only 17% (11% in 2006 and 23% in 2007). Likewise, in the water sector, a study made by consultants for the Department for the Environment, Food and Rural Affairs (Defra) and Ofwat identified four different corporate models, ranging from 100% debt to thin equity models and companies without ‘structured finance’ (i.e. with equity and debt) (SMITH & HANNAN, 2003). Also, a firm 100% reliant on debt (Network Rail) currently manages the rail infrastructure.²¹ But despite these cases where firms 100% reliant on debt are now operating in the market, the overall trend shows capital structures mainly characterised by high gearing and thin equity rather than debt-only models.

2.2 The regulatory control of the capital structure

UK regulators have reacted to the trend towards debt controlling the capital structure of utilities firms.²² However, given that the scope and level of control may vary, some qualifications are necessary. On the one hand, in theory the control may affect all the regulated firms in a given sector or apply only to some specific firm(s). An example of the latter would be to reduce the rate of return of high-leveraged firms to their lower cost of capital, whilst keeping the cost of capital of other firms unaffected. Generally, regulators in the UK have adopted an ample control.

On the other hand, the control can be either ‘strong’ or adopt a ‘soft’ form. Under the strong form regulators opt for an intrusive approach and compulsorily command the

²¹ Currently Network Rail’s debts are explicitly underwritten and funded by the government. The government provides a financial guarantee through the so-called Financial Indemnity Mechanism (FIM). According to the regulator, the use of the FIM will be incrementally restricted and it is expected that by 2014 Network Rail raises its debt on an unsupported basis (ORR, 2008).

²² Regulators have recognised that the reason behind the use of notional gearing is the increase in levels of debt by the regulated firms: e.g. OFGEM (2009b). See also HELM (2009).

adoption of certain capital structure – e.g. establishing minimum levels of equity.²³ With this, regulators totally prevent firms from choosing the capital structure that they deem optimal. This policy option is used in sectors (outside utilities) where systemic effects are highly probable and hence the general public may bear some or most of the losses of financial distress.²⁴ However, in utilities the maximum level of control may be only adequate to deal with risk of new infrastructure projects, but it is arguably inadequate as a permanent regulatory regime. Such an approach would require a close and constant monitoring of the sources of finance – a task likely to be difficult considering the asymmetries of information existent between regulators and firms. Therefore, instead of controlling the capital structure, other measures should be used, even in presence of systemic effect.²⁵

Alternatively, regulators might opt for a ‘soft’ form of control, merely signalling their preferences for a given capital structure – e.g. by adopting ‘notional’ rather than ‘actual’ levels of gearing on its decisions over the cost of capital. Underlying this form of control is an implicit assumption that certain structures are more efficient than others in a given regulated environment. The use of notional gearing has the advantage of still leaving the decisions regarding the capital structure to the firms. The assumption of certain gearing-level by the regulator only provides incentives for companies to adopt such capital structure, but does not impose a minimum level of equity.

The ‘soft’ control is currently used by UK regulators.²⁶ Since privatisation, they have always taken into account the capital structure in their calculations of the cost of capital – but during the early days of privatisation, they did not control it. Lately, however, the cost of capital has not been assessed over the basis of actual gearing, but considering the level that regulators deems more ‘appropriate’ for the entire industry. DE FRAJA & STONES (2004) indicate that since the control started, in virtually all cases the notional gearing exceeded the actual level at the same time. Therefore the companies had an incentive to gear-up. However, it is hard to make a definite assertion. Until fairly recently, not every regulator collected data on actual gearing. Ofgem, for instance, did not provide data in the 1999 electricity distribution price control. Also, official data on gearing levels of gas distribution companies was published for the first time only in March 2009. In many sectors, the information has just started to be collected.

It is true that levels of assumed gearing have been significantly increased over the time. Estimated gearing is now much more closely related to actual gearing – although it may be higher or lower depending on the sector and the considerations taken into account during the price control. As shown in Table 1, in 2004-05 actual gearing was lower than notional gearing in the electricity sector, but it was higher in the water

²³ Having a minimum threshold is an explicit transfer of risk to the private sector. As ERHARDT & IRWIN (2004: 49) explain, ‘[t]he idea is that the investor put at least the specified level of capital at risk, as a way of making risk-transfer effective’. They analyse different options to reduce leverage and hence ‘increase the operator’s financial capacity to bear risk’ (*Ibid*, at 50).

²⁴ A common example is the imposition of minimum capital-adequacy ratios for banks.

²⁵ See *infra*, section IV(A).

²⁶ OFGEM (2006a: 54, para. 8.17) has stated that ‘[Our] gearing assumption should not be interpreted as an endorsement of any particular capital structure. We believe that the companies and their financiers are best placed to decide on the most appropriate capital structure’.

sector. Generally, it seems that currently regulators consider efficient a level of debt of around 50-60%.²⁷ This contrasts markedly, for instance, with the 12% estimated in the water first price control review in 1994.

Table 1: Levels of gearing officially reported for some UK utilities. ²⁸

Gearing	Elect. Dist.		Gas Dist.		Water		London Airports	
	Actual	Notional	Actual	Notional	Actual	Notional	Actual	Notional
1994-95						12		---
1995-96		---				---		---
1996-97		---		---	28.3	---	25	30
1997-98		---		---	36.3	---	32.9	---
1998-99		---		---	42.7	---	30.3	---
1999-00		50		---	44.2	45-55	25.1	---
2000-01		---		---	49.7 [‡]	---	24.6	---
2001-02		---		62.5 [†]	55.6	---		---
2002-03		---		---	59.4	---		25
2003-04		---		---	59.3	---		---
2004-05	50 [*]	57.5		---	61.2	55		---
2005-06	51 ^{**}	---		---	58.5	---		---
2006-07	45	---	61	---	62.2	---		---
2007-08	44	---	63	62.5	66	---		60 [§]
2008-09		---		---		---		50 ^{§§}

Source: various regulatory reports.

* Incorrectly reported as 44% in OFGEM (2008b). ** 50% in OFGEM (2007c); corrected in (2007b)

† In 2001 Transco still operated as a monopoly in gas transport and distribution.

‡ Reported as 48.3% in OFWAT (2001b); 49.7% in later reports.

§ Heathrow and Gatwick airports. §§ Stansted airport.

The choice of gearing assumption was driven by two (potentially conflicting) effects arising from the increase in gearing levels (BUCKS, 2003). The first effect is the impact on the cost of capital. Regulators make a decision about the cost of debt and equity that would be incurred by an efficiently financed regulated firm at the notional gearing. Since the increase in gearing produces a decrease the cost of capital, theoretically the regulatory approach ‘minimised’ the latter for the benefit of consumers (when notional gearing is higher than actual gearing). At the same time, however, increasing levels of debt might lead to a fragile financial position of some firms, with allegedly negative general consequences for the whole regulatory regime. I will turn now to the analysis of these effects, in reverse order.

²⁷ It is unlikely that such estimation will significantly vary during the next revision. For example OFWAT (2007) indicated that for the next price review in 2009 is likely to assume an industry average range above the levels of 2004.

²⁸ In other sectors the percentages are similar. In 2000, the ORR assumed a gearing level of 50% for Railtrack, the company that used to manage the railways infrastructure. Railtrack’s successor, Network Rail, is a company financed by debt and limited by guarantee (*see supra* note 25). In 2001, Ofgem assumed 60% for the electricity transmission companies. However, that year Ofcom (currently Ofcom) only assumed 10-30% of gearing for mobile phone operators (the reasons may be connected to the characteristic of the industry – *see supra*, note 24).

3. The alleged impact of the increase in gearing levels on the 'regulatory contract'

The changes in utilities' capital structures have given rise to a number of concerns related to the general 'regulatory contract' operating between firms and the State.²⁹ It is thought that the trend towards debt may heavily affect the basis of the contract. Amongst the regulatory concerns, three stand out. The first one is related to the possibilities of financial failure and access to capital markets (the 'financeability concern'): regulators have been increasingly worried of the possibilities for the firms to raise finance on 'reasonable' terms in the capital markets. The second concern is related to corporate control (the 'control concern'): an 'equity model' of the firm would be more compatible with the regulatory regime, since only shareholders would have the right incentives to increase productivity at the firm. The last concern is related to the future commitments of utilities (the 'under-investment concern'): in some situations they will be incapable to deliver future investment, particularly when confronted with the possibility of financial distress. In this section I will show that the three concerns are mostly misguided. The reason lies in the overreliance on general financial explanations, without weighting on the reasoning the specific features of the regulatory regime.

3.1 The 'financeability concern'

Regulators see the duty to finance networks as two-fold: first, as the need for the firm to earn a return at least equal to the cost of capital on the RAB.³⁰ This corresponds to the traditional economic view on the duty, which finds its roots in the classic theory of

²⁹ The contract has been a common fictitious analytical framework for studying the relation between the State and regulated firms. According to this doctrine, as an exchange for the monopoly that is granted to a company, the State imposes constraints and/or requires the provision of certain obligations through a 'regulatory contract' (or 'regulatory compact'). Normally rate regulation and/or universal service obligations are stressed. In the American case-law, see e.g. *PacifiCorp v. Pub. Serv. Comm'n*, 103 P.3d 862, 871 (Wyo. 2004) ('The "regulatory compact" provides the fundamental basis for utility regulation. In general, the compact is a theoretical agreement between the utilities and the state in which, as a quid pro quo for being granted a monopoly in a geographical for the provision of a particular good or service, the utility is subject to regulation by the state to ensure that it is prudently investing its revenues in order to provide the best and most efficient service possible to the consumer. In exchange, the utility is allowed to earn a fair rate of return on its rate base'); and *Office of Pub. Util. Council v. Pub. Util. Comm'n*, 104 S.W.3d 225, 227-8 (Tex. Ct. App. 2003) ('Under a fully regulated system, an electricity utility enters into a "regulatory compact" with the public: in return for a monopoly over electricity service in a given area; the utility agrees to provide service to all requesting customers and to charge only the retail rates set by the Commission.'). Nonetheless, it is important to consider that beyond the legal obligations that emanate from the contract (if there is any at all), the latter is better understood as a *theoretical framework* that accounts for the evolution of public utility regulation. As such, its suitability has been disputed (e.g. PROSSER, 1999). The dispute is beyond the scope of this work.

³⁰ Regulatory concerns for allocative efficiency are the ones that have led regulators to consider measurements of (and control) capital and rate of return (ARMSTRONG *et al.*, 1994: 174). Note that, originally, it was thought the RPI-X did not require the measurement of capital and rate of returns (LITTLECHILD, 1983). Nonetheless, it was later recognised that 'RPI-X and rate-of-return regulation have certain common features. Both accept the need to secure an adequate return for the company's shareholders in order to induce them to continue to finance the business, without conceding unnecessarily high prices at the expense of customers' (BEESLEY & LITTLECHILD, 1989: 460). Currently, financial models used to determine the X-factor already incorporate a mechanism to ensure that new investment earns the cost of capital. On the concept of RAB, *see supra* note 30.

the natural monopoly – the regulator must set the price so as to allow the monopoly just to break-even. If the price is set ‘correctly’, in principle a firm that raises capital in the capital markets should not discriminate between long-term and short-term when making investment decisions, provided that the projects generate revenues higher than the cost of capital in net present value (NPV) terms. In addition, most of the regulators now interpret the duty to finance as a duty to maintain the so-called ‘financeability’ of the firms.³¹ This concept refers to the possibility that firm’s revenues, profits and cash-flows allow it to raise finance in the capital markets – on terms considered ‘reasonable’ by the regulator. Thus, regulators have taken the view that the final price should provide sufficient returns to meet given financeability targets. In practice, the targets are linked to the firm’s achievement and retention of strong credit ratings issued by credit rating agencies. As the Competition Commission (CC) (2007: 43, para. 4.67) explains:

‘[W]e consider that the [regulated firm] should have regular access to the debt markets and this can be most easily achieved if they maintain investment grade credit ratings. There should also be some headroom in the rating, so that in the event of a downside shock the [firms] do not immediately slip to non-investment grade ratings’.

The financeability concern comes up from the mismatch between the calculation of the cost of capital made by regulators and means of financing projects by the utility (OXERA, 2006). Whilst the regulatory model provides for a real rate of return, most firms pay out returns to creditors in nominal terms.³² The result is that, due to the difference between real inflows and nominal outflows, firms are left with negative cash flows for a certain period of time (even longer than one single price control period). If - and only if- a firm invests at a rate above the level required to replace its existing assets, the ‘cash-flow gap’ increases to an extent that may lead to a deterioration of the financial indicators.³³ In turn, this result will produce a decrease in credit ratings; it will drive the rate of return up (increasing the cost of finance projects); and allegedly render it more difficult for the firm to access the financial markets.

The trend towards debt has increased the regulator’s concerns. Hence they have sought to make the financeability test mandatory. Most of them now apply the test during

³¹ In this sense, *e.g.*, CC (2007: 73, para. 5.11): ‘The CAA [the aviation regulator] has no express statutory obligation to ensure that regulated airports, including BAA, are adequately financed. The CAA is, however, required to promote the efficient, economic and profitable operation of such airports, and also to encourage investment in new facilities at airports in a timely fashion. In this context, we consider appropriate for us to establish whether our proposals would enable Heathrow and Gatwick to finance their [businesses] on reasonable terms in the banking and capital markets through some combination of debt and equity’; OFWAT (2004: 217): ‘We have a duty to secure that companies are able to finance the proper carrying out of their functions as licensed undertakers (‘finance functions’). We look at this as having two strands. One is to secure that, if a company is efficiently managed and financed, it is able to earn a return at least equal to the cost of capital. The second is that its revenues, profits and cash flows must allow it to raise finance on reasonable terms in the capital markets. We refer to this second strand as financeability’; and ORR (2008: 273, para. 17.1): ‘We have a duty to act in a manner that it will not render it unduly difficult for Network Rail to finance its activities’.

³² When applying a real WACC (see *infra* note 74 and accompanying text), the effects of inflation are compensated through indexation of the RAB. Alternatively, the cost of capital might be calculated using a nominal WACC without RAB indexation. Both approaches are neutral in NPV terms, and the election depends on the regulator. In the UK, only Ofcom uses a nominal approach.

³³ That is a common situation in large infrastructure investments. Note, however, that the indexation of the RAB may reverse this effect (*i.e.* it may lead to positive cash balances), but only in the long-run.

price controls. The test goes as follow. First, a decision is made regarding the appropriate credit rating that the firm should target.³⁴ Then, it is decided what financial indicators and thresholds are going to be used.³⁵ In that regard, regulators rely heavily upon the information provided by credit rating agencies.³⁶ Finally, each company is modelled and the financial indicators are computed and analysed. Within the financeability assessment, it is decided what level of gearing would be consistent with the financeability target.

If a firm fails the test, a number of financeability adjustments can be applied. In principle, they should be NPV neutral.³⁷ However, some of those that have been used by regulators are not. Above all, recent determinations have allowed additional revenues to the firms ('revenue uplifts') whilst warning the firms not to distribute them as dividends.³⁸ In short, regulators have created a mechanism whereby firms get extra revenues to spend on themselves (!). The financial effect of such NPV-positive payments '[...] is to set allowed returns at a level above the cost of capital' (JENKINSON, 2006: 13), and leads to re-valuations of utilities' shares and premiums on purchases.³⁹

³⁴ Even benchmark provisions have now been embedded into some utilities' licences compelling them to maintain minimum financial ratios. Normally 'Investment Grade' is required, which means at least BBB-, Baa3 or any equivalent rating, depending on the issuer. However, at least the CC has increased the level, stating that in the current financial 'turbulence...an efficiently financed company might reasonably seek to target an A3/A- credit rating' (CC, 2008: 93, para. 11.13).

³⁵ The financial indicators are mostly cash-based.

³⁶ The over-reliance on credit rating agencies is extensive: they even meet agencies' representatives and learn about the factors considered by the latter whilst grading a firm (*e.g.* CC, 2008: L6, para. 25). On this, regulators have not considered the impact of the current crisis. Recent high profile episodes such as the collapse of big financial institutions at least undermine the alleged ability of credit agencies to act as 'vehicles' that monitor and spread information.

³⁷ There are a number of neutral alternatives that can be put into practice to allow companies higher returns. *E.g.*, the CC recommended two uplifts during the price control review of BAA in 2002, in order to reflect the financial constraint associated with the new Terminal 5 in Heathrow, along with the use of the mid-point of the WACC range. Nonetheless, they were not adopted by the CAA (which has the 'last word' in setting the prices for the airports) and instead a point estimate towards the higher end of the WACC range recommended by the CC was used. The latter approach was also applied by the CC (2007). In turn, JENKINSON (2006) has proposed to adjust the profile on prices within a control period to match the cash-flow profile and keep financial ratios at appropriate levels. He recognises that such an approach would trade-off stability of financial ratios against stability of price paths for consumers. But he argues that if cash flows cannot be stabilised, the regulator might alter the depreciation profile of the firm and spread the effect over the years.

³⁸ Recently, at least Ofgem and Ofwat have included vast revenue uplifts in their price controls amounting to large sums in NPV terms. In the price control 2004 Ofgem allowed one company an extra payment of £1.6m precisely to 'provide a small cushion against downside risks and improve the projected financial ratios' and to 'maintain a credit rating conformably within investment grade' (OFGEM, 2004c: 114-5). Regulators considered that 'the materiality of the adjustment was small' (OFGEM & OFWAT, 2006: 46, para. 136). In turn, Ofwat allowed payments for approximately £400m for the period 2005-10 (OFWAT, 2004).

³⁹ Fortunately, after taken stock of the weaknesses, regulators have recently signalled some future changes. For instance, Ofwat has indicated that for the next price control review (due at the end of 2009) it will try to ease the financing constraint through several market mechanisms, because it considers the revenue uplift is not appropriate. Should this tool be adopted, it would be applied in a NPV-neutral manner (OFWAT, 2007). OFGEM (2008a) has also stated that if the cost of capital is set at the right level, revenue uplifts are unnecessary.

At a more fundamental level, it can be questioned whether the financeability problem exists at all. There are different lines of argument. First, from a legal perspective, this is a question related to the extension of the duty to finance. The widest interpretation sustains that it is a duty to allow every utility that enters the market to earn returns at least equal to the rate of return. On the contrary, in its narrowest expression (adopted by regulators when assessing financeability) the duty to finance would only cover the *efficient* activities carried out by the firms. It is at least unclear why regulators should give a narrow interpretation to that duty when considering its extension. Certainly, some economic incentives might decrease if every activity of the company is backed by the duty. However, the second approach is too ambiguous and arguably leaves excessive space for regulatory discretion.⁴⁰

Secondly, from an economic/financial perspective, the question is whether it is plausible to think that there is a point where utilities cannot access financial markets by themselves anymore. Regarding the equity markets, there seems to be a feeling that at least in some sectors the access to equity markets is more difficult or costly.⁴¹ Nonetheless, if the objective of the financeability test is mainly to attract equity finance (as it seems to be), the test seems tautological and to some extent whimsical – regulators boost equity because they want to avoid the ‘flight from equity’; and the way to avoid the flight from equity is by boosting equity. This is nothing more than a convenient loophole. Theoretically, as in any other business, an adequate rate of return should be enough to provide incentives to attract capital to utilities.⁴² Therefore, short-term cash-flow gaps should be allowed for by investors.

However, for this to occur it is required that investors have confidence that the regulator will not expropriate long-term returns. This leads to the problem of ‘regulatory commitment’ – a topic mainly related to investors’ perceptions of risk, not with the firms’ capital structure. As will be shown, political risk and regulatory risk are widely seen as relatively low in the UK.⁴³ Furthermore, the levels of risk faced by utilities are very low.⁴⁴ These facts should be sufficient to compensate any potential increase in the rate of return demanded by investors and avoid concerns about financeability. Hence there are no theoretical grounds supporting the thinking that equity investors will not be willing to invest in utilities when debt investors are willing to do so. To a large extent, the low risk reassures the availability of financial resources – either from equity or debt. The evidence supports this assertion: so far there is no evidence showing that firms are or have been unable to raise finance.⁴⁵

⁴⁰ So far, the duty to finance activities has never been revised by the courts.

⁴¹ In the water sector, see OXERA (2006).

⁴² Whilst in practice this is a problematic task, it must be taken into account that by definition the regulated price is set higher than incremental cost, so the firm has incentives to invest and produce. Regulation only prevents *significant* departures from incremental cost. See BREYER (1982: 18-9).

⁴³ See *infra* note 94.

⁴⁴ See *infra* section IV(A).

⁴⁵ For instance, recently the CC did not allow an increase in prices asked by one water company, on the grounds that it was ‘able to finance the proper carrying out of its functions with prices at their current level’ (CC: *Sutton and East Surrey Water plc: Interim Price Determination* [17 June 2009], at 78, para. 4.96).

3.2 The ‘control concern’

The debt model is also disputed on the grounds of managerial corporate control.⁴⁶ It is argued that one of the key advantages of the equity-based model is that the structure of corporate control is familiar and clear. In the event of troubles, whatever the reason may be, shareholders would have a strong incentive to replace the incumbent management. In contrast, when a company operates under a debt-only model, the incentives are less clear and they heavily depend on the deeds of covenant that are in place to protect debt-holders’ rights. If the control is ambiguous, the risk increases. In such a case, it is thought, the weaknesses in decision-making are severely exposed, given the poor control and the absence of incentives for efficiency. In other words, principal-agent problems would tend to increase with debt, and hence the overall economic incentives of PCR might be undermined.⁴⁷

Underlying the argument is the (incorrect) assumption that the adoption of PCR *in itself* implies an equity financial model of the firms – especially if its ‘high-powered’ characteristics were to be preserved.⁴⁸ Since the system works on the basis of the cost reductions set by the regulator (the X-factor), it requires agents responsive to those incentives. According to this argument, shareholders would be the only actors capable of responding correctly. They have the main incentives to outperform expected productivity of the firm and seek managerial improvements, whilst the only incentive for debt holders would be not to engage in activities that may undermine their rather secure repayments.⁴⁹ Therefore, shareholders would be more suitable than debt holders

⁴⁶ In this sense CURRIE (2003) and DTI AND HM TREASURY REPORT (2004).

⁴⁷ Regarding principal-agent problems, *see generally* MILGROM & ROBERTS (1992). Note that even though the ‘control question’ is centred on the relation between managers and principals, there is also an agency problem arising between stockholders and bondholders in firms with hybrid financial structures (i.e. structures with presence of both debt and equity) – a problem known as the ‘asset substitution problem’ in the financial literature (MYERS, 1977). The potential conflict arises from the type of projects that will be taken on by stockholders. Once debt holders have advanced capital to the stockholders, the latter have an incentive to undertake project riskier than those the former would prefer. Recognising this incentive, debt holders will charge a higher price for debt capital (JENSEN & MECKLING, 1976). The agency costs may be attenuated by the use of contracts – covenants, call provisions, conversion rights, etc. – but they can never be eliminated as long as the debt holders cannot perfectly discern if the outcome is the result of uncertainty or is due to the actions of the manager. In turn, in a regulated environment, this agency problem will have an impact in the outcome of the WACC.

⁴⁸ For instance, the DTI AND HM TREASURY REPORT (2004: 35, para. 99) states that ‘Shareholders play an important role in driving managers to respond to the efficiency incentives of the RPI-X regime. The corporate governance model of shareholder ownership provides a clear structure for decision making. However, these incentives can be reduced or removed in highly geared structures, through a loss of shareholder pressure’. Likewise, a consultants’ report for Defra and Ofwat argues that ‘The introduction of equity into the industry at the time of privatisation is seen as the agent of the substantial improvements in performance and efficiency in the sector. Indeed, the RPI-X regime is seen as predicated on the active participation of equity, with the profit maximising interests of shareholders spurring management on continually to outperform regulatory settlements’ (SMITH & HANNAN, 2003: 48, para. 6.1.2). With similar reasoning, ORR (2006: 45, para. 5.1) has stated that ‘Although there are clear justifications for Network Rail’s current financial structure [100% reliant on debt], it does mean that the incentive based regulatory framework provides weak financial incentives on the company to strive for continuous improvements in performance and efficiency’.

⁴⁹ Shareholders are concerned about the upper part of the probability distribution of all the possible performance outcomes – i.e., above the outcome required to pay the debts. In contrast, claimholders receive nothing of the cash flows above the amount specified in their debt contracts. In accordance, riskier projects reduce their expected pay-offs.

to fulfil the regulatory targets. The equity model of private ownership becomes not only necessary, but crucial to improve efficiency.

The ‘control concern’ completely misses the target – mainly because it pays no attention to the insights of agency theories.⁵⁰ First and foremost, contrary to what the ‘control concern’ assumes, an equity-model of the firm does not necessarily create managerial incentives. The ‘control concern’ implicitly assumes that the incentives of the firm’s managers and shareholders are perfectly aligned. Moreover, it is assumed that the alignment is in favour of the latter – i.e. that managers adopt their decisions for the benefit of shareholders.⁵¹ This is not always true. Managers have an incentive to over-expand the size and scope of the firm to satisfy their own ends at the expense of the shareholders (JENSEN & MECKLING, 1976). Particularly, managers in profitable companies are likely to waste money on inefficient investment. One of the reasons is the personal benefits associated with the so-called ‘empire-building’: a larger firm (allegedly) creates more opportunities for career enhancement and promotions, higher rewards and status. In addition, managers may be more concerned about their own reputation and career. If that is the case, they have incentives to take short-term actions at the expense of the long-run shareholder value; exhibit an excessive tendency to ‘herd’ in their investment decisions ignoring their own private information; or simply under-invest not to reveal their managerial ability.⁵²

Indeed, shareholders may intend to exert control over managers in an attempt to avoid the misalignment of incentives. On this, however, the ‘control concern’ underestimates collective action problems resulting from dispersed ownership. Primarily, shareholders have an incentive to free-ride. The costs of monitoring managers are high for an individual shareholder, who must invest a vast amount of time and effort to check the firm performance. This problem is especially acute the smaller the relative wealth of each shareholder to the size of the firm. Hence each shareholder would prefer that other carry out that function. If free-riding is prevalent, the result is a low and inefficient level of monitoring.⁵³

But even if managers act in the interest of shareholders (or the monitoring is optimal), the ‘control question’ still assumes that equity is associated with proactive managerial

⁵⁰ Agency theories have two main strands. The first one is the ‘agency cost model’ of gearing associated with the work of JENSEN & MECKLING (1976). It focuses upon the control of the managers by the owners in conditions of asymmetric information. Thus, debt limits the cash flow available to managers and therefore reduces their discretion. The second one is the ‘control rights’ model mainly associated with HART (1995). It focuses upon the issuance of debt by the owner as a means of not ceding control rights to outside investors.

⁵¹ This ‘shareholder value maximization’, according to which shareholders are legally entitled to demand managerial deference to their interest (even if this is limited by *de facto* opportunism of managers), is a traditional assumption of the Anglo-American corporate environment. It is normally understood as a sort of ‘duty’ to generate (high) profits. WILLIAMSON (1984) argues in favour of this assumption, stating that shareholders are relatively less well protected than other parties such as workers or creditors. Since shareholders need protection the most, rules should primarily be designed to protect their interests.

⁵² See STEIN (2003) for a revision of the literature on these issues.

⁵³ There are mechanisms to solve the collective action problem. Two examples are the executive compensation models and the blockholder models. On the one hand, systems of compensation for performance, commonly seen in firms, aim to align *ex ante* managers’ interests with those of shareholders. On the other hand, a semi-concentrated ownership structure with at least one large shareholder may also help to improve monitoring.

attitudes that would not be present in debt-models. That is simply not true. Indeed, at the extreme some contracts may *de facto* reproduce the property rights on incentives structure that is normally seen in an equity-based model.⁵⁴ In such a case the gap between debt and equity is closed, so that corporate control does not weaken and the incentives to managerial performance remain in place. But with or without protections, the argument is still flawed. There is no evidence supporting some sort of proactive managerial attitude. On the contrary, the literature points out that managers may prefer a ‘quiet life’ and be prone to excessive inertia (AGGARWAL & SAMWICK, 1999; BERTRAND & MUULLAINATHAN, 2003).⁵⁵ This resistance to change may eventually lead to the continuation of negative-NPV projects and/or underinvestment – precisely one of the main regulatory concerns.

On the other hand, even within firms heavily reliant on debt managers may have incentives to outperform. This is mainly due to the high personal costs associated with situations of financial distress.⁵⁶ Amongst these personal costs are reputational and career concerns, costs associated to finding another job, etc.⁵⁷ Only by exerting effort managers can meet the interest payments on debt and avoid the pernicious consequences of bankruptcy.⁵⁸ In the end, however, the (personal) costs associated with bankruptcy may also lead to over-expand the size and scope of the firm, because a larger firm decreases the risk of bankruptcy if the company is well-diversified. In this sense, JENSEN (1986) has argued that increasing gearing may solve the overinvestment problem.⁵⁹ Increasing debt decreases the scope for inefficient managerial behaviour because managers are committed to return cash to claimholders. ‘Free cash-flow’ (i.e. residual cash flow after all positive NPV investment needs have been met) will be used

⁵⁴ See SMITH & WARNER (1979) for one of the first treatments about the use of covenants in bond contract to prevent opportunistic behaviour of firms in financial distress. On covenants, *see generally* TIROLE (2006: 85 *et seq.*).

⁵⁵ This finding is not strange in utilities regulation: remember the ‘quiet life’ of the monopoly (HICKS, 1935) and the so-called ‘X-inefficiency’ (LEIBENSTEIN, 1966). Although the latter is more associated with overinvestment and managerial ‘empire building’, when adapted to PCR it might well be the result of underinvestment (*see infra* section III(C)).

⁵⁶ TITMAN (1984) argues that managers personally bear a substantial portion of the bankruptcy costs. *See also* FAMA (1980) for one of the first discussions on career concerns; and HOLMSTROM (1999) for a formal model of how managers’ actions affect their perceived value in the labour market.

⁵⁷ Needless to say, bankruptcy is also a problem for the firm – particularly if it is strongly reliant on durable goods (i.e. which requires service, maintenance or updating) (TITMAN, 1984). The value of durable goods falls as the likelihood of bankruptcy increases. Customers may take the risk of decrease in the quality of services into account and reduce demand. Whilst this situation does not seem to be applicable to all utilities, it is indeed relevant in industries such as telecommunications or airports.

⁵⁸ Note that this threat is not applicable to Network Rail, a company whose debt is guaranteed by the State (*see supra* note 21). The same reason undermines the positive effect of more efficient monitoring: bondholders have their payments guaranteed regardless of the firm’s performance.

⁵⁹ Others have also stressed the ‘agency benefits’ to debt if reduces the scope of managerial discretion: *e.g.* GROSSMAN & HART (1982). As JENSEN (1986: 323) states: ‘The problem is how to motivate managers to disgorge the cash rather than investing it below the cost of capital or wasting it on organizational inefficiencies’. Note that if managers are unwilling to increase debt, there are incentives for other groups to take over the firm and restructure it. Indeed, as JENSEN recognises, debt does not always have positive control effects. Rapidly growing firms with large and profitable investment projects but no free cash flow will need to go regularly to the financial markets to obtain capital. In this case investment bankers fulfil the role of monitoring. On the contrary, the control function is more important in organisations with large cash flows and low growth prospects and in organisations that must shrink.

to pay off lenders. Therefore, the higher the level of debt, the more powerful the incentives created for managers to work harder to meet the debt-holders payments.⁶⁰

In sum, agency theories demonstrate two crucial findings that undermine the ‘control concern’. First, that the effect of managerial incentives is unclear: they may lead either to underinvestment or overinvestment *regardless* the capital structure of the regulated firm. The final effect will depend largely upon managers’ attitudes and other incentives created by the regulatory regime.⁶¹ Secondly (and maybe more fundamental), PCR in itself has no specific financial model attached to it. The contrary assumption is merely a misconception.⁶² Shareholders are not a necessary condition for PCR to operate, nor are they a necessary condition for the efficiency of the regulatory regime.⁶³

3.3 The ‘under-investment concern’

The last regulatory concern connected with the capital structure and the general regulatory contract is the ‘under-investment concern’. According to this argument, stockholders might be willing to accept some positive NPV projects only if the firm is financed by equity, but not if it is partially debt financed. The reason is the pay-offs from some projects might be large enough to be profitable, but not sufficient to repay the debt-holders. Therefore, some ‘good’ projects may be rejected because of the relation between the distribution of pay-offs and the capital structure of the firm.⁶⁴ The situation is aggravated if there is a possibility of financial distress, because the higher the gearing of the firms, the lower the possibility of absorbing financial shocks. In utilities, it is argued, the firm will postpone long-term investments demanded by regulators in favour of short-term decisions.⁶⁵ In the extreme, all of this may lead to under-investment.

The under-investment concern is flawed. First, as it has been shown in the previous section, it is based upon wrong assumptions. On the one hand, it is assumed that managers always act in the interest of shareholders or, at least, that shareholders can

⁶⁰ MYERS (2003: 243) warns that the free cash-flow theory does not provide a model for the incentives and actions of managers and does not indicate how they should arrange financing.

⁶¹ See *infra* section III(C), explaining the incentives to under-invest created by PCR.

⁶² In fact, in its origins the regulatory regime was never associated with any specific financial model. The financial structure is not even mentioned in the report that was used as a base for the introduction of RPI-X in the UK (LITTLECHILD, 1983). As seen (*supra* section II(A)), the equity-model was a feature purely associated with the politics of privatisation. Underlying the privatisation model was the idea to encourage wider share ownership in order to create a ‘more entrepreneurial society’ (VELJANOVSKI, 1987: 9). This aim, which underlay the first wave of privatisations, was intact when utilities started to be privatised in 1984. As FOSTER (1992: 124) points out, ‘[i]n turning British Telecom [the first utility being privatised] into private company whose shares were sold to the public, the creators of this structure were following precedent’.

⁶³ Note that even when the plans to privatise British Telecom started, the improvements in efficiency were thought to arise from a source different than the RPI-X. The government emphasised the idea of allowing BT to borrow freely from the capital markets, without the constraints faced in the public sector (DTI, 1982) – i.e., ‘privatization would facilitate more efficient capital allocation’ (VICKERS & YARROW, 1988: 158).

⁶⁴ This problem is akin to the ‘asset substitution problem’ analysed *supra* in note 47 and accompanying text.

⁶⁵ Unlike non-regulated companies, regulators demand from regulated firms quality improvements and capital investments to be made in certain periods of time. The expectation is that they should not be reallocated across time.

control managers' incentives and align them with theirs. That is not always true. On the other hand, if the under-investment problem exists at all, it is erroneous to base the explanation on the capital structure. If in general firms with less debt invest more, as the financial evidence shows, there is no evidence showing *why* investment is positively correlated with less debt.⁶⁶ Indeed, agency theories have shown that even if the capital structure is 100% reliant on equity, certain managerial attitudes may lead to under-investment.

Second, and allegedly more essential, important incentives created by the own regulatory regime must be taken into account. There are two main interrelated effects. On the one hand, whilst the discretionary characteristics of PCR permit regulators to set the X-factor with substantial leeway, the regime only encourages firms to make improvements that are repaid within a single review period. This may create incentives to cut back programmes already agreed with the regulator.⁶⁷ Many types of infrastructure are durable enough to make that underinvestment not result in a decline of quality of service or performance. Accordingly, the firm may be tempted to cut back on an investment agreed with the regulator at the beginning of the price-cap period and make more profits.⁶⁸ On the other hand, it is acknowledged that PCR does not encourage efficiency improvements that payback beyond the next price control.⁶⁹ That is, PCR in itself provides firms with incentives to underinvest in Capex and quality of service.⁷⁰ The reason is the lack of regulatory commitment. Firms will make long-term investments only if the regulator commits to recognise them and incorporate them into future price controls. However, the essence of the system is that every n-years period the price is reset. Intrinsically, a problem of time-inconsistency between short-term and long-term projects exists.⁷¹

In sum, the incentives to under-invest are a distinctive problem associated with PCR *regardless* of the capital structure of the firm. That is, the under-investment problem is not as much associated with the firms' financial stability as with the regulatory regime in itself.⁷² The problem largely derives from the inability of regulators to make future

⁶⁶ For a survey of the literature, see STEIN (2003), who points out that the evidence does not clearly reveal *why* firms with more cash and less debt invest more.

⁶⁷ Two related effects may happen. The firm may prefer to delay improvements with short-term paybacks and make them after the price control, hoping to capture the savings as profits. Also, the firm may increase its investments as the price review approaches, hoping to get a higher cap that allows greater future savings.

⁶⁸ For this reason, with PCR the regulatory burden increases, since the agency must monitor the firm more closely to discover whether any saving is due to efficiencies rather than deviations from previous commitments.

⁶⁹ See GÓMEZ-IBÁÑEZ (2003: 241 *et seq.*) and NEWBERY (1999: 50-2).

⁷⁰ See ARMSTRONG *et al.* (1994), who formally show that by itself, PCR does nothing to encourage improvements in the quality of service.

⁷¹ The under-investment question might be seen as the 'the flip side' of the regulatory commitment problem. The latter is related with the investors' perception of risk (*see infra* section IV(A)).

⁷² See GÓMEZ-IBÁÑEZ (2003: 241-2), who provides reasons to the underinvestment claim and states that it hard to say if this effect is better than the overinvestment effect; COWAN (2001: 52), who points out that 'whilst price-cap regulation seems to provide good incentives for operating cost efficiency, it is not clear that it provides optimal investment incentives for utilities'; and NEWBERY (1999: 51), stating that the advantages of price controls come at the expense of adequate capital investment. *See also* NAO (2002). Note that in sharp contrast with PCR, 'cost of service' ratemaking schemes provide incentives for overinvestment (the infamous 'Averch-Johnson effect', named after AVERCH & JOHNSON, 1962).

commitments. Therefore, it is at least dubious that controlling the capital structure is the right way to address what is in essence a design problem.⁷³ Long-term investments should be encouraged by other means, such as direct regulation put into place in the ‘contracting part’ of the regulatory framework.⁷⁴ Other provisions must be incorporated within the regime to counterbalance the negative incentive to under-invest.

4. The specific impact on the cost of capital

Another effect linked to the trend towards debt is more specific: the capital structure impacts on the cost of capital and the rate of return. UK regulators usually assess the cost of capital using the so-called ‘Weighted Average Cost of Capital’ (WACC) – although adopting different approaches to it, as will be shown. The WACC calculates an average (not marginal) cost of capital over the basis of the expected cost of the debt and the cost of the equity. The result gives the cost of capital for the regulated firm as a whole. Both the cost of debt and the cost of equity are computed over the basis of a number of individual components, some estimated by the regulator and others market-determined. Given the individual component estimates, the result is normally a range. Regulators then need to select a single point estimate from within that range, trading-off the benefits for consumers against the cost implications. Formally, the WACC is calculated as:

$$WACC_i = g_i \pi_i^d + (1 - g_i) \pi_i^e$$

Where i is any firm; g_i is its proportion of debt finance or ‘net gearing’; π_i^d is the required rate of return on debt; $(1 - g_i)$ is the net proportion of equity; and π_i^e is the required rate of return on equity.⁷⁵ Unlike the previous group of effects, which focused exclusively on the relation between the government and firms, the impact of the capital structure on the WACC has implications for both firms and consumers.

4.1 Focusing on the government-firm relation

The capital structure has a specific impact on the firms’ rate of return. If certain conditions hold, the capital structure may directly affect the overall cost of capital computed by regulators. For instance, if the assumed level of gearing is lower than the actual gearing of some firms (and consequently the WACC is higher than their real cost of capital), the outcome of the price revision represents an advantage for them.⁷⁶

⁷³ As NEWBERY (1999: 50) points out: ‘Rate-of-return regulation *evolved* through a series of landmark court cases in the United States ... Price regulation was *designed* in the United Kingdom to create an efficient system of regulation...’ (emphasis in the original).

⁷⁴ PCR ‘is a hybrid of the discretionary and contractual approaches to regulation, and it is the contractual elements that are central to its efficiency incentives’ (GÓMEZ-IBANEZ, 2003: 217).

⁷⁵ A more detailed explanation of the WACC method may be found in many standard textbooks of Corporate Finance (*e.g.* BREALEY *et al.*, 2008; COPELAND *et al.*, 2005) and in WRIGHT *et al.* (2003).

⁷⁶ As the MMC stated: ‘A number of regulated utilities have increased their level of gearing in the period since privatization and since debt appears relatively cheaper than equity in CAPM calculations this might be expected to have reduced their WACC’ (MMC: *BG plc, A report under the Gas Act 1986 on the restriction of prices for gas transportation and storages services* [May 1997]). CAPM refers to the standard version of the Capital Asset Pricing Model normally used by UK regulators to assess the cost of equity. The model assumes that the cost of equity for a given firm is equal to the expected return on investing in a single share in that firm. Formally:

However, the impact depends upon the approach to the WACC adopted by the regulator.

There are three different approaches: pre-tax, post-tax and the so-called ‘vanilla WACC’. In the ‘vanilla’ version, the cost of capital is calculated over the basis of a pre-tax cost of debt and a post-tax cost of equity, as a cash flow item, and added to the operating costs of the business.⁷⁷ When the cost of capital is set on a pre-tax basis, the effects of taxation are not allowed for.⁷⁸ In contrast, the effects of taxation are fully considered if the cost of capital is set on a post-tax basis – i.e., adjusting the *cost of debt* for the tax shield.⁷⁹ Therefore, the regulatory choice of a pre-tax or a post-tax approach to the WACC has implications for the tax advantages the firm might

$$E(\pi_i^e) = r_f + \beta_i^e (E(\pi_m) - r_f)$$

Where: r_f is the risk free rate; β_i^e is the firm’s equity beta; and $E(\pi_m) - r_f$ is the ‘equity risk premium’. For a more detailed analysis of the CAPM elements, *see* the bibliography cited *supra* in note 74. For alternative methods to calculate the return on equity in regulation, *see* BREYER (1982: 43-7).

⁷⁷ The ‘vanilla’ form of the WACC is formally expressed through the equation stated in the main text: $WACC_i = g_i \pi_i^d + (1 - g_i) \pi_i^e$. As explained in the text, this version does not contain any tax adjustment: the cost of capital is calculated over the basis of a pre-tax cost of debt and a post-tax cost of equity.

⁷⁸ In the pre-tax approach (also known as ‘tax wedge’) the post-tax cost of equity is ‘grossed up’ by the tax shield (i.e. it is multiplied by a ‘wedge’) and converted in a pre-tax cost of equity. Formally:

$$\text{pre-tax } WACC_i = g_i \pi_i^d + [(1 - g_i) \frac{r_f + \beta_i^e (E(\pi_m) - r_f)}{(1 - t_c)}]$$

Where: t_c is the corporate tax rate. The corporate tax rate use in the calculation is normally the standard marginal tax rate of the corporation tax. At the UK statutory corporate rate of 28%, the factor $1/(1 - t_c)$ is approximately equal to 1.38. The current rate and factor were used by the CC (2007 & 2008). At the former UK statutory corporate rate of 30%, the factor $1/(1 - t_c)$ is approx 1.42. This was mostly used in past calculations. However, ORR and Ofwat use the firms expected tax rate instead of the statutory rate. Despite the fact that in the short term the effective rates of firms deviate quite substantially from the statutory rate, in the long run the average effective rate should be very similar to the standard rate. Therefore, when the resulting cost of capital is applied it provides enough revenues for the investors to meet their tax liabilities.

⁷⁹ Under a post-tax approach, the pre-tax cost of debt is adjusted for the tax shield. Formally:

$$\text{post-tax } WACC_i = [g_i \pi_i^d (1 - t_c)] + [(1 - g_i) r_f + \beta_i^e (E(\pi_m) - r_f)]$$

Since interest is deducted before tax is calculated, this formula captures the tax benefits associated with gearing up. Nevertheless, two downsides make this approach inconvenient to be used in practice. First, if tax payments are being allowed for separately as a cost (i.e. the tax liabilities are being considered as part of the efficient costs of the regulated business), in parallel regulators need to establish policy on the extent of pass-through of tax – especially in presence of high levels of debt. The increase use of debt reduces the tax levels of the firm, and hence required revenues. This critique also applies to the ‘vanilla’ version of the WACC. Secondly, the interest payable on debt has already been taken into account into the taxable profit.

Theoretically both the post-tax approach can be equalised to the pre-tax approach. When the same number for the corporation tax is adopted, *ceteris paribus*, the pre-tax cost of capital translates in the post-tax cost of capital (and vice-versa) according to the following formula:

$$\text{post-tax } WACC_i = \text{pre-tax } WACC_i (1 - t_c)$$

obtain.⁸⁰ The election depends upon the preferences of the regulator and the characteristics of the industry. In the UK, some of the regulators have traditionally follows the pre-tax approach.⁸¹ In contrast, others have applied a post-tax approach or the vanilla version.⁸²

The control of the capital structure based on the effect it produces on the cost of capital is normally mentioned in the literature. From the firm perspective, the effect is related to the investors' perception of risk. Changes in risk perceptions should be reflected in the regulatory model. Within the regulatory model, risk is considered in the determination of the cost of capital through the so-called CAPM betas: asset, equity and debt betas.⁸³ Traditionally, the relation between asset betas and equity betas has led to the widespread conclusion that higher gearing necessarily leads to higher equity betas, and that the increase will be bigger the smaller the value of the corresponding debt beta.⁸⁴ This should be followed by higher expected returns on equity and hence a higher cost of capital.

⁸⁰ E.g. OFGEM (2004c: 109, para. 8.59): one of the objectives to opt for a post-tax approach to the cost of capital was 'reduce the incentives to increase gearing'.

⁸¹ This is the case of the CC (e.g. 2008 & 2007) and its predecessor Monopolies and Merger Commission (MMC): *Gas: Volume 1 of reports under the Fair Trading Act 1973 on the supply within Great Britain of gas through pipes to tariff and non-tariff customers, and the supply within Great Britain of the conveyance or storage of gas by public gas suppliers* (August 1993); and *British Gas plc: Volume 1 of reports under the Gas Act 1986 on the conveyance and storage of gas and the fixing of tariffs for the supply of gas by British Gas plc.* (August 1993) (2 complementary volumes were published as *Volume 2 of reports under the Gas and Fair Trading Acts* [September 1993], and *Volume 3 of reports under the Gas and Fair Trading Acts* [September 1993]). The same is the case for the former and current communication regulator (Ofcom and Ofcom, respectively), the mail regulator (Postcomm) and the airports regulator (Civil Aviation Authority, CAA).

⁸² Ofwat has consistently applied a post-tax approach to the cost of capital. Recently, the office of rail regulation (ORR) and the energy regulator (Ofgem) have been using a post-tax approach to the cost of capital in its 'vanilla' version. Ofgem changed its position in the price control review for the period 2005-2010 (*compare* OFGEM [2004c: para. 8.32; 2004b: para. 7.18; and 2004a] with OFGEM [1999b: para. 5.24]).

⁸³ The firm's equity beta is the only element specific to the firm. β_i^e captures the sensitivity of the firm's equity to 'systematic' risk – i.e., the risk that is common to an entire class of firms in the market. Thus, this coefficient allows assessing the relative 'riskiness' of a firm's equity when compared with the market as a whole. Technically, β_i^e is the covariance of the returns of an asset and the market dividend (i.e. the return on a well-diversified portfolio, usually the stock market as a whole) divided by the variance of the market (i.e. the variance of the return on the diversified portfolio). β_i^e includes the combined effects of both business and financial risks. Within the CAPM, an increase in the expected equity return means that β_i^e should increase linearly. However, one caveat is necessary. Changes in β_i^e can be attributed either to a change in leverage or a change in the firm's underlying 'asset beta' (β_i^a). β_i^a reflects only the business risk in the market(s) where the company operates. A firm with no debt faces no financial risk, so $\beta_i^e = \beta_i^a$. Therefore, the proposition in the text holds only if β_i^a is held constant. Despite their differences, the overall pattern of both β_i^e and β_i^a over time should be similar. For more details, see the bibliography cited *supra* in note 74.

⁸⁴ The relation between β_i^a and β_i^e is given by the following formula:

$$\beta_i^a = \beta_i^e (1 - g_i) + \beta_i^d g_i \quad \text{if } g_i \neq 0$$

Where: $(1 - g_i)$ is the proportion of net equity; β_i^d is the risk of having debt; and g_i is the level of net gearing. To simplify the calculation, $\beta_i^d = 0$ is normally assumed. However, this assumption is questionable, especially when debt accounts for a large proportion of the capital structure of a firm.

In the UK, the calculation of assets betas has been considered an alternative method to the WACC and has not being widely used by regulators. The practice is normally to assess firms' β_i^e and use them in the context of the CAPM. Yet during the price control review of the London Airports the CC used β_i^a to

Ideally, the perception of risk should be reflected in the firm's betas as accurately as possible; and the result in turn reflected in the regulatory computation of the cost of capital. That has not been the regulatory policy. As a protection against the risk of default, regulators have looked to influence the financial behaviour of firms by not only exerting control over gearing levels, but also the equity betas.⁸⁵ That is, the regulatory assumption on the gearing level has exerted a major influence in the calculation of the cost of capital *because* the increased level of gearing has *not* been matched with the estimated betas. Instead, the tendency for regulators since the late 90s has been to set the equity betas coefficients close or equal to one (see Table 2), implying that the risk of the regulated firm is equal or very similar to an average firm in the market.⁸⁶

Table 2: Equity Betas used by regulators in the UK.

Regulator	Company	Year	Equity Beta
Ofwat	Water companies	1994	0.67 – 0.75
		1999	0.7 – 0.8
		2004	1.0
ORR	Railtrack	2000	1.1 – 1.3 ⁸⁷
Ofgem	DPCR	1999	1.0
		2004	1.0
	GDPCR	2001	1.0 [†]
		2007	1.0
	TPCR	2001	1.0 [†]
2006		1.0	
MMC / CC	London Airports	1996	0.7 – 0.9
		2002	0.8 – 1.0
		2007	0.9 – 1.3 [*]
		2008	1.0 – 1.24

[†] In 2001 Transco operated as a monopoly in gas transport and distribution.

^{*} The table expresses the minimum and maximum point-estimated for *both* airports included in the report. The range for Heathrow was 0.9 – 1.15; and for Gatwick 1.0 – 1.3. See CC (2007).

determine the corresponding equity betas (CC, 2007 & 2008). The process is known as ‘ungearing and regearing betas’, which consists of removing the effect of the financial risk from equity betas (because the first and foremost factor affecting the cost of capital is just the underlying business risk). For more details on this process, see BREALEY *et al.* (2008: 541-4).

⁸⁵ The situation might become more complex in case of simultaneous failures of a number of utilities in a given sector – i.e. in case systemic risk arises. Systemic risk is found mainly in financial regulation, where is associated with the possibility of the collapse of the whole financial system caused or exacerbated by idiosyncratic events or conditions in financial intermediaries. There, regulation is implemented to reduce that risk. In public utilities regulation, the possibility of systemic risk is debated despite the fact the probabilities for that risk to occur are relatively high in many of such markets.

⁸⁶ There are no theoretical boundaries for the value of equity betas (β^e_i). A positive β^e_i will imply that the price varies in correlation with the market price. A β^e_i close to the unity implies that the firm behaves similarly to an average firm in the market and therefore the expected return on equity [$E(\pi^e_i)$] will be equal to the expected return on the market [$E(\pi_m)$]. A β^e_i hypothetically zero would mean that the price is not correlated with the market. Finally, a negative β^e_i implies that the value of the firm's equity generally decreases when the market goes up. Normally the beta coefficient is calculated using between three and five years worth of daily or weekly share prices. In regulation, however, it has been argued that different frequencies can be used for estimates of different companies (WRIGHT *et al.*, 2003: 104).

⁸⁷ ORR (2000) argued that Railtrack's betas reflected a ‘premium’ over other regulated industries due to its high level of operational gearing.

UK regulators sustain their estimation of equity beta at unity for different reasons. The main one is based upon informational constraints. It is argued that there is risk inherent to large capital investment programmes, whose long-term horizon would mean that they are constantly subject to uncertainties that would not be captured by historical measures of risk. Thus, either the lack of reliable evidence or instabilities in the estimates over the time is blamed for the greater weight given to unconditional expectations, which in turn leads to consider that utilities are of average risk. Additionally, certainty must also be taken into account. There are just a few publicly-quoted utilities on the London Stock Exchange with publicly available information.⁸⁸ Therefore, regulators should estimate a proxy of the risk faced by all of the firms based only upon the information available. This may be a difficult and demanding task, and the results are unlikely to be accurate. Finally, regulators may not want to change their estimations looking for a sustainable long-term approach – particularly during recent times of financial crisis. If the long-term estimation was that firms behave like an average firm in the market, it may be unreasonable to reduce the estimation of betas whilst the risk is increasing for other firms.

Public utilities should not be ‘assumed’ to be equal to an average firm. Their risk should be calculated according to the specific characteristics of the industry.⁸⁹ Indeed, the regulatory argument for equity betas coefficients equal to one is ‘distinctly generous’ (WRIGHT *et al.*, 2006: 14). There are various reasons for this. First, certainly the different characteristics of the regulatory regime must be taken into account, because they importantly influence the beta estimations. The evidence indicates that, in principle, betas should be higher under PCR than under a ‘cost of service’ (CoS) ratemaking scheme – i.e. investors bear the greatest non-diversifiable risk in PCR (ALEXANDER *et al.*, 2000; 1999; 1996), whilst CoS regulation immunizes shareholders from shocks to long-term cash flows (GUTHRIE, 2006). However, the literature also points out that despite their theoretical differences, in practice CoS schemes and PCR tend to be similar (e.g. KESSIDES, 2004; GROUT, 1995; BAUMOL, 1967). The key differences lie mostly in the level of cost pass-through and how fast changes are reflected in the regulated price (which in turn is normally a function of the length of time that elapses between price reviews).⁹⁰ In the US, under a CoS scheme, equity betas are very low, having an average of 0.2 in the case of electricity, gas and water utilities and 0.5 in telecoms (GROUT, 1995; ALEXANDER *et al.*, 1999). Considering the practical similarities between both regulatory regimes, it is at least hard to justify the doubling of betas made by the UK regulators.

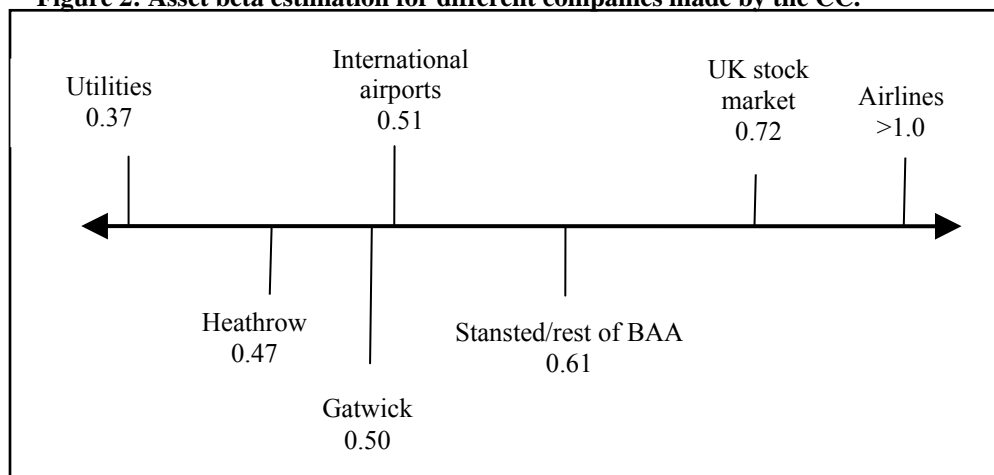
⁸⁸ For instance, this claim has been made by OFGEM (2008: 93, para. 5.7). Amongst the companies listed are Severn Trent, United Utilities, Northumbrian, BT, NG, Pennon and Scottish & Southern.

⁸⁹ For instance, in electricity, transmission would be a lower risk activity than distribution. Nonetheless, OFGEM (2006) has stated that the evidence is not sufficiently robust to quantify these differences accurately.

⁹⁰ Under ‘cost of service’ regulation, investors only bear the consequences of shocks *until* the next regulatory revision of prices. In contrast, under PCR investors only bear the consequences of shocks *after* the regulatory control. Hence the frequency of the price reviews (or the possibility to pass on the costs to consumers) is crucial. More frequent revisions under a ‘cost of service’ scheme will led to less risk and to a decrease in the cost of capital (BRENNAN & SCHWARTZ, 1982). More frequent revisions or more pass through (e.g., via ‘claw-backs’ or ‘re-openers’) under PCR will led to more risk and an increase in the cost of capital (EVANS & GUTHRIE, 2006).

In addition, there is mounting evidence that betas should decrease. Rather old estimations made by GROUT (1995) indicate that the level of betas should be in the bottom half of the distribution, ranging between 0 and 1, with the lowest betas appearing in the water sector. Likewise, ALEXANDER *et al.* (1999) estimated average betas of 0.6 for electricity, 0.84 for gas and 0.67 for water. It is unlikely that these estimations have severely changed in recent times. Indeed, recent evidence by WRIGHT *et al.* (2006) confirms that an estimation of 0.5 is a better measure of equity betas for long-term utilities.⁹¹ Similarly, JENKINSON (2006) has argued that equity betas above 0.4 are hard to justify. Given their captive base of customers and regulated tariffs, the revenues of utilities vary hardly with the general state of the economy. In addition, most of the risk associated with large capital programmes would be diversifiable. JENKINSON's estimation seems to be supported by recent calculation made by the ORR (2008) and by the CC (2008).⁹² As Figure 2 indicates, utilities' asset betas are low compared to airports and well below the risk an investor faces in the UK stock market.

Figure 2: Asset beta estimation for different companies made by the CC.



Source: CC (2008)

The evidence not only shows that betas should decrease. Also, there is strong evidence pointing in the opposite direction to the traditional relation between asset and equity betas assumed by regulators. That is, there would be a *negative* relationship between betas and gearing: in utilities, higher levels of gearing would be associated with *lower* equity betas and therefore lower asset betas.⁹³ The explanation may lie in the own

⁹¹ The estimation, however, present a wide confidence interval. Recently Ofwat has recognised that equity betas in the water sector are very low compare with market and historical trends (OFWAT, 2007: 46).

⁹² Importantly, the ORR (2008: 230, para. 14.17) has recognised that there is 'strong evidence that Network Rails' risk profile is below that of the airports and is similar to the energy and water sectors. We are providing Network Rail with some very significant protections against risk, particularly related to its capital investment programme. It also faces very little volatility in revenues. The majority of its income is fixed for the five tear control period'.

⁹³ The evidence is presented by WRIGHT *et al.* (2006). Their evidence is compatible with that of MARSTON & PERRY (1996) for US firms. By the same token, the CC has stated that does not accept the argument that higher levels of gearing produce a higher cost of capital (CC, 2007: F23, para. 90).

regulators' behaviour: their control over the capital structure may be producing a decrease in the underlying asset betas.⁹⁴

Moreover, UK utilities face low political risk and few problems arising from lack of regulatory commitment.⁹⁵ Indeed, some actions taken and decisions adopted by regulators have increased the risk perceived by investors.⁹⁶ However, the evolution of the regulatory framework has largely contributed to a decrease in the perception of risk – in particular the risk of financial distress.⁹⁷ Despite the fact that there is always some level of remaining risk, a number of measures to prevent potential situations of financial distress (either individual or systemic) has been incorporated.⁹⁸ Considering these measures embedded in the regime, it is at least hard to argue (as regulators do) that utilities' risk co-varies with the market.

First, a wide range of information on the financial health of regulated firms is available to regulators. On the one hand, there are a number of market indicators of financial distress they monitor on a regular basis – e.g., share prices and credit ratings. On the other hand, regulators collect information about the firms from a number of different sources, including cost and revenue reporting arrangements and annual visits to the companies' premises in order to follow up on the reporting submissions. Regulators normally use that information to observe firms' performance against their price controls. They also collect information on the network companies' Capex and monitor changes in that expenditure to ensure the interests of consumers are safeguarded against under-investment.

Secondly, regulators can adopt *ad-hoc* measures in case of deterioration of the financial conditions of the firm. For instance, in setting the current transmission price for the four gas and electricity transmission companies, Ofgem included a mechanism according to which if a firm's investment falls below 20% of its Capex allowance at any stage in the five-year control period it will trigger an automatic review of that

⁹⁴ Similarly, WRIGHT *et al.* (2006: 63): 'Paradoxically, the attempt by the regulator to limit the "dash for debt" may actually have sped up the process'. This fact provides an additional support for the stated view that, under regulation, changes in capital structures are influenced by regulators' behaviour: by itself the regulatory control has influenced the changes in the capital structures of regulated firms.

⁹⁵ See HILL & ABDALA, (1996: 203 *et seq.*): 'A credible and stable regulatory environment reduces the risk attached to investment and reduces the expected rate of return that private investors would require to induce them to participate'; and COWAN (2001), who indicates that the UK is 'relatively fortunate' in having an institutional endowment sufficiently strong that diminished the risk of underinvestment. The literature on commitment and policy risk in general is vast. Amongst many others, see generally GÓMEZ-IBÁÑEZ (2003), NEWBERY (1999), and LEVY & SPILLER (1996).

⁹⁶ An example occurred in railways. After privatization, the Labour party threatened to renationalise the railways, which increased the regulatory risk.

⁹⁷ The fact that utilities were a low-risk business was already acknowledged shortly after BT's privatisation – the first utility privatised in the UK. As FOSTER (1992: 213) recounts, when in 1986 the then director of the telecoms' regulator (OfTel, currently Ofcom) approved BT's proposed price increases, he warned that when he renegotiated the X-factor in 1989 (as he was required to do so by the licence) he would have in mind what rate of return BT was earning. 'He said he felt that he had no choice, given its low level of risk'. See also OFTEL (1986b: 9).

⁹⁸ For a summary of these measures in the electricity sector, see OFGEM (2008a). Additionally, as CEPA (2009: 23) points out, other mechanisms within the price control that reduce uncertainty are not incorporated in the assessment of risk, which normally remains unchanged between the initial and final regulatory proposals for the cost of capital.

company's allowance (OFGEM 2006: paras. 7.13 *et seq.*).⁹⁹ Also, Network Rail has been recently provided by the regulator with a 'risk buffer' of £1bn. over 5 years, with the explicit purpose of managing risk within the regulatory settlement (ORR, 2008). The company has discretion over the use of this fund.¹⁰⁰

Thirdly, there are a number of existing substantive measures specially designed to address a case of financial distress. A good example is the so-called 'ring-fencing licence conditions'. These are several provisions whose purpose is primarily to ensure that assets, cash flows and other financial resources of regulated firms are applied to the needs of the network and are not diverted to any other purposes nor exposed to any unrelated risks. Likewise, they allow the regulator to get access to the information in order to monitor the financial position of the firms, have early warning of severe deterioration and being able to take effective action in the event of a breach. Certainly, as it has been recognised by regulators, the financial health of a firm may deteriorate too quickly for the ring-fence conditions to be effective. But in addition regulators count with general enforcement powers to deal with a broad range of circumstances.

Ultimately, the provisions for special administration are particularly important.¹⁰¹ These provisions apply to insolvent network firms, replacing traditional insolvency proceedings.¹⁰² Under this special regime, an administrator is appointed primarily to fulfil the regulatory obligations of the insolvent firm – i.e. the administrator is tasked with continuing to develop and maintain the network.¹⁰³ For the purpose of achieving that objective, during administration a number of special measures may be implemented. For instance, licence conditions may be modified to secure funding, and the Secretary of State may even provide loans and grants, guarantees or indemnities to the failed firm. Also, if there are outstanding costs from the administration process, they are recovered from other licensees and passed on to consumers. The special administration ends only when either the licensee is 'rescued as a going concern' or its

⁹⁹ The four companies are National Grid Electricity Transmission (NGET); National Grid Gas NTS (National Transmission System); Scottish Power Transmission Limited (SPTL); and Scottish Hydro-Electric Transmission Limited (SHETL). The mechanism is called 'Capital Expenditure Safety Net'.

¹⁰⁰ ORR (2008: 235, para. 14.43) has even argued that although it increased the protections against risk, it is 'taking a cautious approach by not reducing the risk buffer to take account of those further protections'.

¹⁰¹ Special administration regimes are set out in Part 3, Chapter 3, sections 154-159 of the Energy Act (2004), for gas and electricity companies; in Part II, chapter III, sections 23-25, and schedule 3 of the Water Industry Act (1991), for water companies; and in sections 59-65 of the Railways Act (1993). Administrative complementary rules and some sections of the Insolvency Act 1996 may apply, depending on the sector. There is no such a special administration regime for airports (only for air traffic service licence companies), but the common company law provisions apply.

¹⁰² The statute law on winding up companies is contained principally in the Insolvency Act 1986.

¹⁰³ This is the essential difference with the function of a liquidator or a receiver, whose principal responsibility is to sell enough assets to pay off the firm's debts. In the special administration regime, the administrator manages the assets. At issue is not only the assurance of continuity of supply. There is also an economic underlying reason: many of the firm's assets are specific and hence cannot be redeployed in alternatives uses.

assets are transferred to another party.¹⁰⁴ In this process, the interests of shareholders and creditors are secondary: the principal focus is on rescuing the firm in distress.¹⁰⁵

These measures are strong. When combined, they mitigate the potential impact of failures in the system. They certainly do not dissipate the risk of distress completely. Some of them are actions that regulators can only adopt after a firm fails, and therefore provide little guidance on what could happen when the finance becomes an issue between price controls. Also, they do not allow to anticipate a possible situation of systemic risk.¹⁰⁶ Indeed, some risks faced by utilities are also potentially catastrophic and may damage the economic instability of the whole system and therefore should be taken into account.¹⁰⁷ But when considered together, all the measures allow to reassure investors (creditors and also shareholders) that the risk of losing their investment has been kept to minimum levels.

On top of this, in the UK there is no clear commitment not to bailout firms – in fact, the situation seems to be exactly the opposite. Although bailouts are in principle discarded for inefficient companies, regulators have been unable fully to commit against State financial aid in case of failed utilities.¹⁰⁸ Each case is likely to be considered on its own merits, which opens the door to firm-specific bargaining. This lack of commitment seems to imply that the government will certainly intervene bailing out utilities – at least in extreme cases. As in many other countries, the government not only have the ability to absorb the insolvency risk, but also the willingness to do it so.

Moreover, the regulatory framework openly provides a sort of ‘institutionalised’ alternatives to bail out utilities. There is an option for firms to apply for the ‘disapplication’ of their revenue restrictions or even ‘reopen’ the settlement.¹⁰⁹ The latter possibility arises when some exceptional circumstances in which the revenue stream set in the price control ceases to provide sufficient funds for the regulated firm.

¹⁰⁴ *E.g.* Section 155(2) of the Energy Act 2004.

¹⁰⁵ *E.g.* Section 158(3) of the Energy Act 2004 states that the administrator must exercise and perform his powers and duties in the manner that best protect the interests of the creditors of the company, but only so far as they are consistent with the objective of the energy administration.

¹⁰⁶ Calls for bail-outs increase in times of general financial crises, mainly due to three effects. Financial crises rise in the cost of funding projects; induce pressures to cut prices; and scaling back expectations of future demand.

¹⁰⁷ As HOOD *et al.* (2001: 178) indicate, ‘Government central *raison d’être* is indeed often held to include ‘system risk’ roles such as risk-taker of last resort and the regulation of collective or public risk [...]’. However, so far regulators have not been keen to include systemic failure in their price-cap calculations and offset it. This is to some extent comprehensible, since that position would imply the recognition that most of the risk of financial distress is borne by customers.

¹⁰⁸ Regulators normally stress that the risk of financial failure must be borne by the firms, not consumers – especially when it arises from firm’s action or inaction. Nonetheless, the message is contradictory. *E.g.* OFWAT & OFGEM (2006: 27, para. 80) paradoxically have noted that ‘[...] it is not possible to rule out the possibility that a regulator may be asked by the Special Administrator to consider a case for re-opening price limits’, although ‘in making any changes to price limits, regulators will want to ensure that it is investors not consumers that would be expected to bear the costs arising from inefficiency’. OFGEM (2008c: 13, para. 2.31) expresses in similar sense.

¹⁰⁹ In some cases the re-opener provisions are unlikely to be of use in *relieving* financial distress, because they tend to be related to the occurrence of specific events. A disapplication request enables control parameters to be reset for a broader range of reasons than those determined by specific reopener provisions and hence is more likely to be applied.

In such cases, the ‘reopener’ allows to re-set revenue allowances or the parameters that give rise to those allowances. This is a measure that has been used by regulators. For instance, Ofgem has made provision for price control re-openers in each of its current price controls that relate to specific events.¹¹⁰ In water, there is the so-called ‘shipwreck clause’ or ‘substantial effects’ provision, whereby firms may ask for a revision of their so-called ‘K factors’ of the price-cap formula where facing adverse and unavoidable circumstances. Recently, ORR (2008) has also issued provisions regarding the events that may trigger a re-opener.

All of the above contributes to the perception of low-risk amongst investors and leads to conclude that, contrary to the traditional perception, in the UK utilities face very low levels of risk. Ultimately, it seems like the State holds most of the financial risks of almost all types of failures for public utilities.¹¹¹ The State acts as a guarantor of insolvency risk and that undeniable fact should be explicitly recognised within regulatory models. Nonetheless, it does not necessarily follow from this idea that regulators should exert control over the firms’ capital structures. For the regulatory approach to be justified, its reasons should be legitimate – i.e. it should be based on the grounds of practicability and regulatory duties. This legitimate reason is analysed in the next part: regulatory control over the firms’ capital structures will be justified *only if* the cost of capital has an influence on the final price paid by consumers.

4.2 Focusing on the consumer-firm relation

The option for a specific capital structure has also an important effect in the final price paid by consumers. The reason is the cost of capital has become a central component of the periodic price controls, even under PCR.¹¹² It has been transformed into a key element for the determination of the regulated price – even against the expectations of those who introduced PCR in the UK.¹¹³ Since the aim of the regulatory approach

¹¹⁰ See e.g. OFGEM (2004c & 2007a).

¹¹¹ This certainly includes debtholders, but also shareholders. The railways case provides a good example. After the collapse of Railtrack, the company that used to manage the rail infrastructure, initially shareholders did not receive any compensation for their investments, nor did they receive any promise of payment. Nonetheless, the operating arm of Railtrack (along with its £7 billion debt) was finally sold in £500 million. Railtrack’s parent company was subjected to members’ voluntary liquidation as ‘RT Group plc’ and some other assets of the group were also sold. Since then, shareholders have received some reimbursements: since 2003, the group has made 5 payments. As reported by EHRHARDT & IRWIN (2004), all of this equates to between £2.52 and £2.60 per share, compared to the market value of £2.80 per share when trading was suspended in 2001. Despite the evidence, some commentators have incorrectly ruled out the relevance of the railways debate in other sectors, due to its continuous reliance on large amount of State subsidies to finance its activities (e.g. OFWAT & OFGEM, 2006: 27, para. 81; CURRIE, 2003). However, that fact in itself does not rule out the possibility of intervention in other sectors.

¹¹² This is the case in both the UK and the US, even though the role of the cost of capital differs in the regulatory system implemented in each country. Under the ‘cost of service’ regime implemented in the US, the rate of return allowed to the firm tends to be equalised to the cost of capital. Rather differently, under PCR the cost of capital should simply be one more element of the calculation of the cap. Nonetheless, in practice regulators in the UK give strong weight to the cost of capital. In accordance, under both schemes the cost of capital has become a key factor in the price-setting process.

¹¹³ The expectation was that the X-factor would be mainly technologically-driven, with the return for investors affected, but not determined, by the regulatory framework (LITTLECHILD, 1983). Nonetheless, the importance of the rate of return was soon recognised by regulators (see e.g. OFTEL 1985, 1986a, 1987a, 1987b, 1988, 1991, 1992a and 1992b). A detailed account of how ‘it looked as if [the regulator] was undermining the spirit of RPI-X and reintroducing rate-of-return regulation by the

must be focused upon consumers, regulators have incentives to exert endogenous control over the capital structure, exactly as investors may do when they attempt to maximise the return on their assets (DE FRAJA & STONES, 2004). That is, if gearing is efficiency enhancing, those benefits should be captured for consumers.¹¹⁴

Such an approach may also be justified in terms of practicality. Since privatisation is a relatively recent process, information about firms is relatively scarce. Hence the use of real debt/equity ratios (i.e. measured from the firm's book values) seems useless, forcing regulators to still rely heavily upon an average cost of capital under notional debt-equity ratios.¹¹⁵ A different approach would require either time to collect more information (therefore, more intrusive regulation) or the substitution of the WACC.

In contrast, JENKINSON (2006) has argued that the capital structure should not be controlled by regulators. His departure point is that the gearing assumption has had little impact on the outcome for the overall WACC, mainly due to an inconsistent application of the CAPM method made by regulators.¹¹⁶ Accordingly, regulators would not be better placed than firms to decide about the financial structure. Incentives for an optimal structure would exist along with an appropriate setting of the cost of capital and the existence of periodic reviews on the out-turn capital structure. If the cost of capital is set at a reasonable level – Jenkinson argues – financing should be available, investors will indeed commit capital and there is no need to decide upon an optimal level of gearing. Accordingly, regulators should avoid being 'too prescriptive' about financial structures and adopt a *laissez faire* approach instead, leaving the choice of capital structure to the management of the firm.

There is a first reason (although rather weak) to reject that argument. To some extent it seems naïve in the current context to plead for the adoption of a *laissez faire* approach. Regulatory financial modelling carried out during price control reviews is now fully committed to the use of assumed levels of gearing. There are no signs of change and,

back door' can be found in FOSTER (1992: 213 *et seq.*). See also OFGAS (1991) and OFWAT (1991). Even LITTLECHILD (largely considered the architect of PCR in the UK) conceded later that the rate of return was implied in the calculation of the X-factor (LITTLECHILD, 1986).

¹¹⁴ The CC has recently confirm this position: 'It might be in consumers' interest that a positive adjustment to [the regulated price] be made, for example if this were required to avoid an increase to [the firm]'s cost of capital' (CC: *Sutton and East Surrey Water plc: Interim Price Determination* [17 June 2009], at 78, para. 4.94). The protection of the interests of the consumers is a central statutory duty established for all regulators. Its importance has been confirmed by the case-law. *E.g.*, Competition Appeal Tribunal: *T-Mobile (UK) Limited, British Telecommunications Plc, Hutchison 3G UK Limited, Cable & Wireless UK & Ors, Vodafone Limited, Orange Personal Communications Services Limited v Office of Communications* (20 May 2008), Case Numbers 1089/3/3/07, 1090/3/3/07, 1091/3/3/07, 1092/3/3/07, [2008] CAT 12, 2008 WL 2033546, at 98: "In any event, the lack of pass through is relevant only to the question of whether the proposed prices had an adverse effect on end-users...".

¹¹⁵ Such an assumption contrasts sharply with the situation in the US. Indeed, given the long-established nature of most regulated firms, US regulators determine the allowed rate of return taking the debt/equity ratio of the regulated firm as given. The relatively large amount of information allows them to calculate the WACC measured according to the firm's book value.

¹¹⁶ He argues that this lack of significant impact particularly occurred in the 2004 price reviews of water and electricity distribution. The reason would have been the 'loose' application of the CAPM made by regulators, meaning that the latter have not correctly reflected the risk in the model (as was shown in the previous section).

in fact, more regulators are adopting that approach.¹¹⁷ Nonetheless, this still leaves open the question whether this is justified. However, JENKINSON does not fully address this question. He only states that the capital structure has a small impact in the WACC *because of* regulatory inconsistencies. Even if this were true, what would happen if the CAPM were consistently applied? Relying upon the traditional financial approach and the Modigliani-Miller (1958) model, JENKINSON seems to imply that using a pre- or post-tax approach would be irrelevant if gearing levels are matched with the corresponding adjustment of the risk level within the model – more gearing implies higher betas.¹¹⁸ However, that relation is at least doubtful in light of evidence showing a negative relation between risk and high gearing. Hence even if the CAPM were set consistently by the regulators, there may still be reasons to justify the regulatory control of the capital structure because the capital structure affects the WACC (and, once again, the final price paid by consumers).

The task remains how to develop a stronger and more open link between the risks involved within the regulatory context and the outcome of the regulatory review. As seen, regulators have not incorporated that link in their models. ARMSTRONG *et al.* (1994) have argued that the correct way to model risk is to see it as a factor that lowers expected future cash flows, thus reducing expected profitability without altering the cost of capital *per se*. The basis of their argument is that regulatory risk is firm-specific and should be diversifiable.¹¹⁹ They recognise, however, that if regulators applied this model, they would be recognising that there is a possibility of future expropriation.¹²⁰ That is a convincing argument. Nevertheless, the possibility that regulatory decisions on prices can affect the cost of capital, whilst still recognising the risk more openly, has also been explored. The main insights are that consumers do not necessarily have an aversion to price risk and hence prices can and should be subjected to more variations.¹²¹ As STONES (2007: 147) explains,

[B]y manipulating consumer prices, the regulator can change the distribution of risks between consumers and shareholders and arrange for shareholders' returns to be positively correlated, uncorrelated, or even negatively correlated with the market return. The last possibility would provide shareholders with a form of insurance against market risk, and thus the cost of equity would be lower than the cost of debt.

This result can be linked to the control of the capital structures of the firms. As seen, highly geared capital structures have the potential to deliver consumer benefits by

¹¹⁷ Before the last price controls, the CC (and its predecessor the MMC) used to set airports' cost of capital over the basis of actual gearing. However, it changed its position and decided to use notional levels gearing for Heathrow and Gatwick (CC, 2007: Annex F, F7, para. 24) and Stansted (CC, 2008: 92, paras. 11.11 *et seq.*). The argument was linked to financeability (*see supra*, section III(A)).

¹¹⁸ *See supra*, note 83 and accompanying text. JENKINSON explains that when regulators use a pre-tax approach, they do not need to assume a targeted level of gearing, because the capital structure only reflects on the betas. On the contrary, the capital structure may matter when using a post-tax approach, but only because regulators do not correctly reflect the risk on the CAPM. Therefore, high gearing *always* reduces the cost of capital, since the underlying asset beta is lower.

¹¹⁹ In terms of the CAPM, any regulatory action that has an effect that can be diversified does not contribute to the risk.

¹²⁰ It has also been argued that the risk should be confined only to political risk, not regulatory risk. If the cost of capital represents the *expected* rate of return, then regulatory risks should not have any effect on it.

¹²¹ Note that this approach may be undermined by independent actions of intermediaries – for example, by actions taken by suppliers.

reducing the cost of capital and hence the price paid by consumers. Nonetheless, more debt also introduces price volatility. The regulatory task becomes to trade-off the costs of price uncertainty against the benefit of price reductions associated with more debt.¹²² Too much debt implies too much variability in the prices paid by consumers. Therefore, debt-only firms are not optimal, and the socially optimal capital structure always leaves some price uncertainty.¹²³ The outcome depends upon the economic conditions. Specifically, prices should increase in presence of adverse economic conditions and negative shocks (COWAN, 2003; STONES, 2007). Therefore, both firms and consumers should absorb the price variability, with the attitudes of both groups to risk determining how the price should move.¹²⁴

5. Concluding Remarks

The aim of this work has been to analyse whether there is a reason for regulators to control the capital structures of the utilities firms. In that regard, it has provided an assessment of the evolution of the capital structure in the UK utilities industries and the main reasons that explain the current trend toward high levels of debt. Whilst the reasons remain mostly unclear, the revision illustrates that in presence of regulation the specific features of the regulatory regime must be taken into account. It is also shown that various concerns underlying the current regulatory approach towards the capital structure are unfounded. Crucially, the economic benefits of PCR are not undermined because of the change in the capital structures of the firms. Contrary to what has been argued by some commentators, incentive-based regulation does not seem to be necessarily incompatible with high levels of debt.

The main lesson arising from this revision is that there is still a need for regulators to control the capital structure of regulated utilities. The capital structure affects the distribution of risk between firms and consumers and ultimately the prices paid by the latter. The need for a more open link between risk and the regulatory outcome has been highlighted. Regulation should be the result of trading-off price variability and uncertainty. The result of a risk-sharing approach would be a more flexible system capable to adapt to changing financial and economic circumstances. How to increase flexibility without losing either consistency or the incentive-based characteristics of PCR is the key for reforming current regulatory frameworks.

¹²² COWAN (2003) notes that there are a number of ways in which consumers and firms can share risks without regulatory intervention – *e.g.* customers buying shares in the utilities. However, he also points out that for this to be applicable shareholding should be implausibly large.

¹²³ See DE FRAJA & STONES (2004) (modelling the ideas presented in the main text).

¹²⁴ See STONES (2007), who shows that the less price variability should not necessarily lower the return for investors.

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